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WEED CONTROL RESULTS  
Mark VanGessel, Mark Isaacs, Quintin Johnson, Barbara Scott

The purpose of this report is to present results and details of many of the 2019 weed control field trials conducted by Cooperative Extension at the University of Delaware. Results are summarized from data obtained at the Georgetown Research and Education Center and other test locations throughout the state. These results, as well as results from previous years back to 2002, are available at the UD Weed Science web site; <http://extension.udel.edu/ag/weed-science/>.

The results obtained and any conclusions stated are not published herein as recommended practices. The data in this report are especially intended for use by cooperators, commercial field workers, county agents, agricultural teachers, and researchers. They will also be of value to growers who are interested in following closely the development of new herbicides and weed control systems.

Treatments are listed by trade names to facilitate reading by non-technical people. No discrimination is intended and no endorsement is implied by the University of Delaware. Chemical index is cross-referenced by common and trade names.

Many of the chemicals listed are actually a combination of two or more herbicides. Where this is the case, the name of the combination is usually followed by the word "Premix". The common names of the herbicides in that premix are listed in the Index of Chemicals at the front of this document. In addition, the name of the combination is often followed by the herbicides that make up that combination. For example, Bicep II Magnum is a combination of s-metolachlor and atrazine, so Bicep II Magnum will be listed as such:

Bicep II Magnum Premix	5.5 L	2.2 lb ai/A
---s-metolachlor	2.4	0.96
---atrazine	3.1	1.24

This quickly illustrates that Bicep II Magnum (5.5 L lb a.i./gal) contains 2.4 lb a.i./gal of s-metolachlor and 3.1 lb a.i./gal of atrazine, and that Bicep II Magnum applied at a rate of 2.2 lb a.i./A is equivalent to an application of s-metolachlor at 0.96 lb a.i./A and atrazine at 1.24 lb a.i./A.

When analyzing the information in this report, we strongly urge you to read carefully the site description section of each study. We trust you will find the information in this report useful and accurate.

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Corteva	Penn State – Dwight Lingenfelter
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Delaware Department of Agriculture	PictSweet
Delaware Soybean Board	Rutgers University
FMC Corp.	Seabrook Brothers & Sons
Freo	Southern States Seed
Furmano	Syngenta
Gowan	Syngenta Seeds
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## WEED INDEX

<u>Common Name</u>	<u>WSSA Code</u>	<u>Scientific Name</u>	<u>First Page of Trial</u>
Amaranth, Palmer	AMAPA	<i>Amaranthus palmeri</i> S.Wats.	Corn1, 2, 3, 4, 5, 6, 1a, 13, 21, SCRN1, 2, 3, Milo1, 4, Cover8, DSB1, 1b, 2, Soy3, 4, 7, 10, 11, 13a, 14, 16, 16a, 18, 20, Bean1, 4, 5, 6, SwPot1, Tom1, 2, Veg3a
Carpetweed	MOLVE	<i>Mollugo verticillata</i> L.	Soy5b, 10, Bean4, SwPot1, Veg3a
Chamomile, Mayweed	ANTCO	<i>Anthemis cotula</i> L.	SG3, 4
Chickweed, Common	STEME	<i>Stellaria media</i> (L.) Vill./cyr.	Cover12, SG3
Chickweed, Jagged	HLOUM	<i>Holosteum umbellatum</i> L.	SG3, 5, 8
Chickweed, Mousear	CERVU	<i>Cerastium vulgatum</i> L.	Cover12, SG1, 2, 3
Cocklebur, Common	XANST	<i>Xanthium strumarium</i> L.	Bean4
Crabgrass, Large	DIGSA	<i>Digitaria sanguinalis</i> (L.) Scop.	Corn4, 5, 13, SCRN1, 2, Soy5b, 7, 11, 14, 16, 16a
E.primrose, Cutleaf	OEOLA	<i>Oenothera laciniata</i> Hill	Cover12, SG3, 5, 8, Soy2, 12, Brndwn1
Foxtail, Giant	SETFA	<i>Setaria faberi</i> Herm.	Corn5, Soy4, 17
Goosegrass	ELEIN	<i>Eleusine indica</i> (L.) Gaertn.	Soy10, 21
Grass, Annual	GGGAN		Corn1, 9b, 10a, 13, 21, DSB2, Soy5b, 14, Bean4, 5
Henbit	LAMAM	<i>Lamium amplexicaule</i> L.	SG1, 2, 3, 5, 8
Horsenettle	SOLCA	<i>Solanum carolinense</i> L.	Cover8, Soy16
Horseweed	ERICA	<i>Erigeron canadensis</i> L.	Soy5b, 12, Brndwn1
Jimsonweed	DATST	<i>Datura stramonium</i> L.	Soy11
Knawel	SCRAN	<i>Scleranthus annuus</i> L.	SG3, 4, 5, 8
Lambsquarters, Cmn.	CHEAL	<i>Chenopodium album</i> L.	Soy7

<u>Common Name</u>	<u>WSSA Code</u>	<u>Scientific Name</u>	<u>First Page of Trial</u>
Morningglory Species	IPOSS	Ipomoea ssp.	Corn1, 2, 3, 4, 6, 10a, 13, 21, SCRN1, 2, 3, Milo4, Cover8, DSB2, Soy3, 4, 5b, 7, 10, 11, 13a, 14, 16, 16a, 17, 18, 20, Bean1, 4, SwPot1, Tom1, 2, Veg3a
Nightshade, E. Black	SOLPT	Solanum ptychanthum Dunal	Tom1, 2
Nutsedge, Yellow	CYPES	Cyperus esculentus L.	Corn5
Panicum, Fall	PANDI	Panicum dichotomiflorum (L.) Michx.	Corn1, 2, 3, 4, 6, 10a, 13, 23, SCRN1, 2, 3, Soy10, 11, 13a, 16a, 21, Bean1
Pansy, Field	VIORA	Viola rafinesquii Greene	Cover12, SG1, 2, 3, 4, 5, 8, Soy5b, 12, Brndwn1
Pigweed, Smooth	AMACH	Amaranthus hybridus L.	Corn9b, Cover8, Soy5b
Ragweed, Common	AMBEL	Ambrosia elatior L.	Corn1, Cover8, Soy15, 25a
Sida, Prickly	SIDSP	Sida spinosa L.	Corn5, Soy5b
Speedwell, Ivyleaf	VERHE	Veronica hederifolia L.	SG1

## CHEMICAL INDEX

<u>Trade Name</u>	<u>Common Name</u>	<u>Trial</u>
A22668 Premix	"experimental"	Corn2
Accent Q	nicosulfuron	Corn4
Acuron Flexi Premix	bicyclopyrone + mesotrione + s-metolachlor	Corn2, Corn4, Corn5, Milo3
Acuron Premix	atrazine + bicyclopyrone + mesotrione + s-metolachlor	Corn2, Corn4, Corn 5, Milo3
Aim	carfentrazone	SG3
Alite 27	isoxaflutole	Soy14
Anthem Flexx Premix	pyroxasulfone + carfentrazone	Corn1, Corn2, Corn3, Corn5, Soy13a, SG1, SG3
Anthem Maxx Premix	pyroxasulfone + fluthiacet	Corn1, Soy13a, Soy17
Armezon / Impact	topramezone	Corn1, SCRN1, SCRN3
Assure II	quizalofop	Corn22
Atrazine	atrazine	Corn1, Corn2, Corn5, Corn6, Corn9b, Corn10a, Corn13, Corn21, Milo1, Milo3, SCRN1, SCRN2, SCRN3, Cover1
Authority Elite / BroadAxe	sulfentrazone + s-metolachlor	DSB1, Soy5b, Soy13, Soy14, Soy17, Soy19
Authority First Premix	sulfentrazone + cloransulam	Soy5b, Soy14
Authority MTZ Premix	sulfentrazone + metribuzin	Soy5b, Soy11, Cover12
Authority Supreme Premix	sulfentrazone + pyroxasulfone	Soy5b, Soy17
Avenger AG	d-limonene	Veg3a
Avenger AG Optima	d-limonene	Veg3a
Axial XL	pinoxaden	SG4
Axiom Premix	flufenacet + metribuzin	SG1, SG3, SG5
Balance Flexx	isoxaflutole	Corn5, Corn6
BAS 872UAH	"experimental"	Soy13a
Basagran	bentazon	Bean1, Milo1, SCRN1

<u>Trade Name</u>	<u>Common Name</u>	<u>Trial</u>
Basis Blend Premix	rimsulfuron + thifensulfuron	Soy7
BCP1312	"experimental"	Corn21
Bicep II Magnum Premix	s-metolachlor + atrazine	Corn5, Corn9b, Corn10a, Corn13, Corn21, Milo3
Boundary Premix	s-metolachlor + metribuzin	Soy5b, Soy6a, Soy13a, Soy14, Soy17
BroadAxe / Authority Elite	sulfentrazone + s-metolachlor	DSB1, Soy5b, Soy13a, Soy14, Soy17, Soy19a, Soy19b
Buctril	bromoxynil	Milo 1
Cadet	fluthiacet	SCRN1
Callisto	mesotrione	Corn1, Corn2, Corn3, Corn5, Corn10a, Corn13, Corn21, Milo4, SCRN2, SCRN3
Canopy EX Premix	chlorimuron + tribenuron	Cover12
Canopy Premix	chlorimuron + metribuzin	Soy4, Soy5b, Soy6a, Soy10
Capreno Premix	tembotrione + thiencarbazone + isoxadifen	Corn1, Corn5, Corn6
Clarity	dicamba	Milo1, Cover12
Cobra	lactofen	DSB1, Soy8, Soy15, Soy16a, Bean1
Collide	oxyfluorfen	Bean1
Command	clomazone	Soy25, Cole1, SwPot1
Corvus Premix	thiencarbazone + isoxaflutole	Corn5, Corn6
Curbit	ethalfluralin	Pmpkn4, Pmpkn5
Degree Xtra Premix	acetochlor + atrazine	Corn5
Devrinol 2-XT	napropamide	SwPot1, Tom1, Tom2
DiFlexx	dicamba	Corn5, Milo1
DiFlexx Duo Premix	dicamba + tembotrione	Corn1, Corn5, Corn6
Dimetric EXT	metribuzin	SG1, SG3, SG5, SG8
Dual II Magnum	s-metolachlor	Corn2, Corn3, Milo3, Milo4, SCRN1, SCRN2, SCRN3

<u>Trade Name</u>	<u>Common Name</u>	<u>Trial</u>
Dual Magnum	s-metolachlor	Soy14, Soy17, Soy18, Soy19, Bean1, Cole1, Melon1, Pmpkn4, Pmpkn5, SwPot1
Elevore	halauxifen	Soy12, SG8
Engenia	dicamba	DSB1, DSB1b, Soy12, Soy13a, Soy15, Soy16a, Soy17, Milo4
Engenia Pro Premix	dicamba + pyroxasulfone	Soy13a
Enlist Duo Premix	2,4-D choline + glyphosate	DSB1, Soy20
Enlist One	2,4-D choline	DSB2, Corn22
ET	pyraflufen	Soy2
Facet L	quinclorac	Milo1
Fierce Premix	pyroxasulfone + flumioxazin	Soy5b, Soy16a, Soy17
Fierce EZ Premix	pyroxasulfone + flumioxazin	Soy10, Soy11
Fierce MTZ Premix	pyroxasulfone + flumioxazin + metribuzin	Soy5b, Soy10, Soy11
Fierce XLT Premix	pyroxasulfone + flumioxazin + chlorimuron	Soy5b
Finesse Premix	chlorsulfuron + metsulfuron	SG3
FirstRate	cloransulam	DSB2, Soy18
Flexstar	fomesafen	Soy13a
Flexstar GT Premix	fomesafen + glyphosate	DSB1, Soy8
Glory	metribuzin	SG2
GoalTender	oxyfluorfen	Cole1
Gramoxone 2SL	paraquat	Corn13, Soy2, Soy9, Brndn1, Cover8
Gramoxone 3SL	paraquat	Cover1
Halex GT Premix	s-metolachlor + glyphosate + mesotrione	Corn1, Corn4, Corn5, Corn10a, Corn13, Corn21
Harmony Extra SG Premix	thifensulfuron + tribenuron	SG2, SG3, SG4, SG5, SG8
Harness Max Premix	acetochlor + mesotrione	Corn2, Corn3, Corn5

<u>Trade Name</u>	<u>Common Name</u>	<u>Trial</u>
HarnessXtra 5.6L Premix	acetochlor + atrazine	Corn5, Corn6, Corn9b, Corn10a
Harness	acetochlor	SCRN2
Huskie Premix	pyrasulfotole + bromoxynil	Milo1, Milo4, SG2, SG5, SG8
Impact / Amazon	topramezone	Corn1, SCRN1, SCRN3
Interline	glufosinate	Soy20
Keystone NXT Premix	acetochlor + atrazine	Corn1
Lentagran	pyridate	Cole1
Lexar EZ Premix	s-metolachlor + mesotrione + atrazine	Corn6, Corn9b, Corn13
Liberty 280	glufosinate	DSB1, DSB2, Soy2, Soy7, Soy9, Soy10, Soy11, Soy12, Soy14, Soy15, Soy18, Soy21, Soy25a, Meln1, SCRN1, SCRN3, Brndn1
Linex / Lorox / Linuron	linuron	Soy6a, Soy13a, Soy25a, SwPot1
Lumax EZ Premix	s-metolachlor + mesotrione + atrazine	Corn9b, Corn10a, Corn13, Milo3
Maestro	bromoxynil	Milo1
Matrix	rimsulfuron	Tom1
Mauler	metribuzin	Soy15, Soy16a
Metribuzin	metribuzin	Soy8, Soy13a
Moccasin II Plus	s-metolachlor	Tom1
Moccasin MTZ Premix	s-metolachlor + metribuzin	Soy20, Tom1
Osprey Xtra Premix	mesosulfuron + thiencarbazone	SG5
Osprey	mesosulfuron	SG2, SG4
Outlook	dimethenamid-p	Soy13a, Soy14, Soy15, Soy16a, Soy17
Permit	halosulfuron	Milo1
PowerFlex HL	pyroxasulam	SG2, SG4, SG8
Prefix Premix	s-metolachlor + fomesafen	Soy6a, Soy13a, Soy14
Preview Premix	metribuzin + sulfentrazone	Soy 20, Tom1, Tom2

<u>Trade Name</u>	<u>Common Name</u>	<u>Trial</u>
Princep	simazine	Corn4
Prowl	pendimethalin	Soy7
Prowl H <sub>2</sub> O	pendimethalin	Corn4, Corn9b, Corn10a, Corn13a, Soy10, SCRN1, Cole1
Pursuit	imazethapry	Cole1
Quelex Premix	florasulam + halaxifen	SG2, SG3, SG4, SG5, SG8
Raptor	imazamox	Soy8, Bean1
Realm Q Premix	rimsulfuron + mesotrione	Corn1, Corn10a
Reflex	fomesafen	DSB1, DSB2, Soy3, Soy8, Soy9, Soy15, Soy18, Soy21, Bean1, Meln1, Milo4, Pmpkn4, SwPot1
Resicore Premix	acetochlor + mesotrione + clopyralid	Corn1, Corn2, Corn3, Corn4, Corn5
Resolve	rimsulfuron	Corn9b, Corn10a
Resolve Q Multi-Pak	rimsulfuron + thifensulfuron	Corn1
Roundup PowerMax	glyphosate	Corn1, Corn4, Corn5, Corn6, Corn9b, Corn10a, Corn13, Corn21, DSB1, DSB1b, DSB2, Soy2, Soy4, Soy5b, Soy7, Soy10, Soy12, Soy13a, Soy14, Soy15, Soy16a, Soy17, Soy21, Soy25a, Cover 1, Brndn1
Sandea	halosulfuron	Bean1, Bean4
Satellite Hydro	pendimethalin	Tom1
Scout	glufosinate	Soy10, Soy11
Select	clethodim	SwPot1
Select Max	clethodim	Corn22, Soy15, Soy16a, Soy21
Sentrallas Premix	thifensulfuron + fluroxypyr	SG3
Sequence Premix	glyphosate + s-metolachlor	Soy13a
Sharpen	saflufenacil	Soy2, Soy7, Soy12, Soy19, SCRN1, SG1
Shieldex 400SC	tolpyralate	SCRN3

<u>Trade Name</u>	<u>Common Name</u>	<u>Trial</u>
Shutdown	sulfentrazone	Tom1
Simazine	simazine	Corn1, Corn4, Corn9b, Corn13
Spartan Charge Premix	carfentrazone + sulfentrazone	Soy3, Soy9, Soy13a, Bean1
Starane Ultra	fluroxypyr	Milo1, SCRN1, SG2, SG3, SG4, SG5, SG8
Status Premix	diflufenzoxypr + dicamba + safener	Corn21
Storm Premix	bentazon + acifluorfen	Soy8
Surveil Premix	cloransulam + flumioxazin	Soy5b, Soy6a, Soy10
Talinor Premix	bicyclopyrone + bromoxynil	SG5
Tavium Premix	s-metolachlor + dicamba	Soy13a, Soy17
Thistrol	MCPB	Pea1
Tough EC	pyridate	Corn21, Soy4, Cole1, Pea1
Tricor DF	metribuzin	Soy5b, Soy6a, Soy7, Soy10, Soy19, Soy20, Soy25, Tom1, Tom2
Tripzin ZC Premix	pendimethalin + metribuzin	Soy20, Tom1
Trivence Premix	chlorimuron + metribuzin + flumioxazin	Soy4, Soy5, Soy10
Ultra Blazer	acifluorfen	Soy8, Soy20
V-10440	"experimental"	Soy11
Valor SX	flumioxazin	DSB2, Soy5b, Soy6a, Soy7, Soy9, Soy10, Soy15, Soy16a, Soy17, Soy25, Bean1, Milo4, SwPot1, Cover1, SG1
Valor XLT Premix	flumioxazin + chlorimuron	Soy6a
Verdict Premix	saflufenacil + dimethenamid-p	Corn9b, Soy16a
VHP58-R002	"experimental"	Soy11
Warrant	acetochlor	Soy4, Soy10, Soy15, Soy16a, Soy17, Soy18, Milo3
Warrant Ultra Premix	acetochlor + fomesafen	Soy15, Soy16a
Xtendimax	dicamba	Soy10, Soy15, Soy16a, Soy17

<u>Trade Name</u>	<u>Common Name</u>	<u>Trial</u>
Zidua	pyroxasulfone	Corn9, Soy3, Soy5b, Soy15, Milo3, SCRN1, SCRN2
Zidua PRO Premix	pyroxasulfone + imazethapyr + saflufenacil	Soy11, Soy16a, Soy17
Zidua SC	pyroxasulfone	Corn4, Soy14, SG1, SG8
2,4-DB	2,4-DB	Soy20
2,4-D ester	2,4-D ester	Soy12, Cover 12, SG4, SG8

Daily Weather Data 09/01/18 to 11/30/19  
 University of Delaware Research and Education Center  
 Georgetown, Delaware

Data Source is ITERIS															0-10 cm	0-200 cm
	Moisture			Min	Max	Temp	% Relative	Min	Max	Avg	% Cloud	Avg	0-10 cm	0-200 cm		
Date	Total	Unit	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	Cover	Soil	Temp	Scaled Soil		
9/1/2018	0.25	IN	rain	73	83	F	88	1	11	7	mph	81	80	F	0.8	0.51
9/2/2018	0.15	IN	rain	74	87	F	85	0	7	4	mph	74	81	F	0.71	0.5
9/3/2018	0.01	IN	rain	73	90	F	83	0	7	3	mph	41	81	F	0.65	0.5
9/4/2018	0.04	IN	rain	74	93	F	81	0	6	2	mph	20	83	F	0.62	0.49
9/5/2018	0	IN	rain	74	92	F	84	0	5	2	mph	40	83	F	0.59	0.49
9/6/2018	0	IN	rain	74	94	F	78	0	7	3	mph	18	83	F	0.52	0.47
9/7/2018	1.09	IN	rain	74	91	F	89	0	7	2	mph	59	81	F	0.71	0.51
9/8/2018	0.92	IN	rain	68	76	F	94	0	12	6	mph	96	77	F	1	0.65
9/9/2018	0.66	IN	rain	64	71	F	91	6	15	11	mph	99	72	F	0.96	0.68
9/10/2018	0.02	IN	rain	64	77	F	95	3	12	8	mph	100	72	F	0.93	0.72
9/11/2018	0.09	IN	rain	72	87	F	93	0	8	2	mph	85	77	F	0.86	0.71
9/12/2018	0.01	IN	rain	73	86	F	89	0	9	4	mph	69	78	F	0.82	0.7
9/13/2018	0	IN	rain	72	77	F	97	5	13	10	mph	100	77	F	0.78	0.69
9/14/2018	0.38	IN	rain	73	78	F	95	7	12	9	mph	96	76	F	0.91	0.72
9/15/2018	0	IN	rain	68	79	F	88	3	12	8	mph	78	76	F	0.81	0.73
9/16/2018	0	IN	rain	71	80	F	89	3	9	6	mph	73	76	F	0.74	0.72
9/17/2018	0.01	IN	rain	71	82	F	90	3	12	7	mph	87	76	F	0.71	0.71
9/18/2018	1.65	IN	rain	72	84	F	89	3	10	6	mph	87	78	F	0.88	0.74
9/19/2018	0	IN	rain	68	83	F	85	0	11	4	mph	20	77	F	0.91	0.81
9/20/2018	0	IN	rain	64	76	F	85	0	9	4	mph	75	74	F	0.86	0.79
9/21/2018	0	IN	rain	61	80	F	84	0	11	5	mph	46	72	F	0.83	0.78
9/22/2018	0	IN	rain	66	82	F	77	2	8	6	mph	58	75	F	0.8	0.77
9/23/2018	0.98	IN	rain	64	69	F	95	3	10	7	mph	99	70	F	1	0.82
9/24/2018	0.05	IN	rain	64	68	F	96	6	12	9	mph	100	68	F	0.91	0.84
9/25/2018	0	IN	rain	69	85	F	86	4	14	7	mph	79	74	F	0.83	0.83
9/26/2018	0.03	IN	rain	72	87	F	87	1	7	4	mph	68	77	F	0.77	0.81
9/27/2018	0.02	IN	rain	67	72	F	80	1	9	5	mph	88	72	F	0.73	0.79
9/28/2018	0.04	IN	rain	59	75	F	85	0	10	4	mph	77	71	F	0.72	0.77

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	IN	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	33	69	F	0.68	0.74
9/29/2018	0	IN	rain	55	77	F	81	0	5	2	mph	33	69	F	0.68	0.74
9/30/2018	0	IN	rain	58	78	F	77	0	6	2	mph	20	70	F	0.66	0.71
10/1/2018	0	IN	rain	60	83	F	78	0	8	4	mph	17	71	F	0.64	0.7
10/2/2018	0	IN	rain	65	84	F	78	0	12	6	mph	42	73	F	0.62	0.69
10/3/2018	0	IN	rain	65	82	F	79	1	8	3	mph	30	75	F	0.61	0.69
10/4/2018	0	IN	rain	64	89	F	78	0	6	3	mph	54	76	F	0.6	0.69
10/5/2018	0	IN	rain	68	77	F	86	1	10	5	mph	92	74	F	0.59	0.7
10/6/2018	0	IN	rain	68	78	F	88	0	7	4	mph	92	73	F	0.59	0.7
10/7/2018	0	IN	rain	68	87	F	84	0	7	3	mph	46	76	F	0.57	0.69
10/8/2018	0	IN	rain	69	83	F	87	0	11	3	mph	65	76	F	0.55	0.67
10/9/2018	0	IN	rain	70	83	F	89	0	6	3	mph	72	76	F	0.52	0.65
10/10/2018	0	IN	rain	71	87	F	84	0	10	5	mph	57	76	F	0.5	0.63
10/11/2018	2.03	IN	rain	70	86	F	90	0	12	7	mph	93	77	F	0.76	0.65
10/12/2018	0.75	IN	rain	52	72	F	68	1	16	7	mph	42	70	F	1	0.85
10/13/2018	0.01	IN	rain	47	62	F	69	1	9	4	mph	58	61	F	0.92	0.87
10/14/2018	0	IN	rain	47	64	F	75	0	4	2	mph	75	60	F	0.88	0.88
10/15/2018	0.09	IN	rain	60	78	F	80	0	13	7	mph	87	66	F	0.87	0.9
10/16/2018	0	IN	rain	55	75	F	64	1	9	4	mph	91	65	F	0.78	0.91
10/17/2018	0.01	IN	rain	53	68	F	60	1	11	5	mph	46	63	F	0.72	0.91
10/18/2018	0	IN	rain	41	58	F	56	0	9	4	mph	13	58	F	0.67	0.89
10/19/2018	0	IN	rain	38	65	F	69	1	9	4	mph	24	56	F	0.64	0.86
10/20/2018	0.26	IN	rain	56	65	F	81	2	10	5	mph	87	61	F	0.66	0.84
10/21/2018	0.01	IN	rain	39	54	F	59	1	15	7	mph	51	56	F	0.73	0.84
10/22/2018	0	IN	rain	34	58	F	68	1	8	4	mph	22	52	F	0.67	0.83
10/23/2018	0	IN	rain	45	71	F	64	1	8	4	mph	30	57	F	0.65	0.82
10/24/2018	0	IN	rain	44	58	F	55	1	12	4	mph	14	55	F	0.62	0.82
10/25/2018	0	IN	rain	38	54	F	66	0	7	3	mph	34	51	F	0.59	0.81
10/26/2018	1.43	IN	rain	38	58	F	80	0	12	5	mph	81	50	F	0.69	0.8
10/27/2018	0.25	IN	rain	49	64	F	89	2	18	9	mph	94	57	F	0.93	0.94
10/28/2018	0.11	IN	rain	50	61	F	80	0	10	4	mph	81	56	F	0.78	0.91
10/29/2018	0	IN	rain	47	62	F	64	1	11	6	mph	36	56	F	0.69	0.88
10/30/2018	0	IN	rain	41	62	F	69	1	9	3	mph	3	53	F	0.67	0.85

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	IN	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	26	55	F	0.66	0.84
10/31/2018	0	IN	rain	43	70	F	71	0	14	5	mph	26	55	F	0.66	0.84
11/1/2018	0	IN	rain	55	75	F	72	4	12	8	mph	31	61	F	0.65	0.83
11/2/2018	0.09	IN	rain	71	75	F	78	6	16	10	mph	100	67	F	0.65	0.82
11/3/2018	0.42	IN	rain	44	69	F	67	1	9	4	mph	45	62	F	0.93	0.87
11/4/2018	0	IN	rain	33	58	F	75	0	5	4	mph	17	53	F	0.74	0.87
11/5/2018	1.18	IN	rain	54	62	F	90	1	12	7	mph	100	57	F	1	0.94
11/6/2018	0.18	IN	rain	57	75	F	92	0	16	6	mph	83	61	F	0.9	0.97
11/7/2018	0	IN	rain	49	68	F	65	1	8	3	mph	25	60	F	0.81	0.96
11/8/2018	0	IN	rain	48	59	F	59	1	11	5	mph	63	57	F	0.73	0.93
11/9/2018	0.7	IN	rain	48	61	F	80	1	12	7	mph	85	54	F	0.82	0.94
11/10/2018	0	IN	rain	35	55	F	53	2	14	7	mph	36	51	F	0.8	0.98
11/11/2018	0	IN	rain	32	49	F	58	1	5	3	mph	0	44	F	0.7	0.94
11/12/2018	0.45	IN	rain	30	53	F	74	0	5	2	mph	67	45	F	0.71	0.89
11/13/2018	0.16	IN	rain	48	65	F	83	2	12	6	mph	99	53	F	0.85	0.9
11/14/2018	0	IN	rain	39	47	F	49	2	10	5	mph	73	47	F	0.72	0.87
11/15/2018	1.04	IN	rain	40	55	F	75	6	21	13	mph	96	45	F	0.93	0.89
11/16/2018	0.03	IN	rain	40	57	F	69	2	17	7	mph	55	48	F	0.88	0.94
11/17/2018	0	IN	rain	36	51	F	63	1	8	4	mph	20	45	F	0.78	0.92
11/18/2018	0	IN	rain	32	55	F	76	0	7	2	mph	33	45	F	0.74	0.9
11/19/2018	0	IN	rain	37	60	F	80	0	7	3	mph	48	47	F	0.71	0.89
11/20/2018	0	IN	rain	43	55	F	70	1	10	5	mph	67	50	F	0.67	0.88
11/21/2018	0	IN	rain	29	53	F	59	0	9	4	mph	15	45	F	0.63	0.86
11/22/2018	0	IN	rain	26	42	F	38	3	14	7	mph	32	40	F	0.61	0.84
11/23/2018	0	IN	rain	25	38	F	61	1	8	4	mph	67	35	F	0.6	0.82
11/24/2018	1.41	IN	rain	30	61	F	82	1	13	7	mph	92	43	F	0.88	0.85
11/25/2018	0	IN	rain	44	62	F	77	1	10	4	mph	28	50	F	0.94	0.98
11/26/2018	0.42	IN	rain	41	60	F	84	1	13	7	mph	85	49	F	0.94	1
11/27/2018	0	IN	rain	38	46	F	53	2	14	8	mph	41	44	F	0.8	1
11/28/2018	0	IN	rain	35	42	F	48	6	15	10	mph	61	41	F	0.7	1
11/29/2018	0	IN	rain	32	45	F	57	1	10	6	mph	22	39	F	0.65	1
11/30/2018	0	IN	rain	31	52	F	65	1	6	2	mph	79	42	F	0.62	1
12/1/2018	0.01	IN	rain	33	52	F	79	0	6	4	mph	66	43	F	0.6	1

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	Unit	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	88	55	F	0.62	1
12/2/2018	0.03	IN	rain	53	68	F	89	6	11	8	mph	88	55	F	0.62	1
12/3/2018	0	IN	rain	49	66	F	65	2	10	5	mph	45	57	F	0.58	0.96
12/4/2018	0	IN	rain	36	47	F	54	1	10	5	mph	60	46	F	0.54	0.91
12/5/2018	0	IN	rain	29	41	F	60	1	9	4	mph	46	40	F	0.51	0.86
12/6/2018	0	IN	rain	28	44	F	59	1	8	4	mph	44	38	F	0.49	0.82
12/7/2018	0	IN	rain	31	44	F	53	1	10	4	mph	27	40	F	0.46	0.77
12/8/2018	0	IN	rain	24	41	F	59	0	9	2	mph	38	35	F	0.42	0.72
12/9/2018	0.07	IN	rain	33	39	F	65	3	9	6	mph	99	35	F	0.4	0.68
12/10/2018	0	IN	rain	28	41	F	63	1	13	7	mph	47	36	F	0.38	0.65
12/11/2018	0	IN	rain	28	46	F	63	0	6	3	mph	25	35	F	0.31	0.63
12/12/2018	0	IN	rain	34	47	F	57	0	6	2	mph	46	37	F	0.28	0.6
12/13/2018	0	IN	rain	32	55	F	69	0	9	3	mph	81	41	F	0.28	0.58
12/14/2018	0.21	IN	rain	39	58	F	87	0	6	3	mph	94	45	F	0.34	0.56
12/15/2018	1.31	IN	rain	52	60	F	92	4	14	9	mph	100	51	F	1	0.65
12/16/2018	0.34	IN	rain	42	54	F	91	1	11	7	mph	100	50	F	1	0.79
12/17/2018	0	IN	rain	42	54	F	66	1	13	5	mph	52	46	F	0.73	0.79
12/18/2018	0	IN	rain	30	47	F	51	1	10	6	mph	27	42	F	0.64	0.79
12/19/2018	0	IN	rain	26	50	F	69	0	8	2	mph	10	39	F	0.59	0.79
12/20/2018	0.5	IN	rain	30	63	F	88	0	16	5	mph	79	42	F	0.75	0.8
12/21/2018	0.23	IN	rain	57	68	F	86	5	17	10	mph	90	57	F	1	0.91
12/22/2018	0	IN	rain	45	57	F	60	5	14	8	mph	60	50	F	0.69	0.91
12/23/2018	0	IN	rain	35	50	F	63	1	6	3	mph	32	46	F	0.57	0.88
12/24/2018	0.01	IN	rain	36	48	F	65	0	12	4	mph	60	45	F	0.5	0.84
12/25/2018	0	IN	rain	31	44	F	55	0	7	3	mph	29	41	F	0.44	0.79
12/26/2018	0	IN	rain	26	47	F	67	0	5	2	mph	16	39	F	0.4	0.77
12/27/2018	0	IN	rain	28	53	F	72	1	11	4	mph	38	42	F	0.36	0.75
12/28/2018	1.04	IN	rain	51	66	F	87	4	13	9	mph	100	53	F	0.99	0.86
12/29/2018	0	IN	rain	43	62	F	68	1	11	5	mph	45	53	F	0.78	0.99
12/30/2018	0	IN	rain	36	49	F	69	0	3	1	mph	65	48	F	0.61	0.98
12/31/2018	0.26	IN	rain	34	63	F	87	0	14	4	mph	71	44	F	0.64	0.96
1/1/2019	0.05	IN	rain	49	68	F	67	2	16	8	mph	89	58	F	0.66	0.97
1/2/2019	0	IN	rain	40	48	F	70	1	7	4	mph	76	46	F	0.54	0.91

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	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	Unit	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	72	47	F	0.53	0.87
1/3/2019	0.05	IN	rain	35	52	F	76	1	8	4	mph	72	47	F	0.53	0.87
1/4/2019	0.05	IN	rain	30	52	F	79	0	14	4	mph	82	46	F	0.48	0.83
1/5/2019	0.06	IN	rain	44	55	F	84	0	12	6	mph	76	50	F	0.53	0.82
1/6/2019	0	IN	rain	39	56	F	54	1	14	5	mph	10	46	F	0.4	0.78
1/7/2019	0	IN	rain	34	41	F	57	1	10	4	mph	53	39	F	0.32	0.73
1/8/2019	0.12	IN	rain	38	58	F	83	0	9	4	mph	71	44	F	0.4	0.69
1/9/2019	0.01	IN	rain	36	54	F	50	7	15	10	mph	64	46	F	0.36	0.66
1/10/2019	0	IN	rain	32	40	F	47	8	18	12	mph	36	39	F	0.22	0.62
1/11/2019	0	IN	rain	29	38	F	43	0	14	7	mph	8	37	F	0.14	0.58
1/12/2019	0.07	IN	rain	24	36	F	54	0	6	2	mph	63	36	F	0.07	0.56
1/13/2019	0.68	IN	rain	29	37	F	83	4	18	11	mph	100	35	F	0.47	0.56
1/14/2019	0.01	IN	rain	22	34	F	65	0	14	8	mph	47	35	F	0.51	0.59
1/15/2019	0	IN	rain	20	40	F	66	0	8	2	mph	4	33	F	0.49	0.59
1/16/2019	0	IN	rain	23	44	F	69	0	10	3	mph	41	32	F	0.42	0.58
1/17/2019	0	IN	rain	31	39	F	65	0	8	3	mph	73	33	F	0.3	0.56
1/18/2019	0.06	IN	rain	30	46	F	82	0	7	3	mph	81	38	F	0.31	0.54
1/19/2019	0	IN	rain	31	50	F	79	0	15	6	mph	98	38	F	0.23	0.51
1/20/2019	1.16	IN	rain	24	61	F	73	2	19	11	mph	70	45	F	0.59	0.7
1/21/2019	0	IN	rain	16	23	F	33	4	17	12	mph	3	30	F	0.53	0.74
1/22/2019	0	IN	rain	17	35	F	42	0	6	4	mph	15	29	F	0.52	0.72
1/23/2019	0	IN	rain	28	60	F	64	2	16	9	mph	65	35	F	0.51	0.69
1/24/2019	1.35	IN	rain	37	64	F	76	4	19	13	mph	82	48	F	0.62	0.85
1/25/2019	0	IN	rain	28	44	F	59	0	11	5	mph	14	39	F	0.52	1
1/26/2019	0	IN	rain	24	43	F	67	0	7	3	mph	26	35	F	0.44	0.93
1/27/2019	0	IN	rain	28	55	F	62	0	15	6	mph	46	38	F	0.37	0.83
1/28/2019	0	IN	rain	27	44	F	50	0	10	5	mph	52	38	F	0.31	0.74
1/29/2019	0.15	IN	rain	25	49	F	73	0	10	5	mph	76	36	F	0.32	0.69
1/30/2019	0	IN	rain	16	40	F	51	0	19	10	mph	28	34	F	0.37	0.69
1/31/2019	0	IN	rain	13	23	F	36	0	9	5	mph	3	29	F	0.31	0.68
2/1/2019	0.18	IN	rain	14	24	F	69	1	8	4	mph	77	28	F	0.3	0.67
2/2/2019	0	IN	rain	9	37	F	73	0	6	3	mph	2	29	F	0.32	0.66
2/3/2019	0	IN	rain	27	51	F	78	0	7	2	mph	38	31	F	0.38	0.63

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	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	IN	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	38	36	F	0.39	0.59
2/4/2019	0	IN	rain	31	60	F	76	0	6	2	mph	38	36	F	0.39	0.59
2/5/2019	0	IN	rain	33	70	F	73	0	5	2	mph	20	41	F	0.32	0.56
2/6/2019	0.01	IN	rain	41	58	F	76	0	10	5	mph	63	45	F	0.24	0.53
2/7/2019	0	IN	rain	43	58	F	83	2	8	5	mph	86	49	F	0.22	0.51
2/8/2019	0	IN	rain	42	60	F	65	2	14	7	mph	73	49	F	0.2	0.49
2/9/2019	0	IN	rain	27	40	F	37	0	11	6	mph	11	40	F	0.17	0.46
2/10/2019	0.04	IN	rain	20	42	F	54	0	4	2	mph	37	36	F	0.17	0.44
2/11/2019	0.36	IN	rain	34	39	F	88	2	7	5	mph	100	37	F	0.54	0.5
2/12/2019	0.79	IN	rain	38	52	F	88	3	13	8	mph	100	41	F	0.62	0.61
2/13/2019	0.01	IN	rain	37	51	F	62	1	15	6	mph	40	45	F	0.55	0.68
2/14/2019	0	IN	rain	29	56	F	51	1	9	5	mph	41	43	F	0.44	0.64
2/15/2019	0	IN	rain	46	66	F	53	6	18	10	mph	84	50	F	0.36	0.6
2/16/2019	0	IN	rain	36	59	F	42	1	9	6	mph	66	47	F	0.3	0.57
2/17/2019	0.17	IN	rain	30	42	F	65	1	9	4	mph	52	40	F	0.3	0.54
2/18/2019	0.37	IN	rain	39	53	F	67	0	16	8	mph	81	45	F	0.56	0.62
2/19/2019	0	IN	rain	31	42	F	43	1	9	5	mph	48	41	F	0.46	0.61
2/20/2019	0.56	IN	rain	35	45	F	70	0	10	5	mph	98	38	F	0.55	0.62
2/21/2019	0	IN	rain	39	61	F	74	1	10	4	mph	76	46	F	0.57	0.68
2/22/2019	0.01	IN	rain	42	50	F	54	0	6	3	mph	91	46	F	0.51	0.64
2/23/2019	0.27	IN	rain	39	46	F	75	1	12	6	mph	96	43	F	0.53	0.62
2/24/2019	0.8	IN	rain	44	56	F	80	2	16	8	mph	73	45	F	0.66	0.72
2/25/2019	0.01	IN	rain	38	50	F	25	2	23	12	mph	0	43	F	0.55	0.75
2/26/2019	0	IN	rain	33	52	F	39	1	10	5	mph	26	42	F	0.52	0.74
2/27/2019	0	IN	rain	33	42	F	62	1	11	6	mph	60	41	F	0.51	0.75
2/28/2019	0	IN	rain	34	45	F	65	0	14	7	mph	63	44	F	0.48	0.75
3/1/2019	0.59	IN	rain	35	41	F	84	3	12	8	mph	95	39	F	0.55	0.75
3/2/2019	0.1	IN	rain	36	43	F	87	0	11	5	mph	92	41	F	0.59	0.79
3/3/2019	0.93	IN	rain	36	46	F	82	0	11	4	mph	91	41	F	0.56	0.75
3/4/2019	0.18	IN	rain	32	43	F	66	0	12	7	mph	64	41	F	0.61	0.89
3/5/2019	0	IN	rain	28	42	F	50	0	8	3	mph	41	39	F	0.54	0.85
3/6/2019	0	IN	rain	24	34	F	39	1	13	7	mph	36	37	F	0.52	0.82
3/7/2019	0	IN	rain	19	42	F	52	0	9	3	mph	46	35	F	0.51	0.78

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min	Max	Temp	% Relative	Min	Max	Avg	Cloud	Soil	Temp	Scaled Soil	Scaled Soil	
Date	Total	Unit	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	Cover	Temp	Unit	Moisture	Moisture	
3/8/2019	0.18	IN	rain	27	44	F	72	0	8	3	mph	80	37	F	0.54	0.75
3/9/2019	0.02	IN	rain	36	46	F	79	1	9	4	mph	91	40	F	0.57	0.75
3/10/2019	0.73	IN	rain	43	58	F	87	2	10	6	mph	90	46	F	0.82	0.86
3/11/2019	0	IN	rain	44	60	F	57	1	11	5	mph	60	49	F	0.67	0.86
3/12/2019	0	IN	rain	33	51	F	41	0	12	6	mph	2	46	F	0.6	0.81
3/13/2019	0	IN	rain	29	56	F	56	0	11	4	mph	21	46	F	0.55	0.76
3/14/2019	0	IN	rain	46	73	F	56	4	13	9	mph	50	54	F	0.5	0.7
3/15/2019	0.04	IN	rain	62	76	F	67	6	19	14	mph	91	61	F	0.46	0.66
3/16/2019	0	IN	rain	43	65	F	39	1	15	9	mph	17	55	F	0.45	0.63
3/17/2019	0	IN	rain	30	51	F	48	0	11	4	mph	9	47	F	0.41	0.59
3/18/2019	0	IN	rain	30	47	F	68	0	9	3	mph	56	43	F	0.39	0.56
3/19/2019	0	IN	rain	29	53	F	59	0	9	3	mph	12	45	F	0.37	0.53
3/20/2019	0.02	IN	rain	30	53	F	66	0	12	5	mph	50	46	F	0.36	0.49
3/21/2019	0.72	IN	rain	48	57	F	87	4	14	7	mph	96	50	F	0.76	0.55
3/22/2019	0.29	IN	rain	44	55	F	62	7	18	13	mph	80	49	F	0.78	0.62
3/23/2019	0	IN	rain	38	53	F	40	3	16	11	mph	2	47	F	0.6	0.6
3/24/2019	0	IN	rain	30	63	F	40	1	12	6	mph	32	49	F	0.53	0.58
3/25/2019	0	IN	rain	46	65	F	53	1	13	6	mph	85	54	F	0.48	0.55
3/26/2019	0	IN	rain	34	51	F	45	0	14	9	mph	30	50	F	0.43	0.52
3/27/2019	0	IN	rain	31	51	F	56	0	10	5	mph	3	46	F	0.4	0.49
3/28/2019	0	IN	rain	29	64	F	60	0	10	4	mph	18	49	F	0.37	0.46
3/29/2019	0	IN	rain	51	74	F	53	2	11	7	mph	69	57	F	0.34	0.43
3/30/2019	0	IN	rain	53	80	F	52	3	18	9	mph	45	61	F	0.31	0.41
3/31/2019	0.07	IN	rain	43	67	F	57	6	14	10	mph	50	58	F	0.32	0.39
4/1/2019	0	IN	rain	34	50	F	37	1	13	6	mph	11	49	F	0.32	0.38
4/2/2019	0	IN	rain	30	52	F	68	0	13	7	mph	69	46	F	0.29	0.37
4/3/2019	0	IN	rain	40	69	F	50	1	13	7	mph	10	54	F	0.26	0.36
4/4/2019	0	IN	rain	41	69	F	43	0	6	3	mph	33	56	F	0.23	0.34
4/5/2019	0.03	IN	rain	45	54	F	68	1	12	7	mph	100	52	F	0.24	0.33
4/6/2019	0	IN	rain	49	71	F	76	1	6	3	mph	56	58	F	0.26	0.33
4/7/2019	0	IN	rain	43	73	F	66	0	13	5	mph	49	61	F	0.25	0.32
4/8/2019	0.36	IN	rain	61	83	F	69	0	13	7	mph	66	68	F	0.34	0.31

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	IN	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	88	67	F	0.51	0.34
4/9/2019	0	IN	rain	64	70	F	77	1	6	3	mph	88	67	F	0.51	0.34
4/10/2019	0	IN	rain	48	71	F	43	0	13	5	mph	22	64	F	0.39	0.33
4/11/2019	0	IN	rain	46	57	F	64	1	12	8	mph	46	58	F	0.34	0.31
4/12/2019	0	IN	rain	49	77	F	69	1	20	11	mph	83	62	F	0.32	0.3
4/13/2019	0.32	IN	rain	64	72	F	82	1	13	5	mph	97	66	F	0.52	0.33
4/14/2019	0	IN	rain	65	79	F	81	0	13	6	mph	99	68	F	0.45	0.33
4/15/2019	0.96	IN	rain	50	75	F	60	1	22	13	mph	44	66	F	0.81	0.44
4/16/2019	0	IN	rain	46	67	F	46	2	13	7	mph	13	59	F	0.6	0.44
4/17/2019	0	IN	rain	54	62	F	58	1	13	8	mph	57	62	F	0.52	0.43
4/18/2019	0	IN	rain	56	84	F	64	3	14	9	mph	43	67	F	0.48	0.42
4/19/2019	0.57	IN	rain	66	77	F	76	4	17	11	mph	88	69	F	0.56	0.42
4/20/2019	0.66	IN	rain	59	71	F	77	5	14	10	mph	80	68	F	1	0.6
4/21/2019	0	IN	rain	53	65	F	67	0	9	4	mph	48	65	F	0.75	0.63
4/22/2019	0	IN	rain	52	70	F	72	0	9	4	mph	77	64	F	0.66	0.62
4/23/2019	0	IN	rain	50	79	F	61	0	9	4	mph	6	67	F	0.58	0.59
4/24/2019	0	IN	rain	56	74	F	53	0	13	5	mph	57	69	F	0.51	0.56
4/25/2019	0	IN	rain	55	66	F	74	0	10	4	mph	80	64	F	0.47	0.53
4/26/2019	1.04	IN	rain	55	72	F	87	1	14	6	mph	94	64	F	0.84	0.62
4/27/2019	0	IN	rain	53	70	F	43	0	19	10	mph	30	63	F	0.81	0.76
4/28/2019	0	IN	rain	53	74	F	54	1	14	8	mph	79	63	F	0.66	0.72
4/29/2019	0	IN	rain	46	59	F	69	1	10	6	mph	67	59	F	0.6	0.7
4/30/2019	0	IN	rain	51	80	F	77	1	12	6	mph	50	66	F	0.55	0.67
5/1/2019	0	IN	rain	56	70	F	85	1	10	6	mph	63	65	F	0.52	0.64
5/2/2019	0.91	IN	rain	55	87	F	78	0	9	5	mph	45	72	F	0.67	0.64
5/3/2019	0.02	IN	rain	56	74	F	89	0	7	5	mph	58	71	F	0.89	0.81
5/4/2019	0.23	IN	rain	60	76	F	91	1	7	3	mph	79	71	F	0.78	0.8
5/5/2019	0.66	IN	rain	52	60	F	97	3	9	6	mph	99	64	F	0.96	0.87
5/6/2019	0.01	IN	rain	52	70	F	84	1	9	4	mph	72	64	F	0.83	0.91
5/7/2019	0	IN	rain	51	78	F	75	0	10	4	mph	24	67	F	0.72	0.87
5/8/2019	0	IN	rain	57	73	F	81	0	11	5	mph	60	67	F	0.66	0.83
5/9/2019	0	IN	rain	55	76	F	84	2	10	6	mph	58	68	F	0.63	0.8
5/10/2019	0	IN	rain	62	81	F	74	3	14	7	mph	45	70	F	0.6	0.77

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	Unit	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	81	70	F	0.61	0.75
5/11/2019	0.14	IN	rain	60	72	F	80	1	8	5	mph	81	70	F	0.61	0.75
5/12/2019	0.32	IN	rain	50	60	F	94	6	13	9	mph	100	62	F	0.78	0.77
5/13/2019	0.93	IN	rain	50	56	F	94	2	11	7	mph	99	57	F	1	0.94
5/14/2019	0	IN	rain	48	62	F	74	0	10	4	mph	88	58	F	0.95	0.99
5/15/2019	0	IN	rain	46	73	F	59	1	10	5	mph	16	62	F	0.85	0.98
5/16/2019	0.03	IN	rain	54	75	F	66	0	9	4	mph	36	65	F	0.78	0.97
5/17/2019	0	IN	rain	58	81	F	66	1	11	5	mph	49	67	F	0.7	0.96
5/18/2019	0	IN	rain	62	75	F	68	0	9	4	mph	40	70	F	0.63	0.94
5/19/2019	0.02	IN	rain	61	84	F	73	2	14	8	mph	27	73	F	0.57	0.9
5/20/2019	0	IN	rain	73	88	F	66	2	13	8	mph	37	77	F	0.52	0.83
5/21/2019	0	IN	rain	61	73	F	51	0	12	6	mph	17	73	F	0.47	0.77
5/22/2019	0	IN	rain	51	74	F	50	0	10	4	mph	33	69	F	0.44	0.71
5/23/2019	0.24	IN	rain	55	83	F	72	2	11	6	mph	46	70	F	0.54	0.69
5/24/2019	0	IN	rain	67	82	F	61	0	14	7	mph	15	75	F	0.62	0.69
5/25/2019	0	IN	rain	59	73	F	71	2	9	6	mph	57	71	F	0.51	0.65
5/26/2019	0.38	IN	rain	67	90	F	70	1	13	5	mph	47	77	F	0.47	0.62
5/27/2019	0	IN	rain	65	82	F	74	0	7	4	mph	44	78	F	0.75	0.64
5/28/2019	1.07	IN	rain	63	86	F	81	0	12	6	mph	54	74	F	0.87	0.7
5/29/2019	0	IN	rain	69	92	F	67	0	15	5	mph	31	80	F	0.79	0.72
5/30/2019	0.44	IN	rain	69	89	F	76	0	10	3	mph	43	80	F	0.82	0.71
5/31/2019	0	IN	rain	68	84	F	71	1	8	4	mph	42	78	F	0.85	0.74
6/1/2019	0	IN	rain	67	80	F	77	0	7	3	mph	68	77	F	0.75	0.73
6/2/2019	0.03	IN	rain	63	86	F	69	1	12	6	mph	45	77	F	0.68	0.72
6/3/2019	0	IN	rain	56	75	F	53	0	10	5	mph	27	74	F	0.61	0.71
6/4/2019	0	IN	rain	51	75	F	52	0	9	4	mph	10	70	F	0.53	0.69
6/5/2019	0.34	IN	rain	63	84	F	79	1	16	9	mph	60	73	F	0.53	0.66
6/6/2019	0	IN	rain	72	87	F	77	0	9	4	mph	61	79	F	0.71	0.67
6/7/2019	0	IN	rain	67	79	F	79	0	8	5	mph	74	76	F	0.59	0.64
6/8/2019	0	IN	rain	63	76	F	79	2	11	7	mph	84	73	F	0.56	0.62
6/9/2019	0.07	IN	rain	66	73	F	84	6	13	9	mph	84	71	F	0.56	0.61
6/10/2019	1.04	IN	rain	68	84	F	91	3	10	6	mph	95	75	F	0.94	0.68
6/11/2019	0.28	IN	rain	62	79	F	68	0	11	6	mph	49	75	F	0.93	0.72

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	IN	Type	Temp	Temp	F	Humidity	Wind	Wind	Wind	mph	61	71	F	0.8	0.71
6/12/2019	0	IN	rain	57	74	F	70	0	10	6	mph	61	71	F	0.8	0.71
6/13/2019	0.64	IN	rain	63	76	F	85	1	11	6	mph	92	73	F	0.98	0.75
6/14/2019	0	IN	rain	59	74	F	65	0	14	6	mph	19	71	F	0.9	0.77
6/15/2019	0	IN	rain	55	82	F	62	0	13	6	mph	15	71	F	0.77	0.76
6/16/2019	0	IN	rain	67	86	F	69	5	15	9	mph	40	76	F	0.69	0.74
6/17/2019	0.34	IN	rain	71	90	F	70	0	8	4	mph	46	81	F	0.68	0.72
6/18/2019	0.68	IN	rain	71	87	F	81	1	9	4	mph	76	80	F	0.86	0.74
6/19/2019	0.01	IN	rain	72	86	F	85	1	8	5	mph	69	80	F	0.88	0.78
6/20/2019	0.98	IN	rain	72	90	F	79	2	14	7	mph	57	81	F	0.84	0.77
6/21/2019	0.04	IN	rain	69	81	F	70	2	12	6	mph	52	78	F	0.98	0.85
6/22/2019	0	IN	rain	64	82	F	57	0	9	4	mph	20	77	F	0.83	0.85
6/23/2019	0	IN	rain	61	83	F	58	0	8	3	mph	5	76	F	0.77	0.85
6/24/2019	0	IN	rain	63	88	F	70	2	10	5	mph	34	77	F	0.72	0.84
6/25/2019	0	IN	rain	75	87	F	73	2	8	5	mph	73	80	F	0.69	0.85
6/26/2019	0	IN	rain	70	90	F	61	1	7	3	mph	14	81	F	0.65	0.84
6/27/2019	0	IN	rain	72	93	F	61	0	6	3	mph	20	83	F	0.62	0.83
6/28/2019	0.01	IN	rain	71	92	F	68	0	10	3	mph	24	84	F	0.59	0.81
6/29/2019	0.07	IN	rain	73	94	F	73	1	12	5	mph	43	84	F	0.59	0.78
6/30/2019	0	IN	rain	72	89	F	64	1	10	5	mph	28	83	F	0.6	0.76
7/1/2019	0	IN	rain	64	86	F	62	0	5	3	mph	12	81	F	0.56	0.73
7/2/2019	0	IN	rain	65	92	F	65	1	9	5	mph	20	81	F	0.53	0.7
7/3/2019	0	IN	rain	72	93	F	70	0	5	2	mph	12	86	F	0.5	0.67
7/4/2019	0	IN	rain	74	91	F	81	0	10	4	mph	44	85	F	0.48	0.66
7/5/2019	0.17	IN	rain	77	92	F	82	1	7	4	mph	57	85	F	0.49	0.65
7/6/2019	0.03	IN	rain	74	92	F	79	2	12	5	mph	41	85	F	0.52	0.64
7/7/2019	0	IN	rain	74	85	F	83	1	10	4	mph	72	83	F	0.49	0.63
7/8/2019	0.34	IN	rain	68	79	F	84	1	10	6	mph	74	78	F	0.66	0.65
7/9/2019	0	IN	rain	64	86	F	74	0	7	3	mph	24	79	F	0.66	0.66
7/10/2019	0	IN	rain	65	88	F	67	0	11	3	mph	16	80	F	0.56	0.64
7/11/2019	0.33	IN	rain	69	94	F	78	0	12	6	mph	65	82	F	0.55	0.63
7/12/2019	0	IN	rain	73	90	F	78	0	9	4	mph	44	83	F	0.68	0.63
7/13/2019	0	IN	rain	73	89	F	63	0	7	3	mph	4	83	F	0.54	0.61

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	IN	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	8	85	F	0.48	0.58
7/14/2019	0	IN	rain	73	95	F	68	0	7	4	mph	8	85	F	0.48	0.58
7/15/2019	0	IN	rain	71	90	F	62	0	5	2	mph	6	84	F	0.44	0.57
7/16/2019	0	IN	rain	70	94	F	72	1	8	4	mph	32	84	F	0.42	0.56
7/17/2019	0.14	IN	rain	76	99	F	70	1	13	6	mph	49	87	F	0.44	0.55
7/18/2019	0	IN	rain	76	94	F	79	3	8	6	mph	62	87	F	0.55	0.55
7/19/2019	0	IN	rain	77	96	F	70	0	8	4	mph	14	88	F	0.47	0.54
7/20/2019	0	IN	rain	81	98	F	69	3	7	5	mph	8	90	F	0.41	0.53
7/21/2019	0	IN	rain	81	99	F	69	1	9	5	mph	10	90	F	0.36	0.52
7/22/2019	0.11	IN	rain	78	96	F	69	1	16	7	mph	18	89	F	0.32	0.5
7/23/2019	0.7	IN	rain	68	76	F	92	1	11	4	mph	98	79	F	0.64	0.52
7/24/2019	0	IN	rain	67	83	F	76	0	7	4	mph	42	79	F	0.72	0.56
7/25/2019	0	IN	rain	64	85	F	71	0	7	2	mph	25	80	F	0.53	0.54
7/26/2019	0	IN	rain	64	87	F	69	0	7	2	mph	31	79	F	0.45	0.52
7/27/2019	0	IN	rain	65	88	F	71	0	7	3	mph	12	80	F	0.39	0.5
7/28/2019	0	IN	rain	68	92	F	65	2	8	5	mph	9	82	F	0.35	0.48
7/29/2019	0	IN	rain	72	94	F	61	2	10	5	mph	12	84	F	0.3	0.45
7/30/2019	0	IN	rain	72	94	F	62	2	10	6	mph	3	84	F	0.27	0.43
7/31/2019	0.31	IN	rain	71	92	F	80	0	8	4	mph	38	83	F	0.32	0.41
8/1/2019	0.74	IN	rain	71	88	F	84	0	10	3	mph	53	82	F	0.65	0.45
8/2/2019	0.4	IN	rain	71	83	F	91	0	10	2	mph	89	79	F	0.84	0.52
8/3/2019	0	IN	rain	70	85	F	83	0	7	3	mph	80	80	F	0.76	0.54
8/4/2019	0	IN	rain	72	87	F	82	0	9	3	mph	58	82	F	0.64	0.53
8/5/2019	0.01	IN	rain	73	87	F	85	0	8	2	mph	74	82	F	0.57	0.52
8/6/2019	0.01	IN	rain	73	85	F	81	0	9	4	mph	50	81	F	0.51	0.51
8/7/2019	0.81	IN	rain	71	92	F	81	1	15	7	mph	38	82	F	0.59	0.51
8/8/2019	0	IN	rain	69	89	F	75	1	7	4	mph	30	81	F	0.78	0.56
8/9/2019	0	IN	rain	72	88	F	72	1	7	3	mph	45	81	F	0.63	0.54
8/10/2019	0	IN	rain	66	82	F	62	1	7	3	mph	37	78	F	0.54	0.52
8/11/2019	0	IN	rain	63	86	F	65	0	6	2	mph	10	78	F	0.47	0.5
8/12/2019	0	IN	rain	62	88	F	70	0	10	4	mph	15	79	F	0.41	0.47
8/13/2019	0.4	IN	rain	73	86	F	87	0	13	5	mph	76	79	F	0.52	0.47
8/14/2019	0	IN	rain	73	89	F	90	1	7	3	mph	67	81	F	0.58	0.48

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	Unit	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	69	79	F	0.5	0.46
8/15/2019	0	IN	rain	71	81	F	90	1	8	4	mph	69	79	F	0.5	0.46
8/16/2019	0.04	IN	rain	70	84	F	91	0	8	4	mph	65	80	F	0.46	0.45
8/17/2019	0.03	IN	rain	72	86	F	90	1	8	3	mph	58	81	F	0.45	0.44
8/18/2019	0	IN	rain	74	88	F	87	1	8	4	mph	48	82	F	0.43	0.42
8/19/2019	0.6	IN	rain	73	93	F	91	0	11	4	mph	57	83	F	0.5	0.43
8/20/2019	0.01	IN	rain	71	87	F	89	0	9	3	mph	60	81	F	0.64	0.46
8/21/2019	0.01	IN	rain	71	89	F	86	1	14	6	mph	54	81	F	0.52	0.45
8/22/2019	0.35	IN	rain	72	91	F	78	1	9	4	mph	36	83	F	0.67	0.46
8/23/2019	0.62	IN	rain	65	80	F	88	1	10	4	mph	78	79	F	0.71	0.47
8/24/2019	0	IN	rain	62	77	F	78	0	11	5	mph	62	74	F	0.8	0.51
8/25/2019	0	IN	rain	59	76	F	80	0	16	8	mph	53	72	F	0.67	0.51
8/26/2019	0	IN	rain	66	74	F	81	1	11	8	mph	92	73	F	0.6	0.5
8/27/2019	0	IN	rain	62	76	F	86	1	8	4	mph	84	72	F	0.56	0.49
8/28/2019	0	IN	rain	70	83	F	81	1	6	3	mph	84	76	F	0.53	0.48
8/29/2019	0	IN	rain	64	83	F	67	0	8	4	mph	3	76	F	0.48	0.47
8/30/2019	0	IN	rain	60	88	F	66	0	10	4	mph	15	75	F	0.44	0.45
8/31/2019	0	IN	rain	67	86	F	79	0	9	4	mph	14	77	F	0.41	0.43
9/1/2019	0	IN	rain	67	81	F	80	2	12	5	mph	43	76	F	0.38	0.42
9/2/2019	0	IN	rain	66	89	F	77	0	11	5	mph	42	78	F	0.36	0.4
9/3/2019	0.25	IN	rain	66	83	F	84	1	9	4	mph	29	79	F	0.53	0.41
9/4/2019	0	IN	rain	69	88	F	79	0	11	4	mph	65	79	F	0.45	0.4
9/5/2019	0	IN	rain	70	78	F	80	1	6	4	mph	93	78	F	0.4	0.39
9/6/2019	0.42	IN	rain	63	70	F	92	4	17	10	mph	100	72	F	0.67	0.43
9/7/2019	0	IN	rain	57	80	F	75	0	7	3	mph	39	73	F	0.59	0.43
9/8/2019	0	IN	rain	62	83	F	77	0	7	2	mph	46	74	F	0.49	0.42
9/9/2019	0	IN	rain	64	83	F	82	0	7	3	mph	62	75	F	0.44	0.41
9/10/2019	0	IN	rain	63	82	F	80	0	9	4	mph	28	75	F	0.41	0.4
9/11/2019	0	IN	rain	65	89	F	80	0	10	5	mph	22	77	F	0.37	0.39
9/12/2019	0	IN	rain	72	94	F	79	1	11	5	mph	38	81	F	0.34	0.37
9/13/2019	0	IN	rain	64	73	F	74	3	13	9	mph	88	75	F	0.32	0.36
9/14/2019	0	IN	rain	60	83	F	80	0	10	4	mph	75	74	F	0.3	0.36
9/15/2019	0.16	IN	rain	67	82	F	89	0	5	3	mph	72	76	F	0.33	0.35

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	IN	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	56	76	F	0.38	0.34
9/16/2019	0	IN	rain	64	85	F	80	0	8	2	mph	56	76	F	0.38	0.34
9/17/2019	0.06	IN	rain	57	77	F	73	0	12	5	mph	33	75	F	0.36	0.32
9/18/2019	0	IN	rain	54	71	F	71	0	12	5	mph	43	68	F	0.31	0.3
9/19/2019	0	IN	rain	52	70	F	67	0	8	4	mph	41	66	F	0.27	0.29
9/20/2019	0	IN	rain	46	78	F	70	0	6	3	mph	7	65	F	0.24	0.27
9/21/2019	0	IN	rain	54	87	F	71	0	7	3	mph	3	69	F	0.22	0.26
9/22/2019	0	IN	rain	62	89	F	71	0	8	4	mph	11	73	F	0.2	0.25
9/23/2019	0	IN	rain	68	91	F	68	4	11	7	mph	19	77	F	0.18	0.24
9/24/2019	0	IN	rain	60	81	F	61	0	10	4	mph	30	77	F	0.16	0.23
9/25/2019	0	IN	rain	56	81	F	64	0	6	2	mph	10	71	F	0.14	0.22
9/26/2019	0	IN	rain	62	89	F	70	1	12	6	mph	37	74	F	0.12	0.2
9/27/2019	0	IN	rain	60	80	F	74	0	10	4	mph	18	74	F	0.11	0.19
9/28/2019	0	IN	rain	62	87	F	81	0	11	4	mph	51	74	F	0.1	0.17
9/29/2019	0	IN	rain	68	83	F	79	0	11	5	mph	38	76	F	0.09	0.16
9/30/2019	0	IN	rain	64	74	F	77	0	9	4	mph	85	72	F	0.09	0.16
10/1/2019	0	IN	rain	63	85	F	73	0	8	3	mph	43	75	F	0.09	0.15
10/2/2019	0	IN	rain	70	96	F	66	0	9	5	mph	29	79	F	0.09	0.15
10/3/2019	0	IN	rain	71	81	F	91	2	11	7	mph	97	77	F	0.09	0.14
10/4/2019	0	IN	rain	56	78	F	64	0	14	8	mph	22	75	F	0.09	0.14
10/5/2019	0	IN	rain	54	65	F	67	1	11	7	mph	68	66	F	0.08	0.14
10/6/2019	0	IN	rain	57	76	F	71	2	9	5	mph	93	69	F	0.07	0.14
10/7/2019	0	IN	rain	66	84	F	72	1	9	5	mph	68	73	F	0.06	0.13
10/8/2019	0.02	IN	rain	63	68	F	77	7	14	10	mph	97	69	F	0.03	0.12
10/9/2019	0.02	IN	rain	55	63	F	82	7	11	9	mph	98	66	F	0	0.12
10/10/2019	0	IN	rain	54	75	F	66	5	12	8	mph	56	66	F	0	0.1
10/11/2019	0	IN	rain	57	68	F	54	2	13	7	mph	58	66	F	0	0.08
10/12/2019	0	IN	rain	48	77	F	72	0	5	2	mph	36	66	F	0	0.07
10/13/2019	0.09	IN	rain	55	67	F	78	1	8	4	mph	82	64	F	0	0.06
10/14/2019	0	IN	rain	52	76	F	73	0	8	3	mph	40	68	F	0.01	0.07
10/15/2019	0	IN	rain	47	71	F	76	0	8	3	mph	11	63	F	0	0.06
10/16/2019	1.22	IN	rain	51	70	F	87	0	16	6	mph	70	60	F	0.21	0.11
10/17/2019	0	IN	rain	52	62	F	54	6	16	10	mph	38	59	F	0.53	0.18

Data Source is ITERIS													% Cloud Cover	Avg Soil Temp	0-10 cm Temp	0-200 cm Scaled Soil Moisture
	Moisture			Min Temp	Max Temp	Temp Unit	% Relative Humidity	Min Wind	Max Wind	Avg Wind	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	0-200 cm Scaled Soil Moisture
Date	Total	IN	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	18	57	F	0.39	0.17
10/18/2019	0	IN	rain	44	62	F	63	0	10	4	mph	18	57	F	0.39	0.17
10/19/2019	0	IN	rain	37	65	F	72	0	5	1	mph	31	56	F	0.32	0.15
10/20/2019	1.79	IN	rain	47	61	F	94	0	17	8	mph	94	56	F	0.72	0.22
10/21/2019	0	IN	rain	54	66	F	85	0	10	5	mph	76	62	F	0.73	0.3
10/22/2019	0.09	IN	rain	58	70	F	93	0	11	4	mph	100	64	F	0.63	0.29
10/23/2019	0	IN	rain	46	68	F	71	0	9	4	mph	11	63	F	0.6	0.3
10/24/2019	0	IN	rain	41	70	F	73	0	8	2	mph	1	59	F	0.5	0.29
10/25/2019	0	IN	rain	46	71	F	82	0	6	2	mph	69	58	F	0.46	0.28
10/26/2019	0	IN	rain	58	68	F	82	0	9	4	mph	81	62	F	0.43	0.27
10/27/2019	0.31	IN	rain	63	79	F	85	1	15	7	mph	61	65	F	0.54	0.26
10/28/2019	0	IN	rain	52	67	F	73	1	9	5	mph	41	63	F	0.5	0.25
10/29/2019	0.01	IN	rain	54	65	F	85	0	4	2	mph	89	63	F	0.44	0.23
10/30/2019	0	IN	rain	52	70	F	92	0	3	1	mph	94	62	F	0.42	0.21
10/31/2019	0.19	IN	rain	63	79	F	86	4	21	12	mph	90	69	F	0.4	0.21
11/1/2019	0.29	IN	rain	41	57	F	58	0	13	7	mph	14	59	F	0.71	0.25
11/2/2019	0	IN	rain	35	57	F	65	0	6	2	mph	3	52	F	0.52	0.25
11/3/2019	0	IN	rain	35	54	F	67	0	14	4	mph	2	49	F	0.46	0.25
11/4/2019	0	IN	rain	32	61	F	73	0	10	3	mph	25	49	F	0.4	0.24
11/5/2019	0	IN	rain	47	70	F	75	0	9	2	mph	62	55	F	0.36	0.24
11/6/2019	0	IN	rain	40	59	F	63	0	6	3	mph	3	53	F	0.34	0.24
11/7/2019	0.08	IN	rain	36	64	F	77	0	10	4	mph	73	52	F	0.32	0.23
11/8/2019	0.01	IN	rain	33	48	F	55	0	13	7	mph	45	48	F	0.38	0.23
11/9/2019	0	IN	rain	26	46	F	53	0	4	2	mph	9	43	F	0.33	0.21
11/10/2019	0	IN	rain	28	59	F	66	0	10	3	mph	31	45	F	0.29	0.19
11/11/2019	0	IN	rain	42	70	F	70	1	10	4	mph	24	52	F	0.25	0.16
11/12/2019	0.48	IN	rain	32	60	F	70	5	11	8	mph	84	49	F	0.47	0.17
11/13/2019	0	IN	rain	23	37	F	52	0	10	4	mph	13	38	F	0.51	0.19
11/14/2019	0	IN	rain	21	50	F	71	0	8	2	mph	54	39	F	0.43	0.18
11/15/2019	0.05	IN	rain	41	52	F	72	0	6	2	mph	90	46	F	0.43	0.18
11/16/2019	0	IN	rain	40	46	F	62	5	21	14	mph	74	43	F	0.38	0.18
11/17/2019	0.01	IN	rain	37	45	F	85	8	14	12	mph	100	43	F	0.34	0.18
11/18/2019	0	IN	rain	39	46	F	87	0	11	6	mph	98	45	F	0.33	0.17

Data Source is ITERIS													%	Avg	0-10 cm	0-200 cm
	Moisture			Min	Max	Temp	% Relative	Min	Max	Avg	Unit	Cloud Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
Date	Total	Unit	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	86	47	F	0.31	0.17
11/19/2019	0	IN	rain	40	53	F	87	0	5	2	mph	86	47	F	0.31	0.17
11/20/2019	0	IN	rain	41	53	F	71	0	10	4	mph	74	47	F	0.3	0.17
11/21/2019	0	IN	rain	37	53	F	63	2	6	3	mph	33	46	F	0.27	0.17
11/22/2019	0.18	IN	rain	39	57	F	74	1	10	6	mph	73	48	F	0.38	0.17
11/23/2019	0.21	IN	rain	28	50	F	80	0	7	3	mph	56	42	F	0.45	0.18
11/24/2019	0.42	IN	rain	40	58	F	76	1	15	9	mph	56	48	F	0.82	0.25
11/25/2019	0	IN	rain	33	59	F	71	0	5	2	mph	8	45	F	0.55	0.25
11/26/2019	0	IN	rain	34	64	F	77	0	8	2	mph	24	47	F	0.46	0.24
11/27/2019	0	IN	rain	41	60	F	84	0	18	7	mph	70	50	F	0.39	0.23
11/28/2019	0	IN	rain	42	56	F	50	6	18	12	mph	43	50	F	0.33	0.22
11/29/2019	0	IN	rain	34	47	F	58	2	9	6	mph	14	44	F	0.29	0.21
11/30/2019	0	IN	rain	36	46	F	61	0	7	3	mph	88	43	F	0.27	0.2

## University of Delaware

Weed Control with FMC and Corteva Programs in Field Corn  
 Trial ID: Corn1-19 Location: Field #16 Trial Year: 2019  
 Protocol ID: Corn1-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: FMC, Corteva

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 04/24/19  
 Initiation Date: 03/01/19  
 Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays	Corn
Entry Date: 09/23/19	
Variety: RL7844AM	
Attributes: Roundup-ready	
Planting Date: 05/07/19	Planting Rate: 28000 S/A
Depth: 2 IN	
Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 IN	Planting Equipment: FE Field Equipment
Soil Temperature: 77 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 05/14/19	Soil Moisture: NORMAL normal, adequate
Harvest Date: 09/13/19	Harvest Equipment: Plot combine
% Standard Moisture: 15.5	Harvested Width: 5 FT
	Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth Entry Date: 09/23/19

Pest 2 Type: W Code: AMBEL Ambrosia artemisiifolia  
 Common Name: Common ragweed Entry Date: 09/23/19

Pest 3 Type: W Code: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass Entry Date: 09/23/19

**Site and Design**

Treated Plot Width: 6.67 FT	Site Type: FIELD field
Treated Plot Length: 25 FT	
Treated Plot Area: 166.75 FT <sup>2</sup>	Tillage Type: NOTILL no-till
Replications: 3	Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 16A			
% Sand: 76	% OM: 1.4	Texture: SL	sandy loam
% Silt: 15	pH: 6.6	Soil Name: Hurlokk loamy sand, 0-2% slopes	
% Clay: 9	CEC: 4.8	Fert. Level: F	fair
Soil Drainage: F	fair		

**Application Description**

	A	B
Application Date	05/08/19	05/29/19
Appl. Stop Time	01:40 PM	04:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	V2-3
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/21/19	09/23/19
Air Temperature Start, Stop	71 71 F	92 92 F
% Relative Humidity Start, Stop	66 68	44 44
Wind Velocity+Dir. Start	11 mph NE	9 mph WSW
Wind Velocity+Dir. Stop	11 mph NE	9 mph WSW
Wind Velocity+Dir. Max	11 mph NE	9 mph WSW
Wet Leaves (Y/N)	N no	
Soil Temperature	71 F	88 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	61	20
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.42 IN	0.53 IN
Weather Source	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR
Days after Emergence	-6	15
Stage Majority, Percent		V3-4 100
Height Average		8 in
Height Minimum, Maximum		7 9

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100
Height Average		5 in
Height Minimum, Maximum		3 7
Density Average		12 m <sup>2</sup>
Density Min, Max		5 20
Pest 2 Code, Type, Scale	AMBEL W	AMBEL W
Stage Majority, Percent		veg 100
Height Average		4 in
Height Minimum, Maximum		2 6
Density Average		25 m <sup>2</sup>
Density Min, Max		2 50
Pest 3 Code, Type, Scale	DIGSA W	DIGSA W
Stage Majority, Percent		1-tilr 60
Stage Minimum, Percent		4-leaf 10
Stage Maximum, Percent		2-tilr 30
Height Average		6 in
Height Minimum, Maximum		4 8
Density Average		10 m <sup>2</sup>
Density Min, Max		0 20

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIR MIX	AIR MIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	26 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/24/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

05/30/19: Ratings based only on PRE application.

06/08/19: Corn stunting observed in plots without PRE herbicides, so stunting is being confounded with poor weed control

06/21/19: Ragweed was in all untreated plots but none observed in treatments. Control of emerged morningglory species was at least 99% for all treatment ratings based on newly emerged seedlings.

Weed Control with FMC and Corteva Programs in Field Corn									
Trial ID: Corn1-19		Location: Field #16		Trial Year: 2019					
Protocol ID: Corn1-19		Investigator: Mark VanGessel							
Study Director:								Sponsor Contact: FMC, Corteva	
Pest Code	Crop Type, Code				C ZEAMX	AMAPA C -	AMBEL C -	IPOSS C -	
Description		Corn	PalmerAm	C.ragwd				Mornglry	
Rating Type		Injury %							
Rating Unit			Control %						
Rating Date		05/30/19	05/30/19	05/30/19	05/30/19	05/30/19	05/30/19	05/30/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 a	0.0 b
2	Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Roundup PowerMax..glyphosate Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L	4 SE 3.733 0.267 4 L 4.5 AS 4.376 SC 2.084 2.084 0.208 4 L	0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.77 lb ae/a 1.64 lb ai/a 0.78 0.78 0.078 0.5 lb ai/a	PRE A V2-3 B		2.3 a		99.0 a	90.3 a
3	Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate	4 SE 3.733 0.267 4 L 4 SC 4 L 4.5 AS	0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.13 lb ae/a	PRE A V2-3 B		6.7 a		97.7 a	93.7 a
4	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet DiFlexx Duo Premix ----dicamba ----tembotriione Atrazine 4L Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 2.13 SC 1.86 0.27 4 L 4.5 AS	0.109 lb ai/a 0.106 0.0032 0.53 lb ai/a 0.463 0.067 1.5 lb ai/a 1.13 lb ae/a	V2-3 B					
5	Capreno Premix ----thiencarbazone ----tembotriione Atrazine 4L Roundup PowerMax..glyphosate Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	3.45 SC 0.57 2.88 4 L 4.5 AS 4.3 SC 4.174 0.126	0.081 lb ai/a 0.0134 0.0676 1.5 lb ai/a 1.13 lb ae/a 0.109 lb ai/a 0.106 0.0032	V2-3 B					
6	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Status Premix ----diflufenzopyr ----dicamba Atrazine 4L Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 56 WG 16 40 4 L 4.5 AS	0.109 lb ai/a 0.106 0.0032 0.14 lb ai/a 0.04 0.1 1.5 lb ai/a 0.77 lb ae/a	V2-3 B					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=4,6

Could not calculate LSD (% mean diff) for columns 12 because error mean square = 0.

Pest Code Crop Type, Code		GGGAN C -	C ZEAMX	AMAPA C -						
Description		AnnGrass	Corn	PalmerAm						
Rating Type		Control %	Stunting %	Control %						
Rating Unit		05/30/19	06/08/19	06/08/19						
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1	Untreated Check							0.0 b	0.0 d	0.0 d
2	Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Roundup PowerMax..glyphosate Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L	4 SE 3.733 0.267 4 L 4.5 AS 4.376 SC 2.084 2.084 0.208 4 L	0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.77 lb ae/a 1.64 lb ai/a 0.78 0.78 0.078 0.5 lb ai/a	PRE A	99.3 a	3.3 bcd	100.0 a			
3	Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate	4 SE 3.733 0.267 4 L 4 SC 4 L 4.5 AS	0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.13 lb ae/a	PRE A V2-3 B V2-3 B V2-3	99.3 a	10.7 a	100.0 a			
4	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet DiFlexx Duo Premix ----dicamba ----tembotrione Atrazine 4L Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 2.13 SC 1.86 0.27 4 L 4.5 AS	0.109 lb ai/a 0.106 0.0032 0.53 lb ai/a 0.463 0.067 1.5 lb ai/a 1.13 lb ae/a	V2-3 B V2-3 B V2-3 B B		10.3 ab	100.0 a			
5	Capreno Premix ----thien carbazole ----tembotrione Atrazine 4L Roundup PowerMax..glyphosate Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	3.45 SC 0.57 2.88 4 L 4.5 AS 4.3 SC 4.174 0.126	0.081 lb ai/a 0.0134 0.0676 1.5 lb ai/a 1.13 lb ae/a 0.109 lb ai/a 0.106 0.0032	V2-3 B B B B B B		8.0 abc	99.7 a			
6	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Status Premix ----diflufenzopyr ----dicamba Atrazine 4L Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 56 WG 16 40 4 L 4.5 AS	0.109 lb ai/a 0.106 0.0032 0.14 lb ai/a 0.04 0.1 1.5 lb ai/a 0.77 lb ae/a	V2-3 B B V2-3 B B B B		7.3 abc	94.0 c			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=4,6

Could not calculate LSD (% mean diff) for columns 12 because error mean square = 0.

Pest Code Crop Type, Code		AMBEL C - C.ragwd Control % 06/08/19	IPOSS C - Mornglyr Control % 06/08/19	GGGAN C - AnnGrass Control % 06/08/19	C ZEAMX Corn Stunting % 06/21/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing	Code		
1 Untreated Check				0.0 c	0.0 c
2 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Roundup PowerMax..glyphosate Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L	4 SE 3.733 0.267 4 L 4.5 AS 4.376 SC 2.084 2.084 0.208 4 L	0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.77 lb ae/a 1.64 lb ai/a 0.78 0.78 0.078 0.5 lb ai/a	PRE A V2-3 B V2-3 B V2-3 B V2-3	A	100.0 a 95.7 b 100.0 a 2.3 a
3 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate	4 SE 3.733 0.267 4 L 4 SC 4 L 4.5 AS	0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.13 lb ae/a	PRE A V2-3 B V2-3 B V2-3	A	100.0 a 100.0 a 100.0 a 3.3 a
4 Anthem Maxx Premix ----pyroxasulfone ----fluthiacet DiFlexx Duo Premix ----dicamba ----tembotrione Atrazine 4L Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 2.13 SC 1.86 0.27 4 L 4.5 AS	0.109 lb ai/a 0.106 0.0032 0.53 lb ai/a 0.463 0.067 1.5 lb ai/a 1.13 lb ae/a	V2-3 B V2-3 B V2-3 B V2-3 B	B	100.0 a 100.0 a 100.0 a 8.0 a
5 Capreno Premix ----thiencarbazone ----tembotrione Atrazine 4L Roundup PowerMax..glyphosate Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	3.45 SC 0.57 2.88 4 L 4.5 AS 4.3 SC 4.174 0.126	0.081 lb ai/a 0.0134 0.0676 1.5 lb ai/a 1.13 lb ae/a 0.109 lb ai/a 0.106 0.0032	V2-3 B V2-3 B V2-3 B	B	99.7 a 99.0 ab 99.0 ab 3.3 a
6 Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Status Premix ----diflufenzopyr ----dicamba Atrazine 4L Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 56 WG 16 40 4 L 4.5 AS	0.109 lb ai/a 0.106 0.0032 0.14 lb ai/a 0.04 0.1 1.5 lb ai/a 0.77 lb ae/a	V2-3 B V2-3 B V2-3 B V2-3 B	B	99.7 a 97.0 ab 98.0 b 8.3 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4,6

Could not calculate LSD (% mean diff) for columns 12 because error mean square = 0.

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm Control % 06/21/19	IPOSS C - Mornglry Control % 06/21/19	PANDI C - F.panicm Control % 06/21/19	C ZEAMX Corn Yield Bu/A 09/13/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 b	0.0 d
2	Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Roundup PowerMax..glyphosate Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L	4 SE 3.733 0.267 4 L 4.5 AS 4.376 SC 2.084 2.084 0.208 4 L		0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.77 lb ae/a 1.64 lb ai/a 0.78 0.78 0.078 0.5 lb ai/a	PRE A V2-3 B V2-3 B V2-3 B V2-3		99.0 a	91.7 c	99.0 a
3	Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate	4 SE 3.733 0.267 4 L 4 SC 4 L 4.5 AS		0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.13 lb ae/a	PRE A V2-3 B V2-3 B V2-3		99.0 a	96.3 ab	99.0 a
4	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet DiFlexx Duo Premix ----dicamba ----tembotrione Atrazine 4L Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 2.13 SC 1.86 0.27 4 L 4.5 AS		0.109 lb ai/a 0.106 0.0032 0.53 lb ai/a 0.463 0.067 1.5 lb ai/a 1.13 lb ae/a	V2-3 B V2-3 B V2-3 B V2-3 B		99.0 a	98.0 ab	98.3 a
5	Capreno Premix ----thiencarbazone ----tembotrione Atrazine 4L Roundup PowerMax..glyphosate Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	3.45 SC 0.57 2.88 4 L 4.5 AS 4.3 SC 4.174 0.126		0.081 lb ai/a 0.0134 0.0676 1.5 lb ai/a 1.13 lb ae/a 0.109 lb ai/a 0.106 0.0032	V2-3 B V2-3 B V2-3 B V2-3 B		99.0 a	98.3 ab	99.0 a
6	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Status Premix ----diflufenzopyr ----dicamba Atrazine 4L Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 56 WG 16 40 4 L 4.5 AS		0.109 lb ai/a 0.106 0.0032 0.14 lb ai/a 0.04 0.1 1.5 lb ai/a 0.77 lb ae/a	V2-3 B V2-3 B V2-3 B V2-3 B		99.0 a	95.0 abc	99.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=4,6

Could not calculate LSD (% mean diff) for columns 12 because error mean square = 0.

## University of Delaware

Pest Code		C	ZEAMX	AMAPA C -	AMBEL C -	IPOSS C -	
Crop Type, Code		Corn	PalmerAm	C.ragwd	Mornlgy		
Description		Injury %	Control %	Control %	Control %		
Rating Type		05/30/19	05/30/19	05/30/19	05/30/19	05/30/19	
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code	
7	Atrazine 4L	4 L		1.5 lb ai/a	V2-3	B	
	Roundup PowerMax..glyphosate	4.5 AS		0.77 lb ae/a	V2-3	B	
	Impact.....topramezone	2.81 SC		0.022 lb ai/a	V2-3	B	
	Anthem Maxx Premix	4.3 SC		0.109 lb ai/a	V2-3	B	
	----pyroxasulfone	4.174		0.106			
	----fluthiacet	0.126		0.0032			
8	Atrazine 4L	4 L		0.5 lb ai/a	PRE	A	
	Simazine	4 L		0.5 lb ai/a	PRE	A	
	Atrazine 4L	4 L		0.5 lb ai/a	V2-3	B	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V2-3	B	
	Resicore Premix	3.28 SE		1.23 lb ai/a	V2-3	B	
	----acetochlor	2.8		1.05			
	----mesotrione	0.3		0.113			
	----clopyralid	0.18		0.0675			
9	Realm Q Premix	38.7 WG		0.097 lb ai/a	V2-3	B	
	----rimsulfuron	7.5		0.0188			
	----mesotrione	31.2		0.078			
	Atrazine 4L	4 L		1 lb ai/a	V2-3	B	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V2-3	B	
10	Keystone NXT Premix	5.6 SE		2.1 lb ai/a	PRE	A	
	----acetochlor	3.1		1.16			
	----atrazine	2.5		0.94			
	Resolve Q Premix	22.4 SG		0.0175 lb ai/a	V2-3	B	
	----rimsulfuron	18.4		0.0144			
	----thifensulfuron	4		0.00313			
	Atrazine 4L	4 L		0.5 lb ai/a	V2-3	B	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V2-3	B	
LSD P=.05				6.37	17.50	16.49	15.81
Standard Deviation				3.38	9.30	8.76	8.19
CV				137.08	12.32	12.33	11.59
Replicate F				3.259	0.198	0.477	0.049
Replicate Prob(F)				0.0922	0.8246	0.6371	0.9528
Treatment F				2.006	62.368	62.554	70.122
Treatment Prob(F)				0.1866	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4,6

Could not calculate LSD (% mean diff) for columns 12 because error mean square = 0.

University of Delaware

Pest Code	University of Delaware						GGGAN	C - C	AMAPA
Crop Type, Code							ZEAMX		C - C
Description							AnnGrass	Corn	PalmerAm
Rating Type							Control %	Stunting %	Control %
Rating Unit							05/30/19	06/08/19	06/08/19
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code		
7	Atrazine 4L	4 L		1.5 lb	ai/a	V2-3	B		2.3 cd
	Roundup PowerMax..glyphosate	4.5 AS		0.77 lb	ae/a	V2-3	B		100.0 a
	Impact.....topramezone	2.81 SC		0.022 lb	ai/a	V2-3	B		
	Anthem Maxx Premix	4.3 SC		0.109 lb	ai/a	V2-3	B		
	----pyroxasulfone	4.174		0.106					
	----fluthiacet	0.126		0.0032					
8	Atrazine 4L	4 L		0.5 lb	ai/a	PRE	A	96.0 a	2.3 cd
	Simazine	4 L		0.5 lb	ai/a	PRE	A		100.0 a
	Atrazine 4L	4 L		0.5 lb	ai/a	V2-3	B		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb	ae/a	V2-3	B		
	Resicore Premix	3.28 SE		1.23 lb	ai/a	V2-3	B		
	----acetochlor	2.8		1.05					
	----mesotrione	0.3		0.113					
	----clopyralid	0.18		0.0675					
9	Realm Q Premix	38.7 WG		0.097 lb	ai/a	V2-3	B		10.3 ab
	----rimsulfuron	7.5		0.0188					97.7 b
	----mesotrione	31.2		0.078					
	Atrazine 4L	4 L		1 lb	ai/a	V2-3	B		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb	ae/a	V2-3	B		
10	Keystone NXT Premix	5.6 SE		2.1 lb	ai/a	PRE	A	90.3 a	6.3 a-d
	----acetochlor	3.1		1.16					100.0 a
	----atrazine	2.5		0.94					
	Resolve Q Premix	22.4 SG		0.0175 lb	ai/a	V2-3	B		
	----rimsulfuron	18.4		0.0144					
	----thifensulfuron	4		0.00313					
	Atrazine 4L	4 L		0.5 lb	ai/a	V2-3	B		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb	ae/a	V2-3	B		
LSD P=.05								10.07	7.12
Standard Deviation								5.35	4.11
CV								6.95	67.55
Replicate F								0.196	1.037
Replicate Prob(F)								0.8260	0.3773
Treatment F								195.769	2.646
Treatment Prob(F)								0.0001	0.0430
								0.0001	0.0001

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Means followed by same letter or symbol do not significantly differ ( $P < .05$ , LSD). Mean comparisons performed only when ANOVA Treatment P(F) is significant at mean comparison OSI.

Mean comparisons performed only when AOV Treatment F  
Missing data estimates are included in columns: Yates=4.6

Could not calculate LSD (% mean diff) for columns 12 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		AMBEL C - C.ragwd Control % 06/08/19	IPOSS C - Mornglry Control % 06/08/19	GGGAN C - AnnGrass Control % 06/08/19	C ZEAMX Corn Stunting % 06/21/19		
Trt Treatment No. Name	Form Conc Form Type Rate Unit	Appl Timing Appl Code					
7 Atrazine 4L Roundup PowerMax..glyphosate Impact.....topramezone Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	4 L 4.5 AS 2.81 SC 4.3 SC 4.174 0.126	1.5 lb ai/a 0.77 lb ae/a 0.022 lb ai/a 0.109 lb ai/a 0.106 0.0032	V2-3 B	100.0 a	97.3 ab	98.7 ab	0.0 a
8 Atrazine 4L Simazine Atrazine 4L Roundup PowerMax..glyphosate Resicore Premix ----acetochlor ----mesotrione ----clopyralid	4 L 4 L 4 L 4.5 AS 3.28 SE 2.8 0.3 0.18	0.5 lb ai/a 0.5 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 1.23 lb ai/a 1.05 0.113 0.0675	PRE V2-3 B	100.0 a	98.3 ab	100.0 a	0.0 a
9 Realm Q Premix ----rimsulfuron ----mesotrione Atrazine 4L Roundup PowerMax..glyphosate	38.7 WG 7.5 31.2 4 L 4.5 AS	0.097 lb ai/a 0.0188 0.078 1 lb ai/a 1.13 lb ae/a	V2-3 B	99.0 b	96.3 ab	99.0 ab	10.0 a
10 Keystone NXT Premix ----acetochlor ----atrazine Resolve Q Premix ----rimsulfuron ----thifensulfuron Atrazine 4L Roundup PowerMax..glyphosate	5.6 SE 3.1 2.5 22.4 SG 18.4 4 4 L 4.5 AS	2.1 lb ai/a 1.16 0.94 0.0175 lb ai/a 0.0144 0.00313 0.5 lb ai/a 1.13 lb ae/a	PRE V2-3 B	100.0 a	96.7 ab	100.0 a	2.3 a
LSD P=.05 Standard Deviation CV				0.42 0.24 0.27	4.08 2.38 2.7	1.71 0.99 1.11	8.56 4.99 132.52
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				2.250 0.1342 50442.818	0.148 0.8639 509.383	3.472 0.0531 2999.416	0.459 0.6392 1.668
				0.0001	0.0001	0.0001	0.1699

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4,6

Could not calculate LSD (% mean diff) for columns 12 because error mean square = 0.

## University of Delaware

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm Control %	IPOSS C - Mornglry Control %	PANDI C - F.panicm Control %	C ZEAMX Corn Yield Bu/A
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
7	Atrazine 4L Roundup PowerMax..glyphosate Impact.....topramezone Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	4 L 4.5 AS 2.81 SC 4.3 SC 4.174 0.126	1.5 lb ai/a 0.77 lb ae/a 0.022 lb ai/a 0.109 lb ai/a 0.106 0.0032	V2-3 B	99.0 a	94.3 bc	95.7 a	144.9 a	
8	Atrazine 4L Simazine Atrazine 4L Roundup PowerMax..glyphosate Resicore Premix ----acetochlor ----mesotrione ----clopyralid	4 L 4 L 4 L 4.5 AS 3.28 SE 2.8 0.3 0.18	0.5 lb ai/a 0.5 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 1.23 lb ai/a 1.05 0.113 0.0675	PRE V2-3 B	99.0 a	99.0 a	99.0 a	147.6 a	
9	Realm Q Premix ----rimsulfuron ----mesotrione Atrazine 4L Roundup PowerMax..glyphosate	38.7 WG 7.5 31.2 4 L 4.5 AS	0.097 lb ai/a 0.0188 0.078 1 lb ai/a 1.13 lb ae/a	V2-3 B	99.0 a	95.7 abc	95.7 a	106.8 a	
10	Keystone NXT Premix ----acetochlor ----atrazine Resolve Q Premix ----rimsulfuron ----thifensulfuron Atrazine 4L Roundup PowerMax..glyphosate	5.6 SE 3.1 2.5 22.4 SG 18.4 4 4 L 4.5 AS	2.1 lb ai/a 1.16 0.94 0.0175 lb ai/a 0.0144 0.00313 0.5 lb ai/a 1.13 lb ae/a	PRE V2-3 B	99.0 a	95.3 abc	99.0 a	174.3 a	
LSD P=.05 Standard Deviation CV						. 0.00 0.0	4.59 2.67 3.1	4.27 2.49 2.82	70.62 41.17 30.58
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						0.000 1.0000 0.000 1.0000	2.745 0.0911 388.228 0.0001	1.955 0.1705 466.807 0.0001	0.026 0.9747 1.937 0.1112

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=4,6

Could not calculate LSD (% mean diff) for columns 12 because error mean square = 0.

## University of Delaware

Acuron Advanced Formulation Crop Tolerance and Weed Control  
 Trial ID: Corn2-19 Location: Field #14 Trial Year: 2019  
 Protocol ID: Corn2-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Syngenta

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 04/24/19

Initiation Date: 03/01/19

Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays Corn

Entry Date: 09/13/19

Variety: RL7844AM

Attributes: Roundup-ready

Planting Date: 05/10/19

Planting Rate: 28000 S/A

Depth: 2 IN

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Moisture: NORMAL normal, adequate

Soil Temperature: 77 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 05/18/19

Harvest Date: 09/16/19

Harvest Equipment: Plot combine

Harvested Width: 5 FT

Harvested Length: 25 FT

% Standard Moisture: 15.5

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 18 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14A

% Sand: 77 % OM: 1.6 Texture: SL sandy loam

% Silt: 16 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: G good

Soil Drainage: F fair

**Application Description**

A	
Application Date	05/10/19
Appl. Stop Time	01:35 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	Johnson
Appl. Entry Date	05/21/19
Air Temperature Start, Stop	77 78 F
% Relative Humidity Start, Stop	58 56
Wind Velocity+Dir. Start	10 mph SW
Wind Velocity+Dir. Stop	14 mph SW
Wind Velocity+Dir. Max	14 mph SW
Wet Leaves (Y/N)	N no
Soil Temperature	74 F
Soil Moisture	NORMAL
% Cloud Cover	88
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.45 IN

**Crop Stage At Each Application**

A	
Crop 1 Code, BBCH Scale	ZEAMX BCOR
Days after Emergence	-8

**Application Equipment**

A	
Appl. Equipment	Tractr4Nozl
Equipment Type	TRMOSP
Operation Pressure	40 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	20 in
Boom Length	6.7 ft
Boom Height	18 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

Context	Date	By	Notes
STATUS	04/24/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

## Trial Comments

6/14/19: Very minimal stunting (less than 4%) only with treatments 9 and 17.

## University of Delaware

Acuron Advanced Formulation Crop Tolerance and Weed Control					
Trial ID: Corn2-19		Location: Field #14		Trial Year: 2019	
Protocol ID: Corn2-19		Investigator: Mark VanGessel			
Study Director:					
Sponsor Contact: Syngenta					

Pest Code	Crop Type, Code	Description	C ZEAMX Corn	C ZEAMX Corn	AMAPA C - PalmerAm	IPOSS C - Mornlgy		
Rating Type	Rating Unit		Stunting %	Stunting %	Control %	Control %		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Untreated Check				0.0 a	0.0 a	0.0 c	0.0 e
2	Acuron Premix	3.44 ZC	1.08 lb ai/a	PRE A	0.0 a	4.3 a	100.0 a	43.3 a-d
	----atrazine	1	0.314					
	----bicyclopyrone	0.06	0.0188					
	----mesotrione	0.24	0.075					
	----s-metolachlor	2.14	0.67					
3	A22668 (C) Premix	3.54 ZC	1.11 lb ai/a	PRE A	0.0 a	3.3 a	100.0 a	50.0 abc
4	Dual II Magnum..s-metolachlor	7.64 E	0.67 lb ai/a	PRE A	0.0 a	3.3 a	97.7 a	0.0 e
5	Dual II Magnum..s-metolachlor	7.64 E	0.75 lb ai/a	PRE A	0.0 a	2.7 a	88.3 b	0.0 e
6	Acuron Premix	3.44 ZC	1.44 lb ai/a	PRE A	0.0 a	4.3 a	100.0 a	58.3 ab
	----atrazine	1	0.42					
	----bicyclopyrone	0.06	0.025					
	----mesotrione	0.24	0.1					
	----s-metolachlor	2.14	0.9					
7	A22668 (C) Premix	3.54 ZC	1.48 lb ai/a	PRE A	0.0 a	7.7 a	100.0 a	46.7 a-d
8	Dual II Magnum..s-metolachlor	7.64 E	0.89 lb ai/a	PRE A	0.0 a	4.3 a	100.0 a	38.3 b-e
9	Dual II Magnum..s-metolachlor	7.64 E	1 lb ai/a	PRE A	0.0 a	8.3 a	100.0 a	33.3 b-e
10	Resicore Premix	3.28 SE	1.14 lb ai/a	PRE A	0.0 a	3.3 a	100.0 a	40.0 b-e
	----acetochlor	2.8	0.97					
	----mesotrione	0.3	0.104					
	----clopyralid	0.18	0.0626					
11	Harness Max Premix	3.85 L	1.22 lb ai/a	PRE A	0.0 a	8.3 a	100.0 a	35.5 b-e
	----acetochlor	3.52	1.12					
	----mesotrione	0.33	0.105					
12	Acuron Premix	3.44 ZC	2.15 lb ai/a	PRE A	0.0 a	3.3 a	100.0 a	56.7 abc
	----atrazine	1	0.625					
	----bicyclopyrone	0.06	0.0375					
	----mesotrione	0.24	0.15					
	----s-metolachlor	2.14	1.34					
13	A22668 (C) Premix	3.54 ZC	2.21 lb ai/a	PRE A	0.0 a	3.3 a	100.0 a	58.3 ab
14	Dual II Magnum..s-metolachlor	7.64 E	1.34 lb ai/a	PRE A	0.0 a	6.0 a	100.0 a	16.7 cde
15	Dual II Magnum..s-metolachlor	7.64 E	1.5 lb ai/a	PRE A	0.0 a	5.0 a	95.0 a	6.7 de
16	Resicore Premix	3.28 SE	1.71 lb ai/a	PRE A	0.0 a	4.3 a	100.0 a	81.7 a
	----acetochlor	2.8	1.46					
	----mesotrione	0.3	0.156					
	----clopyralid	0.18	0.094					
17	Harness Max Premix	3.85 L	1.83 lb ai/a	PRE A	0.0 a	4.3 a	100.0 a	73.3 ab
	----acetochlor	3.52	1.67					
	----mesotrione	0.33	0.157					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=4,10,11,12

Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

Pest Code	C	ZEAMX	PANDI	AMAPA	IPOSS
Crop Type, Code	CrnPlnts	C - F.panicm	C - PalmerAm	C - Mornlgy	
Description					
Rating Type	Stunted	Contol %	Contol %	Contol %	
Rating Unit	#/25RwF				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1 Untreated Check					
2 Acuron Premix	3.44 ZC	1.08 lb ai/a	PRE	A	
----atrazine	1	0.314			
----bicyclopyrone	0.06	0.0188			
----mesotrione	0.24	0.075			
----s-metolachlor	2.14	0.67			
3 A22668 (C) Premix	3.54 ZC	1.11 lb ai/a	PRE	A	
4 Dual II Magnum..s-metolachlor	7.64 E	0.67 lb ai/a	PRE	A	
5 Dual II Magnum..s-metolachlor	7.64 E	0.75 lb ai/a	PRE	A	
6 Acuron Premix	3.44 ZC	1.44 lb ai/a	PRE	A	
----atrazine	1	0.42			
----bicyclopyrone	0.06	0.025			
----mesotrione	0.24	0.1			
----s-metolachlor	2.14	0.9			
7 A22668 (C) Premix	3.54 ZC	1.48 lb ai/a	PRE	A	
8 Dual II Magnum..s-metolachlor	7.64 E	0.89 lb ai/a	PRE	A	
9 Dual II Magnum..s-metolachlor	7.64 E	1 lb ai/a	PRE	A	
10 Resicore Premix	3.28 SE	1.14 lb ai/a	PRE	A	
----acetochlor	2.8	0.97			
----mesotrione	0.3	0.104			
----clopyralid	0.18	0.0626			
11 Harness Max Premix	3.85 L	1.22 lb ai/a	PRE	A	
----acetochlor	3.52	1.12			
----mesotrione	0.33	0.105			
12 Acuron Premix	3.44 ZC	2.15 lb ai/a	PRE	A	
----atrazine	1	0.625			
----bicyclopyrone	0.06	0.0375			
----mesotrione	0.24	0.15			
----s-metolachlor	2.14	1.34			
13 A22668 (C) Premix	3.54 ZC	2.21 lb ai/a	PRE	A	
14 Dual II Magnum..s-metolachlor	7.64 E	1.34 lb ai/a	PRE	A	
15 Dual II Magnum..s-metolachlor	7.64 E	1.5 lb ai/a	PRE	A	
16 Resicore Premix	3.28 SE	1.71 lb ai/a	PRE	A	
----acetochlor	2.8	1.46			
----mesotrione	0.3	0.156			
----clopyralid	0.18	0.094			
17 Harness Max Premix	3.85 L	1.83 lb ai/a	PRE	A	
----acetochlor	3.52	1.67			
----mesotrione	0.33	0.157			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=4,10,11,12

Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

Pest Code					PANDI C - F.panicm	AMAPA C - PalmerAm	IPOSS C - Mornlry	PANDI C - F.panicm
Crop Type, Code					Contol %	Contol %	Contol %	Contol %
Description	Rating Type	Form	Form	Rate	Appl	Appl		
Trt No.	Treatment Name	Conc	Type	Rate	Unit	Timing	Code	
1	Untreated Check						0.0 f	0.0 c
2	Auron Premix	3.44	ZC	1.08	lb ai/a	PRE	A	3.3 ef
----atrazine		1		0.314				
----bicyclopyrone		0.06		0.0188				
----mesotrione		0.24		0.075				
----s-metolachlor		2.14		0.67				
3	A22668 (C) Premix	3.54	ZC	1.11	lb ai/a	PRE	A	33.3 cde
4	Dual II Magnum..s-metolachlor	7.64	E	0.67	lb ai/a	PRE	A	20.0 def
5	Dual II Magnum..s-metolachlor	7.64	E	0.75	lb ai/a	PRE	A	0.0 f
6	Auron Premix	3.44	ZC	1.44	lb ai/a	PRE	A	18.3 def
----atrazine		1		0.42				
----bicyclopyrone		0.06		0.025				
----mesotrione		0.24		0.1				
----s-metolachlor		2.14		0.9				
7	A22668 (C) Premix	3.54	ZC	1.48	lb ai/a	PRE	A	31.7 c-f
8	Dual II Magnum..s-metolachlor	7.64	E	0.89	lb ai/a	PRE	A	3.3 ef
9	Dual II Magnum..s-metolachlor	7.64	E	1	lb ai/a	PRE	A	0.0 f
10	Resicore Premix	3.28	SE	1.14	lb ai/a	PRE	A	20.0 def
----acetochlor		2.8		0.97				
----mesotrione		0.3		0.104				
----clopyralid		0.18		0.0626				
11	Harness Max Premix	3.85	L	1.22	lb ai/a	PRE	A	36.7 cd
----acetochlor		3.52		1.12				
----mesotrione		0.33		0.105				
12	Auron Premix	3.44	ZC	2.15	lb ai/a	PRE	A	49.0 bcd
----atrazine		1		0.625				
----bicyclopyrone		0.06		0.0375				
----mesotrione		0.24		0.15				
----s-metolachlor		2.14		1.34				
13	A22668 (C) Premix	3.54	ZC	2.21	lb ai/a	PRE	A	61.7 abc
14	Dual II Magnum..s-metolachlor	7.64	E	1.34	lb ai/a	PRE	A	0.0 f
15	Dual II Magnum..s-metolachlor	7.64	E	1.5	lb ai/a	PRE	A	20.0 def
16	Resicore Premix	3.28	SE	1.71	lb ai/a	PRE	A	58.3 bc
----acetochlor		2.8		1.46				
----mesotrione		0.3		0.156				
----clopyralid		0.18		0.094				
17	Harness Max Premix	3.85	L	1.83	lb ai/a	PRE	A	73.3 ab
----acetochlor		3.52		1.67				
----mesotrione		0.33		0.157				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=4,10,11,12

Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	C ZEAMX		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check						109.7 a
2	Acuron Premix	3.44	ZC	1.08 lb ai/a	PRE	A	130.5 a
	----atrazine		1	0.314			
	----bicyclopyrone	0.06		0.0188			
	----mesotrione	0.24		0.075			
	----s-metolachlor	2.14		0.67			
3	A22668 (C) Premix	3.54	ZC	1.11 lb ai/a	PRE	A	118.1 a
4	Dual II Magnum..s-metolachlor	7.64	E	0.67 lb ai/a	PRE	A	139.4 a
5	Dual II Magnum..s-metolachlor	7.64	E	0.75 lb ai/a	PRE	A	124.8 a
6	Acuron Premix	3.44	ZC	1.44 lb ai/a	PRE	A	154.8 a
	----atrazine		1	0.42			
	----bicyclopyrone	0.06		0.025			
	----mesotrione	0.24		0.1			
	----s-metolachlor	2.14		0.9			
7	A22668 (C) Premix	3.54	ZC	1.48 lb ai/a	PRE	A	130.0 a
8	Dual II Magnum..s-metolachlor	7.64	E	0.89 lb ai/a	PRE	A	113.7 a
9	Dual II Magnum..s-metolachlor	7.64	E	1 lb ai/a	PRE	A	145.8 a
10	Resicore Premix	3.28	SE	1.14 lb ai/a	PRE	A	151.9 a
	----acetochlor		2.8	0.97			
	----mesotrione	0.3		0.104			
	----clopyralid	0.18		0.0626			
11	Harness Max Premix	3.85	L	1.22 lb ai/a	PRE	A	150.9 a
	----acetochlor		3.52	1.12			
	----mesotrione	0.33		0.105			
12	Acuron Premix	3.44	ZC	2.15 lb ai/a	PRE	A	163.2 a
	----atrazine		1	0.625			
	----bicyclopyrone	0.06		0.0375			
	----mesotrione	0.24		0.15			
	----s-metolachlor	2.14		1.34			
13	A22668 (C) Premix	3.54	ZC	2.21 lb ai/a	PRE	A	160.0 a
14	Dual II Magnum..s-metolachlor	7.64	E	1.34 lb ai/a	PRE	A	149.4 a
15	Dual II Magnum..s-metolachlor	7.64	E	1.5 lb ai/a	PRE	A	130.8 a
16	Resicore Premix	3.28	SE	1.71 lb ai/a	PRE	A	163.2 a
	----acetochlor		2.8	1.46			
	----mesotrione	0.3		0.156			
	----clopyralid	0.18		0.094			
17	Harness Max Premix	3.85	L	1.83 lb ai/a	PRE	A	138.3 a
	----acetochlor		3.52	1.67			
	----mesotrione	0.33		0.157			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4,10,11,12

Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description	C	ZEAMX Corn	C	ZEAMX Corn	AMAPA C - PalmerAm	IPOSS C - Mornlry
Rating Type Rating Unit		Stunting %		Stunting %	Control %	Control %
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
18 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Callisto.....mesotrione Atrazine 4L	4 SE 3.733 0.267	0.109 lb ai/a 0.102 0.0073	PRE A	0.0 a	2.7 a	100.0 a 73.3 ab
4 SC 4 L	0.15 lb ai/a 0.75 lb ai/a	PRE A				
LSD P=.05		.		6.99	5.43	41.41
Standard Deviation		0.00		4.21	3.27	24.93
CV		0.0		95.97	3.51	63.0
Replicate F		0.000		5.940	1.622	2.025
Replicate Prob(F)		1.0000		0.0061	0.2125	0.1481
Treatment F		0.000		0.752	154.377	3.290
Treatment Prob(F)		1.0000		0.7301	0.0001	0.0017

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=4,10,11,12  
 Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

## University of Delaware

Pest Code		ZEAMX	PANDI	AMAPA	IPOSS
Crop Type, Code		CrnPlnts	C - F.panicm	C - PalmerAm	C - Mornlry
Description					
Rating Type		Stunted	Contol %	Contol %	Contol %
Rating Unit		#/25RwF			
Trt Treatment	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
No. Name					Code
18 Anthem Flex Premix	4 SE	0.109	lb ai/a	PRE	A
----pyroxasulfone	3.733	0.102			
----carfentrazone	0.267	0.0073			
Callisto.....mesotrione	4 SC	0.15	lb ai/a	PRE	A
Atrazine 4L	4 L	0.75	lb ai/a	PRE	A
LSD P=.05		1.95		20.55	26.22
Standard Deviation		1.17		12.38	15.80
CV		171.12		50.09	18.0
Replicate F		2.640		3.354	0.496
Replicate Prob(F)		0.0859		0.0469	0.6134
Treatment F		0.670		17.110	7.446
Treatment Prob(F)		0.8092		0.0001	0.0012

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4,10,11,12

Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description		PANDI C - F.panicm	AMAPA C - PalmerAm	IPOSS C - Morngrly	PANDI C - F.panicm		
Rating Type Rating Unit		Contol %	Contol %	Contol %	Contol %		
Trt Treatment No. Name	Form Conc Type Rate	Rate Unit	Appl Timing Code				
18 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Callisto.....mesotrione Atrazine 4L	4 SE 3.733 0.267 4 SC 4 L	0.109 lb ai/a 0.102 0.0073 0.15 lb ai/a 0.75 lb ai/a	PRE A A	93.3 a     	97.7 a     	0.0 a     	97.3 a     
LSD P=.05 Standard Deviation CV		32.85 19.79 68.21	22.86 13.76 15.3	.	33.57 20.21 121.23		
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		8.841 0.0008 6.105 0.0001	1.543 0.2287 9.619 0.0001	0.000 1.0000 0.000 1.0000	3.510 0.0415 4.515 0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=4,10,11,12  
 Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

## University of Delaware

Pest Code	C	ZEAMX						
Crop Type, Code		Corn						
Description		Yield						
Rating Type		Bu/A						
Rating Unit								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
18	Anthem Flex Premix	4	SE	0.109	lb ai/a	PRE	A	177.1 a
	----pyroxasulfone	3.733		0.102				
	----carfentrazone	0.267		0.0073				
	Callisto.....mesotrione	4	SC	0.15	lb ai/a	PRE	A	
	Atrazine 4L	4	L	0.75	lb ai/a	PRE	A	
LSD P=.05								48.52
Standard Deviation								29.24
CV								20.63
Replicate F								3.351
Replicate Prob(F)								0.0470
Treatment F								1.237
Treatment Prob(F)								0.2902

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=4,10,11,12  
 Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

Acuron Flexi Advanced Formulation Crop Tolerance and Weed Control  
 Trial ID: Corn3-19 Location: Field #14 Trial Year: 2019  
 Protocol ID: Corn3-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Syngenta

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 04/24/19  
 Initiation Date: 03/01/19  
 Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays	Corn
Entry Date: 09/13/19	
Variety: RL7844AM	
Attributes: Roundup-ready	
Planting Date: 05/10/19	Planting Rate: 28000 S/A
Depth: 2 IN	
Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 IN	Planting Equipment: FE Field Equipment
Soil Temperature: 77 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 05/18/19	Soil Moisture: NORMAL normal, adequate
Harvest Date: 09/17/19	Harvest Equipment: Plot combine
% Standard Moisture: 15.5	Harvested Width: 5 FT
	Harvested Length: 25 FT

**Site and Design**

Treated Plot Width: 6.67 FT Site Type: FIELD field  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 18 Tillage Type: CONTIL conventional-till  
 Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14A  
 % Sand: 77 % OM: 1.6 Texture: SL sandy loam  
 % Silt: 16 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 7 CEC: 6.5 Fert. Level: G good  
 Soil Drainage: F fair

**Application Description**

A	
Application Date	05/10/19
Appl. Stop Time	11:30 AM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	Johnson
Appl. Entry Date	05/21/19
Air Temperature Start, Stop	74 74 F
% Relative Humidity Start, Stop	66 66
Wind Velocity+Dir. Start	8 mph SW
Wind Velocity+Dir. Stop	8 mph SW
Wind Velocity+Dir. Max	8 mph SW
Wet Leaves (Y/N)	N no
Soil Temperature	71 F
Soil Moisture	NORMAL
% Cloud Cover	79
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.45 IN
Weather Source	ITERIS

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	ZEAMX BCOR

**Application Equipment**

A	
Appl. Equipment	Tractr4Nozl
Equipment Type	TRMOSP
Operation Pressure	40 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	20 in
Boom Length	6.7 ft
Boom Height	18 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

Context	Date	By	Notes
STATUS	04/24/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

## Trial Comments

6/14/19: No stunting in any plots.

## University of Delaware

Acuron Flexi Advanced Formulation Crop Tolerance and Weed Control  
 Trial ID: Corn3-19 Location: Field #14 Trial Year: 2019  
 Protocol ID: Corn3-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Syngenta

Pest Code				C	ZEAMX	C	ZEAMX	AMAPA
Crop Type, Code				Corn	Corn	Corn	Corn	C - PalmerAm
Description				Stunting %	Stunting %			
Rating Type	Form	Form	Rate	Appl	Appl			
Rating Unit	Conc	Type	Rate	Unit	Timing	Code		
Trt Treatment No. Name								
1 Untreated Check						0.0 a	0.0 c	0.0 e
2 Acuron Flexi Premix	3.26 ZC	0.815 lb ai/a	PRE	A		0.0 a	2.7 ab	96.7 ab
----bicyclopyrone	.08000001	0.02						
----mesotrione	0.32	0.08						
----s-metolachlor	2.86	0.715						
3 A22670 (C) Premix	3.13 ZC	0.88 lb ai/a	PRE	A		0.0 a	0.0 c	100.0 a
4 Dual II Magnum..s-metolachlor	7.64 E	0.71 lb ai/a	PRE	A		0.0 a	0.0 c	45.0 d
5 Dual II Magnum..s-metolachlor	7.64 E	0.79 lb ai/a	PRE	A		0.0 a	0.0 c	75.0 c
6 Acuron Flexi Premix	3.26 ZC	1.08 lb ai/a	PRE	A		0.0 a	2.7 ab	100.0 a
----bicyclopyrone	.08000001	0.0265						
----mesotrione	0.32	0.106						
----s-metolachlor	2.86	0.95						
7 A22670 (C) Premix	3.13 ZC	1.17 lb ai/a	PRE	A		0.0 a	1.0 bc	100.0 a
8 Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	PRE	A		0.0 a	0.0 c	82.7 bc
9 Dual II Magnum..s-metolachlor	7.64 E	1.05 lb ai/a	PRE	A		0.0 a	0.0 c	83.3 bc
10 Resicore Premix	3.28 SE	1.14 lb ai/a	PRE	A		0.0 a	0.0 c	100.0 a
----acetochlor	2.8	0.97						
----mesotrione	0.3	0.104						
----clopyralid	0.18	0.0626						
11 Harness Max Premix	3.85 L	1.22 lb ai/a	PRE	A		0.0 a	3.0 a	96.7 ab
----acetochlor	3.52	1.12						
----mesotrione	0.33	0.105						
12 Acuron Flexi Premix	3.26 ZC	1.63 lb ai/a	PRE	A		0.0 a	0.0 c	100.0 a
----bicyclopyrone	.08000001	0.04						
----mesotrione	0.32	0.16						
----s-metolachlor	2.86	1.43						
13 A22670 (C) Premix	3.13 ZC	1.76 lb ai/a	PRE	A		0.0 a	4.3 a	96.7 ab
14 Dual II Magnum..s-metolachlor	7.64 E	1.42 lb ai/a	PRE	A		0.0 a	3.0 a	93.3 ab
15 Dual II Magnum..s-metolachlor	7.64 E	1.59 lb ai/a	PRE	A		0.0 a	3.7 a	96.7 ab
16 Resicore Premix	3.28 SE	1.71 lb ai/a	PRE	A		0.0 a	0.0 c	100.0 a
----acetochlor	2.8	1.46						
----mesotrione	0.3	0.156						
----clopyralid	0.18	0.094						
17 Harness Max Premix	3.85 L	1.83 lb ai/a	PRE	A		0.0 a	0.0 c	100.0 a
----acetochlor	3.52	1.67						
----mesotrione	0.33	0.157						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Could not calculate LSD (% mean diff) for columns 1,8 because error mean square = 0.

Pest Code Crop Type, Code Description		IPOSS C - Mornglry	C ZEAMX CrnPnts	PANDI C - F.panicm				
Rating Type Rating Unit		Control %	Stunted #/25RwFt	Control %				
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1 Untreated Check						0.0 d	0.0 a	0.0 g
2 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001	0.815 lb ai/a	PRE	A		0.0 d	0.0 a	0.0 g
3 A22670 (C) Premix	3.13 ZC	0.88 lb ai/a	PRE	A		0.0 d	0.0 a	3.3 g
4 Dual II Magnum..s-metolachlor	7.64 E	0.71 lb ai/a	PRE	A		0.0 d	0.0 a	13.3 fg
5 Dual II Magnum..s-metolachlor	7.64 E	0.79 lb ai/a	PRE	A		0.0 d	0.0 a	20.0 efg
6 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001	1.08 lb ai/a	PRE	A	58.3 a	0.0 a	18.3 efg	
7 A22670 (C) Premix	3.13 ZC	1.17 lb ai/a	PRE	A	60.0 a	0.0 a	18.3 efg	
8 Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	PRE	A	0.0 d	1.0 a	11.7 fg	
9 Dual II Magnum..s-metolachlor	7.64 E	1.05 lb ai/a	PRE	A	20.0 cd	0.0 a	16.7 efg	
10 Resicore Premix ----acetochlor ----mesotrione ----clopyralid	3.28 SE 2.8 0.3 0.18	1.14 lb ai/a	PRE	A	58.3 a	0.0 a	40.0 cde	
11 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.22 lb ai/a	PRE	A	43.3 ab	0.7 a	65.0 b	
12 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001	1.63 lb ai/a	PRE	A	56.7 a	0.0 a	66.7 b	
13 A22670 (C) Premix	3.13 ZC	1.76 lb ai/a	PRE	A	26.7 bc	0.3 a	60.0 bc	
14 Dual II Magnum..s-metolachlor	7.64 E	1.42 lb ai/a	PRE	A	0.0 d	0.0 a	18.3 efg	
15 Dual II Magnum..s-metolachlor	7.64 E	1.59 lb ai/a	PRE	A	0.0 d	0.3 a	35.0 def	
16 Resicore Premix ----acetochlor ----mesotrione ----clopyralid	3.28 SE 2.8 0.3 0.18	1.71 lb ai/a	PRE	A	50.0 a	0.0 a	58.3 bcd	
17 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.83 lb ai/a	PRE	A	43.3 ab	0.0 a	56.7 bcd	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,8 because error mean square = 0.

Pest Code Crop Type, Code Description			AMAPA C - PalmerAm	IPOSS C - Mornglry	PANDI C - F.panicm	AMAPA C - PalmerAm		
Rating Type Rating Unit			Control %	Control %	Control %	Control %		
Trt No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
1 Untreated Check				33.3 c	0.0 a	0.0 e	0.0 h	
2 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001 0.32 2.86	0.815 lb ai/a 0.02 0.08 0.715		95.0 a	0.0 a	10.0 e	87.7 a-d	
3 A22670 (C) Premix	3.13 ZC	0.88 lb ai/a	PRE	A	98.3 a	0.0 a	15.0 de	76.7 d
4 Dual II Magnum..s-metolachlor	7.64 E	0.71 lb ai/a	PRE	A	68.3 ab	0.0 a	8.3 e	43.3 g
5 Dual II Magnum..s-metolachlor	7.64 E	0.79 lb ai/a	PRE	A	40.0 bc	0.0 a	8.3 e	53.3 fg
6 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001 0.32 2.86	1.08 lb ai/a 0.0265 0.106 0.95		100.0 a	0.0 a	6.7 e	81.0 cd	
7 A22670 (C) Premix	3.13 ZC	1.17 lb ai/a	PRE	A	86.7 a	0.0 a	0.0 e	91.7 abc
8 Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	PRE	A	90.0 a	0.0 a	0.0 e	56.7 fg
9 Dual II Magnum..s-metolachlor	7.64 E	1.05 lb ai/a	PRE	A	75.0 a	0.0 a	0.0 e	61.7 ef
10 Resicore Premix ----acetochlor ----mesotrione ----clopyralid	3.28 SE 2.8 0.3 0.18	1.14 lb ai/a 0.97 0.104 0.0626		100.0 a	0.0 a	16.7 de	96.7 a	
11 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.22 lb ai/a 1.12 0.105		100.0 a	0.0 a	20.0 cde	95.0 ab	
12 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001 0.32 2.86	1.63 lb ai/a 0.04 0.16 1.43		90.0 a	0.0 a	43.3 bcd	95.0 ab	
13 A22670 (C) Premix	3.13 ZC	1.76 lb ai/a	PRE	A	100.0 a	0.0 a	24.3 b-e	96.7 a
14 Dual II Magnum..s-metolachlor	7.64 E	1.42 lb ai/a	PRE	A	86.7 a	0.0 a	53.3 b	81.7 bcd
15 Dual II Magnum..s-metolachlor	7.64 E	1.59 lb ai/a	PRE	A	93.3 a	0.0 a	15.0 de	75.0 de
16 Resicore Premix ----acetochlor ----mesotrione ----clopyralid	3.28 SE 2.8 0.3 0.18	1.71 lb ai/a 1.46 0.156 0.094		100.0 a	0.0 a	0.0 e	93.3 abc	
17 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.83 lb ai/a 1.67 0.157		100.0 a	0.0 a	48.3 bc	100.0 a	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,8 because error mean square = 0.

Pest Code Crop Type, Code Description		IPOSS C - Mornglry	PANDI C - F.panicm	C	ZEAMX Corn
Rating Type Rating Unit		Control %	Control %		Yield Bu/A
Trt No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code
1 Untreated Check				0.0 b	0.0 c 105.4 e
2 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001 0.32 2.86	0.815 lb ai/a 0.02 0.08 0.715		0.0 b	0.0 c 123.0 de
3 A22670 (C) Premix	3.13 ZC	0.88 lb ai/a	PRE	A	0.0 b 152.5 a-d
4 Dual II Magnum..s-metolachlor	7.64 E	0.71 lb ai/a	PRE	A	0.0 b 3.3 c 134.9 cde
5 Dual II Magnum..s-metolachlor	7.64 E	0.79 lb ai/a	PRE	A	0.0 b 16.7 bc 141.5 a-e
6 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001 0.32 2.86	1.08 lb ai/a 0.0265 0.106 0.95		0.0 b	0.0 c 166.1 abc
7 A22670 (C) Premix	3.13 ZC	1.17 lb ai/a	PRE	A	0.0 b 3.3 c 166.2 abc
8 Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	PRE	A	0.0 b 0.0 c 136.7 b-e
9 Dual II Magnum..s-metolachlor	7.64 E	1.05 lb ai/a	PRE	A	0.0 b 0.0 c 129.9 cde
10 Resicore Premix ----acetochlor ----mesotrione ----clopyralid	3.28 SE 2.8 0.3 0.18	1.14 lb ai/a 0.97 0.104 0.0626		16.7 b	23.3 bc 161.9 abc
11 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.22 lb ai/a 1.12 0.105		0.0 b	26.7 bc 137.9 b-e
12 Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001 0.32 2.86	1.63 lb ai/a 0.04 0.16 1.43		16.7 b	43.3 b 154.9 a-d
13 A22670 (C) Premix	3.13 ZC	1.76 lb ai/a	PRE	A	46.7 a 41.0 b 163.5 abc
14 Dual II Magnum..s-metolachlor	7.64 E	1.42 lb ai/a	PRE	A	0.0 b 0.0 c 140.7 b-e
15 Dual II Magnum..s-metolachlor	7.64 E	1.59 lb ai/a	PRE	A	0.0 b 0.0 c 158.2 a-d
16 Resicore Premix ----acetochlor ----mesotrione ----clopyralid	3.28 SE 2.8 0.3 0.18	1.71 lb ai/a 1.46 0.156 0.094		0.0 b	40.0 b 173.7 ab
17 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.83 lb ai/a 1.67 0.157		0.0 b	38.3 b 179.5 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

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Could not calculate LSD (% mean diff) for columns 1,8 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description		C ZEAMX Corn	C ZEAMX Corn	AMAPA C - PalmerAm					
Rating Type Rating Unit		Stunting %	Stunting %	Control %					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
18 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Callisto.....mesotrione		4 SE 3.733 0.267	0.109 lb ai/a 0.102 0.0073		A		0.0 a	0.0 c	100.0 a
4 SC			0.15 lb ai/a						
LSD P=.05							.	1.68	14.11
Standard Deviation							0.00	1.01	8.50
CV							0.0	89.48	9.77
Replicate F							0.000	0.942	1.416
Replicate Prob(F)							1.0000	0.3996	0.2566
Treatment F							0.000	7.336	27.524
Treatment Prob(F)							1.0000	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,8 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description		IPOSS C - Mornglry	C ZEAMX CrnPnts	PANDI C - F.panicm				
Rating Type Rating Unit		Control %	Stunted #/25RwFt	Control %				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
18 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Callisto.....mesotrione	4 SE 3.733 0.267	0.109 0.102 0.0073	lb ai/a	PRE	A	60.0 a	0.3 a	100.0 a
4 SC	0.15	lb ai/a	PRE	A				
LSD P=.05			22.10		0.68	23.73		
Standard Deviation			13.32		0.41	14.30		
CV			50.3		277.36	42.79		
Replicate F			3.009		2.742	3.940		
Replicate Prob(F)			0.0627		0.0787	0.0289		
Treatment F			11.896		1.445	11.740		
Treatment Prob(F)			0.0001		0.1761	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,8 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - Mornglry	PANDI C - F.panicm	AMAPA C - PalmerAm				
Rating Type Rating Unit		Control %	Control %	Control %	Control %				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code				
18 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Callisto.....mesotrione	4 SE 3.733 0.267	0.109 lb ai/a 0.102 0.0073	PRE	A	100.0 a	0.0 a	96.3 a	100.0 a	
4 SC	0.15 lb ai/a	PRE	A						
LSD P=.05		31.91	.	30.27	13.78				
Standard Deviation		19.23	0.00	18.25	8.31				
CV		22.24	0.0	89.81	10.79				
Replicate F		0.981	0.000	4.707	3.688				
Replicate Prob(F)		0.3851	1.0000	0.0157	0.0355				
Treatment F		3.345	0.000	5.785	29.122				
Treatment Prob(F)		0.0013	1.0000	0.0001	0.0001				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,8 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description		IPOSS C - Mornglry	PANDI C - F.panicm	C ZEAMX Corn				
Rating Type Rating Unit		Control %	Control %	Yield Bu/A				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
18 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Callisto.....mesotrione	4 SE 3.733 0.267	0.109 lb ai/a 0.102 0.0073	4 SC 0.15 lb ai/a	PRE A	20.0 b	96.7 a	147.1 a-d	
LSD P=.05 Standard Deviation CV					23.08 13.91 250.42	31.65 19.07 103.21	38.01 22.91 15.42	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					3.021 0.0620 2.350 0.0166	2.968 0.0649 5.520 0.0001	1.158 0.3263 2.075 0.0344	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,8 because error mean square = 0.

**Acuron and Acuron Flexi in Corn**

Trial ID: Corn4-19      Location: Field #16      Trial Year: 2019  
Protocol ID: Corn4-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: Syngenta

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
ARM Trial Created On: 04/24/19  
Initiation Date: 03/01/19  
Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
Longitude of LL Corner °: 75.455834 W  
Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
Address: 16483 County Seat Hwy  
City+State/Prov: Georgetown, Delaware  
Postal Code: 19947 E-mail: mjv@udel.edu  
Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays	Corn
Entry Date: 09/13/19	
Variety: RL7844AM	
Attributes: Roundup-ready	
Planting Date: 05/07/19	Planting Rate: 28000 S/A
Depth: 2 IN	
Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 IN	Planting Equipment: FE Field Equipment
Soil Temperature: 77 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 05/14/19	Soil Moisture: NORMAL normal, adequate
Harvest Date: 09/13/19	Harvest Equipment: Plot combine
% Standard Moisture: 15.5	Harvested Width: 5 FT
	Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
Common Name: Palmer amaranth Entry Date: 09/23/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
Common Name: Morning glory Entry Date: 09/23/19

Pest 3 Type: W Code: MOLVE Mollugo verticillata  
Common Name: Carpetweed Entry Date: 09/23/19

Pest 4 Type: W Code: AMBEL Ambrosia artemisiifolia  
Common Name: Common ragweed Entry Date: 09/23/19

**Site and Design**

Treated Plot Width: 6.67 FT	Site Type: FIELD field
Treated Plot Length: 25 FT	
Treated Plot Area: 166.75 FT <sup>2</sup>	Tillage Type: NOTILL no-till
Replications: 3	Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 16A  
 % Sand: 76 % OM: 1.4 Texture: SL sandy loam  
 % Silt: 15 pH: 6.6 Soil Name: Hurlokk loamy sand, 0-2% slopes  
 % Clay: 9 CEC: 4.8 Fert. Level: F fair  
 Soil Drainage: F fair

**Application Description**

	A	B	C
Application Date	05/08/19	05/30/19	06/11/19
Appl. Stop Time	02:05 PM	01:00 PM	10:35 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	2-4"wds	2-4"wds
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Appl. Entry Date	05/21/19	09/13/19	09/13/19
Air Temperature Start, Stop	71 71 F	87 87 F	68 72 F
% Relative Humidity Start, Stop	68 68	50 50	73 61
Wind Velocity+Dir. Start	11 mph NE	8 mph SW	7 mph NW
Wind Velocity+Dir. Stop	11 mph NE	8 mph SW	8 mph NNW
Wind Velocity+Dir. Max	11 mph NE	8 mph SW	8 mph NNW
Wet Leaves (Y/N)	N no		
Soil Temperature	73 F	88 F	73 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	17	12	45
Moisture 6 Hours after Appl.	0 IN	0.4 IN	0 IN
Moisture 1 Week after Appl.	1.42 IN	0.8 IN	0.97 IN
Weather Source	ITERIS	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR	ZEAMX BCOR
Days after Emergence	-6	16	28
Stage Majority, Percent		V4 100	veg 100
Height Average		9 in	20 in
Height Minimum, Maximum		8 10	18 24

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100	Veg 100
Height Average		4 in	4 in
Height Minimum, Maximum		2 6	2 6
Density Average		7 m2	1 m2
Density Min, Max		5 10	0 2
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		veg 100	veg 100
Height Average		3 in	4 in
Height Minimum, Maximum		2 5	3 5
Density Average		2 m2	2 m2
Density Min, Max		0 4	0 4
Pest 3 Code, Type, Scale	MOLVE W	MOLVE W	MOLVE W
Stage Majority, Percent		Flower 100	
Diameter		3 in	
Height Minimum, Maximum		2 4	
Density Average		10 m2	
Density Min, Max		2 15	
Pest 4 Code, Type, Scale	AMBEL W	AMBEL W	AMBEL W
Stage Majority, Percent		veg 100	
Height Average		3 in	
Density Average		1 m2	
Density Min, Max		0 2	

**Application Equipment**

	A	B	C
Appl. Equipment	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	18 in	26 in	38 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/24/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

05/30/19: Weed control is quite variable, all treated plots had good to excellent overall weed control.

06/12/19: No injury observed. Poor ragweed control trt.10.

06/21/19: Fair to poor control of common ragweed with trt 10. Morningglory ratings based mostly on newly emerged seedlings - excellent control (>97%) of emerged plots at time of application except treatment 12 & 7- ratings included

control of plots at time of application.

Acuron and Acuron Flexi in Corn						
Trial ID: Corn4-19		Location: Field #16		Trial Year: 2019		
Protocol ID: Corn4-19		Investigator: Mark VanGessel				
Study Director:						
Sponsor Contact: Syngenta						
Pest Code					C ZEAMX	AMAPA
Crop Type, Code					Corn Injury %	C - PalmerAm Control %
Description					05/30/19	Mornlry Control %
Rating Type						06/12/19
Rating Unit						06/12/19
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1 Untreated Check						
2 Acuron Premix	3.44 ZC	2.15 lb ai/a	PRE	A	11.3 a	97.7 a
----atrazine	1	0.625				
----bicyclopyrone	0.06	0.0375				
----mesotrione	0.24	0.15				
----s-metolachlor	2.14	1.34				
Sequence Premix	5.25 EW	2.46 lb ai/a	2-4" wds	C		
----glyphosate	2.25	1.05				
----s-metolachlor	3	1.4				
3 Acuron Premix	3.44 ZC	1.29 lb ai/a	PRE	A	5.7 bc	94.3 a
----atrazine	1	0.375				
----bicyclopyrone	0.06	0.0225				
----mesotrione	0.24	0.09				
----s-metolachlor	2.14	0.8				
Princep.....simazine	4 L	1 lb ai/a	PRE	A		
Halex GT Premix	4.376 SC	1.97 lb ai/a	2-4" wds	C		
----s-metolachlor	2.084	0.94				
----glyphosate	2.084	0.94				
----mesotrione	0.208	0.094				
Nonionic Surfactant	100 L	0.25 % v/v	2-4" wds	C		
Dry Ammonium Sulfate	100 D	1.02 % w/v	2-4" wds	C		
4 Acuron Premix	3.44 ZC	1.29 lb ai/a	PRE	A	1.7 de	99.0 a
----atrazine	1	0.375				
----bicyclopyrone	0.06	0.0225				
----mesotrione	0.24	0.09				
----s-metolachlor	2.14	0.8				
Princep.....simazine	4 L	1 lb ai/a	PRE	A		
Acuron Premix	3.44 ZC	1.29 lb ai/a	2-4" wds	C		
----atrazine	1	0.375				
----bicyclopyrone	0.06	0.0225				
----mesotrione	0.24	0.09				
----s-metolachlor	2.14	0.8				
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-4" wds	C		
Nonionic Surfactant	100 L	0.25 % v/v	2-4" wds	C		
Dry Ammonium Sulfate	100 D	1.02 % w/v	2-4" wds	C		
5 Acuron Flexi Premix	3.26 ZC	1.02 lb ai/a	PRE	A	4.7 cd	96.0 a
----bicyclopyrone	.08000001	0.025				
----mesotrione	0.32	0.1				
----s-metolachlor	2.86	0.895				
Princep.....simazine	4 L	1 lb ai/a	PRE	A		
Acuron Flexi Premix	3.26 ZC	0.815 lb ai/a	2-4" wds	C		
----bicyclopyrone	.08000001	0.02				
----mesotrione	0.32	0.08				
----s-metolachlor	2.86	0.715				
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-4" wds	C		
Nonionic Surfactant	100 L	0.25 % v/v	2-4" wds	C		
Dry Ammonium Sulfate	100 D	1.02 % w/v	2-4" wds	C		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	DIGSA C - L.crbgrs Control %	C ZEAMX Stunting Control %	AMAPA C - PalmerAm Control %	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check						0.0 c	0.0 a	0.0 c
2	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Sequence Premix ----glyphosate ----s-metolachlor	3.44 ZC 1 0.06 0.24 2.14 5.25 EW 2.25 3	ZC 1 0.0375 0.15 1.34 2.46 lb ai/a 1.05 1.4	2.15 lb ai/a 0.625 0.0375 0.15 1.34 2-4" wds C	PRE A	89.3 ab	3.3 a	99.0 a	
3	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 4.376 SC 2.084 2.084 0.208 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1.97 lb ai/a 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	1.29 lb ai/a 0.375 0.0225 0.09 0.8 PRE A 2-4" wds C	89.3 ab	2.3 a	99.0 a		
4	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 3.44 ZC 1 0.06 0.24 2.14 4.5 AS 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 0.375 0.0225 0.09 0.8 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	1.29 lb ai/a 0.375 0.0225 0.09 0.8 PRE A 2-4" wds C	91.0 ab	2.3 a	99.0 a		
5	Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4 L 3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	ZC .08000001 0.32 2.86 1 lb ai/a 0.815 lb ai/a 0.02 0.08 0.715 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	1.02 lb ai/a 0.025 0.1 0.895 1 lb ai/a 0.815 lb ai/a 0.02 0.08 0.715 2-4" wds C	PRE A 2-4" wds C	92.7 ab	2.3 a	99.0 a	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Average=2

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - Mornlry Control %	PANDI C - F.panitm Control %	AMAPA C - PalmerArm Control %	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check						0.0 e	0.0 c	0.0 c
2	Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Sequence Premix ----glyphosate ----s-metolachlor	3.44 ZC 1 0.06 0.24 2.14 5.25 EW 2.25 3	ZC 1 0.0375 0.15 1.34 2.46 lb ai/a 1.05 1.4	2.15 lb ai/a 0.625 0.0375 0.15 1.34 2-4" wds C	PRE	A	81.7 d	99.0 a	99.0 a
3	Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 4.376 SC 2.084 2.084 0.208 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1.97 lb ai/a 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	1.29 lb ai/a 0.375 0.0225 0.09 0.8 PRE A 2-4" wds C		96.7 ab	99.0 a	99.0 a	
4	Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 3.44 ZC 1 0.06 0.24 2.14 4.5 AS 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 0.375 0.0225 0.09 0.8 2-4" wds C	1.29 lb ai/a 0.375 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 0.375 0.0225 0.09 0.8 2-4" wds C	PRE	A	98.7 a	99.0 a	99.0 a
5	Auron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Auron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4 L 3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	ZC .08000001 0.32 2.86 1 lb ai/a 3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	1.02 lb ai/a 0.025 0.1 0.895 1 lb ai/a 0.815 lb ai/a 0.02 0.08 0.715 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	PRE	A	99.0 a	99.0 a	99.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - Mornlry Control %	PANDI C - F.panicm Control %	C ZEAMX Corn Yield Bu/A	07/02/19	07/02/19	09/13/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Untreated Check							0.0 b	0.0 c	144.0 a	
2	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Sequence Premix ----glyphosate ----s-metolachlor	3.44 ZC 1 0.06 0.24 2.14 5.25 EW 2.25 3	ZC 1 0.0375 0.15 1.34 2.46 lb ai/a 1.05 1.4	2.15 lb ai/a 0.625 0.0375 0.15 1.34 2-4" wds C	PRE	A	86.0 a	86.0 b	171.5 a		
3	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 4.376 SC 2.084 2.084 0.208 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1.97 lb ai/a 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	1.29 lb ai/a 0.375 0.0225 0.09 0.8 PRE A 2-4" wds C	PRE	A	99.0 a	99.0 a	171.7 a		
4	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 3.44 ZC 1 0.06 0.24 2.14 4.5 AS 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 0.375 0.0225 0.09 0.8 2-4" wds C	1.29 lb ai/a 0.375 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 0.375 0.0225 0.09 0.8 2-4" wds C	PRE	A	99.0 a	99.0 a	156.1 a		
5	Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4 L 3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	ZC .08000001 0.32 2.86 1 lb ai/a 3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	1.02 lb ai/a 0.025 0.1 0.895 1 lb ai/a 0.815 lb ai/a 0.02 0.08 0.715 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	PRE	A	99.0 a	99.0 a	207.3 a		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Average=2

## University of Delaware

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C	ZEAMX	AMAPA C - PalmerAm Control %	IPOSS C - Morngrly Control %	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
6	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Accent Q.....nicosulfuron Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 3.44 ZC 1 0.06 0.24 2.14 4.5 AS 75 D 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 1 lb ai/a 1.29 lb ai/a 0.0225 0.09 0.8 1.13 lb ae/a 0.0328 lb ai/a 0.25 % v/v 1.02 % w/v	1.29 0.375 0.09 0.8 1 lb ai/a 1.29 lb ai/a 1 lb ai/a 1.29 lb ai/a 0.0225 0.09 0.8 1.13 lb ae/a 0.0328 lb ai/a 0.25 % v/v 1.02 % w/v	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	PRE A PRE A PRE A 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C		9.0 ab	92.7 a	91.0 ab
7	Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup PowerMax..glyphosate	3.26 ZC .08000001 0.32 2.86 3.8 CS 56 WG 16 40 4.5 AS	ZC 0.025 0.1 0.895 CS lb ai/a 0.025 0.025 0.0625 AS	1.02 0.025 0.1 0.895 0.95 0.0875 0.025 0.0625 1.13	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ae/a	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a ae/a	PRE A PRE A 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	0.0 e	91.0 ab	79.7 b
8	Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4.376 SC 2.084 2.084 0.208 100 L 100 D	ZC 0.025 0.1 0.895 SC 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	1.02 0.025 0.1 0.895 1.97 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a v/v w/v	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a 2-4"wds C 2-4"wds C 2-4"wds C	PRE A PRE A 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	1.7 de	99.0 a	86.7 ab
9	Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	ZC 0.045 0.18 1.6 AS 0.25 % v/v 1.02 % w/v	1.83 0.045 0.18 1.6 0.98 0.25 % v/v 1.02 % w/v	lb ai/a lb ai/a lb ai/a lb ai/a lb ae/a lb ai/a lb ai/a	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B		0.0 e	95.3 a	94.7 a
10	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 100 L	SC 0.94 0.94 0.094 0.25 % v/v	1.97 0.94 0.94 0.094 0.25 % v/v	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B		0.0 e	88.0 ab	86.3 ab
11	Resicore Premix ----acetochlor ----mesotrione ----clopypralid Roundup PowerMax..glyphosate	3.28 SE 2.8 0.3 0.18 4.5 AS	SE 0.88 0.094 0.0565 AS	1.03 0.88 0.094 0.0565 0.98	lb ai/a lb ai/a lb ai/a lb ai/a lb ae/a	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B		0.0 e	93.3 a	99.0 a

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

## University of Delaware

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	DIGSA C - L.crbgrs Control %	C ZEAMX Stunting Stunting %	AMAPA C - PalmerAm Control %	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
6	Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Accent Q.....nicosulfuron Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 3.44 ZC 1 0.06 0.24 2.14 4.5 AS 75 D 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1 lb ai/a 1.29 lb ai/a 0.375 0.09 0.8 1.13 lb ae/a 0.0328 lb ai/a 0.25 % v/v 1.02 % w/v	1.29 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 2-4"wds C 0.375 0.09 0.8 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	PRE A PRE A PRE A 2-4"wds C PRE A PRE A PRE A	90.3 ab	8.0 a	99.0 a	
7	Auron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup PowerMax..glyphosate	3.26 ZC .08000001 0.32 2.86 3.8 CS 56 WG 16 40 4.5 AS	ZC .08000001 0.32 2.86 CS WG 0.025 0.1 0.895 0.95 lb ai/a 0.0875 lb ai/a 0.025 0.0625 1.13 lb ae/a	1.02 0.025 0.1 0.895 0.95 lb ai/a 0.0875 lb ai/a 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	lb ai/a lb ai/a lb ai/a lb ai/a 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	PRE A PRE A PRE A PRE A PRE A	84.7 ab	0.0 a	89.3 ab
8	Auron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4.376 SC 2.084 2.084 0.208 100 L 100 D	ZC .08000001 0.32 2.86 SC 2.084 2.084 0.208 0.25 % v/v 1.02 % w/v	1.02 0.025 0.1 0.895 1.97 lb ai/a 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	lb ai/a lb ai/a lb ai/a lb ai/a 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	PRE A PRE A PRE A PRE A PRE A PRE A	79.0 b	2.3 a	89.7 ab
9	Auron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	ZC .08000001 0.32 2.86 AS 0.25 % v/v 1.02 % w/v	1.83 0.045 0.18 1.6 0.98 lb ae/a 0.25 % v/v 1.02 % w/v	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B	97.0 a	0.0 a	99.0 a
10	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 100 L	SC 2.084 2.084 0.208 0.25 % v/v	1.97 0.94 0.94 0.094 0.25 % v/v	lb ai/a lb ai/a lb ai/a lb ai/a 2-4"wds B	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B	84.0 ab	0.0 a	79.0 b
11	Resicore Premix ----acetochlor ----mesotrione ----clopypralid Roundup PowerMax..glyphosate	3.28 SE 2.8 0.3 0.18 4.5 AS	SE 2.8 0.3 0.0565 AS	1.03 0.88 0.094 0.0565 0.98 lb ae/a	lb ai/a lb ai/a lb ai/a lb ai/a 2-4"wds B	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B	98.3 a	0.0 a	91.0 ab

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

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Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - Morngrly Control %	PANDI C - F.panicle Control %	AMAPA C - PalmerAm Control %
Trt Treatment No. Name	Form Conc	Form Type	Rate	Unit	Appl Timing	Appl Code		
6 Acuron Premix ---atrazine ---bicyclopyrone ---mesotrione ---s-metolachlor Princep.....simazine Acuron Premix ---atrazine ---bicyclopyrone ---mesotrione ---s-metolachlor Roundup PowerMax..glyphosate Accent Q.....nicosulfuron Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 3.44 ZC 1 0.06 0.24 2.14 4.5 AS 75 D 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a lb ai/a 0.0225 0.09 0.8 1.13 lb ae/a 0.0328 lb ai/a 0.25 % v/v 1.02 % w/v	1.29 0.375 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 0.375 0.0225 0.09 0.8 1.13 lb ae/a 0.0328 lb ai/a 0.25 % v/v 1.02 % w/v	ai/a ai/a ai/a ai/a ai/a PRE A 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	99.0 a	99.0 a	99.0 a	
7 Acuron Flexi Premix ---bicyclopyrone ---mesotrione ---s-metolachlor Prowl H2O.....pendimethalin Status Premix ---diflufenzoypyr ---dicamba Roundup PowerMax..glyphosate	3.26 ZC .08000001 0.32 2.86 3.8 CS 56 WG 16 40 4.5 AS	ZC 0.025 0.1 0.895 CS 0.0875 lb ai/a 0.025 0.0625 1.13 lb ae/a	1.02 lb ai/a 0.025 0.1 0.895 0.95 lb ai/a 0.0875 lb ai/a 0.025 0.0625 1.13 lb ae/a	ai/a ai/a ai/a ai/a ai/a 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	86.3 bcd	99.0 a	99.0 a	
8 Acuron Flexi Premix ---bicyclopyrone ---mesotrione ---s-metolachlor Halex GT Premix ---s-metolachlor ---glyphosate ---mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4.376 SC 2.084 2.084 0.208 100 L 100 D	ZC 0.025 0.1 0.895 SC 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	1.02 lb ai/a 0.025 0.1 0.895 1.97 lb ai/a 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	ai/a ai/a ai/a ai/a ai/a 2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	89.7 a-d	99.0 a	99.0 a	
9 Acuron Flexi Premix ---bicyclopyrone ---mesotrione ---s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	ZC 0.045 0.18 1.6 AS 0.25 % v/v 1.02 % w/v	1.83 lb ai/a 0.045 0.18 1.6 0.98 lb ae/a 0.25 % v/v 1.02 % w/v	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B	96.7 ab	99.0 a	99.0 a	
10 Halex GT Premix ---s-metolachlor ---glyphosate ---mesotrione Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 100 L	SC 0.94 0.94 0.094 0.25 % v/v	1.97 lb ai/a 0.94 0.94 0.094 0.25 % v/v	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B	85.0 cd	98.3 b	85.7 b	
11 Resicore Premix ---acetochlor ---mesotrione ---clopypralid Roundup PowerMax..glyphosate	3.28 SE 2.8 0.3 0.18 4.5 AS	SE 0.88 0.094 0.0565 AS	1.03 lb ai/a 0.88 0.094 0.0565 0.98 lb ae/a	2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B	95.7 abc	99.0 a	94.3 a	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

## University of Delaware

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - Mornlry Control %	PANDI C - F.panitm Control %	C ZEAMX Corn Yield Bu/A	07/02/19	07/02/19	09/13/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code					
6	Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Princep.....simazine Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Accent Q.....nicosulfuron Nonionic Surfactant Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4 L 3.44 ZC 1 0.06 0.24 2.14 4.5 AS 75 D 100 L 100 D	ZC 1 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 1 lb ai/a 0.375 0.09 0.8 1.13 lb ae/a 0.0328 lb ai/a 0.25 % v/v 1.02 % w/v	1.29 0.0225 0.09 0.8 1 lb ai/a 1.29 lb ai/a 1 lb ai/a 0.375 0.09 0.8 1.13 lb ae/a 0.0328 lb ai/a 0.25 % v/v 1.02 % w/v	lb ai/a lb ai/a lb ai/a lb ai/a ae/a lb ai/a v/v w/v	PRE A PRE A 2-4"wd C PRE A 2-4"wd C 2-4"wd C 2-4"wd C	99.0 a	99.0 a	164.0 a			
7	Auron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup PowerMax..glyphosate	3.26 ZC .08000001 0.32 2.86 3.8 CS 56 WG 16 40 4.5 AS	ZC 0.025 0.1 0.895 CS lb ai/a lb ai/a 0.025 0.0625 1.13 lb ae/a	1.02 0.025 0.1 0.895 0.95 lb ai/a 0.0875 lb ai/a 0.025 0.0625 1.13 lb ae/a	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a 2-4"wd C 2-4"wd C 2-4"wd C	PRE A PRE A 2-4"wd C 2-4"wd C 2-4"wd C	95.3 a	99.0 a	156.7 a			
8	Auron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4.376 SC 2.084 2.084 0.208 100 L 100 D	ZC 0.025 0.1 0.895 SC lb ai/a lb ai/a 0.094 0.25 % v/v 1.02 % w/v	1.02 0.025 0.1 0.895 1.97 lb ai/a 0.94 0.94 0.094 0.25 % v/v 1.02 % w/v	lb ai/a lb ai/a lb ai/a lb ai/a 2-4"wd C 2-4"wd C 2-4"wd C	PRE A PRE A 2-4"wd C 2-4"wd C 2-4"wd C	96.7 a	99.0 a	183.2 a			
9	Auron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.26 ZC .08000001 0.32 2.86 4.5 AS 100 L 100 D	ZC 0.045 0.18 1.6 AS lb ai/a lb ai/a	1.83 0.045 0.18 1.6 0.98 lb ae/a 0.25 % v/v 1.02 % w/v	2-4"wd B 2-4"wd B 2-4"wd B 2-4"wd B	B B B B	99.0 a	99.0 a	151.2 a			
10	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 100 L	SC lb ai/a lb ai/a 0.094 0.25 % v/v	1.97 0.94 0.94 0.094 0.25 % v/v	lb ai/a 2-4"wd B 2-4"wd B 2-4"wd B	B B B B	92.7 a	99.0 a	197.3 a			
11	Resicore Premix ----acetochlor ----mesotrione ----clopypralid Roundup PowerMax..glyphosate	3.28 SE 2.8 0.3 0.18 4.5 AS	SE lb ai/a 0.094 0.0565 AS lb ai/a	1.03 0.88 0.094 0.0565 0.98 lb ae/a	2-4"wd B 2-4"wd B 2-4"wd B	B B B B	95.3 a	99.0 a	166.3 a			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

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Missing data estimates are included in columns:Average=2

## University of Delaware

Pest Code	C	ZEAMX	AMAPA	IPOSS					
Crop Type, Code	C -	Corn	C -	C -					
Description		Injury	PalmerAm	Mornlry					
Rating Type		%	Control	Control					
Rating Unit			%	%					
Rating Date	05/30/19		06/12/19	06/12/19					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
12 Zidua SC.....pyroxasulfone	4.17 SC	0.114 lb ai/a	PRE	A					
Prowl H2O.....pendimethalin	3.8 CS	0.95 lb ai/a	2-4"	wds	C				
Status Premix	56 WG	0.175 lb ai/a	2-4"	wds	C				
----diflufenzopyr	16	0.05							
----dicamba	40	0.125							
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-4"	wds	C				
LSD P=.05			3.97			11.08		14.69	
Standard Deviation			2.34			6.50		8.68	
CV			82.72			7.6		10.36	
Replicate F			0.592			9.673		9.446	
Replicate Prob(F)			0.5619			0.0012		0.0011	
Treatment F			8.568			53.397		29.056	
Treatment Prob(F)			0.0001			0.0001		0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

## University of Delaware

Pest Code		DIGSA C - L.crbgrs Control %	C	ZEAMX Stunting %	AMAPA C - PalmerAm Control %		
Crop Type, Code		06/12/19	06/21/19	06/21/19	06/21/19		
Description							
Rating Type							
Rating Unit							
Rating Date							
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
12 Zidua SC.....pyroxasulfone Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup PowerMax..glyphosate	4.17 SC 3.8 CS 56 WG 16 40 4.5 AS	0.114 lb ai/a 0.95 lb ai/a 0.175 lb ai/a 0.05 0.125 1.13 lb ae/a	PRE 2-4" wds 2-4" wds 2-4" wds	A	80.7 b	5.7 a	99.0 a
LSD P=.05					14.83	5.75	12.46
Standard Deviation					8.76	3.39	7.36
CV					10.77	154.62	8.47
Replicate F					16.992	0.118	3.418
Replicate Prob(F)					0.0001	0.8891	0.0510
Treatment F					27.023	1.687	43.668
Treatment Prob(F)					0.0001	0.1428	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

## University of Delaware

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - Mornlry Control %	PANDI C - F.panicm Control %	AMAPA C - PalmerAm Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
12	Zidua SC.....pyroxasulfone	4.17 SC		0.114 lb ai/a	PRE	A	88.7 a-d	99.0 a
	Prowl H2O.....pendimethalin	3.8 CS		0.95 lb ai/a	2-4"	wds C		
	Status Premix	56 WG		0.175 lb ai/a	2-4"	wds C		
	----diflufenzopyr	16		0.05				
	----dicamba	40		0.125				
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	2-4"	wds C		
LSD P=.05					11.22	0.56	7.88	
Standard Deviation					6.62	0.33	4.65	
CV					7.82	0.37	5.21	
Replicate F					1.210	1.000	1.921	
Replicate Prob(F)					0.3173	0.3840	0.1702	
Treatment F					51.207	22026.252	111.639	
Treatment Prob(F)					0.0001	0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

## University of Delaware

Pest Code		IPOSS C - Morngrly Control %	PANDI C - F.panicm Control %	C ZEAMX Corn Yield Bu/A
Crop Type, Code		07/02/19	07/02/19	09/13/19
Description				
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing
12 Zidua SC.....pyroxasulfone Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup PowerMax..glyphosate	4.17 SC 3.8 CS 56 WG 16 40 4.5 AS	0.114 lb ai/a 0.95 lb ai/a 0.175 lb ai/a 0.05 0.125 1.13 lb ae/a	PRE 2-4" wds 2-4" wds 2-4" wds	A
LSD P=.05 Standard Deviation CV			99.0 a	99.0 a
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)			13.08 7.73 8.75 1.135 0.3395 39.647 0.0001	11.01 6.50 7.25 1.000 0.3840 57.609 0.0001
				40.61 23.98 14.21 6.196 0.0073 1.862 0.1034

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=2

Monsanto Integrated Corn Management Programs  
 Trial ID: Corn5-19 Location: Field #16 Trial Year: 2019  
 Protocol ID: Corn5-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Monsanto (Bayer)

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 04/24/19  
 Initiation Date: 03/01/19  
 Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays	Corn
Entry Date: 08/09/19	
Variety: RL7844AM	
Attributes: Roundup-ready	
Planting Date: 05/07/19	Planting Rate: 28000 S/A
Depth: 2 IN	
Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 IN	Planting Equipment: FE Field Equipment
Soil Temperature: 77 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 05/14/19	Soil Moisture: NORMAL normal, adequate
Harvest Date: 09/16/19	Harvest Equipment: Plot combine
% Standard Moisture: 15.5	Harvested Width: 5 FT
	Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth Entry Date: 08/09/19

Pest 2 Type: W Code: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass Entry Date: 08/09/19

Pest 3 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory Entry Date: 08/09/19

**Site and Design**

Treated Plot Width: 6.67 FT	Site Type: FIELD field
Treated Plot Length: 25 FT	
Treated Plot Area: 166.75 FT <sup>2</sup>	Tillage Type: NOTILL no-till
Replications: 3	Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 16A			
% Sand: 76	% OM: 1.4	Texture: SL	sandy loam
% Silt: 15	pH: 6.6	Soil Name: Hurlokk loamy sand, 0-2% slopes	
% Clay: 9	CEC: 4.8	Fert. Level: F	fair
Soil Drainage: F	fair		

**Application Description**

	A	B	C
Application Date	05/08/19	05/30/19	06/06/19
Appl. Stop Time	03:15 PM	01:15 PM	01:10 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	2-4"wds	V4
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Appl. Entry Date	05/21/19	08/09/19	08/09/19
Air Temperature Start, Stop	71 70 F	87 87 F	82 82 F
% Relative Humidity Start, Stop	68 68	50 50	60 60
Wind Velocity+Dir. Start	11 mph NE	8 mph SW	5 mph NW
Wind Velocity+Dir. Stop	11 mph ENE	8 mph SW	5 mph NW
Wind Velocity+Dir. Max	11 mph NE	8 mph SW	5 mph NW
Wet Leaves (Y/N)	N no		
Soil Temperature	73 F	88 F	83 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	17	12	71
Moisture 6 Hours after Appl.	0 IN	0.4 IN	0 IN
Moisture 1 Week after Appl.	1.42 IN	0.8 IN	1.9 IN
Weather Source	ITERIS	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR	ZEAMX BCOR
Days after Emergence	-6	16	23
Stage Majority, Percent		V4-5 100	V6 100
Height Average		10 in	16 in
Height Minimum, Maximum		9 11	

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent		Veg 100	veg 100
Height Average		4 in	4 in
Height Minimum, Maximum		2 5	2 5
Density Average		5 m2	2 m2
Density Min, Max		0 10	0 4
Pest 2 Code, Type, Scale	DIGSA W	DIGSA W	DIGSA W
Stage Majority, Percent		1-2tlr 100	
Height Average		3 in	
Height Minimum, Maximum		2 5	
Density Average		8 m2	
Density Min, Max		0 16	
Pest 3 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent			cot 60
Stage Minimum, Percent			cot 60
Stage Maximum, Percent			1-leaf 40
Height Average			1 in
Density Average			1 m2
Density Min, Max			0 2

**Application Equipment**

	A	B	C
Appl. Equipment	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	18 in	28 in	32 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/24/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

05/30/18: Nutsedge is the primary weed in all plots. Other weeds present, but enough to rate consistently. These include Palmer amaranth in plots 120, 214, 303; large crabgrass in 210; and morningglory spp. in 307 and 315.

Monsanto Integrated Corn Management Programs									
Trial ID: Corn5-19		Location: Field #16		Trial Year: 2019					
Protocol ID: Corn5-19		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: Monsanto (Bayer)									
Pest Code				C	ZEAMX Corn	CYPES C - Y.nutsge			
Crop Type, Code						C			
Description					ZEAMX Corn				
Rating Type				Stunting %		Stunting %			
Rating Unit				05/30/19		05/30/19			
Rating Date						06/05/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code			
1	Harness Xtra 5.6L Premix	5.6 L	3.36	lb ai/a	PRE	A			
	----acetochlor	3.1	1.86						
	----atrazine	2.5	1.5						
2	Harness Xtra 5.6L Premix	5.6 L	2.8	lb ai/a	PRE	A			
	----acetochlor	3.1	1.55						
	----atrazine	2.5	1.25						
	Balance Flexx...isoxaflutole	2 L	0.047	lb ai/a	PRE	A			
3	Harness Xtra 5.6L Premix	5.6 L	2.8	lb ai/a	PRE	A			
	----acetochlor	3.1	1.55						
	----atrazine	2.5	1.25						
	Corvus Premix	2.63 SC	0.068	lb ai/a	PRE	A			
	----thiencarbazone	0.75	0.0194						
	----isoxaflutole	1.88	0.0486						
4	Corvus Premix	2.63 SC	0.0925	lb ai/a	PRE	A			
	----thiencarbazone	0.75	0.0264						
	----isoxaflutole	1.88	0.066						
	Atrazine 4L	4 L	1	lb ai/a	PRE	A			
5	Corvus Premix	2.63 SC	0.0925	lb ai/a	PRE	A			
	----thiencarbazone	0.75	0.0264						
	----isoxaflutole	1.88	0.066						
	Harness Xtra 5.6L Premix	5.6 L	2.24	lb ai/a	PRE	A			
	----acetochlor	3.1	1.24						
	----atrazine	2.5	1						
6	Harness Max Premix	3.85 L	1.93	lb ai/a	PRE	A			
	----acetochlor	3.52	1.76						
	----mesotrione	0.33	0.165						
	Atrazine 4L	4 L	1	lb ai/a	PRE	A			
7	Auron Premix	3.44 ZC	2.15	lb ai/a	PRE	A			
	----atrazine	1	0.625						
	----bicyclopyrone	0.06	0.0375						
	----mesotrione	0.24	0.15						
	----s-metolachlor	2.14	1.34						
8	Resicore Premix	3.28 SE	2.05	lb ai/a	PRE	A			
	----acetochlor	2.8	1.75						
	----mesotrione	0.3	0.188						
	----clopypralid	0.18	0.113						
	Atrazine 4L	4 L	1	lb ai/a	PRE	A			
9	Harness Max Premix	3.85 L	1.93	lb ai/a	PRE	A			
	----acetochlor	3.52	1.76						
	----mesotrione	0.33	0.165						
	Atrazine 4L	4 L	1	lb ai/a	PRE	A			
	DiFlexx.....dicamba	4 L	0.25	lb ai/a	V4	C			
	Methylated Seed Oil	100 L	1	% v/v	V4	C			
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V4	C			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Description			AMAPA C - PalmerAm	SETFA C - G.foxtl	CYPES C - Y.nutsgc	AMAPA C - PalmerAm	
Rating Type			Control % 06/05/19	Control % 06/05/19	Control % 06/05/19	Control % 06/21/19	
Trt No. Treatment Name	Form Conc Type Rate	Rate Unit Appl Timing	Appl Code				
1 Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	3.36 lb ai/a 1.86 1.5	PRE A	86.0 ab	94.0 ab	66.7 f	41.7 b
2 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole	5.6 L 3.1 2.5 2 L	2.8 lb ai/a 1.55 1.25 0.047 lb ai/a	PRE A	77.7 ab	94.7 ab	68.3 ef	91.7 a
3 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Corvus Premix ----thiencarbazone ----isoxaflutole	5.6 L 3.1 2.5 2.63 SC 0.75 1.88	2.8 lb ai/a 1.55 1.25 0.068 lb ai/a 0.0194 0.0486	PRE A	78.3 ab	100.0 a	74.3 c-f	96.7 a
4 Corvus Premix ----thiencarbazone ----isoxaflutole Atrazine 4L	2.63 SC 0.75 1.88 4 L	0.0925 lb ai/a 0.0264 0.066 1 lb ai/a	PRE A	88.3 ab	98.0 a	85.7 a-f	85.0 a
5 Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	0.0925 lb ai/a 0.0264 0.066 2.24 lb ai/a 1.24 1	PRE A	73.3 b	100.0 a	86.7 a-f	80.0 a
6 Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L	3.85 L 3.52 0.33 4 L	1.93 lb ai/a 1.76 0.165 1 lb ai/a	PRE A	90.0 ab	95.7 ab	91.3 a-d	90.0 a
7 Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor	3.44 ZC 1 0.06 0.24 2.14	2.15 lb ai/a 0.625 0.0375 0.15 1.34	PRE A	83.3 ab	95.3 ab	91.0 a-e	88.3 a
8 Resicore Premix ----acetochlor ----mesotrione ----clopypralid Atrazine 4L	3.28 SE 2.8 0.3 0.18 4 L	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a	PRE A	81.7 ab	99.0 a	85.0 a-f	96.7 a
9 Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L DiFlexx.....dicamba Methylated Seed Oil Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 4 L 100 L 100 D	1.93 lb ai/a 1.76 0.165 1 lb ai/a 0.25 lb ai/a 1 % v/v 1.02 % w/v	PRE A V4 C V4 C V4 C	90.0 ab	94.3 ab	100.0 a	100.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	SIDSP C - PrkISida Control % 06/21/19	DIGSA C - L.crbgrs Control % 06/21/19	CYPES C - Y.nutsge Control % 06/21/19	C ZEAMX Corn Yield Bu/A 09/16/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	3.36 lb ai/a 1.86 1.5	PRE	A	66.7 b	58.3 c	40.0 f	121.2 a
2	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole	5.6 L 3.1 2.5 2 L	2.8 lb ai/a 1.55 1.25 0.047 lb ai/a	PRE	A	97.7 a	98.0 a	57.7 ef	110.6 a
3	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Corvus Premix ----thien carbazole ----isoxaflutole	5.6 L 3.1 2.5 2.63 SC 0.75 1.88	2.8 lb ai/a 1.55 1.25 0.068 lb ai/a 0.0194 0.0486	PRE	A	100.0 a	98.0 a	60.0 def	94.3 a
4	Corvus Premix ----thien carbazole ----isoxaflutole Atrazine 4L	2.63 SC 0.75 1.88 4 L	0.0925 lb ai/a 0.0264 0.066 1 lb ai/a	PRE	A	100.0 a	86.7 abc	61.7 c-f	83.3 a
5	Corvus Premix ----thien carbazole ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	0.0925 lb ai/a 0.0264 0.066 2.24 lb ai/a 1.24 1	PRE	A	66.7 b	63.3 bc	63.3 b-f	94.1 a
6	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L	3.85 L 3.52 0.33 4 L	1.93 lb ai/a 1.76 0.165 1 lb ai/a	PRE	A	100.0 a	90.7 ab	95.7 ab	74.9 a
7	Auron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor	3.44 ZC 1 0.06 0.24 2.14	2.15 lb ai/a 0.625 0.0375 0.15 1.34	PRE	A	100.0 a	91.7 ab	94.0 abc	117.5 a
8	Resicore Premix ----acetochlor ----mesotrione ----clopypralid Atrazine 4L	3.28 SE 2.8 0.3 0.18 4 L	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a	PRE	A	100.0 a	97.3 a	91.7 a-d	125.3 a
9	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L DiFlexx.....dicamba Methylated Seed Oil Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 4 L 100 L 100 D	1.93 lb ai/a 1.76 0.165 1 lb ai/a 0.25 lb ai/a 1 % v/v 1.02 % w/v	PRE V4 V4 V4	A C C C	100.0 a	85.0 abc	97.3 a	124.1 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	Crop Type, Code	Description	C	ZEAMX	CYPES	C	ZEAMX			
Rating Type	Rating Unit	Rating Date		Corn	C - Y.nutsg	Corn				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	Stunting %	Control %	Stunting %
10	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L DiFlexx Duo Premix ----dicamba ----tembotrione Methylated Seed Oil Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 2.13 SC 1.86 0.27 100 L 100 D	1.93 lb ai/a 1.76 0.165 1 lb ai/a 0.4 lb ai/a 0.35 0.0507 1 % v/v 1.02 % w/v	PRE A V4 C V4 C	A A C C C	1.7 a 05/30/19	100.0 a 05/30/19	2.7 a 06/05/19		
11	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L Capreno Premix ----thienicarbazone ----tembotrione Nonionic Surfactant Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 3.45 SC 0.57 2.88 100 L 100 D	1.93 lb ai/a 1.76 0.165 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 0.25 % v/v 1.02 % w/v	PRE A V4 C V4 C	A A C C C	0.0 a 05/30/19	100.0 a 05/30/19	1.0 a 06/05/19		
12	Corvus Premix ----thienicarbazone ----isoxaflutole Atrazine 4L Harness Max Premix ----acetochlor ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	2.63 SC 0.75 1.88 4 L 3.85 L 3.52 0.33 100 L 100 D	0.068 lb ai/a 0.0194 0.0486 1 lb ai/a 1.68 lb ai/a 1.54 0.144 0.25 % v/v 1.02 % w/v	PRE A 2-4"wds B V4 B	A A B C B	0.0 a 05/30/19	95.0 a 05/30/19	0.0 a 06/05/19		
13	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole DiFlexx.....dicamba Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 4 L 100 L 100 D	2.8 lb ai/a 1.55 1.25 0.047 lb ai/a 0.25 lb ai/a 1 % v/v 1.02 % w/v	PRE A PRE A V4 C V4 C	A A A C C C	1.7 a 05/30/19	93.3 a 05/30/19	2.7 a 06/05/19		
14	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole Capreno Premix ----thienicarbazone ----tembotrione Nonionic Surfactant Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 3.45 SC 0.57 2.88 100 L 100 D	2.8 lb ai/a 1.55 1.25 0.047 lb ai/a 0.081 lb ai/a 0.0134 0.0676 0.25 % v/v 1.02 % w/v	PRE A PRE A V4 C V4 C	A A A C C C	0.0 a 05/30/19	91.7 a 05/30/19	0.0 a 06/05/19		
15	Harness Max Premix ----acetochlor ----mesotrione Harness Max Premix ----acetochlor ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.85 L 3.52 0.33 3.85 L 3.52 0.33 100 L 100 D	1.2 lb ai/a 1.1 0.103 1.2 lb ai/a 1.1 0.103 0.25 % v/v 1.02 % w/v	PRE A 2-4"wds B V4 B C B	A A B C B C B	1.0 a 05/30/19	98.3 a 05/30/19	1.0 a 06/05/19		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	SETFA C - G.foxtl	CYPES C - Y.nutsge	AMAPA C - PalmerAm				
Rating Type	Rating Unit	Rating Date	Control % 06/05/19	Control % 06/05/19	Control % 06/05/19	Control % 06/21/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
10	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L DiFlexx Duo Premix ----dicamba ----tembotrione Methylated Seed Oil Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 2.13 SC 1.86 0.27 100 L 100 D	1.93 lb ai/a 1.76 0.165 1 lb ai/a 0.4 lb ai/a 0.35 0.0507 1 % v/v 1.02 % w/v	PRE A V4 C V4 C	87.7 ab	99.0 a	92.7 a-d	100.0 a		
11	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L Capreno Premix ----thien carbazole ----tembotrione Nonionic Surfactant Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 3.45 SC 0.57 2.88 100 L 100 D	1.93 lb ai/a 1.76 0.165 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 0.25 % v/v 1.02 % w/v	PRE A V4 C V4 C	96.7 ab	98.3 a	91.7 a-d	100.0 a		
12	Corvus Premix ----thien carbazole ----isoxaflutole Atrazine 4L Harness Max Premix ----acetochlor ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	2.63 SC 0.75 1.88 4 L 3.85 L 3.52 0.33 100 L 100 D	0.068 lb ai/a 0.0194 0.0486 1 lb ai/a 1.68 lb ai/a 1.54 0.144 0.25 % v/v 1.02 % w/v	PRE A 2-4" wds B V4 2-4" wds B V4	98.3 a	100.0 a	90.0 a-e	100.0 a		
13	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole DiFlexx.....dicamba Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 4 L 100 L 100 D	2.8 lb ai/a 1.55 1.25 0.047 lb ai/a 0.25 lb ai/a 1 % v/v 1.02 % w/v	PRE A A V4 C V4 C	80.0 ab	100.0 a	86.7 a-f	100.0 a		
14	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole Capreno Premix ----thien carbazole ----tembotrione Nonionic Surfactant Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 3.45 SC 0.57 2.88 100 L 100 D	2.8 lb ai/a 1.55 1.25 0.047 lb ai/a 0.081 lb ai/a 0.0134 0.0676 0.25 % v/v 1.02 % w/v	PRE A A V4 C V4 C	76.7 ab	96.7 ab	66.7 f	97.7 a		
15	Harness Max Premix ----acetochlor ----mesotrione Harness Max Premix ----acetochlor ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.85 L 3.52 0.33 3.85 L 3.52 0.33 100 L 100 D	1.2 lb ai/a 1.1 0.103 1.2 lb ai/a 1.1 0.103 0.25 % v/v 1.02 % w/v	PRE A 2-4" wds B V4 2-4" wds B V4	96.7 ab	96.7 ab	98.3 ab	94.0 a		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	SIDSP C - PrklSida Control %	DIGSA C - L.crbgrs Control %	CYPES C - Y.nutsge Control %	C ZEAMX Corn Yield Bu/A 09/16/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
10	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L DiFlexx Duo Premix ----dicamba ----tembotrione Methylated Seed Oil Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 2.13 SC 1.86 0.27 100 L 100 D	1.93 lb ai/a 1.76 0.165 1 lb ai/a 0.4 lb ai/a 0.35 0.0507 1 % v/v 1.02 % w/v	PRE V4 V4	A C C C	100.0 a	98.3 a	95.0 ab	136.3 a
11	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L Capreno Premix ----thiencarbazone ----tembotrione Nonionic Surfactant Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 3.45 SC 0.57 2.88 100 L 100 D	1.93 lb ai/a 1.76 0.165 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 0.25 % v/v 1.02 % w/v	PRE V4 V4	A C C C	100.0 a	100.0 a	93.3 abc	106.7 a
12	Corvus Premix ----thiencarbazone ----isoxaflutole Atrazine 4L Harness Max Premix ----acetochlor ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	2.63 SC 0.75 1.88 4 L 3.85 L 3.52 0.33 100 L 100 D	0.068 lb ai/a 0.0194 0.0486 1 lb ai/a 1.68 lb ai/a 1.54 0.144 0.25 % v/v 1.02 % w/v	PRE 2-4"wds B V4 V4	A B C C	100.0 a	100.0 a	92.3 a-d	123.7 a
13	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole DiFlexx.....dicamba Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 4 L 100 L 100 D	2.8 lb ai/a 1.55 1.25 0.047 lb ai/a 0.25 lb ai/a 1 % v/v 1.02 % w/v	PRE V4 V4 V4	A C C C	100.0 a	83.3 abc	73.3 a-e	128.4 a
14	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole Capreno Premix ----thiencarbazone ----tembotrione Nonionic Surfactant Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 3.45 SC 0.57 2.88 100 L 100 D	2.8 lb ai/a 1.55 1.25 0.047 lb ai/a 0.081 lb ai/a 0.0134 0.0676 0.25 % v/v 1.02 % w/v	PRE V4 V4 V4	A C C C	100.0 a	99.0 a	92.7 abc	117.5 a
15	Harness Max Premix ----acetochlor ----mesotrione Harness Max Premix ----acetochlor ----mesotrione Nonionic Surfactant Dry Ammonium Sulfate	3.85 L 3.52 0.33 3.85 L 3.52 0.33 100 L 100 D	1.2 lb ai/a 1.1 0.103 1.2 lb ai/a 1.1 0.103 0.25 % v/v 1.02 % w/v	PRE 2-4"wds B V4 V4	A B C C	100.0 a	96.7 a	98.3 a	109.7 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Description		C	ZEAMX Corn	CYPES C - Y.nutsg	C	ZEAMX Corn	
Rating Type		Stunting %	05/30/19	Control %	05/30/19	Stunting %	
Rating Unit						06/05/19	
Rating Date							
Trt Treatment No. Name	Form Conc Type	Form Rate Rate	Appl Unit Unit	Appl Timing Timing	Appl Code Code		
16 Degree Xtra Premix ----acetochlor ----atrazine Capreno Premix ----thiencarbazone ----tembotrione Nonionic Surfactant Dry Ammonium Sulfate	4 FL 2.67 1.33 3.45 SC 0.57 2.88 100 L 100 D	3 lb ai/a 2 1 0.081 lb ai/a 0.0134 0.0676 0.25 % v/v 1.02 % w/v	2-4"wds B B B 2-4"wds B B B 2-4"wds B B		3.3 a	83.3 a	1.7 a
17 Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	4.376 SC 2.084 2.084 0.208 4 L 100 L 100 D	1.97 lb ai/a 0.94 0.94 0.094 1 lb ai/a 0.25 % v/v 1.02 % w/v	2-4"wds B B B B 2-4"wds B B 2-4"wds B		0.0 a	88.3 a	0.0 a
18 Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Callisto.....mesotrione Atrazine 4L	5.5 L 2.4 3.1 4.5 AS 4 SC 4 L	2.2 lb ai/a 0.96 1.24 1.13 lb ae/a 0.094 lb ai/a 1.25 lb ai/a	PRE A V4 V4 V4	A		98.3 a	0.0 a
19 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Callisto.....mesotrione Atrazine 4L	4 SE 3.733 0.267 4 SC 4 L	0.109 lb ai/a 0.102 0.0073 0.15 lb ai/a 1 lb ai/a	PRE A A PRE A		0.0 a	100.0 a	2.0 a
20 Untreated Check					0.0 a	66.7 a	0.0 a
LSD P=.05					3.61	30.45	3.43
Standard Deviation					2.18	18.42	2.08
CV					319.65	19.9	157.76
Replicate F					1.471	2.440	1.626
Replicate Prob(F)					0.2426	0.1007	0.2101
Treatment F					0.768	1.322	1.037
Treatment Prob(F)					0.7266	0.2264	0.4466

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	SETFA C - G.foxtl	CYPES C - Y.nutsge	AMAPA C - PalmerAm		
Rating Type		Control %	Control %	Control %	Control %		
Rating Unit		06/05/19	06/05/19	06/05/19	06/21/19		
Rating Date							
Trt Treatment No. Name	Form Conc Form Type Rate	Appl Unit Timing	Appl Code				
16 Degree Xtra Premix ----acetochlor ----atrazine Capreno Premix ----thiencarbazone ----tembotrione Nonionic Surfactant Dry Ammonium Sulfate	4 FL 2.67 1.33 3.45 SC 0.57 2.88 100 L 100 D	3 lb ai/a 2 1 0.081 lb ai/a 0.0134 0.0676 0.25 % v/v 1.02 % w/v	2-4"wds B	83.3 ab	88.3 b	73.0 def	100.0 a
17 Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	4.376 SC 2.084 2.084 0.208 4 L 100 L 100 D	1.97 lb ai/a 0.94 0.94 0.094 1 lb ai/a 0.25 % v/v 1.02 % w/v	2-4"wds B	98.3 a	95.7 ab	76.0 b-f	98.3 a
18 Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Callisto.....mesotrione Atrazine 4L	5.5 L 2.4 3.1 4.5 AS 4 SC 4 L	2.2 lb ai/a 0.96 1.24 1.13 lb ae/a 0.094 lb ai/a 1.25 lb ai/a	PRE V4 C V4 V4	81.0 ab	94.0 ab	71.7 def	100.0 a
19 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Callisto.....mesotrione Atrazine 4L	4 SE 3.733 0.267 4 SC 4 L	0.109 lb ai/a 0.102 0.0073 0.15 lb ai/a 1 lb ai/a	PRE A A PRE A	91.7 ab	100.0 a	96.7 abc	92.7 a
20 Untreated Check			0.0 c	0.0 c	0.0 g	0.0 c	
LSD P=.05		23.57	9.04	22.97	21.74		
Standard Deviation		14.26	5.47	13.90	13.15		
CV		17.4	5.94	17.46	15.01		
Replicate F		12.330	1.902	11.583	3.875		
Replicate Prob(F)		0.0001	0.1632	0.0001	0.0294		
Treatment F		6.324	47.913	7.243	10.404		
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code		SIDSP	DIGSA	CYPES	ZEAMX
Crop Type, Code		C - Prklsida	C - L.crbgrs	C - Y.nutsge	C Corn Yield Bu/A
Description		Control %	Control %	Control %	09/16/19
Rating Type					
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
16	Xtra Premix	4 FL	3 lb ai/a	2-4"	wds B
----acetochlor		2.67	2		
----atrazine		1.33	1		
Capreno Premix		3.45 SC	0.081 lb ai/a	2-4"	wds B
----thiencarbazone		0.57	0.0134		
----tembotrione		2.88	0.0676		
Nonionic Surfactant		100 L	0.25 % v/v	2-4"	wds B
Dry Ammonium Sulfate		100 D	1.02 % w/v	2-4"	wds B
17	Halex GT Premix	4.376 SC	1.97 lb ai/a	2-4"	wds B
----s-metolachlor		2.084	0.94		
----glyphosate		2.084	0.94		
----mesotrione		0.208	0.094		
Atrazine 4L		4 L	1 lb ai/a	2-4"	wds B
Nonionic Surfactant		100 L	0.25 % v/v	2-4"	wds B
Dry Ammonium Sulfate		100 D	1.02 % w/v	2-4"	wds B
18	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	PRE	A
----s-metolachlor		2.4	0.96		
----atrazine		3.1	1.24		
Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	V4	C
Callisto.....mesotrione		4 SC	0.094 lb ai/a	V4	C
Atrazine 4L		4 L	1.25 lb ai/a	V4	C
19	Anthem Flex Premix	4 SE	0.109 lb ai/a	PRE	A
----pyroxasulfone		3.733	0.102		
----carfentrazone		0.267	0.0073		
Callisto.....mesotrione		4 SC	0.15 lb ai/a	PRE	A
Atrazine 4L		4 L	1 lb ai/a	PRE	A
20	Untreated Check			0.0 c	0.0 d
LSD P=.05				30.66	32.16
Standard Deviation				18.55	19.46
CV				20.26	22.57
Replicate F				0.419	1.605
Replicate Prob(F)				0.6608	0.2141
Treatment F				4.955	4.364
Treatment Prob(F)				0.0001	0.0001
					10.487
					17.396
					0.0002
					0.0001
					4.715
					0.576
					0.9004

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Weed Control with Bayer Products in Field Corn**

Trial ID: Corn6-19      Location: Field #14      Trial Year: 2019  
Protocol ID: Corn6-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: Bayer

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 04/24/19

Initiation Date: 03/01/19

Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.64037 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays Corn

Entry Date: 09/24/19

Variety: RL7844AM

Attributes: Roundup-ready

Planting Date: 05/17/19

Depth: 2 IN

Rows per Plot: 4

Row Spacing: 30 IN

Planting Rate: 28000 S/A

Planting Method: PLANTD planted

Planting Equipment: FE Field Equipment

Seed Bed: MEDIUM medium

Soil Moisture: NORMAL normal, adequate

Soil Temperature: 78 F

Emergence Date: 05/22/19

Harvest Date: 09/18/19

Harvest Equipment: Plot combine

Harvested Width: 5 FT

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth Entry Date: 09/24/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory Entry Date: 09/24/19

Pest 3 Type: W Code: PANDI Panicum dichotomiflorum

Common Name: Fall panicum Entry Date: 09/24/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 12 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14B

% Sand: 81 % OM: 1.6 Texture: LS loamy sand

% Silt: 12 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: E excellent

Soil Drainage: G good

**Application Description**

	A	B
Application Date	05/17/19	06/12/19
Appl. Stop Time	02:30 PM	01:20 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	28DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/22/19	09/24/19
Air Temperature Start, Stop	81 81 F	72 72 F
% Relative Humidity Start, Stop	49 49	61 61
Wind Velocity+Dir. Start	7 mph SW	7 mph ESE
Wind Velocity+Dir. Stop	7 mph SW	7 mph ESE
Wind Velocity+Dir. Max	7 mph SW	7 mph ESE
Wet Leaves (Y/N)	N no	N no
Soil Temperature	74 F	75 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	81	100
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	0.26 IN	1.64 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR
Days after Emergence	-5	21
Stage Majority, Percent		V7 100
Height Average		18 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100
Height Average		6 in
Height Minimum, Maximum		5 8
Density Average		2 m2
Density Min, Max		0 4
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		veg 100
Height Average		4 in
Height Minimum, Maximum		2 5
Density Average		4 m2
Density Min, Max		2 6
Pest 3 Code, Type, Scale	PANDI W	PANDI W
Stage Majority, Percent		veg 100
Height Average		5 in
Height Minimum, Maximum		3 8
Density Average		10 m2
Density Min, Max		5 15

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	34 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/24/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/22/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

Trial Comments

## Weed Control with Bayer Products in Field Corn

Trial ID: Corn6-19

Location: Field #14

Trial Year: 2019

Protocol ID: Corn6-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Bayer

Pest Code	Crop Type, Code	Description	C	ZEAMX	AMAPA C - PalmerAm	IPOSS C - mornglry
Rating Type	Rating Unit	Rating Date	Injury %		Control %	Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
1	Untreated Check					
2	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	0.068 lb ai/a 0.0194 0.0486 2.8 lb ai/a 1.55 1.25	PRE	A	0.0 a 90.0 ab 80.0 b
3	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	0.082 lb ai/a 0.0234 0.0586 2.8 lb ai/a 1.55 1.25	PRE	A	0.0 a 96.7 a 76.7 bc
4	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	0.0925 lb ai/a 0.0264 0.066 2.8 lb ai/a 1.55 1.25	PRE	A	0.0 a 100.0 a 78.3 bc
5	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.047 lb ai/a 2.8 lb ai/a 1.55 1.25	PRE	A	0.0 a 100.0 a 73.3 bc
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.0625 lb ai/a 2.8 lb ai/a 1.55 1.25	PRE	A	0.0 a 100.0 a 78.3 bc
7	Balance Flexx...isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	2 L 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L	0.047 lb ai/a 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	PRE	A 28 DAP B 28 DAP B	0.0 a 83.3 b 78.3 bc
8	Balance Flexx...isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	2 L 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L	0.0625 lb ai/a 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	PRE	A 28DAP B 28DAP B	0.0 a 93.3 ab 73.3 bc

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code				PANDI C - F.pancm	AMAPA C - PalmerAm	IPOSS C - mornglry
Rating Type				Control %	Control %	Control %
Rating Unit				06/06/19	06/14/19	06/14/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code
1	Untreated Check				0.0 c	0.0 c
2	Corvus Premix ----thienecarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	0.068 lb ai/a 0.0194 0.0486 2.8 lb ai/a 1.55 1.25	PRE A	96.7 a	100.0 a
3	Corvus Premix ----thienecarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	0.082 lb ai/a 0.0234 0.0586 2.8 lb ai/a 1.55 1.25	PRE A	91.3 a	100.0 a
4	Corvus Premix ----thienecarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	0.0925 lb ai/a 0.0264 0.066 2.8 lb ai/a 1.55 1.25	PRE A	96.3 a	100.0 a
5	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.047 lb ai/a 2.8 lb ai/a 1.55 1.25	PRE A	86.7 a	100.0 a
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.0625 lb ai/a 2.8 lb ai/a 1.55 1.25	PRE A	93.0 a	99.3 a
7	Balance Flexx...isoxaflutole Atrazine 4L Capreno Premix ----thienecarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	2 L 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L	0.047 lb ai/a 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	PRE A 28 DAP B	95.0 a	80.0 b
8	Balance Flexx...isoxaflutole Atrazine 4L Capreno Premix ----thienecarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	2 L 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L	0.0625 lb ai/a 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	PRE A 28DAP B 28DAP B	91.7 a	93.3 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code						PANDI C - F.panicm	AMAPA C - PalmerAm	IPOSS C - mornglry		
Crop Type, Code						Control %	Control %	Control %		
Description						06/14/19	07/15/19	07/15/19		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check						0.0 c	0.0 c		
2	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	SC	0.068 lb ai/a 0.0194 0.0486 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	96.3 ab	100.0 a	16.7 bc
3	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	SC	0.082 lb ai/a 0.0234 0.0586 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	98.7 a	100.0 a	66.7 ab
4	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	SC	0.0925 lb ai/a 0.0264 0.066 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	98.3 a	100.0 a	65.0 ab
5	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	L	0.047 lb ai/a 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	91.0 ab	100.0 a	50.0 abc
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	L	0.0625 lb ai/a 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	94.3 ab	100.0 a	50.0 abc
7	Balance Flexx...isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	2 L 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L	L SC	0.047 lb ai/a 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	lb ai/a	PRE	A	97.7 a	100.0 a	83.3 a
8	Balance Flexx...isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	2 L 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L	L SC	0.0625 lb ai/a 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	lb ai/a	PRE	A	93.0 ab	100.0 a	98.3 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	PANDI C - F.panicm Control %	C ZEAMX Corn Yield Bu/A	09/18/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check						0.0 f	109.0 a	
2	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	SC	0.068 lb ai/a 0.0194 0.0486 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	80.0 abc	167.4 a
3	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	SC	0.082 lb ai/a 0.0234 0.0586 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	85.0 ab	171.3 a
4	Corvus Premix ----thiencarbazone ----isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2.63 SC 0.75 1.88 5.6 L 3.1 2.5	SC	0.0925 lb ai/a 0.0264 0.066 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	53.3 bcd	165.1 a
5	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	L	0.047 lb ai/a 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	36.7 de	134.5 a
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	L	0.0625 lb ai/a 2.8 lb ai/a 1.55 1.25	lb ai/a	PRE	A	46.7 cd	141.1 a
7	Balance Flexx...isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	2 L 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L	L	0.047 lb ai/a 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	lb ai/a	PRE	A	100.0 a	90.9 a
8	Balance Flexx...isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	2 L 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L	L	0.0625 lb ai/a 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	lb ai/a	PRE	A	100.0 a	133.6 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Description	C	ZEAMX Corn	AMAPA C - PalmerAm	IPOSS C - mornglry				
Rating Type	Injury %		Control %	Control %				
Rating Unit	06/06/19		06/06/19	06/06/19				
Rating Date								
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
9 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Capreno Premix ----thiencarbazone ----tembotrione Roundup PowerMax..glyphosate Atrazine 4L	5.6 L 3.1 2.5 3.45 SC 0.57 2.88 4.5 AS 4 L	2.24 lb ai/a 1.24 1 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	PRE A 28DAP B			3.3 a	100.0 a	66.7 c
10 Balance Flexx...isoxaflutole Atrazine 4L DiFlexx Duo Premix ----dicamba ----tembotrione Atrazine 4L	2 L 4 L 2.13 SC 1.86 0.27 4 L	0.047 lb ai/a 1 lb ai/a 0.53 lb ai/a 0.463 0.067 1 lb ai/a	PRE A 28DAP B			0.0 a	96.7 a	66.7 c
11 Harness Xtra 5.6L Premix ----acetochlor ----atrazine DiFlexx Duo Premix ----dicamba ----tembotrione Atrazine 4L	5.6 L 3.1 2.5 2.13 SC 1.86 0.27 4 L	2.24 lb ai/a 1.24 1 0.53 lb ai/a 0.463 0.067 1 lb ai/a	PRE A 28DAP B			0.0 a	100.0 a	68.3 bc
12 Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.71 SC 1.742819 0.2243629 1.742819	2.78 lb ai/a 1.3 0.168 1.3	PRE A			0.0 a	100.0 a	93.3 a
LSD P=.05 Standard Deviation CV						2.82 1.67 600.0	13.26 7.83 8.87	11.92 7.04 10.14
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						1.000 0.3840 1.000 0.4767	0.951 0.4018 39.160 0.0001	3.797 0.0383 32.143 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Description			PANDI C - F.pancm	AMAPA C - PalmerAm	IPOSS C - mornlry	
Rating Type		Control %		Control %	Control %	
Rating Unit		06/06/19		06/14/19	06/14/19	
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code	
9 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	5.6 L 3.1 2.5 3.45 SC 0.57 2.88 4.5 AS 4 L	2.24 lb ai/a 1.24 1 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	PRE A 28DAP B	66.7 b	100.0 a	84.3 abc
10 Balance Flexx...isoxaflutole Atrazine 4L DiFlexx Duo Premix ----dicamba ----tembotriione Atrazine 4L	2 L 4 L 2.13 SC 1.86 0.27 4 L	0.047 lb ai/a 1 lb ai/a 0.53 lb ai/a 0.463 0.067 1 lb ai/a	PRE A 28DAP B	86.7 a	98.3 a	96.7 ab
11 Harness Xtra 5.6L Premix ----acetochlor ----atrazine DiFlexx Duo Premix ----dicamba ----tembotriione Atrazine 4L	5.6 L 3.1 2.5 2.13 SC 1.86 0.27 4 L	2.24 lb ai/a 1.24 1 0.53 lb ai/a 0.463 0.067 1 lb ai/a	PRE A 28DAP B	66.7 b	100.0 a	98.7 a
12 Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.71 SC 1.742819 0.2243629 1.742819	2.78 lb ai/a 1.3 0.168 1.3	PRE A 28DAP B	73.3 b	100.0 a	92.7 abc
LSD P=.05 Standard Deviation CV				12.90 7.62 9.68	13.14 7.76 8.69	14.69 8.68 10.64
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				3.586 0.0449 37.950 0.0001	1.347 0.2805 41.067 0.0001	1.400 0.2676 27.400 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Description			PANDI C - F.panicm	AMAPA C - PalmerAm	IPOSS C - mornlry	
Rating Type		Control %		Control %	Control %	
Rating Unit		06/14/19		07/15/19	07/15/19	
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code	
9 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	5.6 L 3.1 2.5 3.45 SC 0.57 2.88 4.5 AS 4 L	2.24 lb ai/a 1.24 1 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	PRE A 28DAP B	83.3 b	100.0 a	93.3 a
10 Balance Flexx...isoxaflutole Atrazine 4L DiFlexx Duo Premix ----dicamba ----tembotriione Atrazine 4L	2 L 4 L 2.13 SC 1.86 0.27 4 L	0.047 lb ai/a 1 lb ai/a 0.53 lb ai/a 0.463 0.067 1 lb ai/a	PRE A 28DAP B	91.0 ab	100.0 a	100.0 a
11 Harness Xtra 5.6L Premix ----acetochlor ----atrazine DiFlexx Duo Premix ----dicamba ----tembotriione Atrazine 4L	5.6 L 3.1 2.5 2.13 SC 1.86 0.27 4 L	2.24 lb ai/a 1.24 1 0.53 lb ai/a 0.463 0.067 1 lb ai/a	PRE A 28DAP B	82.7 b	100.0 a	100.0 a
12 Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.71 SC 1.742819 0.2243629 1.742819	2.78 lb ai/a 1.3 0.168 1.3	PRE A 28DAP B	83.3 b	96.7 b	66.7 ab
LSD P=.05 Standard Deviation CV				13.96 8.24 9.8	2.82 1.67 1.82	59.39 35.07 53.28
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				9.887 0.0009 32.539 0.0001	1.000 0.3840 895.546 0.0001	2.535 0.1021 2.596 0.0273

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Description Rating Type Rating Unit Rating Date	PANDI C - F.panicm Control % 07/15/19	C ZEAMX Corn Yield Bu/A 09/18/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
9	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L	5.6 L 3.1 2.5 3.45 SC 0.57 2.88 4.5 AS 4 L	2.24 lb ai/a 1.24 1 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a	PRE 28DAP	A		100.0 a	148.3 a	
10	Balance Flexx...isoxaflutole Atrazine 4L DiFlexx Duo Premix ----dicamba ----tembotriione Atrazine 4L	2 L 4 L 2.13 SC 1.86 0.27 4 L	0.047 lb ai/a 1 lb ai/a 0.53 lb ai/a 0.463 0.067 1 lb ai/a	PRE 28DAP	A		10.0 ef	168.3 a	
11	Harness Xtra 5.6L Premix ----acetochlor ----atrazine DiFlexx Duo Premix ----dicamba ----tembotriione Atrazine 4L	5.6 L 3.1 2.5 2.13 SC 1.86 0.27 4 L	2.24 lb ai/a 1.24 1 0.53 lb ai/a 0.463 0.067 1 lb ai/a	PRE 28DAP	B		0.0 f	159.9 a	
12	Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.71 SC 1.742819 0.2243629 1.742819	2.78 lb ai/a 1.3 0.168 1.3	PRE	A		0.0 f	157.8 a	
LSD P=.05 Standard Deviation CV							34.12 20.15 39.53	63.60 37.56 25.8	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)							0.638 0.5378 12.705 0.0001	0.434 0.6535 1.354 0.2614	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Soil-Applied Herbicide Evaluation in Field Corn for Medium-Textured Soils  
 Trial ID: Corn9b-19 Location: Harrington Trial Year: 2019  
 Protocol ID: Corn9b-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 05/01/19

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays Corn

Entry Date: 09/27/19

Attributes: Roundup Ready

Planting Date: 05/09/19

Depth: 2 IN

Planting Method: PLANTD planted

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Moisture: NORMAL normal, adequate

Soil Temperature: 74 F  
 Emergence Date: 05/16/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup>

Treatments: 12 Tillage Type: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Application Description**

	A
Application Date	05/15/19
Appl. Stop Time	11:00 AM
Application Method	SPRAY
Application Timing	PREPREG
Application Placement	BROSOI
Applied By	K. Vollmer
Appl. Entry Date	05/16/19
Soil Moisture	SLIDRY
% Cloud Cover	0

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	ZEAMX BCOR
Days after Emergence	-1

**Application Equipment**

	A
Appl. Equipment	Bckpck6Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	9 ft
Boom Height	18 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	05/01/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/16/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

**Trial Comments**

05/28/19: 100 percent Crabgrass and Smooth pigweed control all treatments except the untreated check.

06/17/19: morningglory sparse throughout study, but not controlled.

Soil-Applied Herbicide Evaluation in Field Corn for Medium-Textured Soils					
Trial ID: Corn9b-19		Location: Harrington		Trial Year: 2019	
Protocol ID: Corn9b-19		Investigator: Mark VanGessel			
Study Director:					
Sponsor Contact:					

Pest Code	Crop Type, Code	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	C ZEAMX Corn Stunting % 05/24/19	C ZEAMX Corn Stunting % 05/28/19	C ZEAMX Corn Stunting % 06/17/19
Description										
Rating Type										
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check							1.7 a	0.0 b	0.0 a
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
2	Lumax EZ Premix	3.67 SC		2.75 lb ai/a	PREP	RE A		4.0 a	0.0 b	1.7 a
	----s-metolachlor	2.49		1.87						
	----mesotrione	0.25		0.187						
	----atrazine	0.93		0.7						
	Atrazine 4L		4 L	0.75 lb ai/a	PREP	RE A				
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
3	Lexar EZ Premix	3.71 SC		3 lb ai/a	PREP	RE A		4.7 a	0.0 b	1.7 a
	----s-metolachlor	1.742819		1.41						
	----mesotrione	0.2243629		0.181						
	----atrazine	1.742819		1.41						
	Simazine		4 L	1.5 lb ai/a	PREP	RE A				
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
4	Bicep II Magnum Premix	5.5 L		2.9 lb ai/a	PREP	RE A		5.7 a	1.0 b	0.0 a
	----s-metolachlor	2.4		1.27						
	----atrazine	3.1		1.63						
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
5	Bicep II Magnum Premix	5.5 L		2.2 lb ai/a	PREP	RE A		5.7 a	16.7 a	1.7 a
	----s-metolachlor	2.4		0.96						
	----atrazine	3.1		1.24						
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
6	Bicep II Magnum Premix	5.5 L		2.2 lb ai/a	PREP	RE A		1.7 a	1.7 b	3.3 a
	----s-metolachlor	2.4		0.96						
	----atrazine	3.1		1.24						
	Resolve SG..... rimsulfuron	25 SG		0.0156 lb ai/a	PREP	RE A				
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
7	Bicep II Magnum Premix	5.5 L		2.2 lb ai/a	PREP	RE A		6.7 a	5.3 b	0.0 a
	----s-metolachlor	2.4		0.96						
	----atrazine	3.1		1.24						
	Prowl H2O..... pendimethalin	3.8 CS		1.43 lb ai/a	PREP	RE A				
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
8	Harness Xtra 5.6L Premix	5.6 L		3.22 lb ai/a	PREP	RE A		2.3 a	0.0 b	1.0 a
	----acetochlor	3.1		1.78						
	----atrazine	2.5		1.44						
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
9	Harness Xtra 5.6L Premix	5.6 L		4.2 lb ai/a	PREP	RE A		6.3 a	3.3 b	1.7 a
	----acetochlor	3.1		2.32						
	----atrazine	2.5		1.88						
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				
10	Zidua..... pyroxasulfone	4.17 SC		0.106 lb ai/a	PREP	RE A		2.3 a	0.0 b	0.0 a
	Atrazine 4L		4 L	1.5 lb ai/a	PREP	RE A				
	Roundup		4.5 AS	0.77 lb ai/a	PREP	RE A				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMACH C - SmthPgwd Control % 06/17/19	GGGAN C - AnnGrass Control % 06/17/19	C -
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Untreated Check Roundup		4.5 AS	0.77	lb ai/a	PREPRE A	0.0 e	0.0 c
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L Roundup	3.67 SC 2.49 0.25 0.93 4 L 4.5 AS		2.75 1.87 0.187 0.7 0.75 0.77	lb ai/a	PREPRE A	100.0 a	95.0 a
3	Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine Simazine Roundup	3.71 SC 1.742819 0.2243629 1.742819 4 L 4.5 AS		3 1.41 0.181 1.41 1.5 0.77	lb ai/a	PREPRE A	100.0 a	97.7 a
4	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup	5.5 L 2.4 3.1 4.5 AS		2.9 1.27 1.63 0.77	lb ai/a	PREPRE A	75.0 cd	60.0 b
5	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup	5.5 L 2.4 3.1 4.5 AS		2.2 0.96 1.24 0.77	lb ai/a	PREPRE A	82.7 a-d	91.7 a
6	Bicep II Magnum Premix ----s-metolachlor ----atrazine Resolve SG..... rimsulfuron Roundup	5.5 L 2.4 3.1 25 SG 4.5 AS		2.2 0.96 1.24 0.0156 0.77	lb ai/a	PREPRE A	100.0 a	100.0 a
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O..... pendimethalin Roundup	5.5 L 2.4 3.1 3.8 CS 4.5 AS		2.2 0.96 1.24 1.43 0.77	lb ai/a	PREPRE A	63.3 d	95.3 a
8	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup	5.6 L 3.1 2.5 4.5 AS		3.22 1.78 1.44 0.77	lb ai/a	PREPRE A	80.0 bcd	98.3 a
9	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup	5.6 L 3.1 2.5 4.5 AS		4.2 2.32 1.88 0.77	lb ai/a	PREPRE A	92.7 abc	86.7 ab
10	Zidua.....pyroxasulfone Atrazine 4L Roundup	4.17 SC 4 L 4.5 AS		0.106 1.5 0.77	lb ai/a	PREPRE A	93.3 abc	98.3 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C ZEAMX	C ZEAMX	C ZEAMX
Description		Corn Stunting %	Corn Stunting %	Corn Stunting %
Rating Type		05/24/19	05/28/19	06/17/19
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc	Form Type Rate	Rate Unit Appl Timing	Appl Code
11 Zidua.....pyroxasulfone Atrazine 4L Roundup	4.17 SC 4 L 4.5 AS	0.16 lb ai/a 1.5 lb ai/a 0.77 lb ai/a	PREPRE A PREPRE A PREPRE A	
12 Verdict Premix ----saflufenacil ----dimethenamid Atrazine 4L Roundup	5.57 EC 0.57 5 4 L 4.5 AS	0.65 lb ai/a 0.0665 0.583 1.5 lb ai/a 0.77 lb ai/a	PREPRE A PREPRE A PREPRE A PREPRE A	
LSD P=.05 Standard Deviation CV			7.61 4.49 119.82	7.91 4.67 200.29
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)			0.177 0.8386 0.574 0.8295	1.332 0.2845 3.194 0.0098
				3.67 2.16 159.06 0.593 0.5614 1.002 0.4754

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

## University of Delaware

Pest Code		AMACH	GGGAN								
Crop Type, Code		C -	C -	C -							
Description		SmthPgwd	AnnGrass								
Rating Type		Control	Control								
Rating Unit		%	%								
Rating Date		06/17/19	06/17/19								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
11	Zidua.....pyroxasulfone Atrazine 4L Roundup	4.17 4 L 4.5 AS	SC 1.5 lb ai/a 0.77 lb ai/a	0.16 1.5 lb ai/a 0.77 lb ai/a	lb ai/a	PREPRE A	PREPRE A	PREPRE A	100.0 a	93.3 a	
12	Verdict Premix ----saflufenacil ----dimethenamid Atrazine 4L Roundup	5.57 0.57 5 4 L 4.5 AS	EC 0.0665 0.583 1.5 lb ai/a 0.77 lb ai/a	0.65 0.0665 0.583 1.5 lb ai/a 0.77 lb ai/a	lb ai/a	PREPRE A	PREPRE A	PREPRE A	96.7 ab	78.3 ab	
LSD P=.05									19.55	31.45	.
Standard Deviation									11.55	18.57	.
CV									14.08	22.41	.
Replicate F									3.499	0.038	
Replicate Prob(F)									0.0479	0.9625	
Treatment F									18.167	7.041	
Treatment Prob(F)									0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

## University of Delaware

Comparison of Approaches to Weed Control in Field Corn for Coarse-Textured Soils  
 Trial ID: Crn10a-19 Location: REC Field #14 Trial Year: 2019  
 Protocol ID: Crn10a-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 05/15/19  
 Initiation Date: 03/01/19  
 Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays	Corn
Entry Date: 09/27/19	
Variety: RL7844AM	
Attributes: Roundup-ready	
Planting Date: 05/17/19	Planting Rate: 28000 S/A
Depth: 2 IN	
Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 IN	Planting Equipment: FE Field Equipment
Soil Temperature: 78 F	Seed Bed: MEDIUM medium
Emergence Date: 05/22/19	Soil Moisture: NORMAL normal, adequate
Harvest Date: 09/18/19	Harvest Equipment: Plot combine
% Standard Moisture: 15.5	Harvested Width: 5 FT
	Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: PANDI Panicum dichotomiflorum  
 Common Name: Fall panicum Entry Date: 09/27/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory Entry Date: 09/27/19

Pest 3 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth Entry Date: 09/27/19

**Site and Design**

Treated Plot Width: 6.67 FT	Site Type: FIELD field
Treated Plot Length: 25 FT	
Treated Plot Area: 166.75 FT <sup>2</sup>	Tillage Type: CONTIL conventional-till
Replications: 3	Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14B			
% Sand: 81	% OM: 1.6	Texture: LS	loamy sand
% Silt: 12	pH: 6.4	Soil Name: Rosedale loamy sand, 0-2% slopes	
% Clay: 7	CEC: 6.5	Fert. Level: E	excellent
Soil Drainage: G	good		

**Application Description**

	A	B	C	D
Application Date	05/17/19	05/30/19	06/04/19	06/12/19
Appl. Stop Time	03:50 PM	12:40 PM	03:00 PM	10:40 AM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	V1-2	V3	V5
Application Placement	BROADC	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson	Johnson
Appl. Entry Date	05/22/19	09/27/19	09/27/19	09/27/19
Air Temperature Start, Stop	79 80 F	86 87 F	72 75 F	71 72 F
% Relative Humidity Start, Stop	54 52	53 50	28 26	55 57
Wind Velocity+Dir. Start	8 mph SSW	5 mph SSW	7 mph WNW	6 mph ENE
Wind Velocity+Dir. Stop	8 mph SW	8 mph SW	6 mph W	10 mph E
Wind Velocity+Dir. Max	8 mph SSW	8 mph SW	7 mph WNW	10 mph E
Wet Leaves (Y/N)	N no	N no	N no	N no
Soil Temperature	74 F	86 F	79 F	71 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	87	27	0	46
Moisture 6 Hours after Appl.	0 IN	0.4 IN	0 IN	0 IN
Moisture 1 Week after Appl.	0.26 IN	0.8 IN	1.71 IN	1.64 IN

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR	ZEAMX BCOR	ZEAMX BCOR
Days after Emergence	-5	8	13	21
Stage Majority, Percent		V3 100	V4 100	V7 100
Height Average		6.5 in	11 in	18 in
Height Minimum, Maximum		6 7	10 12	

**Pest Stage At Each Application**

	A	B	C	D
Pest 1 Code, Type, Scale	PANDI W	PANDI W	PANDI W	PANDI W
Stage Majority, Percent		2-leaf 70	4-leaf 55	2-3 lf 100
Stage Minimum, Percent		1-leaf 10	3-leaf 15	
Stage Maximum, Percent		3-leaf 20	1-tlr 30	
Height Average		1.5 in	4 in	4 in
Height Minimum, Maximum		1 2	2 5	2 5
Density Average		50 m2	15 m2	10 m2
Density Min, Max		10 100	10 20	5 15
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		2-leaf 60	2-3 lf 50	veg 100
Stage Minimum, Percent		cotyl 20	cotyl 10	
Stage Maximum, Percent		3-leaf 20	4-leaf 40	
Height Average		1.5 in	2 in	4 in
Height Minimum, Maximum		1 3	1 3	2 5
Density Average		3 m2	6 m2	10 m2
Density Min, Max		2 5	0 12	5 15
Pest 3 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100	veg 100	
Height Average		1.5 in	1.5 in	
Height Minimum, Maximum		1 2	1 2	
Density Average		15 m2	2 m2	
Density Min, Max		10 20	0 4	

**Application Equipment**

	A	B	C	D
Appl. Equipment	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in	20 in
Boom Length	6.7 ft	6.7 ft	6.7 ft	6.7 ft
Boom Height	18 in	24 in	28 in	34 in
Ground Speed	3 mph	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/15/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/22/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

Trial Comments

## University of Delaware

## Comparison of Approaches to Weed Control in Field Corn for Coarse-Textured Soils

Trial ID: Crn10a-19

Location: REC Field #14

Trial Year: 2019

Protocol ID: Crn10a-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C GLXMA Soybean Stunting % 05/31/19	AMAPA C - PalmerAm Control % 05/31/19	IPOSS C - mornlry Control % 05/31/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Untreated Check					0.0 c	0.0 c	0.0 c
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L	3.67 SC 2.49 0.25 0.93 4 L	2.48 lb ai/a 1.68 0.169 0.63 0.75 lb ai/a	PRE A	2.3 bc	90.7 a	91.7 a	
3	Bicep II Magnum Premix ----s-metolachlor ----atrazine Resolve SG.....rimsulfuron	5.5 L 2.4 3.1 25 SG	2.2 lb ai/a 0.96 1.24 0.0156 lb ai/a	PRE A	6.3 a	92.3 a	89.7 a	
4	Bicep II Magnum Premix ----s-metolachlor ----atrazine Callisto.....mesotrione Roundup WeatherMax..glyphosate	5.5 L 2.4 3.1 4 SC 4.5 AS	2.9 lb ai/a 1.27 1.63 0.094 lb ai/a 0.77 lb ae/a	V5 D	0.0 c	90.7 a	90.7 a	
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup WeatherMax..glyphosate	5.6 L 3.1 2.5 4.5 AS	3.36 lb ai/a 1.86 1.5 0.77 lb ae/a	V5 D	4.7 ab	93.7 a	87.3 ab	
6	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 4 L 100 L	1.79 lb ai/a 0.78 1.01 1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V3 C V3 C V3 C	0.0 c	80.0 b	78.3 b	
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Realm Q Premix ----rimsulfuron ----mesotrione Atrazine 4L Nonionic Surfactant	5.5 L 2.4 3.1 38.7 WG 7.5 31.2 4 L 100 L	1.79 lb ai/a 0.78 1.01 0.097 lb ai/a 0.0188 0.078 0.5 lb ai/a 0.25 % v/v	V3 C V3 C V3 C	0.0 c			
8	Bicep II Magnum Premix ----s-metolachlor ----atrazine Atrazine 4L Prowl H2O.....pendimethalin Nonionic Surfactant	5.5 L 2.4 3.1 4 L 3.8 CS 100 L	1.79 lb ai/a 0.78 1.01 1.25 lb ai/a 1.19 lb ai/a 0.25 % v/v	V3 C V3 C V3 C	0.0 c			
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Atrazine 4L Roundup WeatherMax..glyphosate	5.5 L 2.4 3.1 4 L 4.5 AS	1.79 lb ai/a 0.78 1.01 1.25 lb ai/a 0.77 lb ae/a	V3 C V3 C	0.0 c			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13; Average=7

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	GGGAN C - AnnGrass Control % 05/31/19	C GLXMA Soybean Stunting % 06/11/19	AMAPA C - PalmerAm Control % 06/11/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Untreated Check					0.0 c	0.0 b	0.0 b
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L	3.67 SC 2.49 0.25 0.93 4 L	2.48 lb ai/a 1.68 0.169 0.63 0.75 lb ai/a	PRE A	91.3 a	4.0 ab	79.0 a	
3	Bicep II Magnum Premix ----s-metolachlor ----atrazine Resolve SG.....rimsulfuron	5.5 L 2.4 3.1 25 SG	2.2 lb ai/a 0.96 1.24 0.0156 lb ai/a	PRE A	89.7 ab	5.7 a	75.0 a	
4	Bicep II Magnum Premix ----s-metolachlor ----atrazine Callisto.....mesotrione Roundup WeatherMax..glyphosate	5.5 L 2.4 3.1 4 SC 4.5 AS	2.9 lb ai/a 1.27 1.63 0.094 lb ai/a 0.77 lb ae/a	V5 D	85.7 ab	0.0 b	75.7 a	
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup WeatherMax..glyphosate	5.6 L 3.1 2.5 4.5 AS	3.36 lb ai/a 1.86 1.5 0.77 lb ae/a	V5 D	93.0 a	7.0 a	75.7 a	
6	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 4 L 100 L	1.79 lb ai/a 0.78 1.01 1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V3 C	80.0 b	3.3 ab		
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Realm Q Premix ----rimsulfuron ----mesotrione Atrazine 4L Nonionic Surfactant	5.5 L 2.4 3.1 38.7 WG 7.5 31.2 4 L 100 L	1.79 lb ai/a 0.78 1.01 0.097 lb ai/a 0.0188 0.078 0.5 lb ai/a 0.25 % v/v	V3 C		0.0 b		
8	Bicep II Magnum Premix ----s-metolachlor ----atrazine Atrazine 4L Prowl H2O.....pendimethalin Nonionic Surfactant	5.5 L 2.4 3.1 4 L 3.8 CS 100 L	1.79 lb ai/a 0.78 1.01 1.25 lb ai/a 1.19 lb ai/a 0.25 % v/v	V3 C		2.3 ab		
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Atrazine 4L Roundup WeatherMax..glyphosate	5.5 L 2.4 3.1 4 L 4.5 AS	1.79 lb ai/a 0.78 1.01 1.25 lb ai/a 0.77 lb ae/a	V3 C		3.3 ab		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=13; Average=7

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - mornglry Control %	PANDI C - F.panicm Control %	AMAPA C - PalmerAm Control %	IPOSS C - mornglry Control %	
Trt No.	Treatment Name		Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check					0.0	b	0.0	b	
2	Lumax EZ Premix		3.67 SC	2.48 lb ai/a	PRE	A	79.0	a	80.7	a
	----s-metolachlor		2.49	1.68						
	----mesotrione		0.25	0.169						
	----atrazine		0.93	0.63						
	Atrazine 4L		4 L	0.75 lb ai/a	PRE	A				
3	Bicep II Magnum Premix		5.5 L	2.2 lb ai/a	PRE	A	75.0	a	65.0	a
	----s-metolachlor		2.4	0.96						
	----atrazine		3.1	1.24						
	Resolve SG.....rimsulfuron		25 SG	0.0156 lb ai/a	PRE	A				
4	Bicep II Magnum Premix		5.5 L	2.9 lb ai/a	PRE	A	71.7	a	68.3	a
	----s-metolachlor		2.4	1.27						
	----atrazine		3.1	1.63						
	Callisto.....mesotrione		4 SC	0.094 lb ai/a	V5	D				
	Roundup WeatherMax..glyphosate		4.5 AS	0.77 lb ae/a	V5	D				
5	Harness Xtra 5.6L Premix		5.6 L	3.36 lb ai/a	PRE	A	69.0	a	77.3	a
	----acetochlor		3.1	1.86						
	----atrazine		2.5	1.5						
	Roundup WeatherMax..glyphosate		4.5 AS	0.77 lb ae/a	V5	D				
6	Bicep II Magnum Premix		5.5 L	1.79 lb ai/a	PRE	A	60.0	a	99.0	a
	----s-metolachlor		2.4	0.78						
	----atrazine		3.1	1.01						
	Halex GT Premix		4.376 SC	1.97 lb ai/a	V3	C				
	----s-metolachlor		2.084	0.94						
	----glyphosate		2.084	0.94						
	----mesotrione		0.208	0.094						
	Atrazine 4L		4 L	0.5 lb ai/a	V3	C				
	Nonionic Surfactant		100 L	0.25 % v/v	V3	C				
7	Bicep II Magnum Premix		5.5 L	1.79 lb ai/a	PRE	A			99.0	a
	----s-metolachlor		2.4	0.78						
	----atrazine		3.1	1.01						
	Realm Q Premix		38.7 WG	0.097 lb ai/a	V3	C				
	----rimsulfuron		7.5	0.0188						
	----mesotrione		31.2	0.078						
	Atrazine 4L		4 L	0.5 lb ai/a	V3	C				
	Nonionic Surfactant		100 L	0.25 % v/v	V3	C				
8	Bicep II Magnum Premix		5.5 L	1.79 lb ai/a	PRE	A			99.0	a
	----s-metolachlor		2.4	0.78						
	----atrazine		3.1	1.01						
	Atrazine 4L		4 L	1.25 lb ai/a	V3	C				
	Prowl H2O.....pendimethalin		3.8 CS	1.19 lb ai/a	V3	C				
	Nonionic Surfactant		100 L	0.25 % v/v	V3	C				
9	Bicep II Magnum Premix		5.5 L	1.79 lb ai/a	PRE	A			99.0	a
	----s-metolachlor		2.4	0.78						
	----atrazine		3.1	1.01						
	Atrazine 4L		4 L	1.25 lb ai/a	V3	C				
	Roundup WeatherMax..glyphosate		4.5 AS	0.77 lb ae/a	V3	C				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13; Average=7

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	PANDI C - F.panicm Control % 06/18/19	AMAPA C - PalmerAm Control % 07/03/19	IPOSS C - mornglry Control % 07/03/19	PANDI C - F.panicm Control % 07/03/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check					0.0 h	0.0 c	0.0 c	0.0 e
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L	3.67 SC 2.49 0.25 0.93 4 L	2.48 lb ai/a 1.68 0.169 0.63 0.75 lb ai/a	PRE A	33.3 g	91.3 ab	50.0 b	46.7 d	
3	Bicep II Magnum Premix ----s-metolachlor ----atrazine Resolve SG.....rimsulfuron	5.5 L 2.4 3.1 25 SG	2.2 lb ai/a 0.96 1.24 0.0156 lb ai/a	PRE A	56.7 e	84.7 b	38.3 b	60.0 c	
4	Bicep II Magnum Premix ----s-metolachlor ----atrazine Callisto.....mesotrione Roundup WeatherMax..glyphosate	5.5 L 2.4 3.1 4 SC 4.5 AS	2.9 lb ai/a 1.27 1.63 0.094 lb ai/a 0.77 lb ae/a	V5 D	87.3 bc	99.0 a	92.7 a	99.0 a	
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup WeatherMax..glyphosate	5.6 L 3.1 2.5 4.5 AS	3.36 lb ai/a 1.86 1.5 0.77 lb ae/a	V5 D	94.7 ab	99.0 a	89.7 a	99.0 a	
6	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 4 L 100 L	1.79 lb ai/a 0.78 1.01 1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V3 C	99.0 a	99.0 a	91.0 a	93.7 a	
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Realm Q Premix ----rimsulfuron ----mesotrione Atrazine 4L Nonionic Surfactant	5.5 L 2.4 3.1 38.7 WG 7.5 31.2 4 L 100 L	1.79 lb ai/a 0.78 1.01 0.097 lb ai/a 0.0188 0.078 0.5 lb ai/a 0.25 % v/v	V3 C	53.3 ef	99.0 a	78.3 a	46.7 d	
8	Bicep II Magnum Premix ----s-metolachlor ----atrazine Atrazine 4L Prowl H2O.....pendimethalin Nonionic Surfactant	5.5 L 2.4 3.1 4 L 3.8 CS 100 L	1.79 lb ai/a 0.78 1.01 1.25 lb ai/a 1.19 lb ai/a 0.25 % v/v	V3 C	43.3 fg	94.3 a	88.4 a	43.3 d	
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Atrazine 4L Roundup WeatherMax..glyphosate	5.5 L 2.4 3.1 4 L 4.5 AS	1.79 lb ai/a 0.78 1.01 1.25 lb ai/a 0.77 lb ae/a	V3 C	98.7 ab	99.0 a	92.0 a	99.0 a	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=13; Average=7

Pest Code					C	ZEAMX
Crop Type, Code						Corn
Description						Yield
Rating Type						Bu/A
Rating Unit						
Rating Date						09/18/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Untreated Check					112.8 d
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L	3.67 SC 2.49 0.25 0.93 4 L	2.48 lb ai/a 1.68 0.169 0.63 0.75 lb ai/a	PRE	A	154.3 bc
3	Bicep II Magnum Premix ----s-metolachlor ----atrazine Resolve SG.....rimsulfuron	5.5 L 2.4 3.1 25 SG	2.2 lb ai/a 0.96 1.24 0.0156 lb ai/a	PRE	A	134.8 cd
4	Bicep II Magnum Premix ----s-metolachlor ----atrazine Callisto.....mesotrione Roundup WeatherMax..glyphosate	5.5 L 2.4 3.1 4 SC 4.5 AS	2.9 lb ai/a 1.27 1.63 0.094 lb ai/a 0.77 lb ae/a	V5	D	156.6 abc
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup WeatherMax..glyphosate	5.6 L 3.1 2.5 4.5 AS	3.36 lb ai/a 1.86 1.5 0.77 lb ae/a	V5	D	178.6 a
6	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 4 L 100 L	1.79 lb ai/a 0.78 1.01 1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V3	C	160.3 ab
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Realm Q Premix ----rimsulfuron ----mesotrione Atrazine 4L Nonionic Surfactant	5.5 L 2.4 3.1 38.7 WG 7.5 31.2 4 L 100 L	1.79 lb ai/a 0.78 1.01 0.097 lb ai/a 0.0188 0.078 0.5 lb ai/a 0.25 % v/v	V3	C	150.4 bc
8	Bicep II Magnum Premix ----s-metolachlor ----atrazine Atrazine 4L Prowl H2O.....pendimethalin Nonionic Surfactant	5.5 L 2.4 3.1 4 L 3.8 CS 100 L	1.79 lb ai/a 0.78 1.01 1.25 lb ai/a 1.19 lb ai/a 0.25 % v/v	V3	C	155.4 bc
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Atrazine 4L Roundup WeatherMax..glyphosate	5.5 L 2.4 3.1 4 L 4.5 AS	1.79 lb ai/a 0.78 1.01 1.25 lb ai/a 0.77 lb ae/a	V3	C	163.9 ab

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=13; Average=7

## University of Delaware

Pest Code		C	GLXMA	AMAPA	IPOSS					
Crop Type, Code		C -	Soybean	C -	C -					
Description		PalmerAm	Stunting	mornglry	Control					
Rating Type		%	%	%	%					
Rating Unit										
Rating Date		05/31/19	05/31/19	05/31/19	05/31/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
10	Atrazine 4L Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup WeatherMax..glyphosate	4 L 3.8 CS 56 WG 16 40 4.5 AS	1.25 lb ai/a 1.19 lb ai/a 0.175 lb ai/a 0.05 0.125 0.77 lb ae/a	PRE A V3 C	2.3 bc	90.7 a	86.7 ab			
11	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 4 L 100 L	1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V1-2 B V1-2 B V1-2 B	0.0 c					
12	Roundup WeatherMax..glyphosate Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	4.5 AS 5.5 L 2.4 3.1 3.8 CS	0.77 lb ae/a 2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	V1-2 B V1-2 B V1-2 B	0.0 c					
LSD P=.05						3.55	5.87	9.70		
Standard Deviation						2.10	3.30	5.45		
CV						160.79	4.29	7.28		
Replicate F						0.422	8.317	7.196		
Replicate Prob(F)						0.6607	0.0054	0.0088		
Treatment F						3.238	322.407	112.141		
Treatment Prob(F)						0.0091	0.0001	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13; Average=7

## University of Delaware

Pest Code		GGGAN C - AnnGrass Control %	C	GLXMA Soybean Stunting %	AMAPA C - PalmerAm Control %					
Crop Type, Code		05/31/19		06/11/19	06/11/19					
Description										
Rating Type										
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
10	Atrazine 4L Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup WeatherMax..glyphosate	4 L 3.8 CS 56 WG 16 40 4.5 AS	1.25 lb ai/a 1.19 lb ai/a 0.175 lb ai/a 0.05 0.125 0.77 lb ae/a	PRE A V3 C	88.3 ab	7.0 a				
11	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 4 L 100 L	1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V1-2 B B B V1-2 B		4.7 ab				
12	Roundup WeatherMax..glyphosate Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	4.5 AS 5.5 L 2.4 3.1 3.8 CS	0.77 lb ae/a 2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	V1-2 B B B V1-2 B		6.3 a				
LSD P=.05					11.32	4.87	16.40			
Standard Deviation					6.36	2.87	8.71			
CV					8.44	78.96	14.27			
Replicate F					8.409	2.931	8.921			
Replicate Prob(F)					0.0052	0.0744	0.0092			
Treatment F					83.319	2.536	46.158			
Treatment Prob(F)					0.0001	0.0304	0.0001			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=13; Average=7

## University of Delaware

Pest Code		IPOSS C - mornglry Control %	PANDI C - F.panicm Control %	AMAPA C - PalmerAm Control %	IPOSS C - mornglry Control %
Crop Type, Code		06/11/19	06/11/19	06/18/19	06/18/19
Description					
Rating Type					
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
10	Atrazine 4L Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup WeatherMax..glyphosate	4 L 3.8 CS 56 WG 16 40 4.5 AS	1.25 lb ai/a 1.19 lb ai/a 0.175 lb ai/a 0.05 0.125 0.77 lb ae/a	PRE V3	A C
11	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 4 L 100 L	1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V1-2	B
12	Roundup WeatherMax..glyphosate Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	4.5 AS 5.5 L 2.4 3.1 3.8 CS	0.77 lb ae/a 2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	V1-2	B
LSD P=.05			29.76	25.75	8.72
Standard Deviation			15.81	13.67	5.15
CV			26.74	23.47	5.83
Replicate F			3.563	3.680	0.367
Replicate Prob(F)			0.0783	0.0736	0.6967
Treatment F			10.564	17.677	91.152
Treatment Prob(F)			0.0023	0.0005	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13; Average=7

## University of Delaware

Pest Code			PANDI C - F.panicm Control	AMAPA C - PalmerAm Control	IPOSS C - morngrly Control	PANDI C - F.panicm Control		
Crop Type, Code			%	%	%	%		
Description								
Rating Type								
Rating Unit								
Rating Date			06/18/19	07/03/19	07/03/19	07/03/19		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing		
10	Atrazine 4L Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup WeatherMax..glyphosate	4 L 3.8 CS 56 WG 16 40 4.5 AS	1.25 lb ai/a 1.19 lb ai/a 0.175 lb ai/a 0.05 0.125 0.77 lb ae/a	PRE A V3 C	99.0 a	99.0 a	92.3 a	99.0 a
11	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 4 L 100 L	1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V1-2 B B B	70.0 d	99.0 a	88.0 a	70.0 b
12	Roundup WeatherMax..glyphosate Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	4.5 AS 5.5 L 2.4 3.1 3.8 CS	0.77 lb ae/a 2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	V1-2 B B B V1-2	76.7 cd	99.0 a	56.7 b	70.0 b
LSD P=.05				11.41	9.21	20.36	9.90	
Standard Deviation				6.74	5.44	11.99	5.85	
CV				9.96	6.14	16.79	8.49	
Replicate F				1.109	0.029	2.004	0.628	
Replicate Prob(F)				0.3477	0.9713	0.1598	0.5432	
Treatment F				64.904	80.928	18.032	85.466	
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=13; Average=7

## University of Delaware

Pest Code		C	ZEAMX					
Crop Type, Code			Corn					
Description			Yield					
Rating Type			Bu/A					
Rating Unit								
Rating Date			09/18/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
10	Atrazine 4L Prowl H2O.....pendimethalin Status Premix ----diflufenzopyr ----dicamba Roundup WeatherMax..glyphosate	4 L 3.8 CS 56 WG 16 40 4.5 AS	1.25 lb ai/a 1.19 lb ai/a 0.175 lb ai/a 0.05 0.125 0.77 lb ae/a	PRE PRE V3	A A C			171.7 ab
11	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant	4.376 SC 2.084 2.084 0.208 4 L 100 L		1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v	V1-2	B		158.8 ab
12	Roundup WeatherMax..glyphosate Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	4.5 AS 5.5 L 2.4 3.1 3.8 CS		0.77 lb ae/a 2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	V1-2	B		165.9 ab
LSD P=.05								22.72
Standard Deviation								13.42
CV								8.64
Replicate F								1.974
Replicate Prob(F)								0.1627
Treatment F								4.976
Treatment Prob(F)								0.0007

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=13; Average=7

## University of Delaware

Comparison of Approaches for Weed Control in No-Tillage Field Corn  
 Trial ID: Crn13-19 Location: Field #16 Trial Year: 2019  
 Protocol ID: Crn13-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established

ARM Trial Created On: 04/01/19  
 Initiation Date: 03/01/19  
 Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays	Corn	BBC Scale: BCOR
Entry Date: 09/23/19		
Variety: RL7844AM		
Attributes: Roundup-ready		
Planting Date: 05/07/19	Planting Rate: 28000	S/A
Depth: 2 IN		
Rows per Plot: 4	Planting Method: PLANTD	planted
Row Spacing: 30 IN	Planting Equipment: FE	Field Equipment
Soil Temperature: 77 F	Seed Bed: MEDTRA	medium/trashy
Emergence Date: 05/14/19	Soil Moisture: NORMAL	normal, adequate
Harvest Date: 09/16/19	Harvest Equipment: Plot combine	
% Standard Moisture: 15.5	Harvested Width: 5 FT	
	Harvested Length: 25 FT	

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth Entry Date: 09/23/19

Pest 2 Type: W Code: AMBEL Ambrosia artemisiifolia  
 Common Name: Common ragweed Entry Date: 09/23/19

Pest 3 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory Entry Date: 09/23/19

Pest 4 Type: W Code: GGGAN Annual grasses  
 Common Name: Annual grasses Entry Date: 09/23/19

**Site and Design**

Treated Plot Width: 6.67 FT	Site Type: FIELD field
Treated Plot Length: 25 FT	
Treated Plot Area: 166.75 FT <sup>2</sup>	Tillage Type: NOTILL no-till
Replications: 3	Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 16A  
 % Sand: 76 % OM: 1.4 Texture: SL sandy loam  
 % Silt: 15 pH: 6.6 Soil Name: Hurlokk loamy sand, 0-2% slopes  
 % Clay: 9 CEC: 4.8 Fert. Level: F fair  
 Soil Drainage: F fair

**Application Description**

	A	B	C	D	E
Application Date	04/11/19	04/25/19	05/08/19	05/29/19	06/06/19
Appl. Stop Time	03:15 PM	09:30 AM	02:25 PM	05:00 PM	12:45 PM
Interval to Prev. Appl.		14 DAYS	13 DAYS	21 DAYS	8 DAYS
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	21 DPP	7 DPP	PRE	V3	V5
Application Placement	BROADC	BROADC	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson	Johnson	Johnson
Appl. Entry Date	05/22/19	05/21/19	05/21/19	09/23/19	09/23/19
Air Temperature Start, Stop	57 57 F	63 63 F	71 71 F	92 90 F	81 82 F
% Relative Humidity Start, Stop	53 53	72 72	68 68	44 50	63 60
Wind Velocity+Dir. Start	11 mph E	3 mph	11 mph NE	9 mph WSW	6 mph NNW
Wind Velocity+Dir. Stop	11 mph E	3 mph	11 mph NE	11 mph SSW	5 mph NW
Wind Velocity+Dir. Max	11 mph E	3 mph	11 mph NE	11 mph SSW	6 mph NNW
Wet Leaves (Y/N)	N no	N no	N no	N no	N no
Soil Temperature	66 F	63 F	73 F	88 F	82 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	31	75	17	20	63
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.28 IN	1.03 IN	1.42 IN	0.54 IN	1.9 IN
Weather Source	ITERIS	ITERIS	ITERIS	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B	C	D	E
Crop 1 Code, BBCH Scale	ZEAMX BCOR				
Days after Emergence	-33	-19	-6	15	23
Stage Majority, Percent				V3-4 100	V6 100
Height Average				8 in	17 in
Height Minimum, Maximum				7 9	16 18

**Pest Stage At Each Application**

	A	B	C	D	E
Pest 1 Code, Type, Scale	AMAPA W				
Stage Majority, Percent				veg 100	veg 100
Height Average				4 in	5 in
Height Minimum, Maximum				2 5	2 8
Density Average				3 m2	4 m2
Density Min, Max				0 6	0 8
Pest 2 Code, Type, Scale	AMBEL W				
Stage Majority, Percent				veg 100	veg 100
Height Average				3 in	5 in
Height Minimum, Maximum				2 5	2 9
Density Average				1 m2	2 m2
Density Min, Max				0 2	0 4
Pest 3 Code, Type, Scale	IPOSS W				
Stage Majority, Percent				veg 100	
Height Average				3 in	
Height Minimum, Maximum				2 5	
Density Average				1 m2	
Density Min, Max				0 2	
Pest 4 Code, Type, Scale	GGGAN W				
Stage Majority, Percent					3-tlr 60
Stage Minimum, Percent					2-tl2 10
Stage Maximum, Percent					4-tlr 30
Height Average					10 in
Height Minimum, Maximum					8 12
Density Average					2 m2
Density Min, Max					0 5

**Application Equipment**

	A	B	C	D	E
Appl. Equipment	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi				
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002	11002	11002
Nozzle Spacing	20 in				
Boom Length	6.7 ft				
Boom Height	18 in	18 in	18 in	26 in	34 in
Ground Speed	3 mph				
Carrier	WATER	WATER	WATER	WATER	WATER
Application Amount	20 gal/ac				
Propellant	COMAIR	COMAIR	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/01/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	04/01/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

## University of Delaware

Comparison of Approaches for Weed Control in No-Tillage Field Corn

Trial ID: Crn13-19

Location: Field #16

Trial Year: 2019

Protocol ID: Crn13-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

## Trial Comments

04/24/19: 21 DPP- winter annual weeds (mouseear chickweed, horseweed, field pansy) also >95% control.

06/12/19: Poor Fall Panicum control trt. 2, 3, and 7. Poor ragweed control trt. 4.

07/13/19: Morningglory species density is variable. Poor ragweed control in treatments 2, 3, and 7. Poor fall panicum control in treatments 8, 2, 7, and 3. Poor prickly sida control in treatments 3 and 7.

Comparison of Approaches for Weed Control in No-Tillage Field Corn  
 Trial ID: Crn13-19 Location: Field #16 Trial Year: 2019  
 Protocol ID: Crn13-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	C SECCE	C ZEAMX	C SECCE							
Crop Type, Code	Rye	Corn	Rye							
Description										
Rating Type	Control %	Stunting %	Control %							
Rating Unit	04/24/19	05/30/19	05/30/19							
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Appl Timing	Appl Code			
1	Untreated Check							0.0 c	99.0 a	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	7 DPP	B					
2	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A			92.3 a	7.0 a	94.7 a
	Simazine	4 L	1.5 lb ai/a	21 DPP	A					
	Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A					
	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	C					
	----s-metolachlor	2.49	1.68							
	----mesotrione	0.25	0.169							
	----atrazine	0.93	0.63							
	Atrazine 4L	4 L	0.75 lb ai/a	PRE	C					
	Crop Oil Concentrate	100 L	1.25 % v/v	PRE	C					
3	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A			94.0 a	4.7 ab	93.7 a
	Bicep II Magnum Premix	5.5 L	1.72 lb ai/a	21 DPP	A					
	----s-metolachlor	2.4	0.75							
	----atrazine	3.1	0.97							
	Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A					
	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	C					
	----s-metolachlor	2.4	0.6							
	----atrazine	3.1	0.78							
	Prowl H2O.....pendimethalin	3.8 CS	1.43 lb ai/a	PRE	C					
	Crop Oil Concentrate	100 L	1.25 % v/v	PRE	C					
4	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A			92.3 a	0.0 c	64.7 a
	Bicep II Magnum Premix	5.5 L	2.9 lb ai/a	21 DPP	A					
	----s-metolachlor	2.4	1.27							
	----atrazine	3.1	1.63							
	Simazine	4 L	1.5 lb ai/a	21 DPP	A					
	Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A					
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	E					
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5	E					
	Crop Oil Concentrate	100 L	1.25 % v/v	V5	E					
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	V5	E					
5	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A			88.0 b	8.0 a	92.0 a
	Bicep II Magnum Premix	5.5 L	1.72 lb ai/a	21 DPP	A					
	----s-metolachlor	2.4	0.75							
	----atrazine	3.1	0.97							
	Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A					
	Lexar EZ Premix	3.71 SC	1.58 lb ai/a	PRE	C					
	----s-metolachlor	1.742819	0.74							
	----mesotrione	0.2243629	0.096							
	----atrazine	1.742819	0.74							
	Crop Oil Concentrate	100 L	1.25 % v/v	PRE	C					
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	E					
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5	E					
	Crop Oil Concentrate	100 L	1.25 % v/v	V5	E					
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	V5	E					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	IPOSS C - mornlry	C ZEAMX Corn				
Rating Type	Rating Unit	Rating Date	Control %	Control %	Stunting %				
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
1	Untreated Check	Roundup PowerMax..glyphosate			1.13 lb ae/a		7 DPP	B	0.0 d
2	Gramoxone SL....paraquat	4.5 AS	0.5 lb ai/a			21 DPP	A	99.0 a	95.3 a
	Simazine	4 L	1.5 lb ai/a			21 DPP	A		7.0 a
	Nonionic Surfactant	100 L	0.25 % v/v			21 DPP	A		
	Lumax EZ Premix	3.67 SC	2.48 lb ai/a			PRE	C		
	----s-metolachlor	2.49	1.68						
	----mesotrione	0.25	0.169						
	----atrazine	0.93	0.63						
	Atrazine 4L	4 L	0.75 lb ai/a			PRE	C		
	Crop Oil Concentrate	100 L	1.25 % v/v			PRE	C		
3	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a			21 DPP	A	86.3 ab	85.1 a
	Bicep II Magnum Premix	5.5 L	1.72 lb ai/a			21 DPP	A		4.7 ab
	----s-metolachlor	2.4	0.75						
	----atrazine	3.1	0.97						
	Nonionic Surfactant	100 L	0.25 % v/v			21 DPP	A		
	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a			PRE	C		
	----s-metolachlor	2.4	0.6						
	----atrazine	3.1	0.78						
	Prowl H2O.....pendimethalin	3.8 CS	1.43 lb ai/a			PRE	C		
	Crop Oil Concentrate	100 L	1.25 % v/v			PRE	C		
4	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a			21 DPP	A	56.7 c	55.0 b
	Bicep II Magnum Premix	5.5 L	2.9 lb ai/a			21 DPP	A		7.0 a
	----s-metolachlor	2.4	1.27						
	----atrazine	3.1	1.63						
	Simazine	4 L	1.5 lb ai/a			21 DPP	A		
	Nonionic Surfactant	100 L	0.25 % v/v			21 DPP	A		
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a			V5	E		
	Callisto.....mesotrione	4 SC	0.094 lb ai/a			V5	E		
	Crop Oil Concentrate	100 L	1.25 % v/v			V5	E		
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v			V5	E		
5	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a			21 DPP	A	93.0 a	86.0 a
	Bicep II Magnum Premix	5.5 L	1.72 lb ai/a			21 DPP	A		4.7 ab
	----s-metolachlor	2.4	0.75						
	----atrazine	3.1	0.97						
	Nonionic Surfactant	100 L	0.25 % v/v			21 DPP	A		
	Lexar EZ Premix	3.71 SC	1.58 lb ai/a			PRE	C		
	----s-metolachlor	1.742819	0.74						
	----mesotrione	0.2243629	0.096						
	----atrazine	1.742819	0.74						
	Crop Oil Concentrate	100 L	1.25 % v/v			PRE	C		
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a			V5	E		
	Callisto.....mesotrione	4 SC	0.094 lb ai/a			V5	E		
	Crop Oil Concentrate	100 L	1.25 % v/v			V5	E		
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v			V5	E		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - mornlry	DIGSA C - L.crbgrs				
Rating Type	Control %	Control %	Control %					
Rating Unit	06/12/19	06/12/19	06/12/19					
Rating Date								
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1 Untreated Check						0.0 c	0.0 e	0.0 f
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	7 DPP	B				
2 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A		92.3 ab	93.0 ab	93.0 ab
Simazine	4 L	1.5 lb ai/a	21 DPP	A				
Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A				
Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	C				
----s-metolachlor	2.49	1.68						
----mesotrione	0.25	0.169						
----atrazine	0.93	0.63						
Atrazine 4L	4 L	0.75 lb ai/a	PRE	C				
Crop Oil Concentrate	100 L	1.25 % v/v	PRE	C				
3 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A		89.7 ab	87.3 abc	82.3 bcd
Bicep II Magnum Premix	5.5 L	1.72 lb ai/a	21 DPP	A				
----s-metolachlor	2.4	0.75						
----atrazine	3.1	0.97						
Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A				
Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	C				
----s-metolachlor	2.4	0.6						
----atrazine	3.1	0.78						
Prowl H2O.....pendimethalin	3.8 CS	1.43 lb ai/a	PRE	C				
Crop Oil Concentrate	100 L	1.25 % v/v	PRE	C				
4 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A		89.0 ab	76.7 cd	75.0 cde
Bicep II Magnum Premix	5.5 L	2.9 lb ai/a	21 DPP	A				
----s-metolachlor	2.4	1.27						
----atrazine	3.1	1.63						
Simazine	4 L	1.5 lb ai/a	21 DPP	A				
Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A				
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	E				
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5	E				
Crop Oil Concentrate	100 L	1.25 % v/v	V5	E				
30% Urea Ammonium Nitrate	100 L	2.5 % v/v	V5	E				
5 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A		69.0 b	97.7 a	90.3 abc
Bicep II Magnum Premix	5.5 L	1.72 lb ai/a	21 DPP	A				
----s-metolachlor	2.4	0.75						
----atrazine	3.1	0.97						
Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A				
Lexar EZ Premix	3.71 SC	1.58 lb ai/a	PRE	C				
----s-metolachlor	1.742819	0.74						
----mesotrione	0.2243629	0.096						
----atrazine	1.742819	0.74						
Crop Oil Concentrate	100 L	1.25 % v/v	PRE	C				
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	E				
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5	E				
Crop Oil Concentrate	100 L	1.25 % v/v	V5	E				
30% Urea Ammonium Nitrate	100 L	2.5 % v/v	V5	E				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	IPOSS C - mornlry	DIGSA C - L.crbgrs	PANDI C - F.panicm			
Rating Type	Rating Unit	Rating Date	Control % 06/21/19	Control % 06/21/19	Control % 06/21/19	Control % 06/21/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1	Untreated Check	Roundup PowerMax..glyphosate			1.13 lb ae/a	7 DPP	B	0.0 e	0.0 c
2	Gramoxone SL....paraquat	4.5 AS	2 SL	0.5 lb ai/a	21 DPP	A	99.3 a	60.0 b	93.0 b
	Simazine		4 L	1.5 lb ai/a	21 DPP	A			
	Nonionic Surfactant		100 L	0.25 % v/v	21 DPP	A			
	Lumax EZ Premix		3.67 SC	2.48 lb ai/a	PRE	C			
	----s-metolachlor		2.49	1.68					
	----mesotrione		0.25	0.169					
	----atrazine		0.93	0.63					
	Atrazine 4L		4 L	0.75 lb ai/a	PRE	C			
	Crop Oil Concentrate		100 L	1.25 % v/v	PRE	C			
3	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	21 DPP	A	78.0 bcd	67.5 b	89.8 b
	Bicep II Magnum Premix		5.5 L	1.72 lb ai/a	21 DPP	A			
	----s-metolachlor		2.4	0.75					
	----atrazine		3.1	0.97					
	Nonionic Surfactant		100 L	0.25 % v/v	21 DPP	A			
	Bicep II Magnum Premix		5.5 L	1.38 lb ai/a	PRE	C			
	----s-metolachlor		2.4	0.6					
	----atrazine		3.1	0.78					
	Prowl H2O.....pendimethalin		3.8 CS	1.43 lb ai/a	PRE	C			
	Crop Oil Concentrate		100 L	1.25 % v/v	PRE	C			
4	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	21 DPP	A	76.3 bcd	99.0 a	98.8 a
	Bicep II Magnum Premix		5.5 L	2.9 lb ai/a	21 DPP	A			
	----s-metolachlor		2.4	1.27					
	----atrazine		3.1	1.63					
	Simazine		4 L	1.5 lb ai/a	21 DPP	A			
	Nonionic Surfactant		100 L	0.25 % v/v	21 DPP	A			
	Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V5	E			
	Callisto.....mesotrione		4 SC	0.094 lb ai/a	V5	E			
	Crop Oil Concentrate		100 L	1.25 % v/v	V5	E			
	30% Urea Ammonium Nitrate		100 L	2.5 % v/v	V5	E			
5	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	21 DPP	A	99.0 a	95.3 a	99.0 a
	Bicep II Magnum Premix		5.5 L	1.72 lb ai/a	21 DPP	A			
	----s-metolachlor		2.4	0.75					
	----atrazine		3.1	0.97					
	Nonionic Surfactant		100 L	0.25 % v/v	21 DPP	A			
	Lexar EZ Premix		3.71 SC	1.58 lb ai/a	PRE	C			
	----s-metolachlor		1.742819	0.74					
	----mesotrione		0.2243629	0.096					
	----atrazine		1.742819	0.74					
	Crop Oil Concentrate		100 L	1.25 % v/v	PRE	C			
	Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V5	E			
	Callisto.....mesotrione		4 SC	0.094 lb ai/a	V5	E			
	Crop Oil Concentrate		100 L	1.25 % v/v	V5	E			
	30% Urea Ammonium Nitrate		100 L	2.5 % v/v	V5	E			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	IPOSS C - mornlry	GGGAN C - AnnGrass				
Rating Type	Rating Unit	Rating Date	Control % 07/03/19	Control % 07/03/19	Control % 07/03/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1	Untreated Check						0.0 d	0.0 e	0.0 c
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	7 DPP	B			
2	Gramoxone SL....paraquat	2 SL		0.5 lb ai/a	21 DPP	A	99.0 a	55.0 d	63.3 b
	Simazine	4 L		1.5 lb ai/a	21 DPP	A			
	Nonionic Surfactant	100 L		0.25 % v/v	21 DPP	A			
	Lumax EZ Premix	3.67 SC		2.48 lb ai/a	PRE	C			
	----s-metolachlor	2.49		1.68					
	----mesotrione	0.25		0.169					
	----atrazine	0.93		0.63					
	Atrazine 4L	4 L		0.75 lb ai/a	PRE	C			
	Crop Oil Concentrate	100 L		1.25 % v/v	PRE	C			
3	Gramoxone SL....paraquat	2 SL		0.5 lb ai/a	21 DPP	A	76.7 c	63.0 cd	63.3 b
	Bicep II Magnum Premix	5.5 L		1.72 lb ai/a	21 DPP	A			
	----s-metolachlor	2.4		0.75					
	----atrazine	3.1		0.97					
	Nonionic Surfactant	100 L		0.25 % v/v	21 DPP	A			
	Bicep II Magnum Premix	5.5 L		1.38 lb ai/a	PRE	C			
	----s-metolachlor	2.4		0.6					
	----atrazine	3.1		0.78					
	Prowl H2O.....pendimethalin	3.8 CS		1.43 lb ai/a	PRE	C			
	Crop Oil Concentrate	100 L		1.25 % v/v	PRE	C			
4	Gramoxone SL....paraquat	2 SL		0.5 lb ai/a	21 DPP	A	76.3 c	82.0 a-d	99.0 a
	Bicep II Magnum Premix	5.5 L		2.9 lb ai/a	21 DPP	A			
	----s-metolachlor	2.4		1.27					
	----atrazine	3.1		1.63					
	Simazine	4 L		1.5 lb ai/a	21 DPP	A			
	Nonionic Surfactant	100 L		0.25 % v/v	21 DPP	A			
	Roundup PowerMax..glyphosate	4.5 AS		0.77 lb ae/a	V5	E			
	Callisto.....mesotrione	4 SC		0.094 lb ai/a	V5	E			
	Crop Oil Concentrate	100 L		1.25 % v/v	V5	E			
	30% Urea Ammonium Nitrate	100 L		2.5 % v/v	V5	E			
5	Gramoxone SL....paraquat	2 SL		0.5 lb ai/a	21 DPP	A	99.0 a	96.3 ab	99.0 a
	Bicep II Magnum Premix	5.5 L		1.72 lb ai/a	21 DPP	A			
	----s-metolachlor	2.4		0.75					
	----atrazine	3.1		0.97					
	Nonionic Surfactant	100 L		0.25 % v/v	21 DPP	A			
	Lexar EZ Premix	3.71 SC		1.58 lb ai/a	PRE	C			
	----s-metolachlor	1.742819		0.74					
	----mesotrione	0.2243629		0.096					
	----atrazine	1.742819		0.74					
	Crop Oil Concentrate	100 L		1.25 % v/v	PRE	C			
	Roundup PowerMax..glyphosate	4.5 AS		0.77 lb ae/a	V5	E			
	Callisto.....mesotrione	4 SC		0.094 lb ai/a	V5	E			
	Crop Oil Concentrate	100 L		1.25 % v/v	V5	E			
	30% Urea Ammonium Nitrate	100 L		2.5 % v/v	V5	E			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

Pest Code Crop Type, Code Description Rating Type Rating Unit Rating Date	C ZEAMX Corn Yield Bu/A 09/16/19					
Trt Treatment No. Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
1 Untreated Check Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	7 DPP	B	126.6 a
2 Gramoxone SL....paraquat Simazine Nonionic Surfactant Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L Crop Oil Concentrate	2 SL 4 L 100 L 3.67 SC 2.49 0.25 0.93 4 L 100 L		0.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 2.48 lb ai/a 1.68 0.169 0.63 0.75 lb ai/a 1.25 % v/v	21 DPP 21 DPP 21 DPP PRE C		135.4 a
3 Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Nonionic Surfactant Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin Crop Oil Concentrate	2 SL 5.5 L 2.4 3.1 100 L 5.5 L 2.4 3.1 3.8 CS 100 L		0.5 lb ai/a 1.72 lb ai/a 0.75 0.97 0.25 % v/v 1.38 lb ai/a 0.6 0.78 1.43 lb ai/a 1.25 % v/v	21 DPP 21 DPP A PRE C		131.3 a
4 Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate	2 SL 5.5 L 2.4 3.1 4 L 100 L 4.5 AS 4 SC 100 L 100 L		0.5 lb ai/a 2.9 lb ai/a 1.27 1.63 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a 0.094 lb ai/a 1.25 % v/v 2.5 % v/v	21 DPP 21 DPP A V5 E V5 E V5 E		159.2 a
5 Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Nonionic Surfactant Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine Crop Oil Concentrate Roundup PowerMax..glyphosate Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate	2 SL 5.5 L 2.4 3.1 100 L 3.71 SC 1.742819 0.2243629 1.742819 100 L 4.5 AS 4 SC 100 L 100 L		0.5 lb ai/a 1.72 lb ai/a 0.75 0.97 0.25 % v/v 1.58 lb ai/a 0.74 0.096 0.74 1.25 % v/v 0.77 lb ae/a 0.094 lb ai/a 1.25 % v/v 2.5 % v/v	21 DPP 21 DPP A PRE C V5 E V5 E V5 E		153.5 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

## University of Delaware

Pest Code	C SECCE	C ZEAMX	C SECCE			
Crop Type, Code	Rye	Corn	Rye			
Description						
Rating Type						
Rating Unit	Control %	Stunting %	Control %			
Rating Date	04/24/19	05/30/19	05/30/19			
Trt Treatment No. Name	Form Conc	Form Type Rate	Rate Unit Appl Timing Appl Code			
6 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP A			
Simazine	4 L	1.5 lb ai/a	21 DPP A			
Nonionic Surfactant	100 L	0.25 % v/v	21 DPP A			
Halex GT Premix	4.376 SC	1.97 lb ai/a	V3 D			
----s-metolachlor	2.084	0.94				
----glyphosate	2.084	0.94				
----mesotrione	0.208	0.094				
Atrazine 4L	4 L	1 lb ai/a	V3 D			
Nonionic Surfactant	100 L	0.25 % v/v	V3 D			
Dry Ammonium Sulfate	100 D	1.02 % w/v	V3 D			
7 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP B			
Lexar EZ Premix	3.71 SC	3.25 lb ai/a	7 DPP B			
----s-metolachlor	1.742819	1.53				
----mesotrione	0.2243629	0.197				
----atrazine	1.742819	1.53				
Simazine	4 L	1.5 lb ai/a	7 DPP B			
Nonionic Surfactant	100 L	0.25 % v/v	7 DPP B			
8 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP B			
Simazine	4 L	1.5 lb ai/a	7 DPP B			
Nonionic Surfactant	100 L	0.25 % v/v	7 DPP B			
Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE C			
----s-metolachlor	2.49	1.68				
----mesotrione	0.25	0.169				
----atrazine	0.93	0.63				
Atrazine 4L	4 L	0.75 lb ai/a	PRE C			
Crop Oil Concentrate	100 L	1.25 % v/v	PRE C			
9 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP B			
Lumax EZ Premix	3.67 SC	2.48 lb ai/a	7 DPP B			
----s-metolachlor	2.49	1.68				
----mesotrione	0.25	0.169				
----atrazine	0.93	0.63				
Atrazine 4L	4 L	0.75 lb ai/a	7 DPP B			
Nonionic Surfactant	100 L	0.25 % v/v	7 DPP B			
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5 E			
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5 E			
Crop Oil Concentrate	100 L	1.25 % v/v	V5 E			
30% Urea Ammonium Nitrate	100 L	2.5 % v/v	V5 E			
10 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP B			
Simazine	4 L	1 lb ai/a	7 DPP B			
Nonionic Surfactant	100 L	0.25 % v/v	7 DPP B			
Halex GT Premix	4.376 SC	1.97 lb ai/a	V3 D			
----s-metolachlor	2.084	0.94				
----glyphosate	2.084	0.94				
----mesotrione	0.208	0.094				
Atrazine 4L	4 L	1 lb ai/a	V3 D			
Nonionic Surfactant	100 L	0.25 % v/v	V3 D			
Dry Ammonium Sulfate	100 D	1.02 % w/v	V3 D			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - mornlry	C ZEAMX Corn					
Rating Type		Control %	Control %	Stunting %					
Rating Unit		05/30/19	05/30/19	06/12/19					
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
6	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP	A				
	Simazine	4 L	1.5 lb ai/a	21 DPP	A				
	Nonionic Surfactant	100 L	0.25 % v/v	21 DPP	A				
	Halex GT Premix	4.376 SC	1.97 lb ai/a	V3	D				
	----s-metolachlor	2.084	0.94						
	----glyphosate	2.084	0.94						
	----mesotrione	0.208	0.094						
	Atrazine 4L	4 L	1 lb ai/a	V3	D				
	Nonionic Surfactant	100 L	0.25 % v/v	V3	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3	D				
7	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B				
	Lexar EZ Premix	3.71 SC	3.25 lb ai/a	7 DPP	B				
	----s-metolachlor	1.742819	1.53						
	----mesotrione	0.2243629	0.197						
	----atrazine	1.742819	1.53						
	Simazine	4 L	1.5 lb ai/a	7 DPP	B				
	Nonionic Surfactant	100 L	0.25 % v/v	7 DPP	B				
8	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B				
	Simazine	4 L	1.5 lb ai/a	7 DPP	B				
	Nonionic Surfactant	100 L	0.25 % v/v	7 DPP	B				
	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	C				
	----s-metolachlor	2.49	1.68						
	----mesotrione	0.25	0.169						
	----atrazine	0.93	0.63						
	Atrazine 4L	4 L	0.75 lb ai/a	PRE	C				
	Crop Oil Concentrate	100 L	1.25 % v/v	PRE	C				
9	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B				
	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	7 DPP	B				
	----s-metolachlor	2.49	1.68						
	----mesotrione	0.25	0.169						
	----atrazine	0.93	0.63						
	Atrazine 4L	4 L	0.75 lb ai/a	7 DPP	B				
	Nonionic Surfactant	100 L	0.25 % v/v	7 DPP	B				
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	E				
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5	E				
	Crop Oil Concentrate	100 L	1.25 % v/v	V5	E				
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	V5	E				
10	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B				
	Simazine	4 L	1 lb ai/a	7 DPP	B				
	Nonionic Surfactant	100 L	0.25 % v/v	7 DPP	B				
	Halex GT Premix	4.376 SC	1.97 lb ai/a	V3	D				
	----s-metolachlor	2.084	0.94						
	----glyphosate	2.084	0.94						
	----mesotrione	0.208	0.094						
	Atrazine 4L	4 L	1 lb ai/a	V3	D				
	Nonionic Surfactant	100 L	0.25 % v/v	V3	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3	D				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - mornlry	DIGSA C - L.crbgrs					
Rating Type		Control %	Control %	Control %					
Rating Unit		06/12/19	06/12/19	06/12/19					
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
6	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	21 DPP	A			
	Simazine		4 L	1.5 lb ai/a	21 DPP	A			
	Nonionic Surfactant		100 L	0.25 % v/v	21 DPP	A			
	Halex GT Premix		4.376 SC	1.97 lb ai/a	V3	D			
	----s-metolachlor		2.084	0.94					
	----glyphosate		2.084	0.94					
	----mesotrione		0.208	0.094					
	Atrazine 4L		4 L	1 lb ai/a	V3	D			
	Nonionic Surfactant		100 L	0.25 % v/v	V3	D			
	Dry Ammonium Sulfate		100 D	1.02 % w/v	V3	D			
7	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7 DPP	B			
	Lexar EZ Premix		3.71 SC	3.25 lb ai/a	7 DPP	B			
	----s-metolachlor		1.742819	1.53					
	----mesotrione		0.2243629	0.197					
	----atrazine		1.742819	1.53					
	Simazine		4 L	1.5 lb ai/a	7 DPP	B			
	Nonionic Surfactant		100 L	0.25 % v/v	7 DPP	B			
8	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7 DPP	B			
	Simazine		4 L	1.5 lb ai/a	7 DPP	B			
	Nonionic Surfactant		100 L	0.25 % v/v	7 DPP	B			
	Lumax EZ Premix		3.67 SC	2.48 lb ai/a	PRE	C			
	----s-metolachlor		2.49	1.68					
	----mesotrione		0.25	0.169					
	----atrazine		0.93	0.63					
	Atrazine 4L		4 L	0.75 lb ai/a	PRE	C			
	Crop Oil Concentrate		100 L	1.25 % v/v	PRE	C			
9	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7 DPP	B			
	Lumax EZ Premix		3.67 SC	2.48 lb ai/a	7 DPP	B			
	----s-metolachlor		2.49	1.68					
	----mesotrione		0.25	0.169					
	----atrazine		0.93	0.63					
	Atrazine 4L		4 L	0.75 lb ai/a	7 DPP	B			
	Nonionic Surfactant		100 L	0.25 % v/v	7 DPP	B			
	Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V5	E			
	Callisto.....mesotrione		4 SC	0.094 lb ai/a	V5	E			
	Crop Oil Concentrate		100 L	1.25 % v/v	V5	E			
	30% Urea Ammonium Nitrate		100 L	2.5 % v/v	V5	E			
10	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7 DPP	B			
	Simazine		4 L	1 lb ai/a	7 DPP	B			
	Nonionic Surfactant		100 L	0.25 % v/v	7 DPP	B			
	Halex GT Premix		4.376 SC	1.97 lb ai/a	V3	D			
	----s-metolachlor		2.084	0.94					
	----glyphosate		2.084	0.94					
	----mesotrione		0.208	0.094					
	Atrazine 4L		4 L	1 lb ai/a	V3	D			
	Nonionic Surfactant		100 L	0.25 % v/v	V3	D			
	Dry Ammonium Sulfate		100 D	1.02 % w/v	V3	D			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - mornlry	DIGSA C - L.crbgrs	PANDI C - F.panicm						
Rating Type		Control %	Control %	Control %	Control %						
Rating Unit		06/21/19	06/21/19	06/21/19	06/21/19						
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
6	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	21	DPP	A				
	Simazine		4 L	1.5 lb ai/a	21	DPP	A				
	Nonionic Surfactant		100 L	0.25 % v/v	21	DPP	A				
	Halex GT Premix		4.376 SC	1.97 lb ai/a	V3		D				
	----s-metolachlor		2.084	0.94							
	----glyphosate		2.084	0.94							
	----mesotrione		0.208	0.094							
	Atrazine 4L		4 L	1 lb ai/a	V3		D				
	Nonionic Surfactant		100 L	0.25 % v/v	V3		D				
	Dry Ammonium Sulfate		100 D	1.02 % w/v	V3		D				
7	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7	DPP	B				
	Lexar EZ Premix		3.71 SC	3.25 lb ai/a	7	DPP	B				
	----s-metolachlor		1.742819	1.53							
	----mesotrione		0.2243629	0.197							
	----atrazine		1.742819	1.53							
	Simazine		4 L	1.5 lb ai/a	7	DPP	B				
	Nonionic Surfactant		100 L	0.25 % v/v	7	DPP	B				
8	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7	DPP	B				
	Simazine		4 L	1.5 lb ai/a	7	DPP	B				
	Nonionic Surfactant		100 L	0.25 % v/v	7	DPP	B				
	Lumax EZ Premix		3.67 SC	2.48 lb ai/a	PRE		C				
	----s-metolachlor		2.49	1.68							
	----mesotrione		0.25	0.169							
	----atrazine		0.93	0.63							
	Atrazine 4L		4 L	0.75 lb ai/a	PRE		C				
	Crop Oil Concentrate		100 L	1.25 % v/v	PRE		C				
9	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7	DPP	B				
	Lumax EZ Premix		3.67 SC	2.48 lb ai/a	7	DPP	B				
	----s-metolachlor		2.49	1.68							
	----mesotrione		0.25	0.169							
	----atrazine		0.93	0.63							
	Atrazine 4L		4 L	0.75 lb ai/a	7	DPP	B				
	Nonionic Surfactant		100 L	0.25 % v/v	7	DPP	B				
	Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V5		E				
	Callisto.....mesotrione		4 SC	0.094 lb ai/a	V5		E				
	Crop Oil Concentrate		100 L	1.25 % v/v	V5		E				
	30% Urea Ammonium Nitrate		100 L	2.5 % v/v	V5		E				
10	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7	DPP	B				
	Simazine		4 L	1 lb ai/a	7	DPP	B				
	Nonionic Surfactant		100 L	0.25 % v/v	7	DPP	B				
	Halex GT Premix		4.376 SC	1.97 lb ai/a	V3		D				
	----s-metolachlor		2.084	0.94							
	----glyphosate		2.084	0.94							
	----mesotrione		0.208	0.094							
	Atrazine 4L		4 L	1 lb ai/a	V3		D				
	Nonionic Surfactant		100 L	0.25 % v/v	V3		D				
	Dry Ammonium Sulfate		100 D	1.02 % w/v	V3		D				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

## University of Delaware

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	IPOSS C - mornlry	GGGAN C - AnnGrass			
Rating Type	Rating Unit	Rating Date	Control %	Control %	Control %			
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code		
6	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP A				
	Simazine	4 L	1.5 lb ai/a	21 DPP A				
	Nonionic Surfactant	100 L	0.25 % v/v	21 DPP A				
	Halex GT Premix	4.376 SC	1.97 lb ai/a	V3 D				
	----s-metolachlor	2.084	0.94					
	----glyphosate	2.084	0.94					
	----mesotrione	0.208	0.094					
	Atrazine 4L	4 L	1 lb ai/a	V3 D				
	Nonionic Surfactant	100 L	0.25 % v/v	V3 D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3 D				
7	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP B				
	Lexar EZ Premix	3.71 SC	3.25 lb ai/a	7 DPP B				
	----s-metolachlor	1.742819	1.53					
	----mesotrione	0.2243629	0.197					
	----atrazine	1.742819	1.53					
	Simazine	4 L	1.5 lb ai/a	7 DPP B				
	Nonionic Surfactant	100 L	0.25 % v/v	7 DPP B				
8	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP B				
	Simazine	4 L	1.5 lb ai/a	7 DPP B				
	Nonionic Surfactant	100 L	0.25 % v/v	7 DPP B				
	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE C				
	----s-metolachlor	2.49	1.68					
	----mesotrione	0.25	0.169					
	----atrazine	0.93	0.63					
	Atrazine 4L	4 L	0.75 lb ai/a	PRE C				
	Crop Oil Concentrate	100 L	1.25 % v/v	PRE C				
9	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP B				
	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	7 DPP B				
	----s-metolachlor	2.49	1.68					
	----mesotrione	0.25	0.169					
	----atrazine	0.93	0.63					
	Atrazine 4L	4 L	0.75 lb ai/a	7 DPP B				
	Nonionic Surfactant	100 L	0.25 % v/v	7 DPP B				
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5 E				
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5 E				
	Crop Oil Concentrate	100 L	1.25 % v/v	V5 E				
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	V5 E				
10	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP B				
	Simazine	4 L	1 lb ai/a	7 DPP B				
	Nonionic Surfactant	100 L	0.25 % v/v	7 DPP B				
	Halex GT Premix	4.376 SC	1.97 lb ai/a	V3 D				
	----s-metolachlor	2.084	0.94					
	----glyphosate	2.084	0.94					
	----mesotrione	0.208	0.094					
	Atrazine 4L	4 L	1 lb ai/a	V3 D				
	Nonionic Surfactant	100 L	0.25 % v/v	V3 D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3 D				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=5,10,12,13,15; Average=11

Pest Code Crop Type, Code Description Rating Type Rating Unit Rating Date		C ZEAMX Corn Yield Bu/A 09/16/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
6	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	21	DPP A		170.5 a
	Simazine		4 L	1.5 lb ai/a	21	DPP A		
	Nonionic Surfactant		100 L	0.25 % v/v	21	DPP A		
	Halex GT Premix		4.376 SC	1.97 lb ai/a	V3	D		
	----s-metolachlor		2.084	0.94				
	----glyphosate		2.084	0.94				
	----mesotrione		0.208	0.094				
	Atrazine 4L		4 L	1 lb ai/a	V3	D		
	Nonionic Surfactant		100 L	0.25 % v/v	V3	D		
	Dry Ammonium Sulfate		100 D	1.02 % w/v	V3	D		
7	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7	DPP	B	145.2 a
	Lexar EZ Premix		3.71 SC	3.25 lb ai/a	7	DPP	B	
	----s-metolachlor		1.742819	1.53				
	----mesotrione		0.2243629	0.197				
	----atrazine		1.742819	1.53				
	Simazine		4 L	1.5 lb ai/a	7	DPP	B	
	Nonionic Surfactant		100 L	0.25 % v/v	7	DPP	B	
8	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7	DPP	B	143.3 a
	Simazine		4 L	1.5 lb ai/a	7	DPP	B	
	Nonionic Surfactant		100 L	0.25 % v/v	7	DPP	B	
	Lumax EZ Premix		3.67 SC	2.48 lb ai/a	PRE		C	
	----s-metolachlor		2.49	1.68				
	----mesotrione		0.25	0.169				
	----atrazine		0.93	0.63				
	Atrazine 4L		4 L	0.75 lb ai/a	PRE		C	
	Crop Oil Concentrate		100 L	1.25 % v/v	PRE		C	
9	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7	DPP	B	169.3 a
	Lumax EZ Premix		3.67 SC	2.48 lb ai/a	7	DPP	B	
	----s-metolachlor		2.49	1.68				
	----mesotrione		0.25	0.169				
	----atrazine		0.93	0.63				
	Atrazine 4L		4 L	0.75 lb ai/a	7	DPP	B	
	Nonionic Surfactant		100 L	0.25 % v/v	7	DPP	B	
	Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V5		E	
	Callisto.....mesotrione		4 SC	0.094 lb ai/a	V5		E	
	Crop Oil Concentrate		100 L	1.25 % v/v	V5		E	
	30% Urea Ammonium Nitrate		100 L	2.5 % v/v	V5		E	
10	Gramoxone SL....paraquat		2 SL	0.5 lb ai/a	7	DPP	B	166.0 a
	Simazine		4 L	1 lb ai/a	7	DPP	B	
	Nonionic Surfactant		100 L	0.25 % v/v	7	DPP	B	
	Halex GT Premix		4.376 SC	1.97 lb ai/a	V3	D		
	----s-metolachlor		2.084	0.94				
	----glyphosate		2.084	0.94				
	----mesotrione		0.208	0.094				
	Atrazine 4L		4 L	1 lb ai/a	V3	D		
	Nonionic Surfactant		100 L	0.25 % v/v	V3	D		
	Dry Ammonium Sulfate		100 D	1.02 % w/v	V3	D		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=5,10,12,13,15; Average=11

## University of Delaware

Pest Code	C SECCE	C ZEAMX	C SECCE					
Crop Type, Code	Rye	Corn	Rye					
Description								
Rating Type	Control %	Stunting %	Control %					
Rating Unit								
Rating Date	04/24/19	05/30/19	05/30/19					
Trt Treatment No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
11 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B			0.0 c	98.3 a
Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	7 DPP	B				
----s-metolachlor	2.4	0.96						
----atrazine	3.1	1.24						
Nonionic Surfactant	100 L	0.25 % v/v	7 DPP	B				
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	D				
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3	D				
Atrazine 4L	4 L	1 lb ai/a	V3	D				
12 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B			0.0 c	99.0 a
Atrazine 4L	4 L	1.5 lb ai/a	7 DPP	B				
Simazine	4 L	1.5 lb ai/a	7 DPP	B				
Nonionic Surfactant	100 L	0.25 % v/v	7 DPP	B				
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	E				
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5	E				
Crop Oil Concentrate	100 L	1.25 % v/v	V5	E				
30% Urea Ammonium Nitrate	100 L	2.5 % v/v	V5	E				
13 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B			1.7 bc	97.7 a
Atrazine 4L	4 L	1.5 lb ai/a	7 DPP	B				
Simazine	4 L	1.5 lb ai/a	7 DPP	B				
Nonionic Surfactant	100 L	0.25 % v/v	7 DPP	B				
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	E				
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5	E				
14 Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP A			88.7 b	2.3 bc	95.3 a
Bicep II Magnum Premix	5.5 L	2.9 lb ai/a	21 DPP A					
----s-metolachlor	2.4	1.27						
----atrazine	3.1	1.63						
Simazine	4 L	1.5 lb ai/a	21 DPP A					
Nonionic Surfactant	100 L	0.25 % v/v	21 DPP A					
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	E				
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V5	E				
LSD P=.05					3.47	3.53	22.74	
Standard Deviation					1.91	2.10	13.55	
CV					2.1	103.81	14.42	
Replicate F					0.046	0.669	0.927	
Replicate Prob(F)					0.9554	0.5209	0.4086	
Treatment F					5.248	5.617	1.304	
Treatment Prob(F)					0.0127	0.0001	0.2722	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - mornlry	C ZEAMX Corn						
Rating Type		Control %	Control %	Stunting %						
Rating Unit		05/30/19	05/30/19	06/12/19						
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Appl Timing	Appl Code			
11	Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Atrazine 4L		2 SL 5.5 L 2.4 3.1 100 L 4.5 AS 4 SC 4 L	0.5 lb 2.2 lb 0.96 1.24 0.25 % v/v 0.77 lb ae/a 0.094 lb ai/a 1 lb ai/a	ai/a	7 DPP 7 DPP B		70.0 bc	55.0 b	0.0 c
12	Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate		2 SL 4 L 4 L 100 L 4.5 AS 4 SC 100 L 100 L	0.5 lb 1.5 lb 1.5 lb 0.25 % v/v 0.77 lb ae/a 0.094 lb ai/a 1.25 % v/v 2.5 % v/v	ai/a	7 DPP 7 DPP B		60.0 c	56.7 b	2.3 bc
13	Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione		2 SL 4 L 4 L 100 L 4.5 AS 4 SC	0.5 lb 1.5 lb 1.5 lb 0.25 % v/v 0.77 lb ae/a 0.094 lb ai/a	ai/a	7 DPP 7 DPP B		65.0 bc	53.3 b	2.3 bc
14	Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione		2 SL 5.5 L 2.4 3.1 4 L 100 L 4.5 AS 4 SC	0.5 lb 2.9 lb 1.27 1.63 1.5 lb 0.25 % v/v 0.77 lb ae/a 0.094 lb ai/a	ai/a	21 DPP A 21 DPP A		13.3 d	20.0 c	8.0 a
LSD P=.05								21.34	23.33	4.54
Standard Deviation								12.71	13.84	2.71
CV								19.75	22.47	76.8
Replicate F								3.251	5.446	0.335
Replicate Prob(F)								0.0549	0.0112	0.7185
Treatment F								21.837	15.161	3.562
Treatment Prob(F)								0.0001	0.0001	0.0028

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - mornglry	DIGSA C - L.crbgrs				
Rating Type	Control %	Control %	Control %					
Rating Unit	06/12/19	06/12/19	06/12/19					
Rating Date								
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
11 Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Atrazine 4L		2 SL 5.5 L 2.4 3.1 100 L 4.5 AS 4 SC 4 L	0.5 lb ai/a 2.2 lb ai/a 0.96 1.24 0.25 % v/v 0.77 lb ae/a V3 0.094 lb ai/a V3 1 lb ai/a V3	7 DPP 7 DPP B		98.3 a	99.0 a	97.7 ab
12 Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate		2 SL 4 L 4 L 100 L 4.5 AS 4 SC 100 L 100 L	0.5 lb ai/a 1.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5 1.25 % v/v V5 2.5 % v/v V5	7 DPP 7 DPP B		82.3 ab	83.3 bcd	75.0 cde
13 Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione		2 SL 4 L 4 L 100 L 4.5 AS 4 SC	0.5 lb ai/a 1.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5	7 DPP 7 DPP B		82.3 ab	78.3 cd	71.7 de
14 Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione		2 SL 5.5 L 2.4 3.1 4 L 100 L 4.5 AS 4 SC	0.5 lb ai/a 2.9 lb ai/a 1.27 1.63 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5	21 DPP A 21 DPP A		84.0 ab	75.0 cd	68.3 de
LSD P=.05 Standard Deviation CV						27.37 16.30 19.65	13.96 8.32 10.15	16.42 9.78 12.54
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						0.074 0.9291 7.155 0.0001	8.011 0.0019 28.199 0.0001	13.042 0.0001 20.090 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - mornlry	DIGSA C - L.crbgrs	PANDI C - F.panitm						
Rating Type	Control %		Control %		Control %						
Rating Unit	06/21/19		06/21/19		06/21/19						
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
11	Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Atrazine 4L		2 SL 5.5 L 2.4 3.1 100 L 4.5 AS 4 SC 4 L	0.5 lb ai/a 2.2 lb ai/a 0.96 1.24 0.25 % v/v 0.77 lb ae/a V3 0.094 lb ai/a V3 1 lb ai/a V3	7 DPP 7 DPP B		99.0 a	96.0 a	99.0 a	99.0 a	
12	Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate		2 SL 4 L 4 L 100 L 4.5 AS 4 SC 100 L 100 L	0.5 lb ai/a 1.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5 1.25 % v/v V5 2.5 % v/v V5	7 DPP 7 DPP B		77.3 bcd	87.0 a	99.0 a	99.0 a	
13	Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione		2 SL 4 L 4 L 100 L 4.5 AS 4 SC	0.5 lb ai/a 1.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5	7 DPP 7 DPP B		75.0 bcd	92.0 a	99.0 a	99.0 a	
14	Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione		2 SL 5.5 L 2.4 3.1 4 L 100 L 4.5 AS 4 SC	0.5 lb ai/a 2.9 lb ai/a 1.27 1.63 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5	21 DPP A 21 DPP A		71.5 d	92.0 a	99.2 a	99.3 a	
LSD P=.05							17.10	13.23	4.44	34.34	
Standard Deviation							10.15	7.74	2.62	20.22	
CV							12.57	9.81	2.9	23.53	
Replicate F							5.776	0.365	0.298	1.186	
Replicate Prob(F)							0.0090	0.6991	0.7450	0.3251	
Treatment F							19.301	38.114	299.466	2.041	
Treatment Prob(F)							0.0001	0.0001	0.0001	0.0704	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - mornlry	GGGAN C - AnnGrass				
Rating Type		Control %	Control %	Control %				
Rating Unit		07/03/19	07/03/19	07/03/19				
Rating Date								
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
11 Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Atrazine 4L		2 SL 5.5 L 2.4 3.1 100 L 4.5 AS 4 SC 4 L	0.5 lb ai/a 2.2 lb ai/a 0.96 1.24 0.25 % v/v 0.77 lb ae/a V3 0.094 lb ai/a V3 1 lb ai/a V3	7 DPP 7 DPP B		99.0 a	99.0 a	99.0 a
12 Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate		2 SL 4 L 4 L 100 L 4.5 AS 4 SC 100 L 100 L	0.5 lb ai/a 1.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5 1.25 % v/v 2.5 % v/v	7 DPP 7 DPP B		82.3 abc	93.7 abc	99.0 a
13 Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione		2 SL 4 L 4 L 100 L 4.5 AS 4 SC	0.5 lb ai/a 1.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5	7 DPP 7 DPP B		79.3 bc	96.6 ab	99.0 a
14 Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione		2 SL 5.5 L 2.4 3.1 4 L 100 L 4.5 AS 4 SC	0.5 lb ai/a 2.9 lb ai/a 1.27 1.63 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5	21 DPP A 21 DPP A		75.3 c	96.6 ab	86.0 a
LSD P=.05 Standard Deviation CV						17.29 10.30 12.52	30.71 18.22 23.1	13.59 8.10 9.76
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						6.157 0.0065 19.239 0.0001	0.740 0.4878 6.691 0.0001	1.014 0.3766 34.837 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

Pest Code Crop Type, Code Description Rating Type Rating Unit Rating Date	C ZEAMX Corn Yield Bu/A 09/16/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
11	Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Atrazine 4L	2 SL 5.5 L 2.4 3.1 100 L 4.5 AS 4 SC 4 L	0.5 lb ai/a 2.2 lb ai/a 0.96 1.24 0.25 % v/v 0.77 lb ae/a V3 0.094 lb ai/a V3 1 lb ai/a V3	7 DPP 7 DPP B				145.3 a
12	Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate	2 SL 4 L 4 L 100 L 4.5 AS 4 SC 100 L 100 L	0.5 lb ai/a 1.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5 1.25 % v/v 2.5 % v/v	7 DPP 7 DPP B				150.3 a
13	Gramoxone SL....paraquat Atrazine 4L Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione	2 SL 4 L 4 L 100 L 4.5 AS 4 SC	0.5 lb ai/a 1.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5	7 DPP 7 DPP B				141.4 a
14	Gramoxone SL....paraquat Bicep II Magnum Premix ----s-metolachlor ----atrazine Simazine Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione	2 SL 5.5 L 2.4 3.1 4 L 100 L 4.5 AS 4 SC	0.5 lb ai/a 2.9 lb ai/a 1.27 1.63 1.5 lb ai/a 0.25 % v/v 0.77 lb ae/a V5 0.094 lb ai/a V5	21 DPP A 21 DPP A				154.2 a
LSD P=.05 Standard Deviation CV								38.04 22.66 15.17
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)								10.358 0.0005 1.092 0.4068

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=5,10,12,13,15; Average=11

**Evaluation of Tough Weed Control in Field Corn**

Trial ID: Crn21-19      Location: Field #14      Trial Year: 2019  
 Protocol ID: Crn21-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Belchim

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 04/26/19  
 Initiation Date: 03/01/19  
 Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C ZEAMX Zea mays	Corn
Entry Date: 09/23/19	
Variety: RL7844AM	
Attributes: Roundup-ready	
Planting Date: 05/10/19	Planting Rate: 28000 S/A
Depth: 2 IN	
Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 IN	Planting Equipment: FE Field Equipment
Soil Temperature: 77 F	Seed Bed: MEDIUM medium
Emergence Date: 05/18/19	Soil Moisture: NORMAL normal, adequate
Harvest Date: 09/17/19	Harvest Equipment: Plot combine
% Standard Moisture: 15.5	Harvested Width: 5 FT
	Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth Entry Date: 09/23/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory Entry Date: 09/23/19

Pest 3 Type: W Code: PANDI Panicum dichotomiflorum  
 Common Name: Fall panicum Entry Date: 09/23/19

**Site and Design**

Treated Plot Width: 6.67 FT Site Type: FIELD field  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 12 Tillage Type: CONTIL conventional-till  
 Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14B  
 % Sand: 81 % OM: 1.6 Texture: LS loamy sand  
 % Silt: 12 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 7 CEC: 6.5 Fert. Level: E excellent  
 Soil Drainage: G good

**Application Description**

	A	B
Application Date	05/10/19	06/07/19
Appl. Stop Time	11:40 AM	02:40 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	4-6"wds
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/21/19	09/23/19
Air Temperature Start, Stop	74 77 F	78 79 F
% Relative Humidity Start, Stop	66 58	69 72
Wind Velocity+Dir. Start	8 mph SW	7 mph ENE
Wind Velocity+Dir. Stop	9 mph SW	7 mph E
Wind Velocity+Dir. Max	9 mph SW	7 mph ENE
Wet Leaves (Y/N)	N no	N no
Soil Temperature	71 F	80 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	79	45
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.45 IN	2.01 IN
Weather Source	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR
Days after Emergence	-8	20
Stage Majority, Percent		V6 100
Height Average		17 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100
Height Average		7 in
Height Minimum, Maximum		4 10
Density Average		4 m2
Density Min, Max		1 7
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		run 60
Stage Minimum, Percent		veg 40
Stage Maximum, Percent		run 60
Height Average		7 in
Height Minimum, Maximum		5 8
Density Average		5 m2
Density Min, Max		3 7
Pest 3 Code, Type, Scale	PANDI W	PANDI W
Stage Majority, Percent		5-leaf 65
Stage Minimum, Percent		5-leaf 65
Stage Maximum, Percent		1-tilr 45
Height Average		5 in
Height Minimum, Maximum		4 6
Density Average		24 m2
Density Min, Max		16 30

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	32 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/26/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

Trial Comments

## Evaluation of Tough Weed Control in Field Corn

Trial ID: Crn21-19

Location: Field #14

Trial Year: 2019

Protocol ID: Crn21-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Belchim

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	IPOSS C - mornglry	C ZEAMX Corn				
Rating Type	Rating Unit	Rating Date	Control %	Control %	Stunting %				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A	99.0 a	88.0 a	1.0 cd	
	----s-metolachlor	2.4	0.6						
	----atrazine	3.1	0.78						
	Halex GT Premix	4.376 SC	1.97 lb ai/a	4-6" wds	B				
	----s-metolachlor	2.084	0.94						
	----glyphosate	2.084	0.94						
	----mesotrione	0.208	0.094						
	Atrazine 4L	4 L	0.5 lb ai/a	4-6" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B				
2	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A	81.7 bc	78.3 a	3.3 bcd	
	----s-metolachlor	2.4	0.6						
	----atrazine	3.1	0.78						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4-6" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B				
3	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A	79.3 c	80.0 a	0.0 d	
	----s-metolachlor	2.4	0.6						
	----atrazine	3.1	0.78						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4-6" wds	B				
	Tough EC.....pyridate	5 EC	0.313 lb ai/a	4-6" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B				
4	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A	81.7 bc	81.7 a	1.7 cd	
	----s-metolachlor	2.4	0.6						
	----atrazine	3.1	0.78						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4-6" wds	B				
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	4-6" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B				
5	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A	94.0 ab	96.0 a	0.0 d	
	----s-metolachlor	2.4	0.6						
	----atrazine	3.1	0.78						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4-6" wds	B				
	Status Premix	56 WG	0.0875 lb ai/a	4-6" wds	B				
	----diflufenzopyr	16	0.025						
	----dicamba	40	0.0625						
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B				
6	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A	99.0 a	90.0 a	0.0 d	
	----s-metolachlor	2.4	0.6						
	----atrazine	3.1	0.78						
	Halex GT Premix	4.376 SC	1.97 lb ai/a	4-6" wds	B				
	----s-metolachlor	2.084	0.94						
	----glyphosate	2.084	0.94						
	----mesotrione	0.208	0.094						
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Average=1,2,5

Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

Pest Code	C	ZEAMX	C	ZEAMX	AMAPA					
Crop Type, Code		Corn	Corn		C -					
Description					PalmerAm					
Rating Type										
Rating Unit	LeafBurn %		Stunting %		Control %					
Rating Date	06/11/19		06/17/19		06/17/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A			1.7 d	0.0 a	96.3 a
	----s-metolachlor	2.4	0.6							
	----atrazine	3.1	0.78							
	Halex GT Premix	4.376 SC	1.97 lb ai/a	4-6" wds	B					
	----s-metolachlor	2.084	0.94							
	----glyphosate	2.084	0.94							
	----mesotrione	0.208	0.094							
	Atrazine 4L	4 L	0.5 lb ai/a	4-6" wds	B					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B					
2	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A			2.3 cd	0.0 a	76.3 b
	----s-metolachlor	2.4	0.6							
	----atrazine	3.1	0.78							
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4-6" wds	B					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B					
3	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A			2.7 bcd	0.0 a	88.0 a
	----s-metolachlor	2.4	0.6							
	----atrazine	3.1	0.78							
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4-6" wds	B					
	Tough EC.....pyridate	5 EC	0.313 lb ai/a	4-6" wds	B					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B					
4	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A			4.3 ab	0.0 a	88.7 a
	----s-metolachlor	2.4	0.6							
	----atrazine	3.1	0.78							
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4-6" wds	B					
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	4-6" wds	B					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B					
5	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A			3.7 abc	0.0 a	98.3 a
	----s-metolachlor	2.4	0.6							
	----atrazine	3.1	0.78							
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4-6" wds	B					
	Status Premix	56 WG	0.0875 lb ai/a	4-6" wds	B					
	----diflufenzopyr	16	0.025							
	----dicamba	40	0.0625							
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B					
6	Bicep II Magnum Premix	5.5 L	1.38 lb ai/a	PRE	A			3.0 a-d	0.0 a	92.7 a
	----s-metolachlor	2.4	0.6							
	----atrazine	3.1	0.78							
	Halex GT Premix	4.376 SC	1.97 lb ai/a	4-6" wds	B					
	----s-metolachlor	2.084	0.94							
	----glyphosate	2.084	0.94							
	----mesotrione	0.208	0.094							
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4-6" wds	B					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Average=1,2,5

Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

Pest Code	Crop Type, Code	Description	IPOSS	GGGAN	C ZEAMX			
Rating Type	Rating Unit	Rating Date	Control %	Control %	Yield Bu/A			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
1	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 4 L 100 D	1.38 lb ai/a 0.6 0.78 1.97 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 1.02 % w/v	PRE 4-6"wds B	A	93.0 ab	91.3 abc	194.1 a
2	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 1.02 % w/v	PRE 4-6"wds B	A	83.0 c	81.3 d	181.4 a
3	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Tough EC.....pyridate Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 5 EC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.313 lb ai/a 1.02 % w/v	PRE 4-6"wds B	A	89.0 bc	83.0 d	162.4 a
4	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Callisto.....mesotrione Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 4 SC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.094 lb ai/a 1.02 % w/v	PRE 4-6"wds B	A	87.0 bc	88.0 bcd	191.1 a
5	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Status Premix ----diflufenzopyr ----dicamba Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 56 WG 16 40 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.0875 lb ai/a 0.025 0.0625 1.02 % w/v	PRE 4-6"wds B	A	88.0 bc	93.0 ab	183.3 a
6	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 100 D	1.38 lb ai/a 0.6 0.78 1.97 lb ai/a 0.94 0.94 0.094 1.02 % w/v	PRE 4-6"wds B	A			149.0 a

Means followed by same letter or symbol do not significantly differ ( $P \leq .05$ ,  $1\text{SD}$ )

Mean comparisons performed only when ANOVA Treatment P(F) is significant at mean comparison OSI.

Mean comparisons performed only when AOV Treatment F(1) is significant.  
Missing data estimates are included in columns: Average=1,2,5

Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

## University of Delaware

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	IPOSS C - mornglry	C ZEAMX Corn			
Rating Type	Rating Unit	Rating Date	Control % 07/03/19	Control % 07/03/19	Stunting % 06/11/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code		
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Status Premix ----diflufenzopyr ----dicamba Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 56 WG 16 40 100 D	1.38 lb ai/a 0.6 0.78 1.97 lb ai/a 0.94 0.94 0.094 0.0875 lb ai/a 0.025 0.0625 1.02 % w/v	PRE A 4-6"wds B	99.0 a	99.0 a	2.3 cd	
8	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Tough EC.....pyridate Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 5 EC 100 D	1.38 lb ai/a 0.6 0.78 1.97 lb ai/a 0.94 0.94 0.094 0.313 lb ai/a 1.02 % w/v	PRE A 4-6"wds B	94.7 ab	82.3 a	4.7 abc	
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Tough EC.....pyridate Atrazine 4L Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 5 EC 4 L 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.313 lb ai/a 0.5 lb ai/a 1.02 % w/v	PRE A 4-6"wds B	91.0 abc	88.0 a	7.3 ab	
10	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Tough EC.....pyridate Atrazine 4L Callisto.....mesotrione Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 5 EC 4 L 4 SC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.313 lb ai/a 0.5 lb ai/a 0.094 lb ai/a 1.02 % w/v	PRE A 4-6"wds B	99.0 a	96.0 a	9.0 a	
11	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate BCP1312 Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 3.33 SC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.039 lb ai/a 1.02 % w/v	PRE A 4-6"wds B	88.0 abc	89.0 a	9.0 a	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,2,5

Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

## University of Delaware

Pest Code	Crop Type, Code	Description	C	ZEAMX	C	ZEAMX	AMAPA
Rating Type	Rating Unit	Rating Date	LeafBurn	%	Stunting	%	C - PalmerAm
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Status Premix ----diflufenzopyr ----dicamba Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 56 WG 16 40 100 D	1.38 lb ai/a 0.6 0.78 1.97 lb ai/a 0.94 0.94 0.094 0.0875 lb ai/a 0.025 0.0625 1.02 % w/v	PRE A 4-6"wds B B B B B B B B B	4.0 abc	0.0 a	90.7 a
8	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Tough EC.....pyridate Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 5 EC 100 D	1.38 lb ai/a 0.6 0.78 1.97 lb ai/a 0.94 0.94 0.094 0.313 lb ai/a 1.02 % w/v	PRE A 4-6"wds B B B B B B B	4.3 ab	0.0 a	88.0 a
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Tough EC.....pyridate Atrazine 4L Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 5 EC 4 L 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.313 lb ai/a 0.5 lb ai/a 1.02 % w/v	PRE A 4-6"wds B B B B B	4.7 a	0.0 a	95.3 a
10	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Tough EC.....pyridate Atrazine 4L Callisto.....mesotrione Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 5 EC 4 L 4 SC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.313 lb ai/a 0.5 lb ai/a 0.094 lb ai/a 1.02 % w/v	PRE A 4-6"wds B B B B B B	3.7 abc	0.0 a	98.3 a
11	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate BCP1312 Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 3.33 SC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.039 lb ai/a 1.02 % w/v	PRE A 4-6"wds B B B B	2.3 cd	0.0 a	98.7 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,2,5

Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

## University of Delaware

Pest Code	Crop Type, Code	Description	IPOSS C - mornglry	GGGAN C - AnnGrass	C ZEAMX Corn				
Rating Type	Rating Unit	Rating Date	Control %	Control %	Yield Bu/A				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Status Premix ----diflufenzopyr ----dicamba Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 56 WG 16 40 100 D	1.38 lb ai/a 0.6 0.78 1.97 lb ai/a 0.94 0.94 0.094 0.0875 lb ai/a 0.025 0.0625 1.02 % w/v	PRE A	87.3 bc	91.3 abc	191.3 a		
8	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Tough EC.....pyridate Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208 5 EC 100 D	1.38 lb ai/a 0.6 0.78 1.97 lb ai/a 0.94 0.94 0.094 0.313 lb ai/a 1.02 % w/v	PRE A	89.7 abc	84.7 cd	185.7 a		
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Tough EC.....pyridate Atrazine 4L Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 5 EC 4 L 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.313 lb ai/a 0.5 lb ai/a 1.02 % w/v	PRE A	83.0 c	91.3 abc	187.6 a		
10	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Tough EC.....pyridate Atrazine 4L Callisto.....mesotrione Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 5 EC 4 L 4 SC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.313 lb ai/a 0.5 lb ai/a 0.094 lb ai/a 1.02 % w/v	PRE A	97.0 a	97.7 a	196.8 a		
11	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate BCP1312 Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 3.33 SC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.039 lb ai/a 1.02 % w/v	PRE A	88.7 bc	86.3 bcd	181.1 a		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,2,5

Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA	IPOSS					
Crop Type, Code	C - PalmerAm	C - mornglry	C	ZEAMX				
Description				Corn				
Rating Type		Control	Control					
Rating Unit	%	%		Stunting %				
Rating Date	07/03/19	07/03/19		06/11/19				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code				
12 Bicep II Magnum Premix	5.5 L	1.38 lb	ai/a	PRE	A	94.3 ab	80.0 a	8.0 a
----s-metolachlor	2.4	0.6						
----atrazine	3.1	0.78						
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	4-6"wd	B			
BCP1312	3.33 SC	0.039 lb	ai/a	4-6"wd	B			
Tough EC.....pyridate	5 EC	0.313 lb	ai/a	4-6"wd	B			
Dry Ammonium Sulfate	100 D	1.02 %	w/v	4-6"wd	B			
LSD P=.05						13.22	13.78	4.48
Standard Deviation						7.76	8.09	2.65
CV						8.46	9.26	68.58
Replicate F						0.844	0.413	0.075
Replicate Prob(F)						0.4448	0.6674	0.9277
Treatment F						2.726	2.260	5.561
Treatment Prob(F)						0.0248	0.0545	0.0003

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Average=1,2,5  
 Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description	C ZEAMX Corn	C ZEAMX Corn	AMAPA C - PalmerAm				
Rating Type	LeafBurn %	Stunting %	Control %				
Rating Unit	06/17/19	06/17/19	06/17/19				
Rating Date							
Trt Treatment No. Name	Form Conc Type Rate	Rate Unit Appl Timing	Appl Code				
12 Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate BCP1312 Tough EC.....pyridate Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 3.33 SC 5 EC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.039 lb ai/a 0.313 lb ai/a 1.02 % w/v	PRE 4-6"wds B 4-6"wds B 4-6"wds B 4-6"wds B	A	3.0 a-d	0.0 a	96.0 a
LSD P=.05 Standard Deviation CV				1.68 0.99 29.98	.	11.38 6.72 7.28	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				0.198 0.8219 2.743 0.0211	0.000 1.0000 0.000 1.0000	9.740 0.0009 2.779 0.0198	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,2,5

Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

## University of Delaware

Pest Code		IPOSS	GGGAN	C				
Crop Type, Code		C -	C -	ZEAMX				
Description		mornglry	AnnGrass	Corn				
Rating Type		Control	Control	Yield				
Rating Unit		%	%	Bu/A				
Rating Date	06/17/19	06/17/19		09/17/19				
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
12 Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate BCP1312 Tough EC.....pyridate Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 3.33 SC 5 EC 100 D	1.38 lb ai/a 0.6 0.78 1.13 lb ae/a 0.039 lb ai/a 0.313 lb ai/a 1.02 % w/v	PRE 4-6"wds B 4-6"wds B 4-6"wds B 4-6"wds B	A	92.3 ab	92.0 abc	168.4 a	
LSD P=.05			7.53		8.13		29.00	
Standard Deviation			4.42		4.78		17.12	
CV			4.97		5.36		9.46	
Replicate F			43.081		35.880		0.449	
Replicate Prob(F)			0.0001		0.0001		0.6438	
Treatment F			2.630		3.131		2.069	
Treatment Prob(F)			0.0315		0.0143		0.0706	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,2,5

Could not calculate LSD (% mean diff) for columns 5 because error mean square = 0.

**Quizalofop in Enlist Corn**

Trial ID: Crn22-19 Location: Field #34 Trial Year: 2019  
Protocol ID: Crn22-19 Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: AMVAC

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Trial Status: E established

ARM Trial Created On: 05/01/19

Initiation Date: 03/01/19

Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

C

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 60 FT

Treated Plot Area: 600 FT<sup>2</sup> Treatments: 12 Tillage Type: NOTILL no-till  
Replications: 4 Study Design: RACOBL Randomized Complete Block (RCB)

**Trial Initiation Comments:**

Crops were planted on 5/29/18.

**Soil Description**

Description Name: Field 34

% Sand: 79 % OM: 1.4 Texture: SL sandy loam  
% Silt: 10 pH: 6.5 Soil Name: Hammonton loamy sand, 0-2% slopes  
% Clay: 11 CEC: 4.9 Fert. Level: G good  
Soil Drainage: F fair

**Application Description**

	A	B
Application Date	06/25/19	07/05/19
Appl. Stop Time	12:40 PM	01:15 PM
Application Method	SPRAY	SPRAY
Application Timing	2-4"BL wds	+7 days
Application Placement	BROADC	BROADC
Applied By	Johnson	VanGessel
Appl. Entry Date	09/24/19	09/24/19
Air Temperature Start, Stop	83 86 F	92 92 F
% Relative Humidity Start, Stop	70 59	56 56
Wind Velocity+Dir. Start	3 mph	1 mph
Wind Velocity+Dir. Stop	4 mph	1 mph
Wind Velocity+Dir. Max	7 mph W	1 mph
Wet Leaves (Y/N)	N no	N no
Soil Temperature	81 F	91 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	89	89
Moisture 6 Hours after Appl.	0 IN	0.17 IN
Moisture 1 Week after Appl.	0.08 IN	0.86 IN

**Application Equipment**

	A	B
Appl. Equipment	Bckpck6Nozl	Bckpck6Nozl
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	18 in
Boom Length	9 ft	9 ft
Boom Height	28 in	32 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2

Trt No Treatment Application Comment  
 9 Plot 201 also got sprayed with trt. 11.

Context	Date	By	Notes
STATUS	05/01/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/31/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

Trial Comments

Quinalofop in Enlist Corn		Location: Field #34		Trial Year: 2019					
Trial ID: Crn22-19	Protocol ID: Crn22-19	Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: AMVAC									
Crop Type, Code				C TRZAW	C HORVW				
Description				W.wheat	W.barley				
Rating Type				Control	Control				
Rating Unit				%	%				
Rating Date				07/01/19	07/01/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code			
1	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		0.0 e	0.0 d	0.0 c
2	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.71 lb ae/a	2-4"BL	wds A		47.5 b	37.5 c	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.055 lb ai/a 1 % v/v	2-4"BL	wds A				
3	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.71 lb ae/a	2-4"BL	wds A		40.0 cd	47.5 abc	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.055 lb ai/a 1 % v/v	2-4"BL	wds A				
4	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.71 lb ae/a	2-4"BL	wds A		37.5 d	50.0 abc	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.0825 lb ai/a 1 % v/v	2-4"BL	wds A				
5	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		40.0 cd	40.0 bc	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.055 lb ai/a 1 % v/v	2-4"BL	wds A				
6	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		45.0 bc	46.3 abc	17.5 b
	Crop Oil Concentrate	0.88 EC 100 L	0.055 lb ai/a 1 % v/v	2-4"BL	wds A				
7	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		37.5 d	52.5 ab	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.0825 lb ai/a 1 % v/v	2-4"BL	wds A				
8	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.71 lb ae/a	2-4"BL	wds A		0.0 e	0.0 d	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.055 lb ai/a 1 % v/v	+7 days	B				
9	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.71 lb ae/a	2-4"BL	wds A		0.2 e	0.7 d	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.0825 lb ai/a 1 % v/v	+7 days	B				
10	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		0.0 e	0.0 d	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.055 lb ai/a 1 % v/v	+7 days	B				
11	Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		0.0 e	0.0 d	0.0 c
	Crop Oil Concentrate	0.88 EC 100 L	0.0825 lb ai/a 1 % v/v	+7 days	B				
12	Enlist One.....2,4-D choline Select Max.....clethodim	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		57.5 a	58.8 a	71.3 a
	Crop Oil Concentrate	1 EC 100 L	0.25 lb ai/a 1 % v/v	2-4"BL	wds A				
LSD P=.05						7.46	13.16	15.02	
Standard Deviation						5.18	9.14	10.43	
CV						20.36	32.91	141.0	
Replicate F						4.254	8.967	1.116	
Replicate Prob(F)						0.0123	0.0002	0.3571	
Treatment F						79.199	29.871	15.806	
Treatment Prob(F)						0.0001	0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2,3,4,5,6,7,8,9,12; Average=10,11

Crop Type, Code						C ZEAMX	C TRZAW	C HORVW
						RR Corn Control %	W.wheat Control %	W.barley Control %
						07/01/19	07/13/19	07/13/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
1	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		0.0 d	0.0 f
2	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.71 lb ae/a 0.055 lb ai/a 1 % v/v	2-4"BL	wds A		74.5 c	84.3 bcd
3	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate Dry Ammonium Sulfate	3.8 SL 0.88 EC 100 L 100 D	0.71 lb ae/a 0.055 lb ai/a 1 % v/v 2.04 % w/v	2-4"BL	wds A		81.8 ab	85.0 bcd
4	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.71 lb ae/a 0.0825 lb ai/a 1 % v/v	2-4"BL	wds A		82.5 ab	90.0 abc
5	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.95 lb ae/a 0.055 lb ai/a 1 % v/v	2-4"BL	wds A		81.8 ab	83.8 cd
6	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate Dry Ammonium Sulfate	3.8 SL 0.88 EC 100 L 100 D	0.95 lb ae/a 0.055 lb ai/a 1 % v/v 2.04 % w/v	2-4"BL	wds A		77.5 bc	78.8 d
7	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.95 lb ae/a 0.0825 lb ai/a 1 % v/v	2-4"BL	wds A		78.0 bc	93.0 ab
8	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.71 lb ae/a 0.055 lb ai/a 1 % v/v	2-4"BL	wds A	+7 days	0.0 d	60.0 e
9	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.71 lb ae/a 0.0825 lb ai/a 1 % v/v	2-4"BL	wds A	+7 days	0.0 d	64.2 e
10	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.95 lb ae/a 0.055 lb ai/a 1 % v/v	2-4"BL	wds A	+7 days	0.0 d	62.5 e
11	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.95 lb ae/a 0.0825 lb ai/a 1 % v/v	2-4"BL	wds A	+7 days	0.0 d	62.5 e
12	Enlist One.....2,4-D choline Select Max.....clethodim Crop Oil Concentrate	3.8 SL 1 EC 100 L	0.95 lb ae/a 0.25 lb ai/a 1 % v/v	2-4"BL	wds A		83.8 a	97.5 a
LSD P=.05						5.60	8.80	9.34
Standard Deviation						3.89	6.11	6.48
CV						8.34	8.51	8.65
Replicate F						0.869	1.926	0.818
Replicate Prob(F)						0.4675	0.1453	0.4935
Treatment F						450.113	72.990	62.339
Treatment Prob(F)						0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2,3,4,5,6,7,8,9,12; Average=10,11

Crop Type, Code		C ZEAMX	C ZEAMX	C TRZAW
Description		EnlstCrn	RR Corn	W.wheat
Rating Type		Control %	Control %	Control %
Rating Unit				
Rating Date		07/13/19	07/13/19	07/27/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code
1 Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-4"BL	wds A
2 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.71 lb ae/a 0.055 lb ai/a	2-4"BL	wds A
Crop Oil Concentrate	100 L	1 % v/v	2-4"BL	wds A
3 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.71 lb ae/a 0.055 lb ai/a	2-4"BL	wds A
Crop Oil Concentrate	100 L	1 % v/v	2-4"BL	wds A
Dry Ammonium Sulfate	100 D	2.04 % w/v	2-4"BL	wds A
4 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.71 lb ae/a 0.0825 lb ai/a	2-4"BL	wds A
Crop Oil Concentrate	100 L	1 % v/v	2-4"BL	wds A
5 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.95 lb ae/a 0.055 lb ai/a	2-4"BL	wds A
Crop Oil Concentrate	100 L	1 % v/v	2-4"BL	wds A
6 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.95 lb ae/a 0.055 lb ai/a	2-4"BL	wds A
Crop Oil Concentrate	100 L	1 % v/v	2-4"BL	wds A
Dry Ammonium Sulfate	100 D	2.04 % w/v	2-4"BL	wds A
7 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.95 lb ae/a 0.0825 lb ai/a	2-4"BL	wds A
Crop Oil Concentrate	100 L	1 % v/v	2-4"BL	wds A
8 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.71 lb ae/a 0.055 lb ai/a	+7 days	B
Crop Oil Concentrate	100 L	1 % v/v	+7 days	B
9 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.71 lb ae/a 0.0825 lb ai/a	+7 days	B
Crop Oil Concentrate	100 L	1 % v/v	+7 days	B
10 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.95 lb ae/a 0.055 lb ai/a	+7 days	B
Crop Oil Concentrate	100 L	1 % v/v	+7 days	B
11 Enlist One.....2,4-D choline Assure II.....quizalofop	3.8 SL 0.88 EC	0.95 lb ae/a 0.0825 lb ai/a	+7 days	B
Crop Oil Concentrate	100 L	1 % v/v	+7 days	B
12 Enlist One.....2,4-D choline Select Max.....clethodim	3.8 SL 1 EC	0.95 lb ae/a 0.25 lb ai/a	2-4"BL	wds A
Crop Oil Concentrate	100 L	1 % v/v	2-4"BL	wds A
LSD P=.05			15.96	8.05
Standard Deviation			11.08	5.59
CV			76.56	14.31
Replicate F			2.263	7.29
Replicate Prob(F)			0.1000	16.88
Treatment F			22.882	0.2457
Treatment Prob(F)			104.863	15.069
			0.0001	0.0001
				0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2,3,4,5,6,7,8,9,12; Average=10,11

Crop Type, Code						C HORVW	C ZEAMX	C ZEAMX	
						W.barley Control % 07/27/19	EnlstCrn Control % 07/27/19	RR Corn Control % 07/27/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-4"BL	wds A		0.0 d	0.0 d	0.0 f
2	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.71 lb ae/a 0.055 lb ai/a 1 % v/v	2-4"BL	wds A		97.3 ab	0.0 d	87.0 cde
3	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate Dry Ammonium Sulfate	3.8 SL 0.88 EC 100 L 100 D	0.71 lb ae/a 0.055 lb ai/a 1 % v/v 2.04 % w/v	2-4"BL	wds A		87.5 c	5.0 cd	85.8 de
4	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.71 lb ae/a 0.0825 lb ai/a 1 % v/v	2-4"BL	wds A		99.0 a	0.0 d	91.8 bc
5	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.95 lb ae/a 0.055 lb ai/a 1 % v/v	2-4"BL	wds A		91.3 bc	0.0 d	91.8 bc
6	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate Dry Ammonium Sulfate	3.8 SL 0.88 EC 100 L 100 D	0.95 lb ae/a 0.055 lb ai/a 1 % v/v 2.04 % w/v	2-4"BL	wds A		91.3 bc	0.0 d	82.5 e
7	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.95 lb ae/a 0.0825 lb ai/a 1 % v/v	2-4"BL	wds A		99.0 a	3.5 cd	92.8 b
8	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.71 lb ae/a 0.055 lb ai/a 1 % v/v	2-4"BL	wds A	+7 days	96.3 ab	10.0 c	88.8 bcd
9	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.71 lb ae/a 0.0825 lb ai/a 1 % v/v	2-4"BL	wds A	+7 days	99.0 a	0.0 d	90.8 bcd
10	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.95 lb ae/a 0.055 lb ai/a 1 % v/v	2-4"BL	wds A	+7 days	96.3 ab	6.7 cd	90.0 bcd
11	Enlist One.....2,4-D choline Assure II.....quizalofop Crop Oil Concentrate	3.8 SL 0.88 EC 100 L	0.95 lb ae/a 0.0825 lb ai/a 1 % v/v	2-4"BL	wds A	+7 days	99.0 a	22.5 b	90.8 bcd
12	Enlist One.....2,4-D choline Select Max.....clethodim Crop Oil Concentrate	3.8 SL 1 EC 100 L	0.95 lb ae/a 0.25 lb ai/a 1 % v/v	2-4"BL	wds A		98.3 a	99.0 a	99.0 a
LSD P=.05 Standard Deviation CV							6.46	9.81	5.23
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)							4.47	6.71	3.63
							5.09	54.89	4.39
							0.680	0.136	2.796
							0.5713	0.9372	0.0560
							155.750	70.258	210.492
							0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2,3,4,5,6,7,8,9,12; Average=10,11

**Influence of Adjuvant Type on AMV5131**

Trial ID: Crn23-19 Location: Field #34 Trial Year: 2019  
Protocol ID: Crn23-19 Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: AMVAC

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Trial Status: E established

ARM Trial Created On: 05/01/19

Initiation Date: 03/01/19

Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

C

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 60 FT

Treated Plot Area: 600 FT<sup>2</sup>

Treatments: 9 Tillage Type: NOTILL no-till

Replications: 4

Study Design: RACOBL Randomized Complete Block (RCB)

Trial Initiation Comments:

Crops were planted on 5/29/18.

**Soil Description**

Description Name: Field 34

% Sand: 79	% OM: 1.4	Texture: SL	sandy loam
% Silt: 10	pH: 6.5	Soil Name: Hammonton loamy sand, 0-2% slopes	
% Clay: 11	CEC: 4.9	Fert. Level: G	good
Soil Drainage: F	fair		

**Application Description**

	A
Application Date	06/25/19
Appl. Stop Time	11:00 AM
Application Method	SPRAY
Application Timing	<6"
Application Placement	BROADC
Applied By	Johnson
Appl. Entry Date	09/24/19
Air Temperature Start, Stop	81 83 F
% Relative Humidity Start, Stop	74 70
Wind Velocity+Dir. Start	6 mph W
Wind Velocity+Dir. Stop	3 mph
Wind Velocity+Dir. Max	6 mph W
Wet Leaves (Y/N)	N no
Soil Temperature	79 F
Soil Moisture	NORMAL
% Cloud Cover	86
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	0.08 IN

**Application Equipment**

	A
Appl. Equipment	Bckpck6Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	9 ft
Boom Height	28 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	05/01/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/31/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

Trial Comments

Influence of Adjuvant Type on AMV5131										
Trial ID: Crn23-19		Location: Field #34		Trial Year: 2019						
Protocol ID: Crn23-19		Investigator: Mark VanGessel								
Study Director:										
Sponsor Contact: AMVAC										
Pest Code Crop Type, Code				C PHSLU LimaBean Control % 07/13/19	C GLXMA Soybean Control % 07/13/19	C TRZAW W.wheat Control % 07/13/19	C SETIT FxtlMilt Control % 07/13/19	PANDI C - F.panicm Control % 07/13/19		
Description										
Rating Type										
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1 AMV5131 Dry Ammonium Sulfate	2.72 SL 100 D	0.276 lb 1.8 %	ai/a w/v	<6" <6"	A A	93.3 a	97.3 a	50.0 d	76.3 a	68.8 ab
2 AMV5131 R-11 NIS	2.72 SL 100 SL	0.276 lb 0.25 %	ai/a v/v	<6" <6"	A A	97.3 a	99.0 a	52.5 cd	70.0 a	63.8 b
3 AMV5131 R-11 NIS Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb 0.25 % 1.8 %	ai/a v/v w/v	<6" <6" <6"	A A A	99.0 a	97.3 a	60.0 bcd	75.8 a	65.0 b
4 AMV5131 Prime Oil COC	2.72 SL 100 SL	0.276 lb 1 %	ai/a v/v	<6" <6"	A A	95.5 a	99.0 a	52.5 cd	77.5 a	50.0 c
5 AMV5131 Prime Oil COC Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb 1 % 1.8 %	ai/a v/v w/v	<6" <6" <6"	A A A	96.8 a	95.5 a	60.0 bcd	80.0 a	72.5 ab
6 AMV5131 Premium MSO	2.72 SL 100 SL	0.276 lb 1 %	ai/a v/v	<6" <6"	A A	98.0 a	99.0 a	52.5 cd	79.5 a	67.5 ab
7 AMV5131 Premium MSO Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb 1 % 1.8 %	ai/a v/v w/v	<6" <6" <6"	A A A	98.0 a	99.0 a	77.5 a	78.0 a	71.3 ab
8 AMV5131 Hybrid (HSMOC)	2.72 SL 100 SL	0.276 lb 0.75 %	ai/a v/v	<6" <6"	A A	98.0 a	99.0 a	71.3 ab	76.8 a	68.8 ab
9 AMV5131 Hybrid (HSMOC) Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb 0.75 % 1.8 %	ai/a v/v w/v	<6" <6" <6"	A A A	99.0 a	98.0 a	62.5 bc	71.3 a	78.8 a
LSD P=.05					4.53	4.20	11.74	10.64	12.94	
Standard Deviation					3.11	2.88	8.04	7.29	8.86	
CV					3.19	2.93	13.44	9.58	13.16	
Replicate F				6.703	1.370	9.227	3.526	4.698		
Replicate Prob(F)				0.0019	0.2757	0.0003	0.0301	0.0102		
Treatment F				1.405	0.741	5.469	0.881	3.150		
Treatment Prob(F)				0.2446	0.6551	0.0005	0.5460	0.0139		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=8,9; Average=6

Pest Code Crop Type, Code		C PHSLU	C GLXMA	C TRZAW	C SETIT
Description	LimaBean Control %	Soybean Control %	W.wheat Control %	FxtlMilt Control %	
Rating Type	07/27/19	07/27/19	07/27/19	07/27/19	07/27/19
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing			
1 AMV5131 Dry Ammonium Sulfate	2.72 SL 100 D	0.276 lb ai/a <6" 1.8 % w/v <6"	A A	99.0 a	91.0 a
2 AMV5131 R-11 NIS	2.72 SL 100 SL	0.276 lb ai/a <6" 0.25 % v/v <6"	A A	99.0 a	93.3 a
3 AMV5131 R-11 NIS Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb ai/a <6" 0.25 % v/v <6" 1.8 % w/v <6"	A A A	94.3 a	99.0 a
4 AMV5131 Prime Oil COC	2.72 SL 100 SL	0.276 lb ai/a <6" 1 % v/v <6"	A A	99.0 a	94.3 a
5 AMV5131 Prime Oil COC Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb ai/a <6" 1 % v/v <6" 1.8 % w/v <6"	A A A	95.3 a	94.3 a
6 AMV5131 Premium MSO	2.72 SL 100 SL	0.276 lb ai/a <6" 1 % v/v <6"	A A	99.0 a	98.3 a
7 AMV5131 Premium MSO Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb ai/a <6" 1 % v/v <6" 1.8 % w/v <6"	A A A	99.0 a	99.0 a
8 AMV5131 Hybrid (HSMOC)	2.72 SL 100 SL	0.276 lb ai/a <6" 0.75 % v/v <6"	A A	99.0 a	96.7 a
9 AMV5131 Hybrid (HSMOC) Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb ai/a <6" 0.75 % v/v <6" 1.8 % w/v <6"	A A A	94.3 a	99.0 a
LSD P=.05		7.87	8.90	15.56	18.31
Standard Deviation		4.52	5.14	10.58	12.45
CV		4.64	5.35	17.37	20.01
Replicate F		0.852	8.530	3.213	1.957
Replicate Prob(F)		0.4462	0.0030	0.0438	0.1514
Treatment F		0.700	1.000	1.924	0.585
Treatment Prob(F)		0.6873	0.4726	0.1096	0.7790

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=8,9; Average=6

Pest Code Crop Type, Code	C PHSLU	C GLXMA	C TRZAW	C SETIT	PANDI C -				
Description	LimaBean Control %	Soybean Control %	W.wheat Control %	FxtlMilt Control %	F.panicm Control %				
Rating Type	08/01/19	08/01/19	08/01/19	08/01/19	08/01/19				
Rating Unit									
Rating Date									
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1 AMV5131 Dry Ammonium Sulfate	2.72 SL 100 D	0.276 lb ai/a 1.8 % w/v	<6" <6"	A A	77.5 a	86.8 a	63.8 e	83.0 a	68.3 a
2 AMV5131 R-11 NIS	2.72 SL 100 SL	0.276 lb ai/a 0.25 % v/v	<6" <6"	A A	81.3 a	87.0 a	70.0 a-d	84.3 a	71.3 a
3 AMV5131 R-11 NIS Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb ai/a 0.25 % v/v 1.8 % w/v	<6" <6" <6"	A A A	81.3 a	89.5 a	68.8 bcd	83.8 a	73.8 a
4 AMV5131 Prime Oil COC	2.72 SL 100 SL	0.276 lb ai/a 1 % v/v	<6" <6"	A A	80.5 a	86.3 a	67.5 cde	85.8 a	70.0 a
5 AMV5131 Prime Oil COC Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb ai/a 1 % v/v 1.8 % w/v	<6" <6" <6"	A A A	82.5 a	88.5 a	72.5 ab	84.5 a	69.5 a
6 AMV5131 Premium MSO	2.72 SL 100 SL	0.276 lb ai/a 1 % v/v	<6" <6"	A A	83.3 a	89.5 a	66.3 de	81.3 a	72.5 a
7 AMV5131 Premium MSO Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb ai/a 1 % v/v 1.8 % w/v	<6" <6" <6"	A A A	84.0 a	86.5 a	73.8 a	85.0 a	75.0 a
8 AMV5131 Hybrid (HSMOC)	2.72 SL 100 SL	0.276 lb ai/a 0.75 % v/v	<6" <6"	A A	83.8 a	89.0 a	70.0 a-d	84.3 a	73.8 a
9 AMV5131 Hybrid (HSMOC) Dry Ammonium Sulfate	2.72 SL 100 SL 100 D	0.276 lb ai/a 0.75 % v/v 1.8 % w/v	<6" <6" <6"	A A A	82.0 a	89.3 a	71.3 abc	85.8 a	76.3 a
LSD P=.05				4.42	5.06	3.88	4.88	11.08	
Standard Deviation				3.03	3.47	2.66	3.34	7.59	
CV				3.7	3.94	3.83	3.97	10.51	
Replicate F			3.066	5.333	5.869	1.408	0.907		
Replicate Prob(F)			0.0472	0.0059	0.0037	0.2647	0.4524		
Treatment F			1.750	0.632	5.557	0.710	0.501		
Treatment Prob(F)			0.1378	0.7430	0.0005	0.6802	0.8433		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=8,9; Average=6

**Sweet Corn Weed Control to Allow Rotational Flexibility**

Trial ID: SCRN1-19

Location: Field #16

Trial Year: 2019

Protocol ID: SCRN1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/30/19

Initiation Date: 03/01/19 Planned Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C ZEAMS Zea mays saccharata Sweet corn

Entry Date: 12/10/19

Variety: BC0804

Planting Date: 06/03/19

Planting Rate: 24000 S/A

Depth: 0.75 IN

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 IN

Planting Equipment: FE Field Equipment

Soil Temperature: 74 F  
Emergence Date: 06/09/19

Seed Bed: MEDTRA medium/trashy

Soil Moisture: NORMAL normal, adequate

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 9 Tillage Type: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 16B

% Sand: 77 % OM: 1.4 Texture: SL sandy loam

% Silt: 12 pH: 6.6 Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11 CEC: 4.8 Fert. Level: F fair

Soil Drainage: F fair

**Application Description**

	A	B
Application Date	06/04/19	07/03/19
Appl. Stop Time	02:05 PM	01:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	28DAP
Application Placement	BROADC	BROADC
Applied By	Q.Johnson	Q.Johnson
Appl. Entry Date	12/10/19	12/10/19
Air Temperature Start, Stop	72 72 F	91 91 F
% Relative Humidity Start, Stop	28 28	54 54
Wind Velocity+Dir. Start	7 mph WNW	3 mph
Wind Velocity+Dir. Stop	7 mph WNW	3 mph
Wind Velocity+Dir. Max	7 mph WNW	3 mph
Wet Leaves (Y/N)	N no	N no
Soil Temperature	79 F	92 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	0	1
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.76 IN	0.53 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMS BCOR	ZEAMS BCOR
Days after Emergence	-5	24
Stage Majority, Percent		V10 100
Height Average		14 in

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	30 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/30/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/25/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

Trial Comments

## Sweet Corn Weed Control to Allow Rotational Flexibility

Trial ID: SCRN1-19

Location: Field #16

Trial Year: 2019

Protocol ID: SCRN1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Crop Type, Code	C ZEAMS	AMAPA C -	IPOSS C -	PANDI C -						
Description	SweetCrn	PalmerAm	Mornlry	F.Panicm						
Rating Type	Stunting %	Control %	Control %	Control %						
Rating Unit	06/19/19	06/19/19	06/19/19	06/19/19						
Rating Date										
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1 Dual II Magnum..s-metolachlor	7.64 E	0.64 lb ai/a	PRE	A			0.0 c	40.0	20.0 a	43.3 c
Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B						
Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B						
Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B						
2 Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			0.0 c	90.0	40.0 a	61.7 bc
Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B						
Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B						
Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B						
3 Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			.	.	.	.
Prowl H2O.....pendimethalin	3.8 CS	1.43 lb ai/a	PRE	A						
Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B						
Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B						
4 Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			.	.	.	.
Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B						
Starane Ultra...fluoroxypr	2.8 EC	0.14 lb ae/a	28DAP	B						
Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B						
5 Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			.	.	.	.
Impact.....topramezone	2.81 SC	0.0165 lb ai/a	28DAP	B						
Crop Oil Concentrate	100 L	1.25 % v/v	28DAP	B						
30% Urea Ammonium Nitrate	100 L	2 % v/v	28DAP	B						
6 Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			.	.	.	.
ImpactZ Premix	4.26 SC	0.266 lb ai/a	28DAP	B						
----topramezone	0.26	0.0162								
----atrazine	4	0.25								
Crop Oil Concentrate	100 L	1.25 % v/v	28DAP	B						
30% Urea Ammonium Nitrate	100 L	2 % v/v	28DAP	B						
7 Zidua.....pyroxasulfone	85 WG	0.106 lb ai/a	PRE	A			12.3 a	.	46.7 a	99.0 a
Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B						
Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B						
8 Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			5.7 b	.	63.3 a	60.0 c
Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	PRE	A						
Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B						
Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B						

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3,6,7,8,11,12,14,15; Average=4,5,10,13

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

Pest Code Crop Type, Code		C	ZEAMS	IPOSS C - SweetCrn	DIGSA C - Mornglry	PANDI C - L.crbgrs	F.panicm
Description				Stunting % 07/02/19	Control % 07/02/19	Control % 07/02/19	Control % 07/02/19
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Dual II Magnum..s-metolachlor	7.64 E	0.64 lb ai/a	PRE	A		
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B		
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B		
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B		
2	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A		
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B		
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B		
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B		
3	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A		
	Prowl H2O.....pendimethalin	3.8 CS	1.43 lb ai/a	PRE	A		
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B		
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B		
4	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A		
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B		
	Starane Ultra...fluoroxypr	2.8 EC	0.14 lb ae/a	28DAP	B		
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B		
5	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A		
	Impact.....topramezone	2.81 SC	0.0165 lb ai/a	28DAP	B		
	Crop Oil Concentrate	100 L	1.25 % v/v	28DAP	B		
	30% Urea Ammonium Nitrate	100 L	2 % v/v	28DAP	B		
6	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A		
	ImpactZ Premix	4.26 SC	0.266 lb ai/a	28DAP	B		
	----topramezone	0.26	0.0162				
	----atrazine	4	0.25				
	Crop Oil Concentrate	100 L	1.25 % v/v	28DAP	B		
	30% Urea Ammonium Nitrate	100 L	2 % v/v	28DAP	B		
7	Zidua.....pyroxasulfone	85 WG	0.106 lb ai/a	PRE	A		
	Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B		
8	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A		
	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	PRE	A		
	Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3,6,7,8,11,12,14,15; Average=4,5,10,13

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

Pest Code	Crop Type, Code	Description	C ZEAMS SweetCrn	AMAPA C - PalmerAm	IPOSS C - Mornglry	PANDI C - F.panicm					
Rating Type	Rating Unit	Rating Date	LeafBurn %	Control %	Control %	Control %					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1	Dual II Magnum..s-metolachlor	7.64 E	0.64 lb ai/a	PRE	A			3.7 a	53.3 d	56.8 bc	43.3 cd
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B						
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B						
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B						
2	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			4.3 a	60.0 cd	51.8 cd	53.3 bcd
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B						
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B						
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B						
3	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			4.3 a		43.3 d	39.6 d
	Prowl H2O.....pendimethalin	3.8 CS	1.43 lb ai/a	PRE	A						
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B						
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B						
4	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			3.7 a	79.7 abc	83.3 a	70.0 abc
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B						
	Starane Ultra...fluoroxypry	2.8 EC	0.14 lb ae/a	28DAP	B						
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B						
5	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			5.7 a	70.0 bcd	56.7 bcd	78.8 ab
	Impact.....topramezone	2.81 SC	0.0165 lb ai/a	28DAP	B						
	Crop Oil Concentrate	100 L	1.25 % v/v	28DAP	B						
	30% Urea Ammonium Nitrate	100 L	2 % v/v	28DAP	B						
6	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			3.7 a	92.0 ab	68.3 b	71.7 abc
	ImpactZ Premix	4.26 SC	0.266 lb ai/a	28DAP	B						
	----topramezone	0.26	0.0162								
	----atrazine	4	0.25								
	Crop Oil Concentrate	100 L	1.25 % v/v	28DAP	B						
	30% Urea Ammonium Nitrate	100 L	2 % v/v	28DAP	B						
7	Zidua.....pyroxasulfone	85 WG	0.106 lb ai/a	PRE	A			3.7 a	94.3 ab	95.3 a	81.7 ab
	Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B						
	Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B						
8	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			3.0 a	99.0 a	93.0 a	90.3 a
	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	PRE	A						
	Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B						
	Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B						

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3,6,7,8,11,12,14,15; Average=4,5,10,13

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	IPOSS C - Mornglry	PANDI C - F.Panicm					
Rating Type	Rating Unit	Rating Date	Control %	Control %	Control %					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1	Dual II Magnum..s-metolachlor	7.64 E	0.64 lb ai/a	PRE	A			88.0 a	58.2 b	53.3 d
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B					
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B					
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B					
2	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A				58.2 b	61.7 cd
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B					
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B					
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B					
3	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A				50.0 b	47.1 d
	Prowl H2O.....pendimethalin	3.8 CS	1.43 lb ai/a	PRE	A					
	Basagran.....bentazon	4 L	0.75 lb ai/a	28DAP	B					
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B					
4	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			88.0 a	79.3 a	63.3 bcd
	Cadet.....fluthiacet	0.91 EC	0.0064 lb ai/a	28DAP	B					
	Starane Ultra...fluoroxypry	2.8 EC	0.14 lb ae/a	28DAP	B					
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B					
5	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			94.3 a	58.3 b	78.3 abc
	Impact.....topramezone	2.81 SC	0.0165 lb ai/a	28DAP	B					
	Crop Oil Concentrate	100 L	1.25 % v/v	28DAP	B					
	30% Urea Ammonium Nitrate	100 L	2 % v/v	28DAP	B					
6	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			99.0 a	76.7 a	80.0 ab
	ImpactZ Premix	4.26 SC	0.266 lb ai/a	28DAP	B					
	----topramezone	0.26	0.0162							
	----atrazine	4	0.25							
	Crop Oil Concentrate	100 L	1.25 % v/v	28DAP	B					
	30% Urea Ammonium Nitrate	100 L	2 % v/v	28DAP	B					
7	Zidua.....pyroxasulfone	85 WG	0.106 lb ai/a	PRE	A			94.3 a	81.7 a	90.7 a
	Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B					
8	Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			99.0 a	81.7 a	79.0 abc
	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	PRE	A					
	Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3,6,7,8,11,12,14,15; Average=4,5,10,13

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

## University of Delaware

Pest Code	C	ZEAMS	AMAPA	IPOSS	PANDI
Crop Type, Code	-	-	C	C	C
Description	SweetCrn	PalmerAm	Mornglry	F.Panicm	
Rating Type	Stunting	Control	Control	Control	
Rating Unit	%	%	%	%	
Rating Date	06/19/19	06/19/19	06/19/19	06/19/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing
9	Dual II Magnum.s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A
	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	PRE	A
	Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B
	Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B
LSD P=.05				9.0 ab	95.0
Standard Deviation				4.79	86.6 a
CV				2.54	92.0 ab
Replicate F				47.09	
Replicate Prob(F)					44.21
Treatment F					30.44
Treatment Prob(F)					22.90
					14.50
					44.62
					20.37
					2.519
					1.259
					0.1500
					0.3607
					13.851
					3.606
					7.838
					0.0011
					0.0669
					0.0221

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3,6,7,8,11,12,14,15; Average=4,5,10,13

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	C ZEAMS	IPOSS C -	DIGSA C -	PANDI C -						
Description	SweetCrn	Mornlry	L.crbgrs	F.panicm						
Rating Type	Stunting %	Control %	Control %	Control %						
Rating Unit	07/02/19	07/02/19	07/02/19	07/02/19						
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
9 Dual II Magnum.s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			6.7 b	86.7 a	84.2 a	48.9 a
Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	PRE	A						
Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B						
Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B						
LSD P=.05							5.57	8.83	10.26	17.20
Standard Deviation							2.89	4.57	5.14	8.61
CV							91.16	9.67	6.21	16.91
Replicate F							1.260	0.091	1.580	0.250
Replicate Prob(F)							0.3409	0.9142	0.2811	0.7864
Treatment F							9.820	175.678	11.501	3.810
Treatment Prob(F)							0.0046	0.0001	0.0056	0.0711

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3,6,7,8,11,12,14,15; Average=4,5,10,13

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

## University of Delaware

Pest Code	C	ZEAMS	AMAPA	IPOSS	PANDI
Crop Type, Code	C -	SweetCrn	C -	C -	C -
Description	PalmerAm		Mornglry	F.panicm	
Rating Type	LeafBurn				
Rating Unit	%				
Rating Date	07/05/19		07/13/19	07/13/19	07/13/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
9 Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A	
Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	PRE	A	
Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B	
Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B	
LSD P=.05			2.37	25.62	13.42
Standard Deviation			1.37	13.87	7.66
CV			33.88	17.14	10.73
Replicate F			1.980	0.323	1.458
Replicate Prob(F)			0.1705	0.7320	0.2660
Treatment F			0.911	5.069	21.214
Treatment Prob(F)			0.5317	0.0139	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=3,6,7,8,11,12,14,15; Average=4,5,10,13  
 Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA	IPOSS	PANDI					
Crop Type, Code		C - PalmerAm	C - Mornglry	C - F.Panicm					
Description									
Rating Type		Control	Control	Control					
Rating Unit	%		%	%					
Rating Date	07/22/19	07/22/19	07/22/19	07/22/19					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
9 Dual II Magnum..s-metolachlor	7.64 E	1.43 lb ai/a	PRE	A			99.0 a	81.0 a	80.0 ab
Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	PRE	A					
Liberty 280....glufosinate	2.34 SL	0.366 lb ai/a	28DAP	B					
Dry Ammonium Sulfate	100 D	1.02 % w/v	28DAP	B					
LSD P=.05			12.21		12.85		17.91		
Standard Deviation			6.71		7.34		10.29		
CV			7.1		10.57		14.63		
Replicate F			1.161		1.690		5.627		
Replicate Prob(F)			0.3520		0.2200		0.0150		
Treatment F			1.612		9.322		5.988		
Treatment Prob(F)			0.2404		0.0002		0.0015		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=3,6,7,8,11,12,14,15; Average=4,5,10,13  
 Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

Zidua vs Dual II Magnum in Sweet Corn

Trial ID: SCRN2-19 Location: Field #14 Trial Year: 2019  
Protocol ID: SCRN2-19 Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
ARM Trial Created On: 05/15/19  
Initiation Date: 03/01/19  
Completion Date: 11/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
Longitude of LL Corner °: 75.455834 W  
Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
Address: 16483 County Seat Hwy  
City+State/Prov: Georgetown, Delaware  
Postal Code: 19947 E-mail: mjv@udel.edu  
Country: USA United States

**Crop Description**

Crop 1: C ZEAMS Zea mays saccharata Sweet corn

Entry Date: 12/10/19

Variety: Overland

Planting Date: 05/22/19

Planting Rate: 24000 S/A

Depth: 0.75 IN

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 IN

Planting Equipment: FE Field Equipment

Seed Bed: SMOOTH smooth

Soil Temperature: 79 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 05/27/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 6 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14A

% Sand: 77 % OM: 1.6 Texture: SL sandy loam  
% Silt: 16 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes  
% Clay: 7 CEC: 6.5 Fert. Level: E excellent  
Soil Drainage: F fair

**Application Description**

	A	B
Application Date	05/22/19	06/24/19
Appl. Stop Time	12:30 PM	02:12 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	5WAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/23/19	12/10/19
Air Temperature Start, Stop	70 70 F	88 88 F
% Relative Humidity Start, Stop	29 29	50 50
Wind Velocity+Dir. Start	3 mph	9 mph SSW
Wind Velocity+Dir. Stop	3 mph	9 mph SSW
Wind Velocity+Dir. Max	3 mph	9 mph SSW
Wet Leaves (Y/N)	N no	Y yes
Soil Temperature	74 F	85 F
Soil Moisture	NORMAL	Normal
% Cloud Cover	19	36
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.68 IN	0.08 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMS	BCOR
Days after Emergence	-5	28
Stage Majority, Percent		Veg 100
Height Average		24 in

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	40 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/15/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

Trial Comments

## Zidua vs Dual II Magnum in Sweet Corn

Trial ID: SCRN2-19

Location: Field #14

Trial Year: 2019

Protocol ID: SCRN2-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code	C	ZEAMS	DIGSA	PANDI	AMAPA
Crop Type, Code		SweetCrn	C - L.crbgrs	C - F.panicm	C - PalmerAm
Description		Stunting %	Control %	Control %	Control %
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1 Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	0.955 lb ai/a 0.75 lb ai/a	PRE PRE	A A	0.0 c
2 Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.43 lb ai/a 0.75 lb ai/a	PRE PRE	A A	8.0 ab
3 Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A	6.3 b
4 Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A	10.7 a
5 Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	A A	5.7 b
6 Untreated Check Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate	4 SC 100 L 100 L	0.0625 lb ai/a 1.17 % v/v 2.5 % v/v	5WAP 5WAP 5WAP	B B B	0.0 c
LSD P=.05			3.85	3.86	14.09
Standard Deviation			2.12	2.12	7.75
CV			41.45	2.59	10.36
Replicate F			2.129	1.000	4.630
Replicate Prob(F)			0.1697	0.4019	0.0377
Treatment F			12.465	1076.800	70.106
Treatment Prob(F)			0.0005	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code	DIGSA	PANDI	AMAPA	DIGSA							
Crop Type, Code	C - L.crbgrs	C - F.panicm	C - PalmerAm	C - L.crbgrs							
Description	Control %	Control %	Control %	Control %							
Rating Type											
Rating Unit											
Rating Date	06/18/19	06/18/19	06/18/19	07/03/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1	Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	0.955 lb ai/a 0.75 lb ai/a	PRE PRE	A A	99.0 a	30.0 c	94.3 a	86.7 c		
2	Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.43 lb ai/a 0.75 lb ai/a	PRE PRE	A A	99.0 a	60.0 b	97.7 a	85.0 c		
3	Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A	99.0 a	92.3 a	99.0 a	95.0 ab		
4	Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A	97.7 a	96.7 a	99.0 a	97.7 a		
5	Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	A A	96.0 a	66.7 b	99.0 a	90.0 bc		
6	Untreated Check Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate	4 SC 100 L 100 L	0.0625 lb ai/a 1.17 % v/v 2.5 % v/v	5WAP 5WAP 5WAP	B B B	0.0 b	0.0 d	0.0 b	0.0 d		
LSD P=.05						4.38	7.70	6.41	6.32		
Standard Deviation						2.41	4.23	3.52	3.47		
CV						2.94	7.35	4.32	4.59		
Replicate F						0.585	0.077	0.699	0.281		
Replicate Prob(F)						0.5749	0.9260	0.5199	0.7607		
Treatment F						832.507	231.001	386.470	348.226		
Treatment Prob(F)						0.0001	0.0001	0.0001	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	PANDI C - F.panicm Control %	AMAPA C - PalmerAm Control %	IPOSS C - mornglry Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing		
1	Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	0.955 lb ai/a 0.75 lb ai/a	PRE PRE	A A	33.3 c	71.7 b	0.0 b
2	Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.43 lb ai/a 0.75 lb ai/a	PRE PRE	A A	46.7 bc	82.7 ab	30.0 a
3	Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A	83.3 a	99.0 a	36.7 a
4	Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A	94.3 a	94.3 ab	30.0 a
5	Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	A A	53.3 b	94.3 ab	43.3 a
6	Untreated Check Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate	4 SC 100 L 100 L	0.0625 lb ai/a 1.17 % v/v 2.5 % v/v	5WAP 5WAP 5WAP	B B B	0.0 d	0.0 c	0.0 b
LSD P=.05						14.50	25.94	23.72
Standard Deviation						7.97	14.26	13.04
CV						15.37	19.36	55.88
Replicate F						1.672	0.357	1.275
Replicate Prob(F)						0.2364	0.7081	0.3213
Treatment F						55.336	20.679	6.196
Treatment Prob(F)						0.0001	0.0001	0.0072

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Comparison of HPPD-herbicides for sweet corn and rotation to cover crops  
 Trial ID: SCRN3-19 Location: Field #14 Trial Year: 2019  
 Protocol ID: SCRN3-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/13/19

Initiation Date: 03/01/19 Planned Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C ZEAMS Zea mays saccharata Sweet corn

Entry Date: 12/09/19

Variety: Overland

Planting Date: 05/17/19

Planting Rate: 24000 S/A

Depth: 0.75 IN

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 IN

Planting Equipment: FE Field Equipment

Seed Bed: SMOOTH smooth

Soil Temperature: 79 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 05/22/19

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory

Entry Date: 12/09/19

Pest 2 Type: W Code: PANDI Panicum dichotomiflorum

Common Name: Fall panicum

Entry Date: 12/09/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 14 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: FACTOR Factorial

**Field Prep./Maintenance:**

Treatments 1-12 total preemergence application of Dual II Magnum (1.25 pt/A) applied on 05/21/19 (5/17/19 application was intended to be a total preemergence application).

**Soil Description**

Description Name: Field 14A

% Sand: 77 % OM: 1.6 Texture: SL sandy loam

% Silt: 16 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: E excellent

Soil Drainage: F fair

<b>Application Description</b>		A	B	C	D
Application Date	05/17/19	06/12/19	06/17/19		
Appl. Stop Time	01:15 PM	01:55 PM	02:00 PM		
Application Method	SPRAY	SPRAY	SPRAY	no applic	
Application Timing	PRE	4WAP	4WAP (7-9)	6WAP	
Application Placement	BROADC	BROADC	BROADC		
Applied By	Johnson	Johnson	VanGessel		
Appl. Entry Date	05/22/19	12/09/19	12/09/19		
Air Temperature Start, Stop	80 80 F	72 73 F	89 89 F		
% Relative Humidity Start, Stop	51 51	61 61	50 50		
Wind Velocity+Dir. Start	11 mph SW	7 mph ESE	3 mph		
Wind Velocity+Dir. Stop	11 mph SW	8 mph ESE	3 mph		
Wind Velocity+Dir. Max	11 mph SW	8 mph ESE	3 mph		
Wet Leaves (Y/N)	N no	N no	N no		
Soil Temperature	73 F	75 F	90 F		
Soil Moisture	NORMAL	NORMAL	NORMAL		
% Cloud Cover	68	100	62		
Moisture 6 Hours after Appl.	0 IN	0 IN	0.01 IN		
Moisture 1 Week after Appl.	0.26 IN	1.64 IN	2.02 IN		
Weather Source	ITERIS	ITERIS	ITERIS		

<b>Crop Stage At Each Application</b>					
	A	B	C	D	
Crop 1 Code, BBCH Scale	ZEAMS BCOR				
Days after Emergence	-5	21	26		
Stage Majority, Percent		V10 100	V10-11 100		
Height Average		16 in	17 in		

<b>Pest Stage At Each Application</b>					
	A	B	C	D	
Pest 1 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W	IPOSS W	
Stage Majority, Percent		veg 100	veg 100		
Height Average		4 in	4 in		
Height Minimum, Maximum		3 6	3 6		
Density Average		8 m2	8 m2		
Density Min, Max		4 12	4 12		
Pest 2 Code, Type, Scale	PANDI W	PANDI W	PANDI W	PANDI W	
Stage Majority, Percent		veg 100	veg 100		
Height Average		5 in	5 in		
Height Minimum, Maximum		3 7	3 7		
Density Average		15 m2	15 m2		
Density Min, Max		2 30	2 30		

**Application Equipment**

	A	B	C	D
Appl. Equipment	Tractr6Nozl	Tractr6Nozl	Bckpck6Nozl	
Equipment Type	TRMOSP	TRMOSP	SPRBAC	
Operation Pressure	40 psi	40 psi	31 psi	
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	
Nozzle Size	11002	11002	11002	
Nozzle Spacing	20 in	20 in	18 in	
Boom Length	10 ft	10 ft	9 ft	
Boom Height	18 in	32 in	32 in	
Ground Speed	3 mph	3 mph	3 mph	
Carrier	WATER	WATER	WATER	
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac	
Propellant	COMAIR	COMAIR	COMCO2	

Context	Date	By	Notes
STATUS	05/13/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/22/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

06/12/19: Treatments 1-6, 10-12, and 14 (4WAP) were sprayed on this date. Treatments 7-9 were sprayed on 6-17-19 at 2:00 pm by MJV.

The 6WAP treatment was not applied.

10/14/19: Cereal rye emergence was very poor (suspect poor seed quality based on other trials with same seed source). Crimson clover emergence was delayed and variable, thus not rated on this date.

10/23/19: High weed pressure in 114, 207, 307,

Comparison of HPPD-herbicides for sweet corn and rotation to cover crops  
 Trial ID: SCRN3-19 Location: Field #14 Trial Year: 2019  
 Protocol ID: SCRN3-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	C ZEAMS	AMAPA C - PalmerAm	IPOSS C - morngly	PANDI C - F.panicm								
Crop Type, Code	Swt Corn	Control	Control	Control								
Description	Stunting	%	%	%								
Rating Type		06/19/19	06/19/19	06/19/19								
Rating Unit												
Rating Date												
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code					
1	Callisto.....mesotrione Nonionic Surfactant No atrazine (1X rate)	4 SC 100 L	0.094 lb ai/a 0.25 % v/v	4WAP B 4WAP B		0.0 a	68.3 cd	80.0 abc	0.0 f			
2	Callisto.....mesotrione Nonionic Surfactant No atrazine (2X rate)	4 SC 100 L	0.188 lb ai/a 0.25 % v/v	4WAP B 4WAP B		2.3 a	73.3 bc	85.0 ab	36.7 d			
3	Callisto.....mesotrione Nonionic Surfactant Atrazine 4L	4 SC 100 L 4 L	0.094 lb ai/a 0.25 % v/v 0.75 lb ai/a	4WAP B 4WAP B 4WAP B		2.3 a	95.3 a	84.0 ab	18.3 e			
4	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	2.81 SC 100 L 100 L	0.0165 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B		0.0 a	80.0 b	61.7 de	53.3 c			
5	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	2.81 SC 100 L 100 L	0.033 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B		0.0 a	96.0 a	66.7 cde	71.7 b			
6	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate Atrazine 4L	2.81 SC 100 L 100 L 4 L	0.0165 lb ai/a 1 % v/v 2.5 % v/v 0.75 lb ai/a	4WAP B 4WAP B 4WAP B 4WAP B		2.3 a	99.0 a	73.3 bcd	76.0 b			
7	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	3.5 SC 100 L 100 L	0.082 lb ai/a 1 % v/v 2.5 % v/v	4WAP C 4WAP C 4WAP C		0.0 a	43.3 e	10.0 gh	0.0 f			
8	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	3.5 SC 100 L 100 L	0.164 lb ai/a 1 % v/v 2.5 % v/v	4WAP C 4WAP C 4WAP C		0.0 a	30.0 f	10.0 gh	13.3 e			
9	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Atrazine 4L	3.5 SC 100 L 100 L 4 L	0.082 lb ai/a 1 % v/v 2.5 % v/v 0.75 lb ai/a	4WAP C 4WAP C 4WAP C 4WAP C		0.0 a	66.7 cd	53.3 ef	25.0 de			
10	Shieldex 400SC..tolpyralate Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	3.33 SC 100 L 100 L	0.0312 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B		0.0 a	99.0 a	0.0 h	36.7 d			
11	Shieldex 400SC..tolpyralate Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	3.33 SC 100 L 100 L	0.0624 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B		0.0 a	65.0 d	21.7 g	50.0 c			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=7,8; Average=2,5

Pest Code	Crop Type, Code	Description	IPOSS C - morngly	PANDI C - F.panicm	C RAPSL TillageRad	C VICVI HairytVtch
Rating Type			Control	Control	Stunting	Stunting
Rating Unit	%			%	%	
Rating Date	07/03/19	07/03/19		10/14/19	10/14/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Callisto.....mesotrione Nonionic Surfactant No atrazine (1X rate)	4 SC 100 L	0.094 lb ai/a 0.25 % v/v	4WAP B 4WAP B	45.0 cd	20.0 ef
2	Callisto.....mesotrione Nonionic Surfactant No atrazine (2X rate)	4 SC 100 L	0.188 lb ai/a 0.25 % v/v	4WAP B 4WAP B	75.0 ab	36.7 de
3	Callisto.....mesotrione Nonionic Surfactant Atrazine 4L	4 SC 100 L 4 L	0.094 lb ai/a 0.25 % v/v 0.75 lb ai/a	4WAP B 4WAP B 4WAP B	80.0 a	33.3 de
4	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	2.81 SC 100 L 100 L	0.0165 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	10.0 ef	72.7 abc
5	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	2.81 SC 100 L 100 L	0.033 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	20.0 def	79.0 ab
6	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate Atrazine 4L	2.81 SC 100 L 100 L 4 L	0.0165 lb ai/a 1 % v/v 2.5 % v/v 0.75 lb ai/a	4WAP B 4WAP B 4WAP B 4WAP B	50.0 bc	81.7 a
7	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	3.5 SC 100 L 100 L	0.082 lb ai/a 1 % v/v 2.5 % v/v	4WAP C 4WAP C 4WAP C	23.3 c-f	43.3 de
8	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	3.5 SC 100 L 100 L	0.164 lb ai/a 1 % v/v 2.5 % v/v	4WAP C 4WAP C 4WAP C	32.5 cde	36.7 de
9	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Atrazine 4L	3.5 SC 100 L 100 L 4 L	0.082 lb ai/a 1 % v/v 2.5 % v/v 0.75 lb ai/a	4WAP C 4WAP C 4WAP C 4WAP C	78.3 ab	50.0 cd
10	Shieldex 400SC..tolpyralate Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	3.33 SC 100 L 100 L	0.0312 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	10.0 ef	50.0 cd
11	Shieldex 400SC..tolpyralate Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	3.33 SC 100 L 100 L	0.0624 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	0.0 f	36.7 de

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=7,8; Average=2,5

Pest Code			C	RAPSL	C	VICVI
Crop Type, Code				TillageRad		HairyVtch
Description				CanopeVideo		CanopeVideo
Rating Type						
Rating Unit			Avg%GC		Avg%GC	
Rating Date			10/23/19		10/23/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Callisto.....mesotrione Nonionic Surfactant No atrazine (1X rate)	4 SC 100 L	SC 100 L	0.094 lb ai/a 0.25 % v/v	4WAP B 4WAP B	83.380 a
2	Callisto.....mesotrione Nonionic Surfactant No atrazine (2X rate)	4 SC 100 L	SC 100 L	0.188 lb ai/a 0.25 % v/v	4WAP B 4WAP B	81.790 a
3	Callisto.....mesotrione Nonionic Surfactant Atrazine 4L	4 SC 100 L 4 L	SC 100 L 4 L	0.094 lb ai/a 0.25 % v/v 0.75 lb ai/a	4WAP B 4WAP B 4WAP B	93.030 a
4	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	2.81 SC 100 L 100 L	SC 100 L 100 L	0.0165 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	86.027 a
5	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	2.81 SC 100 L 100 L	SC 100 L 100 L	0.033 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	87.660 a
6	Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate Atrazine 4L	2.81 SC 100 L 100 L 4 L	SC 100 L 100 L 4 L	0.0165 lb ai/a 1 % v/v 2.5 % v/v 0.75 lb ai/a	4WAP B 4WAP B 4WAP B 4WAP B	86.800 a
7	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	3.5 SC 100 L 100 L	SC 100 L 100 L	0.082 lb ai/a 1 % v/v 2.5 % v/v	4WAP C 4WAP C 4WAP C	85.160 a
8	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	3.5 SC 100 L 100 L	SC 100 L 100 L	0.164 lb ai/a 1 % v/v 2.5 % v/v	4WAP C 4WAP C 4WAP C	90.907 a
9	Laudis.....tembotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Atrazine 4L	3.5 SC 100 L 100 L 4 L	SC 100 L 100 L 4 L	0.082 lb ai/a 1 % v/v 2.5 % v/v 0.75 lb ai/a	4WAP C 4WAP C 4WAP C 4WAP C	89.673 a
10	Shieldex 400SC..tolpyralate Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (1X rate)	3.33 SC 100 L 100 L	SC 100 L 100 L	0.0312 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	88.737 a
11	Shieldex 400SC..tolpyralate Crop Oil Concentrate 30% Urea Ammonium Nitrate No atrazine (2X rate)	3.33 SC 100 L 100 L	SC 100 L 100 L	0.0624 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	88.180 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=7,8; Average=2,5

## University of Delaware

Pest Code Crop Type, Code Description	C ZEAMS Swt Corn	AMAPA C - PalmerAm	IPOSS C - morngly	PANDI C - F.panicm			
Rating Type	Stunting	Control	Control	Control			
Rating Unit	%	%	%	%			
Rating Date	06/19/19	06/19/19	06/19/19	06/19/19			
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing					
12 Shieldex 400SC..tolpyralate Crop Oil Concentrate 30% Urea Ammonium Nitrate Atrazine 4L	3.33 SC 100 L 100 L 4 L	0.0312 lb ai/a 1 % v/v 2.5 % v/v 0.75 lb ai/a	4WAP B 4WAP B 4WAP B 4WAP B	0.0 a	92.0 a	46.7 f	53.3 c
13 Untreated Check Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1.19 lb ai/a 0.585 lb ai/a 0.9 % w/v	PRE A 6WAP D 6WAP D	0.0 a	0.0 g	0.0 h	0.0 f
14 Weed-free Check Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1.19 lb ai/a 0.402 lb ai/a 0.9 % w/v	PRE A 4WAP B 4WAP B		94.7 a	90.0 a	90.0 a
LSD P=.05 Standard Deviation CV		2.99 1.77 329.14	7.75 4.54 6.33	13.93 8.30 17.03	12.89 7.68 20.51		
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		3.600 0.0429 1.000 0.4777	1.917 0.1745 127.993 0.0001	0.171 0.8433 49.739 0.0001	1.663 0.2090 44.545 0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=7,8; Average=2,5

## University of Delaware

Pest Code Crop Type, Code Description	IPOSS C - mornglry	PANDI C - F.panicm	C RAPSL TillageRad	C VICVI HairyVtch			
Rating Type	Control	Control	Stunting	Stunting			
Rating Unit	%	%	%	%			
Rating Date	07/03/19	07/03/19	10/14/19	10/14/19			
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit	Appl Timing Code			
12 Shieldex 400SC..tolpyralate Crop Oil Concentrate 30% Urea Ammonium Nitrate Atrazine 4L	3.33 SC 100 L 100 L 4 L	0.0312 lb ai/a 1 % v/v 2.5 % v/v 0.75 lb ai/a	4WAP B 4WAP B 4WAP B 4WAP B	36.7 cde	53.3 bcd	8.3 a	5.7 a
13 Untreated Check Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1.19 lb ai/a 0.585 lb ai/a 0.9 % w/v	PRE A 6WAP D 6WAP D	0.0 f	0.0 f	4.7 a	3.3 a
14 Weed-free Check Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1.19 lb ai/a 0.402 lb ai/a 0.9 % w/v	PRE A 4WAP B 4WAP B			6.1 a	4.6 a
LSD P=.05 Standard Deviation CV		28.50 16.68 47.05		27.05 16.05 35.17	7.99 4.75 126.16	8.21 4.88 120.87	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		0.139 0.8712 8.893 0.0001		1.826 0.1827 6.187 0.0001	1.030 0.3715 0.974 0.5012	1.340 0.2801 0.515 0.8942	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=7,8; Average=2,5

## University of Delaware

Pest Code		C RAPSL	C VICVI						
Crop Type, Code		TillageRad	HairyVtch						
Description		CanopeVideo	CanopeVideo						
Rating Type									
Rating Unit		Avg%GC	Avg%GC						
Rating Date		10/23/19	10/23/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
12	Shieldex 400SC..tolpyralate	3.33 SC	0.0312 lb ai/a	4WAP	B			93.257 a	88.287 a
	Crop Oil Concentrate	100 L	1 % v/v	4WAP	B				
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B				
	Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B				
13	Untreated Check							86.837 a	80.830 a
	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A				
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	6WAP	D				
	Dry Ammonium Sulfate	100 D	0.9 % w/v	6WAP	D				
14	Weed-free Check							85.077 a	76.443 a
	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A				
	Liberty 280....glufosinate	2.34 SL	0.402 lb ai/a	4WAP	B				
	Dry Ammonium Sulfate	100 D	0.9 % w/v	4WAP	B				
LSD P=.05								10.9642	15.6322
Standard Deviation								6.5328	9.3141
CV								7.46	11.08
Replicate F								1.393	2.840
Replicate Prob(F)								0.2663	0.0766
Treatment F								0.789	0.721
Treatment Prob(F)								0.6649	0.7272

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=7,8; Average=2,5

Comparison of HPPD-herbicides for sweet corn and rotation to cover crops  
 Trial ID: SCRN3-19 Location: Field #14 Trial Year: 2019  
 Protocol ID: SCRN3-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	C	ZEAMS	AMAPA	IPOSS	PANDI
Crop Type, Code	Swt Corn	C - PalmerAm	C - mornglry	C - F.panicm	
Description					
Rating Type	Stunting	Control	Control	Control	
Rating Unit	%	%	%	%	
Rating Date	06/19/19	06/19/19	06/19/19	06/19/19	
Trt No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
TABLE OF R MEANS					
Replicate 1			1.8	78.0	48.8
Replicate 2			0.0	73.5	48.8
Replicate 3			0.0	75.5	50.6
TABLE OF A (HPPD) MEANS					
1 Callisto.....mesotrione	4 SC	0.094 lb ai/a	4WAP B	1.6 a	79.0 c
1 Nonionic Surfactant	100 L	0.25 % v/v	4WAP B		83.0 a
2 Impact.....topramezone	2.81 SC	0.0165 lb ai/a	4WAP B	0.8 a	91.7 a
2 Crop Oil Concentrate	100 L	1 % v/v	4WAP B		67.2 b
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP B		67.0 a
3 Laudis.....tembotrione	3.5 SC	0.082 lb ai/a	4WAP C	0.0 a	46.7 d
3 Crop Oil Concentrate	100 L	1 % v/v	4WAP C		24.4 c
3 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP C		12.8 c
4 Shieldex 400SC..tolpyralate	3.33 SC	0.0312 lb ai/a	4WAP B	0.0 a	85.3 b
4 Crop Oil Concentrate	100 L	1 % v/v	4WAP B		22.8 c
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP B		46.7 b
LSD P=.05			1.79	4.61	8.79
Standard Deviation			1.83	4.59	8.99
CV			313.34	6.06	18.22
22.58					
TABLE OF B (atrazine) MEANS					
1 No atrazine (1X rate)			0.0 a	72.7 b	37.9 c
2 No atrazine (2X rate)			0.6 a	66.1 c	45.8 b
3 Atrazine 4L	4 L	0.75 lb ai/a	4WAP B	1.2 a	88.3 a
43.2 a					
LSD P=.05			1.55	3.99	7.61
Standard Deviation			1.83	4.59	8.99
CV			313.34	6.06	18.22
22.58					
TABLE OF A (HPPD) B (atrazine) MEANS					
1 Callisto.....mesotrione	4 SC	0.094 lb ai/a	4WAP B	0.0 a	68.3 cd
1 Nonionic Surfactant	100 L	0.25 % v/v	4WAP B		80.0 ab
1 No atrazine (1X rate)					0.0 a
2 Impact.....topramezone	2.81 SC	0.0165 lb ai/a	4WAP B	0.0 a	80.0 b
2 Crop Oil Concentrate	100 L	1 % v/v	4WAP B		61.7 cde
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP B		53.3 a
1 No atrazine (1X rate)					
3 Laudis.....tembotrione	3.5 SC	0.082 lb ai/a	4WAP C	0.0 a	43.3 e
3 Crop Oil Concentrate	100 L	1 % v/v	4WAP C		10.0 fg
3 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP C		0.0 a
1 No atrazine (1X rate)					
4 Shieldex 400SC..tolpyralate	3.33 SC	0.0312 lb ai/a	4WAP B	0.0 a	99.0 a
4 Crop Oil Concentrate	100 L	1 % v/v	4WAP B		0.0 g
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP B		36.7 a
1 No atrazine (1X rate)					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Description	IPOSS C - mornlry	PANDI C - F.panicm	C RAPSL TillageRad	C VICVI HairytVtch
Rating Type	Control	Control	Stunting	Stunting
Rating Unit Rating Date	% 07/03/19	% 07/03/19	% 10/14/19	10/14/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing		
TABLE OF R MEANS				
Replicate 1		39.4	42.7	2.8 3.7
Replicate 2		39.6	50.0	3.4 2.6
Replicate 3		36.3	55.7	4.3 5.9
TABLE OF A (HPPD) MEANS				
1 Callisto.....mesotrione 1 Nonionic Surfactant	4 SC 100 L	0.094 lb ai/a 0.25 % v/v	4WAP B 4WAP B	66.7 a 30.0 c
2 Impact.....topramezone 2 Crop Oil Concentrate 2 30% Urea Ammonium Nitrate	2.81 SC 100 L 100 L	0.0165 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	26.7 c 77.8 a
3 Laudis.....tembotrione 3 Crop Oil Concentrate 3 30% Urea Ammonium Nitrate	3.5 SC 100 L 100 L	0.082 lb ai/a 1 % v/v 2.5 % v/v	4WAP C 4WAP C 4WAP C	44.7 b 43.3 bc
4 Shieldex 400SC..tolpyralate 4 Crop Oil Concentrate 4 30% Urea Ammonium Nitrate	3.33 SC 100 L 100 L	0.0312 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	15.6 c 46.7 b
LSD P=.05		17.53	16.29	4.63 4.53
Standard Deviation		17.62	16.66	4.74 4.64
CV		45.89	33.69	135.37 114.37
TABLE OF B (atrazine) MEANS				
1 No atrazine (1X rate)		22.1 b	46.5 a	2.6 a 2.3 a
2 No atrazine (2X rate)		31.9 b	47.3 a	4.4 a 5.3 a
3 Atrazine 4L	4 L	0.75 lb ai/a	4WAP B	61.3 a 54.6 a
LSD P=.05		15.18	14.10	4.01 3.93
Standard Deviation		17.62	16.66	4.74 4.64
CV		45.89	33.69	135.37 114.37
TABLE OF A (HPPD) B (atrazine) MEANS				
1 Callisto.....mesotrione 1 Nonionic Surfactant 1 No atrazine (1X rate)	4 SC 100 L	0.094 lb ai/a 0.25 % v/v	4WAP B 4WAP B	45.0 a 20.0 a
2 Impact.....topramezone 2 Crop Oil Concentrate 2 30% Urea Ammonium Nitrate 1 No atrazine (1X rate)	2.81 SC 100 L 100 L 100 L	0.0165 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	10.0 a 72.7 a
3 Laudis.....tembotrione 3 Crop Oil Concentrate 3 30% Urea Ammonium Nitrate 1 No atrazine (1X rate)	3.5 SC 100 L 100 L	0.082 lb ai/a 1 % v/v 2.5 % v/v	4WAP C 4WAP C 4WAP C	23.3 a 43.3 a
4 Shieldex 400SC..tolpyralate 4 Crop Oil Concentrate 4 30% Urea Ammonium Nitrate 1 No atrazine (1X rate)	3.33 SC 100 L 100 L	0.0312 lb ai/a 1 % v/v 2.5 % v/v	4WAP B 4WAP B 4WAP B	10.0 a 50.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code			C RAPSL	C VICVI					
Crop Type, Code			TillageRad	HairyVtch					
Description			CanopeVideo	CanopeVideo					
Rating Type									
Rating Unit			Avg%GC	Avg%GC					
Rating Date			10/23/19	10/23/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
TABLE OF R MEANS									
Replicate 1							85.294	86.974	
Replicate 2							89.340	88.160	
Replicate 3							89.016	79.665	
TABLE OF A (HPPD) MEANS									
1 Callisto.....mesotrione		4 SC	0.094 lb ai/a	4WAP	B		86.067 a	87.760 a	
1 Nonionic Surfactant		100 L	0.25 % v/v	4WAP	B				
2 Impact.....topramezone		2.81 SC	0.0165 lb ai/a	4WAP	B		86.829 a	81.006 a	
2 Crop Oil Concentrate		100 L	1 % v/v	4WAP	B				
2 30% Urea Ammonium Nitrate		100 L	2.5 % v/v	4WAP	B				
3 Laudis.....tembotrione		3.5 SC	0.082 lb ai/a	4WAP	C		88.580 a	85.898 a	
3 Crop Oil Concentrate		100 L	1 % v/v	4WAP	C				
3 30% Urea Ammonium Nitrate		100 L	2.5 % v/v	4WAP	C				
4 Shieldex 400SC..tolpyralate		3.33 SC	0.0312 lb ai/a	4WAP	B		90.058 a	85.069 a	
4 Crop Oil Concentrate		100 L	1 % v/v	4WAP	B				
4 30% Urea Ammonium Nitrate		100 L	2.5 % v/v	4WAP	B				
LSD P=.05							6.8609	8.9928	
Standard Deviation							7.0179	9.1986	
CV							7.9854	10.8304	
TABLE OF B (atrazine) MEANS									
1 No atrazine (1X rate)							85.826 a	84.003 a	
2 No atrazine (2X rate)							87.134 a	82.838 a	
3 Atrazine 4L		4 L	0.75 lb ai/a	4WAP	B		90.690 a	87.959 a	
LSD P=.05							5.9417	7.7880	
Standard Deviation							7.0179	9.1986	
CV							7.9854	10.8304	
TABLE OF A (HPPD) B (atrazine) MEANS									
1 Callisto.....mesotrione		4 SC	0.094 lb ai/a	4WAP	B		83.380 a	87.023 a	
1 Nonionic Surfactant		100 L	0.25 % v/v	4WAP	B				
1 No atrazine (1X rate)									
2 Impact.....topramezone		2.81 SC	0.0165 lb ai/a	4WAP	B		86.027 a	80.537 a	
2 Crop Oil Concentrate		100 L	1 % v/v	4WAP	B				
2 30% Urea Ammonium Nitrate		100 L	2.5 % v/v	4WAP	B				
1 No atrazine (1X rate)									
3 Laudis.....tembotrione		3.5 SC	0.082 lb ai/a	4WAP	C		85.160 a	85.997 a	
3 Crop Oil Concentrate		100 L	1 % v/v	4WAP	C				
3 30% Urea Ammonium Nitrate		100 L	2.5 % v/v	4WAP	C				
1 No atrazine (1X rate)									
4 Shieldex 400SC..tolpyralate		3.33 SC	0.0312 lb ai/a	4WAP	B		88.737 a	82.453 a	
4 Crop Oil Concentrate		100 L	1 % v/v	4WAP	B				
4 30% Urea Ammonium Nitrate		100 L	2.5 % v/v	4WAP	B				
1 No atrazine (1X rate)									

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Description	C ZEAMS Swt Corn	AMAPA C - PalmerAm	IPOSS C - mornglry	PANDI C - F.panicm						
Rating Type	Stunting	Control	Control	Control						
Rating Unit	%	%	%	%						
Rating Date	06/19/19	06/19/19	06/19/19	06/19/19						
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1 Callisto.....mesotrione	4 SC	0.094 lb ai/a	4WAP	B			2.3 a	73.3 bc	85.0 a	36.7 a
1 Nonionic Surfactant	100 L	0.25 % v/v	4WAP	B						
2 No atrazine (2X rate)										
2 Impact.....topramezone	2.81 SC	0.0165 lb ai/a	4WAP	B			0.0 a	96.0 a	66.7 bcd	71.7 a
2 Crop Oil Concentrate	100 L	1 % v/v	4WAP	B						
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B						
2 No atrazine (2X rate)										
3 Laudis.....tembotrione	3.5 SC	0.082 lb ai/a	4WAP	C			0.0 a	30.0 f	10.0 fg	13.3 a
3 Crop Oil Concentrate	100 L	1 % v/v	4WAP	C						
3 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	C						
2 No atrazine (2X rate)										
4 Shieldex 400SC..tolpyralate	3.33 SC	0.0312 lb ai/a	4WAP	B			0.0 a	65.0 d	21.7 f	50.0 a
4 Crop Oil Concentrate	100 L	1 % v/v	4WAP	B						
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B						
2 No atrazine (2X rate)										
1 Callisto.....mesotrione	4 SC	0.094 lb ai/a	4WAP	B			2.3 a	95.3 a	84.0 a	18.3 a
1 Nonionic Surfactant	100 L	0.25 % v/v	4WAP	B						
3 Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B						
2 Impact.....topramezone	2.81 SC	0.0165 lb ai/a	4WAP	B			2.3 a	99.0 a	73.3 abc	76.0 a
2 Crop Oil Concentrate	100 L	1 % v/v	4WAP	B						
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B						
3 Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B						
3 Laudis.....tembotrione	3.5 SC	0.082 lb ai/a	4WAP	C			0.0 a	66.7 cd	53.3 de	25.0 a
3 Crop Oil Concentrate	100 L	1 % v/v	4WAP	C						
3 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	C						
3 Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B						
4 Shieldex 400SC..tolpyralate	3.33 SC	0.0312 lb ai/a	4WAP	B			0.0 a	92.0 a	46.7 e	53.3 a
4 Crop Oil Concentrate	100 L	1 % v/v	4WAP	B						
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B						
3 Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B						
LSD P=.05							3.10	7.98	15.23	13.84
Standard Deviation							1.83	4.59	8.99	8.17
CV							313.34	6.06	18.22	22.58

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Description	IPOSS C - mornlry	PANDI C - F.panicm	C RAPSL TillageRad	C VICVI HairytVtch										
Rating Type	Control	Control	Stunting	Stunting										
Rating Unit	%	%	%	%										
Rating Date	07/03/19	07/03/19	10/14/19	10/14/19										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code								
1 Callisto.....mesotrione	4 SC	0.094	lb ai/a	4WAP	B		75.0	a	36.7	a	6.3	a	5.7	a
1 Nonionic Surfactant	100 L	0.25	% v/v	4WAP	B									
2 No atrazine (2X rate)														
2 Impact.....topramezone	2.81 SC	0.0165	lb ai/a	4WAP	B		20.0	a	79.0	a	0.0	a	6.7	a
2 Crop Oil Concentrate	100 L	1	% v/v	4WAP	B									
2 30% Urea Ammonium Nitrate	100 L	2.5	% v/v	4WAP	B									
2 No atrazine (2X rate)														
3 Laudis.....tembotrione	3.5 SC	0.082	lb ai/a	4WAP	C		32.5	a	36.7	a	4.7	a	5.7	a
3 Crop Oil Concentrate	100 L	1	% v/v	4WAP	C									
3 30% Urea Ammonium Nitrate	100 L	2.5	% v/v	4WAP	C									
2 No atrazine (2X rate)														
4 Shieldex 400SC..tolpyralate	3.33 SC	0.0312	lb ai/a	4WAP	B		0.0	a	36.7	a	6.7	a	3.3	a
4 Crop Oil Concentrate	100 L	1	% v/v	4WAP	B									
4 30% Urea Ammonium Nitrate	100 L	2.5	% v/v	4WAP	B									
2 No atrazine (2X rate)														
1 Callisto.....mesotrione	4 SC	0.094	lb ai/a	4WAP	B		80.0	a	33.3	a	2.3	a	3.3	a
1 Nonionic Surfactant	100 L	0.25	% v/v	4WAP	B									
3 Atrazine 4L	4 L	0.75	lb ai/a	4WAP	B									
2 Impact.....topramezone	2.81 SC	0.0165	lb ai/a	4WAP	B		50.0	a	81.7	a	3.3	a	4.7	a
2 Crop Oil Concentrate	100 L	1	% v/v	4WAP	B									
2 30% Urea Ammonium Nitrate	100 L	2.5	% v/v	4WAP	B									
3 Atrazine 4L	4 L	0.75	lb ai/a	4WAP	B									
3 Laudis.....tembotrione	3.5 SC	0.082	lb ai/a	4WAP	C		78.3	a	50.0	a	0.0	a	4.7	a
3 Crop Oil Concentrate	100 L	1	% v/v	4WAP	C									
3 30% Urea Ammonium Nitrate	100 L	2.5	% v/v	4WAP	C									
3 Atrazine 4L	4 L	0.75	lb ai/a	4WAP	B									
4 Shieldex 400SC..tolpyralate	3.33 SC	0.0312	lb ai/a	4WAP	B		36.7	a	53.3	a	8.3	a	5.7	a
4 Crop Oil Concentrate	100 L	1	% v/v	4WAP	B									
4 30% Urea Ammonium Nitrate	100 L	2.5	% v/v	4WAP	B									
3 Atrazine 4L	4 L	0.75	lb ai/a	4WAP	B									
LSD P=.05		30.36		28.21			8.02		7.85					
Standard Deviation		17.62		16.66			4.74		4.64					
CV		45.89		33.69			135.37		114.37					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code		C RAPSL	C VICVI						
Crop Type, Code		TillageRad	HairyVtch						
Description		CanopeVideo	CanopeVideo						
Rating Type									
Rating Unit		Avg%GC	Avg%GC						
Rating Date		10/23/19	10/23/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Callisto.....mesotrione	4 SC	0.094 lb ai/a	4WAP	B			81.790 a	88.527 a
1	Nonionic Surfactant	100 L	0.25 % v/v	4WAP	B				
2	No atrazine (2X rate)								
2	Impact.....topramezone	2.81 SC	0.0165 lb ai/a	4WAP	B			87.660 a	74.367 a
2	Crop Oil Concentrate	100 L	1 % v/v	4WAP	B				
2	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B				
2	No atrazine (2X rate)								
3	Laudis.....tembotrione	3.5 SC	0.082 lb ai/a	4WAP	C			90.907 a	83.990 a
3	Crop Oil Concentrate	100 L	1 % v/v	4WAP	C				
3	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	C				
3	No atrazine (2X rate)								
4	Shieldex 400SC..tolpyralate	3.33 SC	0.0312 lb ai/a	4WAP	B			88.180 a	84.467 a
4	Crop Oil Concentrate	100 L	1 % v/v	4WAP	B				
4	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B				
4	No atrazine (2X rate)								
1	Callisto.....mesotrione	4 SC	0.094 lb ai/a	4WAP	B			93.030 a	87.730 a
1	Nonionic Surfactant	100 L	0.25 % v/v	4WAP	B				
3	Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B				
2	Impact.....topramezone	2.81 SC	0.0165 lb ai/a	4WAP	B			86.800 a	88.113 a
2	Crop Oil Concentrate	100 L	1 % v/v	4WAP	B				
2	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B				
3	Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B				
3	Laudis.....tembotrione	3.5 SC	0.082 lb ai/a	4WAP	C			89.673 a	87.707 a
3	Crop Oil Concentrate	100 L	1 % v/v	4WAP	C				
3	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	C				
3	Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B				
4	Shieldex 400SC..tolpyralate	3.33 SC	0.0312 lb ai/a	4WAP	B			93.257 a	88.287 a
4	Crop Oil Concentrate	100 L	1 % v/v	4WAP	B				
4	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	4WAP	B				
3	Atrazine 4L	4 L	0.75 lb ai/a	4WAP	B				
LSD P=.05						11.8834	15.5760		
Standard Deviation						7.0179	9.1986		
CV						7.9854	10.8304		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For C ZEAMS Swt Corn Stunting % 06/19/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	134.750000				
R	2	24.500000	12.250000	3.667	0.0422	
A	3	14.972222	4.990741	1.494	0.2438	1.8
B	2	8.166667	4.083333	1.222	0.3138	1.5
AB	6	13.611111	2.268519	0.679	0.6681	3.1
ERROR	22	73.500000	3.340909			

  

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Control % 06/19/19 Missing values in column 2 results in unbalanced data, Least Squares Analysis is preferred						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	28	17116.000000				
R	2	122.000000	61.000000	2.902	0.0860	
A	3	10814.000000	3604.666667	171.469	0.0001	4.6
B	2	3110.166667	1555.083333	73.973	0.0001	4.0
AB	6	2754.500000	459.083333	21.838	0.0001	8.0
ERROR	15	315.333333	21.022222			

  

FACTORIAL/POOLED ERROR AOV For IPOSS C morngly Control % 06/19/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	34084.305556				
R	2	26.888889	13.444444	0.166	0.8479	
A	3	25002.972222	8334.324074	103.060	0.0001	8.8
B	2	4411.055556	2205.527778	27.273	0.0001	7.6
AB	6	2864.277778	477.379630	5.903	0.0009	15.2
ERROR	22	1779.111111	80.868687			

  

FACTORIAL/POOLED ERROR AOV For PANDI C F.panicm Control % 06/19/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	23347.638889				
R	2	252.722222	126.361111	1.891	0.1746	
A	3	17334.083333	5778.027778	86.477	0.0001	8.0
B	2	3376.055556	1688.027778	25.264	0.0001	6.9
AB	6	914.833333	152.472222	2.282	0.0729	13.8
ERROR	22	1469.944444	66.815657			

  

FACTORIAL/POOLED ERROR AOV For IPOSS C morngly Control % 07/03/19 Missing values in column 5 results in unbalanced data, Least Squares Analysis is preferred						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	30	30964.409722				
R	2	83.680556	41.840278	0.135	0.8749	
A	3	13486.631944	4495.543981	14.478	0.0001	17.5
B	2	9971.180556	4985.590278	16.056	0.0001	15.2
AB	6	2144.097222	357.349537	1.151	0.3765	30.4
ERROR	17	5278.819444	310.518791			

  

FACTORIAL/POOLED ERROR AOV For PANDI C F.panicm Control % 07/03/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	19486.888889				
R	2	1019.555556	509.777778	1.837	0.1829	
A	3	11033.333333	3677.777778	13.252	0.0001	16.3
B	2	478.722222	239.361111	0.862	0.4359	14.1
AB	6	849.500000	141.583333	0.510	0.7941	28.2
ERROR	22	6105.777778	277.535354			

  

FACTORIAL/POOLED ERROR AOV For C RAPSL TillageRad Stunting % 10/14/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	771.000000				
R	2	12.166667	6.083333	0.271	0.7651	
A	3	142.333333	47.444444	2.114	0.1275	4.6
B	2	20.166667	10.083333	0.449	0.6439	4.0
AB	6	102.500000	17.083333	0.761	0.6080	8.0
ERROR	22	493.833333	22.446970			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For C VICVI HairyVtch Stunting 10/14/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	699.888889				
R	2	69.388889	34.694444	1.613	0.2220	
A	3	36.777778	12.259259	0.570	0.6407	4.5
B	2	62.055556	31.027778	1.442	0.2579	3.9
AB	6	58.388889	9.731481	0.452	0.8355	7.9
ERROR	22	473.277778	21.512626			

FACTORIAL/POOLED ERROR AOV For C RAPSL TillageRad CanopeVideo Avg%GC 10/23/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	1618.858000				
R	2	121.298617	60.649308	1.231	0.3112	
A	3	86.631156	28.877052	0.586	0.6303	6.861
B	2	152.063217	76.031608	1.544	0.2358	5.942
AB	6	175.358694	29.226449	0.593	0.7322	11.883
ERROR	22	1083.506317	49.250287			

FACTORIAL/POOLED ERROR AOV For C VICVI HairyVtch CanopeVideo Avg%GC 10/23/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	2950.055564				
R	2	507.980572	253.990286	3.002	0.0704	
A	3	219.294097	73.098032	0.864	0.4745	8.993
B	2	172.975622	86.487811	1.022	0.3763	7.788
AB	6	188.302178	31.383696	0.371	0.8895	15.576
ERROR	22	1861.503094	84.613777			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation of POST Grain Sorghum Herbicides**

Trial ID: Milo1-19

Location: Field #36

Trial Year: 2019

Protocol ID: Milo1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/30/19

Initiation Date: 03/01/19

Completion Date: 11/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C SORVU Sorghum bicolor Grain sorghum

Entry Date: 12/11/19

Variety: DKS51-01

Planting Date: 07/09/19

Planting Rate: 4

S/ROWFT

Depth: 1 in

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 in

Planting Equipment: FE Field Equipment

Soil Temperature: 85 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 07/13/19

Soil Moisture: NORMAL normal, adequate

Harvest Date: 11/16/19

Harvest Equipment: Plot combine

% Standard Moisture: 14.0

Harvested Width: 6.25 FT

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth Entry Date: 12/11/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 12 Tillage Type: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Total preemergence application of Dual II Magnum (1.25 pt/A) on 07/10/19.

**Soil Description**

Description Name: Field 36

% Sand: 77

% OM: 1.3 Texture: SL

sandy loam

% Silt: 12

pH: 6.5

Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11

CEC: 5.1

Fert. Level: G good

Soil Drainage: G

good

**Application Description**

A	
Application Date	07/31/19
Appl. Stop Time	11:40 AM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROADC
Applied By	Johnson
Appl. Entry Date	12/11/19
Air Temperature Start, Stop	86 87 F
% Relative Humidity Start, Stop	65 59
Wind Velocity+Dir. Start	4 mph WSW
Wind Velocity+Dir. Stop	3 mph
Wind Velocity+Dir. Max	4 mph WSW
Wet Leaves (Y/N)	N no
Soil Temperature	85 F
Soil Moisture	NORMAL
% Cloud Cover	59
Moisture 6 Hours after Appl.	0.12 IN
Moisture 1 Week after Appl.	1.45 IN

**Crop Stage At Each Application**

A	
Crop 1 Code, BBCH Scale	SORVU BGRM
Days after Emergence	18
Stage Majority, Percent	V7
Height Average	12 in

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	AMAPA W
Stage Majority, Percent	veg 100
Height Average	11 in
Height Minimum, Maximum	8 14
Density Average	4 m2
Density Min, Max	1 8

**Application Equipment**

A	
Appl. Equipment	Tractr4Nozl
Equipment Type	TRMOSP
Operation Pressure	40 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	20 in
Boom Length	6.7 ft
Boom Height	30 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

Context	Date	By	Notes
STATUS	05/30/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	10/10/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

#### Trial Comments

07/27/19: Milo stand is fair. Some Palmer amaranth plants were not killed with burndown (they were severely damaged but not killed); and begining to regrow.

08/04/19: Treatment 4 in rep 3 had much more injury than the other two reps, not sure why. Maybe agitation? Palmer amaranth control did not seem to be affected.

Evaluation of POST Grain Sorghum Herbicides									
Trial ID: Milo1-19		Location: Field #36		Trial Year: 2019					
Protocol ID: Milo1-19		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact:									
Pest Code					C SORVU	C SORVU	C SORVU		
Crop Type, Code					GrnSrghm	GrnSrghm	AMAPA C - PalmerAm		
Description					Stunting %	Stunting %	Control %		
Rating Type					08/04/19	08/04/19	08/04/19		
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check								
2	Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	2.05 EC 0.3 1.75 4 L 100 L 100 D	0.208 lb ai/a 0.0304 0.178 0.5 lb ai/a 0.25 % v/v 0.6 % w/v	ai/a	POST A	A	15.7 ab		
3	Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	2.05 EC 0.3 1.75 4 L 100 L 100 D	0.256 lb ai/a 0.0375 0.219 0.5 lb ai/a 0.25 % v/v 0.6 % w/v	ai/a	POST A	A	14.0 abc		
4	Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Starane Ultra...fluroxypyr Nonionic Surfactant Dry Ammonium Sulfate	2.05 EC 0.3 1.75 4 L 2.8 EC 100 L 100 D	0.208 lb ai/a 0.0304 0.178 0.5 lb ai/a 0.0656 lb ae/a 0.25 % v/v 0.6 % w/v	ai/a	POST A	A	17.3 a		
5	Atrazine 4L Buctril 2EC.....bromoxynil	4 L 2 EC	0.5 lb ai/a 0.25 lb ai/a	ai/a	POST A	A	0.0 d		
6	Clarity.....dicamba Atrazine 4L Nonionic Surfactant	4 L 4 L 100 L	0.28 lb ai/a 0.5 lb ai/a 0.25 % v/v	ai/a	POST A	A	4.7 cd		
7	Facet L.....quinclorac Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate	1.5 L 4 L 100 L 100 L	0.375 lb ae/a 1 lb ai/a 1 % v/v 2.5 % v/v	lb ae/a	POST A	A	8.0 a-d		
8	DiFlexx.....dicamba Atrazine 4L Nonionic Surfactant	4 L 4 L 100 L	0.28 lb ai/a 0.5 lb ai/a 0.25 % v/v	ai/a	POST A	A	5.7 bcd		
9	Permit.....halosulfuron DiFlexx.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate	75 DF 4 L 100 L 100 L	0.0314 lb ai/a 0.28 lb ai/a 1 % v/v 2.5 % v/v	lb ai/a	POST A	A	13.3 abc		
10	Facet L.....quinclorac DiFlexx.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate	1.5 L 4 L 100 L 100 L	0.375 lb ae/a 0.28 lb ai/a 1 % v/v 2.5 % v/v	lb ae/a	POST A	A	10.7 a-d		
11	Atrazine 4L Starane Ultra...fluroxypyr Nonionic Surfactant	4 L 2.8 EC 100 L	0.5 lb ai/a 0.0656 lb ae/a 0.25 % v/v	ai/a	POST A	A	0.0 d		
							0.0 c		
							0.0 b		
							63.3 ab		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4; Average=5

Pest Code Crop Type, Code		AMAPA C - PalmerAm	AMAPA C - PalmerAm	C SORVU GrnSrghm
Description		Control % 09/01/19	Control % 10/14/19	Yield Bu/A 11/16/19
Trt No. Treatment Name	Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code
1 Untreated Check			0.0 c	0.0 f
2 Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	2.05 EC 0.3 1.75 4 L 100 L 100 D	0.208 lb ai/a 0.0304 0.178 0.5 lb ai/a 0.25 % v/v 0.6 % w/v	POST A	80.0 b
3 Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	2.05 EC 0.3 1.75 4 L 100 L 100 D	0.256 lb ai/a 0.0375 0.219 0.5 lb ai/a 0.25 % v/v 0.6 % w/v	POST A	81.7 ab
4 Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Starane Ultra...fluroxypyr Nonionic Surfactant Dry Ammonium Sulfate	2.05 EC 0.3 1.75 4 L 2.8 EC 100 L 100 D	0.208 lb ai/a 0.0304 0.178 0.5 lb ai/a 0.0656 lb ae/a 0.25 % v/v 0.6 % w/v	POST A	94.5 a
5 Atrazine 4L Buctril 2EC.....bromoxynil	4 L 2 EC	0.5 lb ai/a 0.25 lb ai/a	POST A	80.0 b
6 Clarity.....dicamba Atrazine 4L Nonionic Surfactant	4 L 4 L 100 L	0.28 lb ai/a 0.5 lb ai/a 0.25 % v/v	POST A	92.3 ab
7 Facet L.....quinclorac Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate	1.5 L 4 L 100 L 100 L	0.375 lb ae/a 1 lb ai/a 1 % v/v 2.5 % v/v	POST A	95.0 a
8 DiFlexx.....dicamba Atrazine 4L Nonionic Surfactant	4 L 4 L 100 L	0.28 lb ai/a 0.5 lb ai/a 0.25 % v/v	POST A	81.7 ab
9 Permit.....halosulfuron DiFlexx.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate	75 DF 4 L 100 L 100 L	0.0314 lb ai/a 0.28 lb ai/a 1 % v/v 2.5 % v/v	POST A	93.3 ab
10 Facet L.....quinclorac DiFlexx.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate	1.5 L 4 L 100 L 100 L	0.375 lb ae/a 0.28 lb ai/a 1 % v/v 2.5 % v/v	POST A	92.5 ab
11 Atrazine 4L Starane Ultra...fluroxypyr Nonionic Surfactant	4 L 2.8 EC 100 L	0.5 lb ai/a 0.0656 lb ae/a 0.25 % v/v	POST A	82.5 ab
			80.0 e	72.1 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=4; Average=5

## University of Delaware

Pest Code Crop Type, Code	C SORVU GrnSrghm	C SORVU Stunting % 08/04/19	C SORVU GrnSrghm	AMAPA C - PalmerAm
Description				
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code	
12 Basagran.....bentazon Atrazine 4L Nonionic Surfactant	4 L 4 L 100 L	0.75 lb ai/a 0.5 lb ai/a 0.25 % v/v	POST A POST A POST A	0.0 d 4.7 bc 0.0 b
LSD P=.05		10.93	6.12	9.67
Standard Deviation		6.45	3.62	5.71
CV		86.69	51.46	159.34
Replicate F		1.029	1.537	0.923
Replicate Prob(F)		0.3739	0.2371	0.4122
Treatment F		3.184	23.733	2.492
Treatment Prob(F)		0.0100	0.0001	0.0329
				0.909 0.4183 13.003 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4; Average=5

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm	AMAPA C - PalmerAm	C SORVU GrnSrghm						
Description		Control %	Control %	Yield Bu/A 11/16/19						
Rating Type		09/01/19	10/14/19							
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
12	Basagran.....bentazon	4 L	0.75 lb	ai/a	POST	A		90.0 ab	94.3 ab	73.0 a
	Atrazine 4L	4 L	0.5 lb	ai/a	POST	A				
	Nonionic Surfactant	100 L	0.25 %	v/v	POST	A				
LSD P=.05					13.67		10.46		24.15	
Standard Deviation					7.85		6.18		14.26	
CV					9.78		7.47		20.65	
Replicate F					1.821		7.787		3.863	
Replicate Prob(F)					0.1959		0.0028		0.0365	
Treatment F					32.852		56.281		0.599	
Treatment Prob(F)					0.0001		0.0001		0.8099	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4; Average=5

Comparison of Sorghum and Soybeans for Palmer Amaranth Control  
 Trial ID: Milo4-19 Location: Field #36 Trial Year: 2019  
 Protocol ID: Milo4-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established

Trial Status Date: 07/09/19 Last Changed By: Mark VanGessel  
 ARM Trial Created On: 05/30/19  
 Initiation Date: 03/01/19  
 Completion Date: 11/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W USA 49.376656 - 24.53833  
 -124.715843 - -66.968887  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C SORVU Sorghum bicolor	Grain sorghum	BBCH Scale: BGRM
Entry Date: 07/09/19		
Variety: DKS51-01		
Planting Date: 07/09/19	Planting Rate: 5	S/ROWFT
Depth: 1 in		
Rows per Plot: 7	Planting Method: PLANTD	planted
Row Spacing: 15 in	Planting Equipment: FE	Field Equipment
	Seed Bed: MEDTRA	medium/trashy
	Soil Moisture: NORMAL	normal, adequate
Emergence Date: 11/13/19	Harvest Equipment: Plot combine	
Harvest Date: 11/16/19	Harvested Width: 6.25 ft	
% Standard Moisture: 14.0	Harvested Length: 25 ft	
Crop 2: C GLXMA Glycine max	Soybean	BBCH Scale: BSOY
Entry Date: 07/09/19		
Variety: S43XS27		
Attributes: Xtend		
Planting Date: 07/08/19	Planting Rate: 180000	S/A
Depth: 1 in		
Rows per Plot: 7	Planting Method: PLANTD	planted
Row Spacing: 15 in	Planting Equipment: FE	Field Equipment
	Seed Bed: MEDTRA	medium/trashy
	Soil Moisture: NORMAL	normal, adequate
Emergence Date: 07/13/19	Harvest Equipment: Plot combine	
Harvest Date: 11/07/19	Harvested Width: 7.5 FT	
% Standard Moisture: 13.0	Harvested Length: 25 FT	

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth Entry Date: 12/11/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory Entry Date: 12/11/19

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 250 FT<sup>2</sup> Treatments: 12      Tillage Type: NOTILL no-till  
 Replications: 4      Study Design: SPLPLO Split-Plot

**Soil Description**

Description Name: Field 36  
 % Sand: 77      % OM: 1.3      Texture: SL      sandy loam  
 % Silt: 12      pH: 6.5      Soil Name: Hurlokk loamy sand, 0-2% slopes  
 % Clay: 11      CEC: 5.1      Fert. Level: G      good  
 Soil Drainage: G      good

**Application Description**

	A	B
Application Date	07/09/19	07/31/19
Appl. Stop Time	02:15 PM	12:10 PM
Interval to Prev. Appl.		22 DAYS
Application Method	SPRAY	SPRAY
Application Timing	PRE	4WAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	12/11/19	12/11/19
Air Temperature Start, Stop	85 85 F	87 87 F
% Relative Humidity Start, Stop	57 57	59 59
Wind Velocity+Dir. Start	0 mph	3 mph
Wind Velocity+Dir. Stop	0 mph	3 mph
Wind Velocity+Dir. Max	0 mph	3 mph
Wet Leaves (Y/N)	N no	N no
Soil Temperature	87 F	87 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	49	16
Moisture 6 Hours after Appl.	0 IN	0.12 IN
Moisture 1 Week after Appl.	0.33 IN	1.45 IN
Weather Source	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	SORVU BGRM	SORVU BGRM
Days after Emergence	-127	-105
Stage Scale Used		DESC
Stage Majority, Percent		V7 100
Height Average		12 in
Crop 2 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-4	18
Stage Scale Used		DESC
Stage Majority, Percent		V3-4 100
Height Average		8 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100
Height Average		11 in
Height Minimum, Maximum		8 14
Density Average		4 m2
Density Min, Max		0 8
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		veg 100
Height Average		3 in
Height Minimum, Maximum		2 5
Density Average		3 m2
Density Min, Max		0 6

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	30 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Minimum Mix/Treatment	0.4591 GAL	0.4591 GAL
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	07/09/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

07/27/19: Milo looks better than soybeans; soybeans are short for this stage. Stand of both looks good. Some Palmer amaranth plants were not killed with burndown (they were severely damaged but not killed); and begining to regrow.

08/04/19: Some Palmer amaranth plants burnt off but not killed at planting time are causing variability in control ratings.

10/14/19: Palmer amaranth not killed with the burndown, regrew and suppressed soybean growth more than sorghum and reduced overall control.

Comparison of Sorghum and Soybeans for Palmer Amaranth Control  
 Trial ID: Milo4-19 Location: Field #36 Trial Year: 2019  
 Protocol ID: Milo4-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	Crop Type, Code		AMAPA C -	IPOSS C -	AMAPA C -	IPOSS C -
Description		PalmerAm	Mornlry	PalmerAm	Mornlry	
Rating Type		Control %	Control %	Control %	Control %	
Rating Unit		08/04/19	08/04/19	09/01/19	09/01/19	
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Sorghum Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	60.0 de
2	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.19 lb ai/a 1 lb ai/a	PRE PRE	A A	70.0 cd
3	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L Callisto.....mesotrione	7.64 E 4 L 4 SC	1.19 lb ai/a 1 lb ai/a 0.125 lb ai/a	PRE PRE PRE	A A A	83.5 ab
4	Sorghum Dual II Magnum..s-metolachlor Engenia.....dicamba Nonionic Surfactant	7.64 E 5 SL 100 L	1.19 lb ai/a 0.25 lb ae/a 0.25 % v/v	PRE 4 WAP B 4 WAP B	A	71.3 bcd
5	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Nonionic Surfactant	7.64 E 4 L 2.05 EC 0.3 1.75 4 L 100 L	1.19 lb ai/a 1 lb ai/a 0.208 lb ai/a 0.0304 0.178 0.75 lb ai/a 0.25 % v/v	PRE PRE 4 WAP B 4 WAP B 4 WAP B 4 WAP B	A A A A	72.5 bc
6	Sorghum Untreated Check				0.0 f	0.0 e
7	Soybean DT/RR Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	55.0 e
8	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin	7.64 E 75 DF	1.19 lb ai/a 0.188 lb ai/a	PRE PRE	A A	65.0 cde
9	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin Valor SX.....flumioxazin	7.64 E 75 DF 51 WG	1.19 lb ai/a 0.188 lb ai/a 0.064 lb ai/a	PRE PRE PRE	A A A	91.0 a
10	Soybean DT/RR Dual II Magnum..s-metolachlor Engenia.....dicamba Nonionic Surfactant	7.64 E 5 SL 100 L	1.19 lb ai/a 0.25 lb ae/a 0.25 % v/v	PRE 4 WAP B 4 WAP B	A	73.8 bc
11	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant	7.64 E 75 DF 2 L 4.5 AS 100 L	1.19 lb ai/a 0.188 lb ai/a 0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 4 WAP B 4 WAP B 4 WAP B	A A A A	68.8 cd

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2; Average=3,4

Pest Code	Crop Type, Code		AMAPA C - C	GLXMA	C GLXMA
Description		PalmerAm	Soybean	Soybean	
Rating Type		Control %	Yield lb/plot	Yield Bu/A	
Rating Unit		10/14/19	11/07/19	11/07/19	
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing Appl Code
1	Sorghum Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
2	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.19 lb ai/a 1 lb ai/a	PRE PRE	A A
3	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L Callisto.....mesotrione	7.64 E 4 L 4 SC	1.19 lb ai/a 1 lb ai/a 0.125 lb ai/a	PRE PRE PRE	A A A
4	Sorghum Dual II Magnum..s-metolachlor Engenia.....dicamba Nonionic Surfactant	7.64 E 5 SL 100 L	1.19 lb ai/a 0.25 lb ae/a 0.25 % v/v	PRE 4 WAP B 4 WAP B	A
5	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Nonionic Surfactant	7.64 E 4 L 2.05 EC 0.3 1.75 4 L 100 L	1.19 lb ai/a 1 lb ai/a 0.208 lb ai/a 0.0304 0.178 0.75 lb ai/a 0.25 % v/v	PRE PRE 4 WAP B 4 WAP B 4 WAP B 4 WAP B	A A A A A A
6	Sorghum Untreated Check				53.8 de
7	Soybean DT/RR Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
8	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin	7.64 E 75 DF	1.19 lb ai/a 0.188 lb ai/a	PRE PRE	A A
9	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin Valor SX.....flumioxazin	7.64 E 75 DF 51 WG	1.19 lb ai/a 0.188 lb ai/a 0.064 lb ai/a	PRE PRE PRE	A A A
10	Soybean DT/RR Dual II Magnum..s-metolachlor Engenia.....dicamba Nonionic Surfactant	7.64 E 5 SL 100 L	1.19 lb ai/a 0.25 lb ae/a 0.25 % v/v	PRE 4 WAP B 4 WAP B	A
11	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant	7.64 E 75 DF 2 L 4.5 AS 100 L	1.19 lb ai/a 0.188 lb ai/a 0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 4 WAP B 4 WAP B 4 WAP B	A A A A A

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2; Average=3,4

Pest Code Crop Type, Code		C SORVU						
Description		GrnSrghm						
Rating Type		Yield						
Rating Unit		Bu/A						
Rating Date		11/16/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Sorghum Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A			29.4 b
2	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.19 lb ai/a 1 lb ai/a	PRE PRE	A A			46.1 a
3	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L Callisto.....mesotrione	7.64 E 4 L 4 SC	1.19 lb ai/a 1 lb ai/a 0.125 lb ai/a	PRE PRE PRE	A A A			48.5 a
4	Sorghum Dual II Magnum..s-metolachlor Engenia.....dicamba Nonionic Surfactant	7.64 E 5 SL 100 L	1.19 lb ai/a 0.25 lb ae/a 0.25 % v/v	PRE 4 WAP B 4 WAP B	A			59.4 a
5	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L Huskie Premix ----pyrasulfotole ----bromoxynil Atrazine 4L Nonionic Surfactant	7.64 E 4 L 2.05 EC 0.3 1.75 4 L 100 L	1.19 lb ai/a 1 lb ai/a 0.208 lb ai/a 0.0304 0.178 0.75 lb ai/a 0.25 % v/v	PRE PRE 4 WAP B 4 WAP B 4 WAP B 4 WAP B	A A A A A A			54.6 a
6	Sorghum Untreated Check							28.1 b
7	Soybean DT/RR Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A			
8	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin	7.64 E 75 DF	1.19 lb ai/a 0.188 lb ai/a	PRE PRE	A A			
9	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin Valor SX.....flumioxazin	7.64 E 75 DF 51 WG	1.19 lb ai/a 0.188 lb ai/a 0.064 lb ai/a	PRE PRE PRE	A A A			
10	Soybean DT/RR Dual II Magnum..s-metolachlor Engenia.....dicamba Nonionic Surfactant	7.64 E 5 SL 100 L	1.19 lb ai/a 0.25 lb ae/a 0.25 % v/v	PRE 4 WAP B 4 WAP B	A			
11	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant	7.64 E 75 DF 2 L 4.5 AS 100 L	1.19 lb ai/a 0.188 lb ai/a 0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 4 WAP B 4 WAP B 4 WAP B	A A A A A			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2; Average=3,4

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm	IPOSS C - Mornglry	AMAPA C - PalmerAm	IPOSS C - Mornglry
Description		Control %	Control %	Control %	Control %
Rating Type					
Rating Unit					
Rating Date		08/04/19	08/04/19	09/01/19	09/01/19
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code	
12 Soybean DT/RR Untreated Check				0.0 f	0.0 e
LSD P=.05		12.26	9.79	23.22	18.53
Standard Deviation		8.49	6.75	15.98	12.72
CV		14.33	15.85	29.37	26.42
Replicate F		5.525	1.220	3.889	1.204
Replicate Prob(F)		0.0038	0.3216	0.0202	0.3288
Treatment F		47.447	109.051	14.011	24.313
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2; Average=3,4

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm	C GLXMA	C GLXMA
Description		Control %	Yield lb/plot	Yield Bu/A
Rating Type				
Rating Unit				
Rating Date	10/14/19	11/07/19	11/07/19	11/07/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Unit Appl Timing	Appl Code	
12 Soybean DT/RR Untreated Check		0.0 g	2.683 a	10.3 a
LSD P=.05		15.58	1.7494	6.73
Standard Deviation		10.79	1.1607	4.47
CV		17.45	33.94	33.94
Replicate F		6.575	5.744	5.744
Replicate Prob(F)		0.0015	0.0080	0.0080
Treatment F		29.129	2.135	2.135
Treatment Prob(F)		0.0001	0.1171	0.1171

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2; Average=3,4

## University of Delaware

Pest Code Crop Type, Code	C SORVU GrnSrghm Yield Bu/A 11/16/19
Description	
Rating Type	
Rating Unit	
Rating Date	
Trt Treatment No. Name	Form Form Conc Type Rate Rate Unit Appl Timing Appl Code
12 Soybean DT/RR Untreated Check	
LSD P=.05	15.15
Standard Deviation	10.06
CV	22.68
Replicate F	3.412
Replicate Prob(F)	0.0451
Treatment F	6.640
Treatment Prob(F)	0.0019

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2; Average=3,4

Comparison of Sorghum and Soybeans for Palmer Amaranth Control  
 Trial ID: Milo4-19 Location: Field #36 Trial Year: 2019  
 Protocol ID: Milo4-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code Crop Type, Code		AMAPA C - PalmerAm	IPOSS C - Mornglry	AMAPA C - PalmerAm	IPOSS C - Mornglry
Description		Control % 08/04/19	Control % 08/04/19	Control % 09/01/19	Control % 09/01/19
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
TABLE OF R MEANS					
Replicate 1		65.3	43.1	65.4	52.1
Replicate 2		55.4	42.9	48.8	46.7
Replicate 3		53.3	44.7	45.4	50.7
Replicate 4		62.8	39.6	58.0	43.2
TABLE OF A (Crop) MEANS					
1 Sorghum		59.5 a	49.7 a	63.0 a	58.3 a
2 Soybean DT/RR		58.9 a	35.4 b	45.8 b	38.1 b
LSD P=.05		5.56	3.82	9.09	7.16
Standard Deviation		9.47	6.47	15.39	12.11
CV		15.99	15.21	28.30	25.15
TABLE OF B (Herbicide Program) MEANS					
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	57.5 c
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	67.5 b
2 Atrazine 4L	4 L	1 lb ai/a	PRE	A	
3 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	87.3 a
3 Atrazine 4L	4 L	1 lb ai/a	PRE	A	
3 Callisto.....mesotrione	4 SC	0.125 lb ai/a	PRE	A	
4 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	72.5 b
4 Engenia.....dicamba	5 SL	0.25 lb ae/a	4 WAP	B	
4 Nonionic Surfactant	100 L	0.25 % v/v	4 WAP	B	
5 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	70.6 b
5 Atrazine 4L	4 L	1 lb ai/a	PRE	A	
5 Huskie Premix	2.05 EC	0.208 lb ai/a	4 WAP	B	
5 ----pyrasulfotole	0.3	0.0304			
5 ----bromoxynil	1.75	0.178			
5 Atrazine 4L	4 L	0.75 lb ai/a	4 WAP	B	
5 Nonionic Surfactant	100 L	0.25 % v/v	4 WAP	B	
6 Untreated Check		0.0 d	0.0 c	8.8 c	3.8 e
LSD P=.05		9.63	6.61	15.74	12.41
Standard Deviation		9.47	6.47	15.39	12.11
CV		15.99	15.21	28.30	25.15
TABLE OF A (Crop) B (Herbicide Program) MEANS					
1 Sorghum		60.0 a	0.7 e	53.8 a	36.7 a
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	
2 Soybean DT/RR		55.0 a	0.0 e	21.3 a	0.0 a
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	
1 Sorghum		70.0 a	72.4 b	56.3 a	66.7 a
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	
2 Atrazine 4L	4 L	1 lb ai/a	PRE	A	
2 Soybean DT/RR		65.0 a	37.5 d	33.3 a	40.0 a
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	
2 Atrazine 4L	4 L	1 lb ai/a	PRE	A	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		AMAPA C - C	GLXMA	C GLXMA
Description		PalmerAm	Soybean	Soybean
Rating Type		Control %	Yield lb/plot	Yield Bu/A
Rating Unit				
Rating Date		10/14/19	11/07/19	11/07/19
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code
TABLE OF R MEANS				
Replicate 1			70.3	
Replicate 2			56.0	
Replicate 3			54.1	
Replicate 4			66.8	
TABLE OF A (Crop) MEANS			77.5 a	
1 Sorghum				
2 Soybean DT/RR			46.1 b	
LSD P=.05			6.76	
Standard Deviation			11.50	
CV			18.61	
TABLE OF B (Herbicide Program) MEANS				
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
2 Atrazine 4L	4 L	1 lb ai/a	PRE	A
3 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
3 Atrazine 4L	4 L	1 lb ai/a	PRE	A
3 Callisto.....mesotrione	4 SC	0.125 lb ai/a	PRE	A
4 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
4 Engenia.....dicamba	5 SL	0.25 lb ae/a	4 WAP	B
4 Nonionic Surfactant	100 L	0.25 % v/v	4 WAP	B
5 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
5 Atrazine 4L	4 L	1 lb ai/a	PRE	A
5 Huskie Premix	2.05 EC	0.208 lb ai/a	4 WAP	B
5 ----pyrasulfotole	0.3	0.0304		
5 ----bromoxynil	1.75	0.178		
5 Atrazine 4L	4 L	0.75 lb ai/a	4 WAP	B
5 Nonionic Surfactant	100 L	0.25 % v/v	4 WAP	B
6 Untreated Check			26.9 d	
LSD P=.05			11.70	
Standard Deviation			11.50	
CV			18.61	
TABLE OF A (Crop) B (Herbicide Program) MEANS				
1 Sorghum			67.5 cd	.
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
2 Soybean DT/RR			20.0 f	2.560 a
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
1 Sorghum			79.3 abc	.
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
2 Atrazine 4L	4 L	1 lb ai/a	PRE	A
2 Soybean DT/RR			40.0 e	2.765 a
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
2 Atrazine 4L	4 L	1 lb ai/a	PRE	A

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code		C SORVU		
Crop Type, Code		GrnSrgm		
Description		Yield		
Rating Type		Bu/A		
Rating Unit				
Rating Date		11/16/19		
Trt Treatment No. Name	Form Conc Form Type Rate	Rate Unit Appl Timing Appl Code		
TABLE OF R MEANS				
Replicate 1				
Replicate 2				
Replicate 3				
Replicate 4				
TABLE OF A (Crop) MEANS				
1 Sorghum				
2 Soybean DT/RR				
LSD P=.05				
Standard Deviation				
CV				
TABLE OF B (Herbicide Program) MEANS				
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
2 Atrazine 4L	4 L	1 lb ai/a	PRE A	
3 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
3 Atrazine 4L	4 L	1 lb ai/a	PRE A	
3 Callisto.....mesotrione	4 SC	0.125 lb ai/a	PRE A	
4 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
4 Engenia.....dicamba	5 SL	0.25 lb ae/a	4 WAP B	
4 Nonionic Surfactant	100 L	0.25 % v/v	4 WAP B	
5 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
5 Atrazine 4L	4 L	1 lb ai/a	PRE A	
5 Huskie Premix	2.05 EC	0.208 lb ai/a	4 WAP B	
5 ----pyrasulfotole	0.3	0.0304		
5 ----bromoxynil	1.75	0.178		
5 Atrazine 4L	4 L	0.75 lb ai/a	4 WAP B	
5 Nonionic Surfactant	100 L	0.25 % v/v	4 WAP B	
6 Untreated Check				
LSD P=.05				
Standard Deviation				
CV				
TABLE OF A (Crop) B (Herbicide Program) MEANS				
1 Sorghum			29.4 a	
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
2 Soybean DT/RR			.	
1 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
1 Sorghum			46.1 a	
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
2 Atrazine 4L	4 L	1 lb ai/a	PRE A	
2 Soybean DT/RR			.	
2 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	
2 Atrazine 4L	4 L	1 lb ai/a	PRE A	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	IPOSS C -	AMAPA C -	IPOSS C -		
Description		PalmerAm	Mornlry	PalmerAm	Mornlry		
Rating Type		Control %	Control %	Control %	Control %		
Rating Unit		08/04/19	08/04/19	09/01/19	09/01/19		
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Sorghum						
3	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
3	Atrazine 4L		4 L	1 lb ai/a	PRE	A	
3	Callisto.....mesotrione		4 SC	0.125 lb ai/a	PRE	A	
2	Soybean DT/RR						
3	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
3	Atrazine 4L		4 L	1 lb ai/a	PRE	A	
3	Callisto.....mesotrione		4 SC	0.125 lb ai/a	PRE	A	
1	Sorghum						
4	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
4	Engenia.....dicamba		5 SL	0.25 lb ae/a	4 WAP	B	
4	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
2	Soybean DT/RR						
4	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
4	Engenia.....dicamba		5 SL	0.25 lb ae/a	4 WAP	B	
4	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
1	Sorghum						
5	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
5	Atrazine 4L		4 L	1 lb ai/a	PRE	A	
5	Huskie Premix		2.05 EC	0.208 lb ai/a	4 WAP	B	
5	----pyrasulfotole		0.3	0.0304			
5	----bromoxynil		1.75	0.178			
5	Atrazine 4L		4 L	0.75 lb ai/a	4 WAP	B	
5	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
2	Soybean DT/RR						
5	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
5	Atrazine 4L		4 L	1 lb ai/a	PRE	A	
5	Huskie Premix		2.05 EC	0.208 lb ai/a	4 WAP	B	
5	----pyrasulfotole		0.3	0.0304			
5	----bromoxynil		1.75	0.178			
5	Atrazine 4L		4 L	0.75 lb ai/a	4 WAP	B	
5	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
1	Sorghum						
6	Untreated Check						
0.0 a		0.0 e		17.5 a		7.5 a	
2	Soybean DT/RR						
6	Untreated Check						
0.0 a		0.0 e		0.0 a		0.0 a	
LSD P=.05		13.62		9.35		22.26	
Standard Deviation				9.47		6.47	
CV		15.99		15.21		15.39	
						28.30	
						25.15	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - C	GLXMA	C GLXMA						
Description	PalmerAm	Soybean	Soybean							
Rating Type	Control %	Yield lb/plot	Yield							
Rating Unit			Bu/A							
Rating Date	10/14/19	11/07/19	11/07/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Sorghum							86.0 ab	.	.
3	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A				
3	Atrazine 4L		4 L	1 lb ai/a	PRE	A				
3	Callisto.....mesotrione		4 SC	0.125 lb ai/a	PRE	A				
2	Soybean DT/RR						85.3 ab	4.068 a	15.7 a	
3	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A				
3	Atrazine 4L		4 L	1 lb ai/a	PRE	A				
3	Callisto.....mesotrione		4 SC	0.125 lb ai/a	PRE	A				
1	Sorghum						92.5 a	.	.	
4	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A				
4	Engenia.....dicamba		5 SL	0.25 lb ae/a	4 WAP	B				
4	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B				
2	Soybean DT/RR						75.0 bc	4.518 a	17.4 a	
4	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A				
4	Engenia.....dicamba		5 SL	0.25 lb ae/a	4 WAP	B				
4	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B				
1	Sorghum						86.3 ab	.	.	
5	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A				
5	Atrazine 4L		4 L	1 lb ai/a	PRE	A				
5	Huskie Premix		2.05 EC	0.208 lb ai/a	4 WAP	B				
5	----pyrasulfotole		0.3	0.0304						
5	----bromoxynil		1.75	0.178						
5	Atrazine 4L		4 L	0.75 lb ai/a	4 WAP	B				
5	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B				
2	Soybean DT/RR						56.3 de	3.930 a	15.1 a	
5	Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A				
5	Atrazine 4L		4 L	1 lb ai/a	PRE	A				
5	Huskie Premix		2.05 EC	0.208 lb ai/a	4 WAP	B				
5	----pyrasulfotole		0.3	0.0304						
5	----bromoxynil		1.75	0.178						
5	Atrazine 4L		4 L	0.75 lb ai/a	4 WAP	B				
5	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B				
1	Sorghum						53.8 de	.	.	
6	Untreated Check									
2	Soybean DT/RR						0.0 g	2.683 a	10.3 a	
6	Untreated Check									
LSD P=.05							16.55	1.7494	6.73	
Standard Deviation							11.50	1.1607	4.47	
CV							18.61	33.9357	33.94	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	C	SORVU				
Crop Type, Code	GrnSrgmh					
Description	Yield					
Rating Type	Bu/A					
Rating Unit						
Rating Date	11/16/19					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1 Sorghum						
3 Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
3 Atrazine 4L		4 L	1 lb ai/a	PRE	A	
3 Callisto.....mesotrione		4 SC	0.125 lb ai/a	PRE	A	
2 Soybean DT/RR						48.5 a
3 Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
3 Atrazine 4L		4 L	1 lb ai/a	PRE	A	
3 Callisto.....mesotrione		4 SC	0.125 lb ai/a	PRE	A	
1 Sorghum						59.4 a
4 Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
4 Engenia.....dicamba		5 SL	0.25 lb ae/a	4 WAP	B	
4 Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
2 Soybean DT/RR						.
4 Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
4 Engenia.....dicamba		5 SL	0.25 lb ae/a	4 WAP	B	
4 Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
1 Sorghum						54.6 a
5 Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
5 Atrazine 4L		4 L	1 lb ai/a	PRE	A	
5 Huskie Premix		2.05 EC	0.208 lb ai/a	4 WAP	B	
5 ----pyrasulfotole		0.3	0.0304			
5 ----bromoxynil		1.75	0.178			
5 Atrazine 4L		4 L	0.75 lb ai/a	4 WAP	B	
5 Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
2 Soybean DT/RR						.
5 Dual II Magnum..s-metolachlor	7.64 E		1.19 lb ai/a	PRE	A	
5 Atrazine 4L		4 L	1 lb ai/a	PRE	A	
5 Huskie Premix		2.05 EC	0.208 lb ai/a	4 WAP	B	
5 ----pyrasulfotole		0.3	0.0304			
5 ----bromoxynil		1.75	0.178			
5 Atrazine 4L		4 L	0.75 lb ai/a	4 WAP	B	
5 Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
1 Sorghum						28.1 a
6 Untreated Check						
2 Soybean DT/RR						.
6 Untreated Check						
LSD P=.05						15.15
Standard Deviation						10.06
CV						22.68

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Control % 08/04/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	41772.479167				
R	3	1194.562500	398.187500	4.440	0.0100	
A	1	4.687500	4.687500	0.052	0.8206	5.6
B	5	37365.104167	7473.020833	83.323	0.0001	9.6
AB	5	248.437500	49.687500	0.554	0.7342	13.6
ERROR	33	2959.687500	89.687500			

FACTORIAL/POOLED ERROR AOV For IPOSS C Morngly Control % 08/04/19 Missing values in column 2 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	56067.673031				
R	3	166.688716	55.562905	1.325	0.2845	
A	1	2458.751633	2458.751633	58.652	0.0001	3.8
B	5	48664.314408	9732.862882	232.172	0.0001	6.6
AB	5	3520.288572	704.057714	16.795	0.0001	9.4
ERROR	30	1257.629702	41.920990			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Control % 09/01/19 Missing values in column 3 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	43	49185.629630				
R	3	2977.814815	992.604938	4.190	0.0140	
A	1	3559.259259	3559.259259	15.024	0.0006	9.1
B	5	33758.518519	6751.703704	28.501	0.0001	15.7
AB	5	2020.018519	404.003704	1.705	0.1649	22.3
ERROR	29	6870.018519	236.897190			

FACTORIAL/POOLED ERROR AOV For IPOSS C Morngly Control % 09/01/19 Missing values in column 4 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	42	47979.108796				
R	3	584.432870	194.810957	1.327	0.2853	
A	1	4900.520833	4900.520833	33.391	0.0001	7.2
B	5	37178.067130	7435.613426	50.665	0.0001	12.4
AB	5	1206.770833	241.354167	1.645	0.1810	17.5
ERROR	28	4109.317130	146.761326			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Control % 10/14/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	43959.312500				
R	3	2296.062500	765.354167	5.785	0.0027	
A	1	11875.520833	11875.520833	89.766	0.0001	6.8
B	5	21512.187500	4302.437500	32.522	0.0001	11.7
AB	5	3909.854167	781.970833	5.911	0.0005	16.5
ERROR	33	4365.687500	132.293561			

Randomized Complete Block (RCB) AOV For C GLXMA Soybean Yield lb/plot 11/07/19 Missing factor A levels prevents analyzing column 6 as Split-Plot design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	57.814296			
Replicate	3	23.218946	7.739649	5.744	0.0080
Treatment	5	14.385571	2.877114	2.135	0.1171
ERROR	15	20.209779	1.347319		

Randomized Complete Block (RCB) AOV For C GLXMA Soybean Yield Bu/A 11/07/19 Missing factor A levels prevents analyzing column 7 as Split-Plot design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	856.839776			
Replicate	3	344.117593	114.705864	5.744	0.0080
Treatment	5	213.202100	42.640420	2.135	0.1171
ERROR	15	299.520082	19.968005		

Randomized Complete Block (RCB) AOV For C SORVU GrnSrgm Yield Bu/A 11/16/19 Missing factor A levels prevents analyzing column 10 as Split-Plot design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	5908.297130			
Replicate	3	1034.928637	344.976212	3.412	0.0451
Treatment	5	3356.803296	671.360659	6.640	0.0019
ERROR	15	1516.565197	101.104346		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Burndown for Cereal Rye

Trial ID: Cover1-19

Location: REC Fld #32

Trial Year: 2019

Protocol ID: Cover1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Syngenta

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 04/17/19

Initiation Date: 03/01/19

Completion Date: 10/06/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C SECCE Secale cereale Rye

Entry Date: 10/10/19

Variety: VNS

Attributes: For Cover-crop

Planting Date: 10/17/18

Planting Rate: 120 LB/A

Depth: 0.75 IN

Rows per Plot: 16

Planting Method: DRILLE drilled

Row Spacing: 7 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 64 F

Soil Moisture: NORMAL normal, adequate

Crop 2: C GLXMA Glycine max Soybean

Entry Date: 10/10/19

Variety: S43SX27

Attributes: Xtend

Planting Date: 06/03/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 73 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 06/09/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 21 Tillage Type: NOTILL no-till

Replications: 3 Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 36

% Sand: 77 % OM: 1.3 Texture: SL sandy loam

% Silt: 12 pH: 6.5 Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11 CEC: 5.1 Fert. Level: G good

Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	04/18/19	05/02/19	05/16/19
Appl. Stop Time	12:30 PM	11:55 AM	02:50 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	Jointing	Boot	HeadEm
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Appl. Entry Date	05/22/19	05/22/19	05/21/19
Air Temperature Start, Stop	79 79 F	79 81 F	71 73 F
% Relative Humidity Start, Stop	52 52	65 62	51 50
Wind Velocity+Dir. Start	7 mph SSW	3 mph	7 mph W
Wind Velocity+Dir. Stop	7 mph SSW	8 mph S	8 mph W
Wind Velocity+Dir. Max	7 mph SSW	8 mph S	8 mph W
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	71 F	74 F	72 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	64	9	28
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.25 IN	1.83 IN	0.02 IN

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	SECCE BCER	SECCE BCER	SECCE BCER
Crop 2 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-52	-38	-24

**Application Equipment**

	A	B	C
Appl. Equipment	Tractr6Nozl	Tractr6Nozl	Tractr6Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in
Boom Length	10 ft	10 ft	10 ft
Boom Height	18 in	18 in	18 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/17/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

## Trial Comments

05/07/19: % kill count on Rye

Rye biomass (0.5m<sup>2</sup> = 4 rows x 28 inches) taken on 4/22, on 5/02 at boot stage, and on 5/15 at termination timing.

Burndown for Cereal Rye Trial ID: Cover1-19 Protocol ID: Cover1-19		Location: REC Fld #32 Investigator: Mark VanGessel Study Director: Sponsor Contact: Syngenta		Trial Year: 2019			
Crop Type, Code		C SECCE	C SECCE	C SECCE			
Description		Control %	Control %	Control %			
Rating Type		05/07/19	05/21/19	05/29/19			
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code		
1	Gramoxone 3SL...paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Jointing	3 SL 100 L	0.75 lb ai/a 0.25 % v/v	Jointing A Jointing A	89.0 de	89.3 c	82.7 b
2	Gramoxone 3SL...paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Boot	3 SL 100 L	0.75 lb ai/a 0.25 % v/v	Boot Boot	89.3 cde	95.7 abc	99.0 a
3	Gramoxone 3SL...paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Head Emergence	3 SL 100 L	0.75 lb ai/a 0.25 % v/v	HeadEm C HeadEm C		95.7 abc	99.0 a
4	Gramoxone 3SL...paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Jointing	3 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Jointing A Jointing A Jointing A	99.0 a	99.0 a	99.0 a
5	Gramoxone 3SL...paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Boot	3 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Boot B Boot B Boot B	94.0 bc	96.3 abc	99.0 a
6	Gramoxone 3SL...paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Head Emergence	3 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	HeadEm C HeadEm C HeadEm C		92.3 abc	97.0 a
7	Gramoxone 3SL...paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Jointing	3 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Jointing A Jointing A Jointing A	97.7 ab	99.0 a	97.7 a
8	Gramoxone 3SL...paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Boot	3 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Boot B Boot B Boot B	91.0 cd	96.3 abc	96.7 a
9	Gramoxone 3SL...paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Head Emergence	3 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	HeadEm C HeadEm C HeadEm C		94.7 abc	96.3 a
10	Roundup PowerMax..glyphosate Dry Ammonium Sulfate No Added Herbicide Cereal stage - Jointing	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	Jointing A Jointing A	99.0 a	99.0 a	99.0 a
11	Roundup PowerMax..glyphosate Dry Ammonium Sulfate No Added Herbicide Cereal stage - Boot	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	Boot B Boot B	66.7 f	97.7 ab	99.0 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2

Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C SECCE	DryWght g/0.5m <sup>2</sup>	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Gramoxone 3SL...paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Jointing	3 SL 100 L	0.75 lb ai/a 0.25 % v/v	Jointing	A		
2	Gramoxone 3SL...paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Boot	3 SL 100 L	0.75 lb ai/a 0.25 % v/v	Boot	B		
3	Gramoxone 3SL...paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Head Emergence	3 SL 100 L	0.75 lb ai/a 0.25 % v/v	HeadEm	C		
4	Gramoxone 3SL...paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Jointing	3 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Jointing	A		
5	Gramoxone 3SL...paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Boot	3 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Boot	B		
6	Gramoxone 3SL...paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Head Emergence	3 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	HeadEm	C		
7	Gramoxone 3SL...paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Jointing	3 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Jointing	A		
8	Gramoxone 3SL...paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Boot	3 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Boot	B		
9	Gramoxone 3SL...paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Head Emergence	3 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	HeadEm	C		
10	Roundup PowerMax..glyphosate Dry Ammonium Sulfate No Added Herbicide Cereal stage - Jointing	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	Jointing	A		42.3 b
11	Roundup PowerMax..glyphosate Dry Ammonium Sulfate No Added Herbicide Cereal stage - Boot	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	Boot	B		97.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2

## University of Delaware

Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C SECCE	C SECCE	C SECCE
					Control %	Control %	Control %
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
12 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	HeadEm C				89.3 c
Dry Ammonium Sulfate	100 D	1.02 % w/v	HeadEm C				99.0 a
No Added Herbicide							
Cereal stage - Head Emergence							
13 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				99.0 a
Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A				99.0 a
Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A				
Cereal stage - Jointing							
14 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Boot B				85.0 e
Dry Ammonium Sulfate	100 D	1.02 % w/v	Boot B				97.0 ab
Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Boot B				99.0 a
Cereal stage - Boot							
15 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	HeadEm C				91.7 bc
Dry Ammonium Sulfate	100 D	1.02 % w/v	HeadEm C				99.0 a
Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	HeadEm C				
Cereal stage - Head Emergence							
16 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				99.0 a
Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A				98.3 ab
Atrazine 4L	4 L	1.5 lb ai/a	Jointing A				99.0 a
Cereal stage - Jointing							
17 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Boot B				46.7 g
Dry Ammonium Sulfate	100 D	1.02 % w/v	Boot B				97.7 ab
Atrazine 4L	4 L	1.5 lb ai/a	Boot B				99.0 a
Cereal stage - Boot							
18 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	HeadEm C				81.0 d
Dry Ammonium Sulfate	100 D	1.02 % w/v	HeadEm C				99.0 a
Atrazine 4L	4 L	1.5 lb ai/a	HeadEm C				
Cereal stage - Head Emergence							
19 Cereal stage - Boot							99.0 a
Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Boot B				93.0 bcd
Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	Boot B				
Nonionic Surfactant	100 L	0.25 % v/v	Boot B				
20 Cereal stage - Head Emergence							99.0 a
Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	HeadEm C				95.7 abc
Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	HeadEm C				
Nonionic Surfactant	100 L	0.25 % v/v	HeadEm C				
21 Untreated Check					0.0 h	0.0 e	0.0 c
LSD P=.05					4.81	7.15	3.01
Standard Deviation					2.87	4.33	1.82
CV					3.49	4.78	1.96
Replicate F					1.047	0.430	3.305
Replicate Prob(F)					0.3654	0.6534	0.0469
Treatment F					282.938	72.002	423.017
Treatment Prob(F)					0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2

## University of Delaware

Crop Type, Code Description Rating Type Rating Unit Rating Date		C SECCE DryWght g/0.5m <sup>2</sup>					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
12	Roundup PowerMax..glyphosate Dry Ammonium Sulfate No Added Herbicide Cereal stage - Head Emergence	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	HeadEm C			120.3 a
13	Roundup PowerMax..glyphosate Dry Ammonium Sulfate Valor SX.....flumioxazin Cereal stage - Jointing	4.5 AS 100 D 51 WG	1.13 lb ae/a 1.02 % w/v 0.096 lb ai/a	Jointing A			
14	Roundup PowerMax..glyphosate Dry Ammonium Sulfate Valor SX.....flumioxazin Cereal stage - Boot	4.5 AS 100 D 51 WG	1.13 lb ae/a 1.02 % w/v 0.096 lb ai/a	Boot	B	B	
15	Roundup PowerMax..glyphosate Dry Ammonium Sulfate Valor SX.....flumioxazin Cereal stage - Head Emergence	4.5 AS 100 D 51 WG	1.13 lb ae/a 1.02 % w/v 0.096 lb ai/a	HeadEm C			
16	Roundup PowerMax..glyphosate Dry Ammonium Sulfate Atrazine 4L Cereal stage - Jointing	4.5 AS 100 D 4 L	1.13 lb ae/a 1.02 % w/v 1.5 lb ai/a	Jointing A			
17	Roundup PowerMax..glyphosate Dry Ammonium Sulfate Atrazine 4L Cereal stage - Boot	4.5 AS 100 D 4 L	1.13 lb ae/a 1.02 % w/v 1.5 lb ai/a	Boot	B	B	
18	Roundup PowerMax..glyphosate Dry Ammonium Sulfate Atrazine 4L Cereal stage - Head Emergence	4.5 AS 100 D 4 L	1.13 lb ae/a 1.02 % w/v 1.5 lb ai/a	HeadEm C			
19	Cereal stage - Boot Gramoxone 3SL...paraquat Metribuzin.....metribuzin Nonionic Surfactant	3 SL 75 DF 100 L	0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	Boot	B	B	
20	Cereal stage - Head Emergence Gramoxone 3SL...paraquat Metribuzin.....metribuzin Nonionic Surfactant	3 SL 75 DF 100 L	0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	HeadEm C			
21	Untreated Check						
LSD P=.05							36.63
Standard Deviation							16.16
CV							18.67
Replicate F							0.155
Replicate Prob(F)							0.8614
Treatment F							18.415
Treatment Prob(F)							0.0096

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2

Burndown for Cereal Rye Trial ID: Cover1-19 Protocol ID: Cover1-19		Location: REC Fld #32 Investigator: Mark VanGessel Study Director: Sponsor Contact: Syngenta		Trial Year: 2019		
Crop Type, Code Description Rating Type Rating Unit Rating Date				C SECCE Control % 05/07/19	C SECCE Control % 05/21/19	C SECCE Control % 05/29/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Unit	Appl Timing	Appl Code		
TABLE OF R MEANS						
Replicate 1				88.5	94.3	96.7
Replicate 2				88.3	95.6	97.8
Replicate 3				87.0	94.9	98.4
TABLE OF A (Non-selective) MEANS						
1 Gramoxone 3SL...paraquat 1 Nonionic Surfactant	3 SL 100 L	0.75 lb ai/a 0.25 % v/v	Jointing A	93.3 a	95.4 a	96.3 b
2 Roundup PowerMax..glyphosate 2 Dry Ammonium Sulfate	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	Jointing A	82.6 b	94.5 a	99.0 a
LSD P=.05				1.74	2.60	1.08
Standard Deviation				3.08	4.69	1.95
CV				3.50	4.94	2.00
TABLE OF B (Additional herbicides) MEANS						
1 No Added Herbicide				86.0 b	94.4 a	96.3 b
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A	94.3 a	95.9 a	98.7 a
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A	83.6 c	94.5 a	97.9 a
LSD P=.05				2.13	3.18	1.32
Standard Deviation				3.08	4.69	1.95
CV				3.50	4.94	2.00
TABLE OF C (Rye Stage) MEANS						
1 Cereal stage - Jointing				97.1 a	97.3 a	96.1 b
2 Cereal stage - Boot				78.8 b	96.8 a	98.6 a
3 Cereal stage - Head Emergence				.	90.8 b	98.2 a
LSD P=.05				2.13	3.18	1.32
Standard Deviation				3.08	4.69	1.95
CV				3.50	4.94	2.00
TABLE OF A (Non-selective) B (Additional herbicides) MEANS						
1 Gramoxone 3SL...paraquat 1 Nonionic Surfactant 1 No Added Herbicide	3 SL 100 L	0.75 lb ai/a 0.25 % v/v	Jointing A	89.2 c	93.6 a	93.6 c
2 Roundup PowerMax..glyphosate 2 Dry Ammonium Sulfate 1 No Added Herbicide	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	Jointing A	82.8 d	95.3 a	99.0 a
1 Gramoxone 3SL...paraquat 1 Nonionic Surfactant 2 Valor SX.....flumioxazin	3 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Jointing A	96.5 a	95.9 a	98.3 ab
2 Roundup PowerMax..glyphosate 2 Dry Ammonium Sulfate 2 Valor SX.....flumioxazin	4.5 AS 100 D 51 WG	1.13 lb ae/a 1.02 % w/v 0.096 lb ai/a	Jointing A	92.0 bc	95.9 a	99.0 a
1 Gramoxone 3SL...paraquat 1 Nonionic Surfactant 3 Atrazine 4L	3 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Jointing A	94.3 ab	96.7 a	96.9 b
2 Roundup PowerMax..glyphosate 2 Dry Ammonium Sulfate 3 Atrazine 4L	4.5 AS 100 D 4 L	1.13 lb ae/a 1.02 % w/v 1.5 lb ai/a	Jointing A	72.8 e	92.3 a	99.0 a
LSD P=.05				3.01	4.50	1.87

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C SECCE	DryWght g/0.5m <sup>2</sup>	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
<b>TABLE OF R MEANS</b>							
Replicate 1							
Replicate 2							
Replicate 3							
<b>TABLE OF A (Non-selective) MEANS</b>							
1 Gramoxone 3SL...paraquat		3 SL		0.75 lb ai/a	Jointing A		
1 Nonionic Surfactant		100 L		0.25 % v/v	Jointing A		
2 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	Jointing A		
2 Dry Ammonium Sulfate		100 D		1.02 % w/v	Jointing A		
LSD P=.05							
Standard Deviation							
CV							
<b>TABLE OF B (Additional herbicides) MEANS</b>							
1 No Added Herbicide							
2 Valor SX.....flumioxazin		51 WG		0.096 lb ai/a	Jointing A		
3 Atrazine 4L		4 L		1.5 lb ai/a	Jointing A		
LSD P=.05							
Standard Deviation							
CV							
<b>TABLE OF C (Rye Stage) MEANS</b>							
1 Cereal stage - Jointing							
2 Cereal stage - Boot							
3 Cereal stage - Head Emergence							
LSD P=.05							
Standard Deviation							
CV							
<b>TABLE OF A (Non-selective) B (Additional herbicides) MEANS</b>							
1 Gramoxone 3SL...paraquat		3 SL		0.75 lb ai/a	Jointing A		
1 Nonionic Surfactant		100 L		0.25 % v/v	Jointing A		
1 No Added Herbicide							
2 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	Jointing A		
2 Dry Ammonium Sulfate		100 D		1.02 % w/v	Jointing A		
1 No Added Herbicide							
1 Gramoxone 3SL...paraquat		3 SL		0.75 lb ai/a	Jointing A		
1 Nonionic Surfactant		100 L		0.25 % v/v	Jointing A		
2 Valor SX.....flumioxazin		51 WG		0.096 lb ai/a	Jointing A		
2 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	Jointing A		
2 Dry Ammonium Sulfate		100 D		1.02 % w/v	Jointing A		
2 Valor SX.....flumioxazin		51 WG		0.096 lb ai/a	Jointing A		
1 Gramoxone 3SL...paraquat		3 SL		0.75 lb ai/a	Jointing A		
1 Nonionic Surfactant		100 L		0.25 % v/v	Jointing A		
3 Atrazine 4L		4 L		1.5 lb ai/a	Jointing A		
2 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	Jointing A		
2 Dry Ammonium Sulfate		100 D		1.02 % w/v	Jointing A		
3 Atrazine 4L		4 L		1.5 lb ai/a	Jointing A		
LSD P=.05							

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Type, Code Description Rating Type Rating Unit Rating Date	Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Unit	Appl Timing Appl Code	C SECCE Control % 05/07/19	C SECCE Control % 05/21/19	C SECCE Control % 05/29/19
Standard Deviation					3.08	4.69	1.95
CV					3.50	4.94	2.00
TABLE OF A (Non-selective) C (Rye Stage) MEANS							
1 Gramoxone 3SL...paraquat		3 SL	0.75 lb ai/a	Jointing A	95.2 b	95.8 ab	93.1 b
1 Nonionic Surfactant		100 L	0.25 % v/v	Jointing A			
1 Cereal stage - Jointing							
2 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	Jointing A	99.0 a	98.8 a	99.0 a
2 Dry Ammonium Sulfate	100 D		1.02 % w/v	Jointing A			
1 Cereal stage - Jointing							
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A		91.4 c	96.1 ab	98.2 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A				
2 Cereal stage - Boot							
2 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	Jointing A	66.1 d	97.4 ab	99.0 a
2 Dry Ammonium Sulfate	100 D		1.02 % w/v	Jointing A			
2 Cereal stage - Boot							
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A		.	94.2 b	97.4 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A				
3 Cereal stage - Head Emergence							
2 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	Jointing A	.	87.3 c	99.0 a
2 Dry Ammonium Sulfate	100 D		1.02 % w/v	Jointing A			
3 Cereal stage - Head Emergence							
LSD P=.05					3.01	4.50	1.87
Standard Deviation					3.08	4.69	1.95
CV					3.50	4.94	2.00
TABLE OF B (Additional herbicides) C (Rye Stage) MEANS							
1 No Added Herbicide					94.0 b	94.2 a	90.8 b
1 Cereal stage - Jointing							
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A		99.0 a	99.0 a	99.0 a
1 Cereal stage - Jointing							
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A		98.3 a	98.7 a	98.3 a
1 Cereal stage - Jointing							
1 No Added Herbicide					78.0 d	96.7 a	99.0 a
2 Cereal stage - Boot							
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A		89.5 c	96.7 a	99.0 a
2 Cereal stage - Boot							
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A		68.8 e	97.0 a	97.8 a
2 Cereal stage - Boot							
1 No Added Herbicide					.	92.5 a	99.0 a
3 Cereal stage - Head Emergence							
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A		.	92.0 a	98.0 a
3 Cereal stage - Head Emergence							
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A		.	87.8 a	97.7 a
3 Cereal stage - Head Emergence							
LSD P=.05					3.69	5.51	2.29
Standard Deviation					3.08	4.69	1.95
CV					3.50	4.94	2.00
TABLE OF A (Non-selective) B (Additional herbicides) C (Rye Stage) MEANS							

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Type, Code Description Rating Type Rating Unit Rating Date		C SECCE DryWght g/0.5m2
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Appl Appl Unit Timing Code
Standard Deviation CV		
TABLE OF A (Non-selective) C (Rye Stage) MEANS		
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a Jointing A
1 Nonionic Surfactant	100 L	0.25 % v/v Jointing A
1 Cereal stage - Jointing		
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a Jointing A
2 Dry Ammonium Sulfate	100 D	1.02 % w/v Jointing A
1 Cereal stage - Jointing		
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a Jointing A
1 Nonionic Surfactant	100 L	0.25 % v/v Jointing A
2 Cereal stage - Boot		
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a Jointing A
2 Dry Ammonium Sulfate	100 D	1.02 % w/v Jointing A
2 Cereal stage - Boot		
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a Jointing A
1 Nonionic Surfactant	100 L	0.25 % v/v Jointing A
3 Cereal stage - Head Emergence		
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a Jointing A
2 Dry Ammonium Sulfate	100 D	1.02 % w/v Jointing A
3 Cereal stage - Head Emergence		
LSD P=.05		
Standard Deviation		
CV		
TABLE OF B (Additional herbicides) C (Rye Stage) MEANS		
1 No Added Herbicide		
1 Cereal stage - Jointing		
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a Jointing A
1 Cereal stage - Jointing		
3 Atrazine 4L	4 L	1.5 lb ai/a Jointing A
1 Cereal stage - Jointing		
1 No Added Herbicide		
2 Cereal stage - Boot		
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a Jointing A
2 Cereal stage - Boot		
3 Atrazine 4L	4 L	1.5 lb ai/a Jointing A
2 Cereal stage - Boot		
1 No Added Herbicide		
3 Cereal stage - Head Emergence		
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a Jointing A
3 Cereal stage - Head Emergence		
3 Atrazine 4L	4 L	1.5 lb ai/a Jointing A
3 Cereal stage - Head Emergence		
LSD P=.05		
Standard Deviation		
CV		
TABLE OF A (Non-selective) B (Additional herbicides) C (Rye Stage) MEANS		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Type, Code Description Rating Type Rating Unit Rating Date	Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	C SECCE	C SECCE	C SECCE
							Control %	Control %	Control %
							05/07/19	05/21/19	05/29/19
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				89.0 bc	89.3 a	82.7 b
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
1 No Added Herbicide									
1 Cereal stage - Jointing									
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				99.0 a	99.0 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
1 No Added Herbicide									
1 Cereal stage - Jointing									
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				99.0 a	99.0 a	99.0 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A						
1 Cereal stage - Jointing									
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				99.0 a	99.0 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A						
1 Cereal stage - Jointing									
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				97.7 a	99.0 a	97.7 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A						
1 Cereal stage - Jointing									
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				99.0 a	98.3 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A						
1 Cereal stage - Jointing									
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				89.3 bc	95.7 a	99.0 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
1 No Added Herbicide									
2 Cereal stage - Boot									
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				66.7 d	97.7 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
1 No Added Herbicide									
2 Cereal stage - Boot									
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				94.0 ab	96.3 a	99.0 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A						
2 Cereal stage - Boot									
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				85.0 c	97.0 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A						
2 Cereal stage - Boot									
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				91.0 b	96.3 a	96.7 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A						
2 Cereal stage - Boot									
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				46.7 e	97.7 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A						
2 Cereal stage - Boot									
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				.	95.7 a	99.0 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
1 No Added Herbicide									
3 Cereal stage - Head Emergence									

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C SECCE	DryWght g/0.5m <sup>2</sup>	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a		Jointing A	.
1	Nonionic Surfactant	100 L		0.25 % v/v		Jointing A	.
1	No Added Herbicide						.
1	Cereal stage - Jointing						.
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		Jointing A	42.3 a
2	Dry Ammonium Sulfate	100 D		1.02 % w/v		Jointing A	.
1	No Added Herbicide						.
1	Cereal stage - Jointing						.
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a		Jointing A	.
1	Nonionic Surfactant	100 L		0.25 % v/v		Jointing A	.
2	Valor SX.....flumioxazin	51 WG		0.096 lb ai/a		Jointing A	.
1	Cereal stage - Jointing						.
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		Jointing A	.
2	Dry Ammonium Sulfate	100 D		1.02 % w/v		Jointing A	.
2	Valor SX.....flumioxazin	51 WG		0.096 lb ai/a		Jointing A	.
1	Cereal stage - Jointing						.
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a		Jointing A	.
1	Nonionic Surfactant	100 L		0.25 % v/v		Jointing A	.
3	Atrazine 4L	4 L		1.5 lb ai/a		Jointing A	.
1	Cereal stage - Jointing						.
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		Jointing A	.
2	Dry Ammonium Sulfate	100 D		1.02 % w/v		Jointing A	.
3	Atrazine 4L	4 L		1.5 lb ai/a		Jointing A	.
1	Cereal stage - Jointing						.
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a		Jointing A	.
1	Nonionic Surfactant	100 L		0.25 % v/v		Jointing A	.
1	No Added Herbicide						.
2	Cereal stage - Boot						.
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		Jointing A	97.0 a
2	Dry Ammonium Sulfate	100 D		1.02 % w/v		Jointing A	.
1	No Added Herbicide						.
2	Cereal stage - Boot						.
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a		Jointing A	.
1	Nonionic Surfactant	100 L		0.25 % v/v		Jointing A	.
2	Valor SX.....flumioxazin	51 WG		0.096 lb ai/a		Jointing A	.
2	Cereal stage - Boot						.
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		Jointing A	.
2	Dry Ammonium Sulfate	100 D		1.02 % w/v		Jointing A	.
2	Valor SX.....flumioxazin	51 WG		0.096 lb ai/a		Jointing A	.
2	Cereal stage - Boot						.
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a		Jointing A	.
1	Nonionic Surfactant	100 L		0.25 % v/v		Jointing A	.
3	Atrazine 4L	4 L		1.5 lb ai/a		Jointing A	.
2	Cereal stage - Boot						.
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		Jointing A	.
2	Dry Ammonium Sulfate	100 D		1.02 % w/v		Jointing A	.
3	Atrazine 4L	4 L		1.5 lb ai/a		Jointing A	.
2	Cereal stage - Boot						.
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a		Jointing A	.
1	Nonionic Surfactant	100 L		0.25 % v/v		Jointing A	.
1	No Added Herbicide						.
3	Cereal stage - Head Emergence						.

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Type, Code Description Rating Type Rating Unit Rating Date	Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	C SECCE	C SECCE	C SECCE
							Control % 05/07/19	Control % 05/21/19	Control % 05/29/19
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				.	89.3 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
1 No Added Herbicide									
3 Cereal stage - Head Emergence									
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				.	92.3 a	97.0 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A						
3 Cereal stage - Head Emergence									
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				.	91.7 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
2 Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	Jointing A						
3 Cereal stage - Head Emergence									
1 Gramoxone 3SL...paraquat	3 SL	0.75 lb ai/a	Jointing A				.	94.7 a	96.3 a
1 Nonionic Surfactant	100 L	0.25 % v/v	Jointing A						
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A						
3 Cereal stage - Head Emergence									
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Jointing A				.	81.0 a	99.0 a
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	Jointing A						
3 Atrazine 4L	4 L	1.5 lb ai/a	Jointing A						
3 Cereal stage - Head Emergence									
LSD P=.05							5.21	7.79	3.23
Standard Deviation							3.08	4.69	1.95
CV							3.50	4.94	2.00

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C SECCE	DryWght g/0.5m2	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	Jointing A		
2	Dry Ammonium Sulfate	100 D		1.02 % w/v	Jointing A		
1	No Added Herbicide						
3	Cereal stage - Head Emergence						
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a	Jointing A		
1	Nonionic Surfactant	100 L		0.25 % v/v	Jointing A		
2	Valor SX.....flumioxazin	51 WG		0.096 lb ai/a	Jointing A		
3	Cereal stage - Head Emergence						
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	Jointing A		
2	Dry Ammonium Sulfate	100 D		1.02 % w/v	Jointing A		
2	Valor SX.....flumioxazin	51 WG		0.096 lb ai/a	Jointing A		
3	Cereal stage - Head Emergence						
1	Gramoxone 3SL...paraquat	3 SL		0.75 lb ai/a	Jointing A		
1	Nonionic Surfactant	100 L		0.25 % v/v	Jointing A		
3	Atrazine 4L	4 L		1.5 lb ai/a	Jointing A		
3	Cereal stage - Head Emergence						
2	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	Jointing A		
2	Dry Ammonium Sulfate	100 D		1.02 % w/v	Jointing A		
3	Atrazine 4L	4 L		1.5 lb ai/a	Jointing A		
3	Cereal stage - Head Emergence						
LSD P=.05						36.63	
Standard Deviation						16.16	
CV						18.67	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For C SECCE Control % 05/07/19 Analysis will skip factor level C3 for column 1 - all C3 treatments are missing

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	8617.888889				
R	2	16.222222	8.111111	0.856	0.4385	
A	1	1045.444444	1045.444444	110.340	0.0001	1.7
B	2	750.722222	375.361111	39.617	0.0001	2.1
AB	2	522.388889	261.194444	27.567	0.0001	3.0
C	1	3025.000000	3025.000000	319.270	0.0001	2.1
AC	1	1906.777778	1906.777778	201.248	0.0001	3.0
BC	2	624.500000	312.250000	32.956	0.0001	3.7
ABC	2	518.388889	259.194444	27.356	0.0001	5.2
ERROR	22	208.444444	9.474747			

FACTORIAL/POOLED ERROR AOV For C SECCE Control % 05/21/19 Missing values in column 2 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	52	1869.441343				
R	2	16.000093	8.000046	0.364	0.6979	
A	1	9.753750	9.753750	0.443	0.5101	2.6
B	2	24.066759	12.033380	0.547	0.5839	3.2
AB	2	88.751944	44.375972	2.017	0.1491	4.5
C	2	470.583426	235.291713	10.695	0.0003	3.2
AC	2	251.957500	125.978750	5.726	0.0073	4.5
BC	4	142.305741	35.576435	1.617	0.1932	5.5
ABC	4	140.020556	35.005139	1.591	0.1998	7.8
ERROR	33	726.001574	22.000048			

FACTORIAL/POOLED ERROR AOV For C SECCE Control % 05/29/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	53	908.592593				
R	2	25.592593	12.796296	3.371	0.0462	
A	1	101.407407	101.407407	26.712	0.0001	1.1
B	2	54.037037	27.018519	7.117	0.0026	1.3
AB	2	54.037037	27.018519	7.117	0.0026	1.9
C	2	68.259259	34.129630	8.990	0.0007	1.3
AC	2	68.259259	34.129630	8.990	0.0007	1.9
BC	4	203.962963	50.990741	13.432	0.0001	2.3
ABC	4	203.962963	50.990741	13.432	0.0001	3.2
ERROR	34	129.074074	3.796296			

Randomized Complete Block (RCB) AOV For C SECCE DryWght g/0.5m2 Missing factor A levels prevents analyzing column 4 as Factorial design; Missing factor A2 B2 C1 levels prevents analyzing column 4 as Factorial design; Missing factor A2 B3 C1 levels prevents analyzing column 4 as Factorial design; Missing factor A2 B2 C2 levels prevents analyzing column 4 as Factorial design; Missing factor A2 B3 C2 levels prevents analyzing column 4 as Factorial design; Missing factor A2 B2 C3 levels prevents analyzing column 4 as Factorial design; Missing factor A2 B3 C3 levels prevents analyzing column 4 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	8	10742.222222			
Replicate	2	80.888889	40.444444	0.155	0.8614
Treatment	2	9616.888889	4808.444444	18.415	0.0096
ERROR	4	1044.444444	261.111111		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Rolled versus Standing Rye for Weed Suppression**

Trial ID: Cover8-19      Location: Georgetown DE      Trial Year: 2019  
 Protocol ID: Cover8-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Va Tech

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 Initiation Date: 08/01/18  
 Completion Date: 06/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C TRZAW Triticum aestivum Winter wheat

Crop 2: C SECCE Secale cereale Rye

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory

Pest 3 Type: W Code: AMBEL Ambrosia artemisiifolia  
 Common Name: Common ragweed

Artificial Population: X

**Site and Design**

Treated Plot Width: 4 m	Site Type: FIELD field	
Treated Plot Length: 6 m		
Treated Plot Area: 24 m <sup>2</sup>	Treatments: 14	Tillage Type: NOTILL no-till
Replications: 4		Study Design: SPLPLO Split-Plot

**Field Prep./Maintenance:**

A total preplant application of Roundup PowerMax (1 qt/A) + 2,4-D ester (1 pt/A) was made on 05/03/19.

**Soil Description**

Description Name: Field 32			
% Sand: 81	% OM: 1.1	Texture: LS	loamy sand
% Silt: 10	pH: 5.8	Soil Name: Hammonton loamy sand, 0-2% slopes	
% Clay: 9	CEC: 5.4	Fert. Level: G	good
Soil Drainage: F	fair		

**Application Description**

A	
Application Date	04/24/19
Appl. Stop Time	08:30 AM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROADC
Applied By	Q Johnson
Air Temperature Start, Stop	67 67 F
% Relative Humidity Start, Stop	73 73
Wind Velocity+Dir. Start	3 mph
Wind Velocity+Dir. Stop	3 mph
Wind Velocity+Dir. Max	3 mph
Wet Leaves (Y/N)	N no
Soil Temperature	64 F
Soil Moisture	NORMAL
% Cloud Cover	53
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.03 IN

**Crop Stage At Each Application**

A	
Crop 1 Code, BBCH Scale	TRZAW BCER
Crop 2 Code, BBCH Scale	SECCE BCER

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	AMAPA W
Pest 2 Code, Type, Scale	IPOSS W
Pest 3 Code, Type, Scale	AMBEL W

**Application Equipment**

A	
Appl. Equipment	Bckpck6Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	9 ft
Boom Height	40 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	04/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

## Rolled versus Standing Rye for Weed Suppression

Trial ID: Cover8-19      Location: Georgetown DE      Trial Year: 2019  
Protocol ID: Cover8-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: Va Tech

## Trial Comments

Planting dates for cover crops: October 4, October 25, and circa November 20

11/01/18: First planting had very good stand, although the 7th unit had no seed drop throughout the trial  
Second planting a few plants are spiking through.

04/22/19: Cover crop growth is not very good; appears to be N-deficient with poor tillering. Weed growth is heavy.

04/23/19: Light measurements below canopy can be compared between cover treatments but NOT to above canopy readings. Below canopy was not an accurate measurement of solar radiation.

04/24/19: Cover crop at burndown, early planting dates were: wheat 16-22 inches tall, boot stage. Rye 16-24 inches tall, early boot stage.

04/30/19: Light measurements taken starting 11:01 a.m.-11:26. Soil temp. taken 10:40 a.m. 20% cloud cover- clouds are light, wispy, but solid throughout. Weeds present at plots 103-13, 110-6, some weeds developed at 203-9, heavy weeds at 205-13. Plots 408 and 409- clouds rolled in when taking light readings.

05/02/19: Cover crop biomass taken.

05/07/19: Soil Temp taken start 10:55-11:15 a.m., Light measurements taken starting from 11:20-11:45 a.m., 60% cloud cover. Chickweed present at plot 104-9, heavy chickweed at 205-13.

05/15/19: Light measurements taken starting 11:15-11:35 a.m., Soil temp taken starting from 11:40-12:00 p.m., 10% cloud cover. Chickweed present at plot 103-13. Respective cover rolled with ZRX after light readings.

05/22/19: 1st time with rolled cover. 50% cloud cover- thin, and wispy, but solid over most of the sky. Soil Temp Start- 11:25 a.m. Light measurements Start- 11:45 a.m. End- 12:20 p.m.

05/23/19: Not enough consistent weeds to Rate- CEP scattered and barely any PANSY. Emerged summer annuals - data presented as present =1, absent = 0.

05/29/19: Start at 11:25 am and end at 11:55 am for both temp and light. 30% cloud cover, variable.

06/04/19: Both light measurements and soil temps taken at same time. Start at 11:30 am and end at 12:35 pm. Cloud cover 0%.

06/07/19: At biomass - plot 109 had heavy pigweed competition in ragweed area. plot 309 had heavy Palmer and morningglory competition at ragweed area. plot 312 had heavy Palmer at ragweed area. Deer feeding on some ragweed plants.

Rolled versus Standing Rye for Weed Suppression															
Trial ID: Cover8-19		Location: Georgetown DE		Trial Year: 2019											
Protocol ID: Cover8-19		Investigator: Mark VanGessel													
Study Director:		Sponsor Contact: Va Tech													
Pest Code	C - CovrCrop	C - CovrCrop	C - CovrCrop	C - CoverCrop	SOLCA C -	AMACH C - microplot	AMBEL C - microplot	IPOSS C - wholePlot							
Crop Type, Code					HorseNtl Control	SmthPgwd Pres / Abse	C.ragwd Pres / Abse	Mornlry Pres / Abse							
Crop Name															
Description	height	biomass													
Rating Type		dryweight	Control	Control											
Rating Unit	inches		%	%											
Rating Date	05/02/19	05/02/19	05/10/19	05/16/19	05/16/19	1 / 0	1 / 0	1 / 0	05/23/19						
Trt Treatment No. Name															
1 Rolled/Crimped mid-Sept (112 lbs/A) Cereal Rye	31.8 a	97.0 bcd	86.3 abc	99.5 a	97.3 a	0.8 a	1.0 a	0.5 bc							
2 Rolled/Crimped mid-Sept (112 lbs/A) Wheat	24.5 bc	138.3 a	83.8 c	100.0 a	93.0 ab	0.3 a	1.0 a	0.5 bc							
3 Rolled/Crimped mid-Oct (84 lbs/A) Cereal Rye	26.8 b	77.5 cde	90.0 a	100.0 a	95.0 a	0.8 a	1.0 a	0.8 ab							
4 Rolled/Crimped mid-Oct (84 lbs/A) Wheat	22.8 cd	99.5 bc	86.3 abc	99.5 a	92.0 ab	0.8 a	0.8 a	0.5 bc							
5 Rolled/Crimped mid-Nov (56 lbs/A) Cereal Rye	21.3 cde	54.0 e	90.0 a	100.0 a	92.3 ab	0.5 a	1.0 a	0.8 ab							
6 Rolled/Crimped mid-Nov (56 lbs/A) Wheat	15.8 f	63.3 de	88.8 ab	100.0 a	92.0 ab	0.5 a	1.0 a	0.8 ab							
7 Standing mid-Sept (112 lbs/A) Cereal Rye	33.5 a	120.5 ab	88.8 ab	99.3 a	90.0 ab	0.8 a	1.0 a	0.8 ab							
8 Standing mid-Sept (112 lbs/A) Wheat	24.5 bc	150.0 a	83.8 c	97.5 a	91.0 ab	1.0 a	1.0 a	1.0 a							
9 Standing mid-Oct (84 lbs/A) Cereal Rye	27.3 b	72.8 cde	90.0 a	98.8 a	90.8 ab	0.8 a	1.0 a	1.0 a							
10 Standing mid-Oct (84 lbs/A) Wheat	20.0 de	82.3 cde	84.5 bc	99.3 a	90.3 ab	1.0 a	1.0 a	1.0 a							
11 Standing mid-Nov (56 lbs/A) Cereal Rye	22.8 cd	60.3 e	85.0 bc	98.3 a	92.8 ab	1.0 a	1.0 a	0.8 ab							
12 Standing mid-Nov (56 lbs/A) Wheat	17.8 ef	70.0 cde	84.5 bc	100.0 a	83.8 b	1.0 a	1.0 a	1.0 a							
13 No Cover Crop					60.5	1.0	1.0	0.8							

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Crop Name Description Rating Type Rating Unit Rating Date	AMASS C - 1WA roll PigwdSp Control % (plot) 05/30/19	AMBEL C - 1WA roll C.ragwd Control % (micro) 05/30/19	AMBEL C - 1WA roll C.ragwd Count 1m2 # (micro) 05/30/19	AMASS C - 2WA roll PigwdSp Control % 06/06/19	AMASS C - 2WA roll PigwdSp density #/1m2 06/07/19	AMASS C - 2WA roll PigwdSp dryweight g/1m2 06/07/19	IPOSS C - 2WA roll Mornlry density #/1m2 06/07/19	IPOSS C - 2WA roll Mornlry dryweight g/1m2 06/07/19
Trt Treatment No. Name								
1 Rolled/Crimped mid-Sept (112 lbs/A) Cereal Rye	61.0 ab	12.5 cd	9.8 a	30.8 bc	58.3 a	13.5380 a	12.8 bcd	2.3015 bcd
2 Rolled/Crimped mid-Sept (112 lbs/A) Wheat	48.8 bc	18.8 bcd	9.0 a	18.8 b-e	36.8 a	9.5560 a	18.8 abc	2.3143 bcd
3 Rolled/Crimped mid-Oct (84 lbs/A) Cereal Rye	30.0 cd	25.0 bc	7.8 a	10.0 cde	34.5 a	9.1913 a	11.3 cd	1.6033 bcd
4 Rolled/Crimped mid-Oct (84 lbs/A) Wheat	22.5 d	3.8 d	7.8 a	20.0 b-e	84.3 a	12.9698 a	18.3 abc	1.3995 bcd
5 Rolled/Crimped mid-Nov (56 lbs/A) Cereal Rye	27.5 cd	18.8 bcd	8.8 a	8.3 cde	63.8 a	17.0758 a	11.0 cd	1.0065 cd
6 Rolled/Crimped mid-Nov (56 lbs/A) Wheat	21.3 de	16.3 cd	10.0 a	10.0 cde	56.5 a	15.8315 a	10.5 cd	1.4123 bcd
7 Standing mid-Sept (112 lbs/A) Cereal Rye	70.3 a	50.0 a	5.3 a	60.0 a	19.3 a	7.5043 a	24.8 a	5.2840 a
8 Standing mid-Sept (112 lbs/A) Wheat	58.8 ab	45.0 a	6.0 a	38.8 ab	103.0 a	13.3600 a	15.3 bcd	1.2745 bcd
9 Standing mid-Oct (84 lbs/A) Cereal Rye	22.0 d	33.3 ab	7.5 a	23.8 bcd	65.0 a	13.0050 a	20.5 ab	2.8265 b
10 Standing mid-Oct (84 lbs/A) Wheat	35.0 cd	27.5 bc	8.8 a	38.8 ab	30.8 a	6.7315 a	15.3 bcd	2.4568 bc
11 Standing mid-Nov (56 lbs/A) Cereal Rye	0.0 e	6.3 d	9.8 a	5.0 de	79.0 a	12.1430 a	8.0 d	0.6998 d
12 Standing mid-Nov (56 lbs/A) Wheat	28.8 cd	5.0 d	9.5 a	20.8 b-e	94.3 a	14.1595 a	7.5 d	1.2950 bcd
13 No Cover Crop	0.0	0.0	10.0	0.0	50.0	13.2080	9.5	1.5438

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Crop Name Description Rating Type Rating Unit Rating Date	AMBEL C - 2WA roll C.ragwd density #/0.5m <sup>2</sup> 06/07/19	AMBEL C - 2WA roll C.ragwd dryweight g/0.5m <sup>2</sup> 06/07/19	AMASS C - 3WA roll PigwdSp Control % 06/13/19	IPOSS C - 3WA roll Mornlry Control % 06/13/19
Trt Treatment No. Name				
1 Rolled/Crimped mid-Sept (112 lbs/A) Cereal Rye	9.8 a	1.2048 c	33.8 ab	16.3 a
2 Rolled/Crimped mid-Sept (112 lbs/A) Wheat	8.8 a	1.1725 c	27.0 a-d	13.3 a
3 Rolled/Crimped mid-Oct (84 lbs/A) Cereal Rye	5.8 a	1.4240 c	12.0 b-e	3.8 a
4 Rolled/Crimped mid-Oct (84 lbs/A) Wheat	6.3 a	1.3495 c	18.8 b-e	0.0 a
5 Rolled/Crimped mid-Nov (56 lbs/A) Cereal Rye	7.8 a	2.4910 abc	0.0 e	0.0 a
6 Rolled/Crimped mid-Nov (56 lbs/A) Wheat	10.3 a	3.8978 ab	8.8 cde	0.0 a
7 Standing mid-Sept (112 lbs/A) Cereal Rye	5.3 a	2.5973 abc	45.0 a	5.0 a
8 Standing mid-Sept (112 lbs/A) Wheat	6.3 a	2.0733 bc	30.0 abc	13.3 a
9 Standing mid-Oct (84 lbs/A) Cereal Rye	8.3 a	4.2030 a	17.5 b-e	5.0 a
10 Standing mid-Oct (84 lbs/A) Wheat	7.3 a	2.9740 abc	34.0 ab	10.0 a
11 Standing mid-Nov (56 lbs/A) Cereal Rye	10.3 a	3.7005 ab	5.0 de	5.0 a
12 Standing mid-Nov (56 lbs/A) Wheat	9.3 a	2.9095 abc	5.0 de	0.0 a
13 No Cover Crop	7.8	2.7408	0.0	0.0

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name	C - CovrCrop	C - CovrCrop	C - CovrCrop	C - CoverCrop	SOLCA C - HorseNtl Control	AMACH C - microplot SmthPgwd Pres / Abse	AMBEL C - microplot C.ragwd Pres / Abse	IPOSS C - wholePlot Mornlry Pres / Abse
Description Rating Type	height	biomass dryweight		Control	Control	HorseNtl Control	SmthPgwd Pres / Abse	C.ragwd Pres / Abse
Rating Unit Rating Date	inches 05/02/19	g/0.5m <sup>2</sup> 05/02/19	% 05/10/19	% 05/16/19	% 05/16/19	1 / 0 05/23/19	1 / 0 05/23/19	1 / 0 05/23/19
Trt Treatment No. Name								
14 Gramoxone SL....paraquat Crop Oil Concentrate					89.8	0.5	1.0	0.3
LSD P=.05	3.63	34.25	4.49	2.08	9.63	0.63	0.21	0.37
Comp. Trt. LSD	3.55	27.77	4.69	1.99	12.81	0.60	0.19	0.60
Standard Deviation	2.44	23.05	3.02	1.40	6.48	0.42	0.14	0.25
CV	10.15	25.49	3.48	1.41	7.26	56.66	14.7	34.15
Replicate F	5.058	4.635	6.481	3.177	15.810	1.187	0.857	7.905
Replicate Prob(F)	0.0103	0.0143	0.0036	0.0492	0.0001	0.3427	0.4811	0.0014
Treatment F	18.476	7.394	2.844	1.331	7.407	1.278	0.857	3.363
Treatment Prob(F)	0.0001	0.0001	0.0239	0.2851	0.0001	0.3087	0.6046	0.0093

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description Rating Type Rating Unit Rating Date	AMASS C - 1WA roll PigwdSp Control % (plot) 05/30/19	AMBEL C - 1WA roll C.ragwd Control % (micro) 05/30/19	AMBEL C - 1WA roll C.ragwd Count 1m2 # (micro) 05/30/19	AMASS C - 2WA roll PigwdSp Control density #/1m2 06/06/19	AMASS C - 2WA roll PigwdSp Control % 06/07/19	AMASS C - 2WA roll PigwdSp dryweight g/1m2 06/07/19	IPOSS C - 2WA roll Mornlry density #/1m2 06/07/19	IPOSS C - 2WA roll Mornlry dryweight g/1m2 06/07/19
Trt Treatment No. Name								
14 Gramoxone SL....paraquat Crop Oil Concentrate	31.3	12.5	9.5	0.0	75.5	15.8538	9.8	0.8320
LSD P=.05	21.34	16.90	4.01	22.87	71.11	9.16885	9.03	1.71774
Comp. Trt. LSD	28.75	22.98	4.75	24.86	71.96	9.26000	11.44	1.72678
Standard Deviation	14.36	11.37	2.70	15.39	47.87	6.17191	6.08	1.15628
CV	44.01	58.01	31.66	75.68	78.77	49.62	44.09	61.67
Replicate F	9.381	4.040	0.978	2.229	3.153	12.142	4.430	2.805
Replicate Prob(F)	0.0006	0.0233	0.4249	0.1198	0.0503	0.0001	0.0169	0.0692
Treatment F	8.489	7.104	1.224	4.930	1.083	1.024	2.898	4.093
Treatment Prob(F)	0.0001	0.0001	0.3385	0.0011	0.4284	0.4709	0.0191	0.0033

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	AMBEL	AMBEL	AMASS	IPOSS
Crop Type, Code	C -	C -	C -	C -
Crop Name	2WA roll	2WA roll	3WA roll	3WA roll
Description	C.ragwd	C.ragwd	PigwdSp	Morngrly
Rating Type	density	dryweight	Control	Control
Rating Unit	#/.5m <sup>2</sup>	g/.5m <sup>2</sup>	%	%
Rating Date	06/07/19	06/07/19	06/13/19	06/13/19
Trt Treatment No. Name				
14 Gramoxone SL....paraquat Crop Oil Concentrate	6.8	1.6778	10.0	12.5
LSD P=.05	5.18	1.89087	23.32	11.99
Comp. Trt. LSD	5.44	2.07514	23.73	16.65
Standard Deviation	3.49	1.27282	15.70	8.07
CV	44.6	51.78	89.07	134.47
Replicate F	5.376	2.747	0.529	0.012
Replicate Prob(F)	0.0081	0.0731	0.6680	0.9980
Treatment F	0.909	2.566	3.282	2.158
Treatment Prob(F)	0.5615	0.0327	0.0105	0.0655

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Rolled versus Standing Rye for Weed Suppression					
Trial ID: Cover8-19		Location: Georgetown DE		Trial Year: 2019	
Protocol ID: Cover8-19		Investigator: Mark VanGessel			
Study Director:				Sponsor Contact: Va Tech	
Pest Code		C - CovrCrop	C - CovrCrop	C - CovrCrop	C - CoverCrop
Crop Type, Code			biomass		
Crop Name					
Description		height	dryweight	Control	Control
Rating Type		inches	g/0.5m <sup>2</sup>	05/10/19	05/16/19
Rating Unit		05/02/19	05/02/19		
Rating Date					
Trt Treatment No. Name					
TABLE OF R MEANS					
Replicate 1		22.1	76.1	84.2	99.7
Replicate 2		23.5	80.9	89.6	100.0
Replicate 3		24.9	98.3	86.9	98.3
Replicate 4		25.7	106.5	86.5	99.3
TABLE OF A (Standing vs Rolled) MEANS					
1 Rolled/Crimped		23.8 a	88.3 a	87.5 a	99.8 a
2 Standing		24.3 a	92.6 a	86.1 a	98.8 b
LSD P=.05		1.45	11.34	1.92	0.81
Standard Deviation		2.47	19.31	3.26	1.39
CV		10.25	21.35	3.76	1.39
TABLE OF B (Planting Date) MEANS					
1 mid-Sept (112 lbs/A)		28.6 a	126.4 a	85.6 a	99.1 a
2 mid-Oct (84 lbs/A)		24.2 b	83.0 b	87.7 a	99.4 a
3 mid-Nov (56 lbs/A)		19.4 c	61.9 c	87.1 a	99.6 a
LSD P=.05		1.77	13.89	2.35	1.00
Standard Deviation		2.47	19.31	3.26	1.39
CV		10.25	21.35	3.76	1.39
TABLE OF C (Cover Crop) MEANS					
1 Cereal Rye		27.2 a	80.3 b	88.3 a	99.3 a
2 Wheat		20.9 b	100.5 a	85.3 b	99.4 a
LSD P=.05		1.45	11.34	1.92	0.81
Standard Deviation		2.47	19.31	3.26	1.39
CV		10.25	21.35	3.76	1.39
TABLE OF A (Standing vs Rolled) B (Planting Date) MEANS					
1 Rolled/Crimped		28.1 a	117.6 a	85.0 bc	99.8 a
1 mid-Sept (112 lbs/A)					
2 Standing		29.0 a	135.3 a	86.3 abc	98.4 a
1 mid-Sept (112 lbs/A)					
1 Rolled/Crimped		24.8 a	88.5 a	88.1 ab	99.8 a
2 mid-Oct (84 lbs/A)					
2 Standing		23.6 a	77.5 a	87.3 abc	99.0 a
2 mid-Oct (84 lbs/A)					
1 Rolled/Crimped		18.5 a	58.6 a	89.4 a	100.0 a
3 mid-Nov (56 lbs/A)					
2 Standing		20.3 a	65.1 a	84.8 c	99.1 a
3 mid-Nov (56 lbs/A)					
LSD P=.05		2.51	19.64	3.32	1.41
Standard Deviation		2.47	19.31	3.26	1.39

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code	SOLCA	AMACH	AMBEL
Crop Type, Code	C -	C -	C -
Crop Name	HorseNtl	microplot	microplot
Description		SmthPgwd	C.ragwd
Rating Type	Control	Pres / Abse	Pres / Abse
Rating Unit	%	1 / 0	1 / 0
Rating Date	05/16/19	05/23/19	05/23/19
Trt Treatment No. Name			
TABLE OF R MEANS			
Replicate 1	83.4	0.6	1.0
Replicate 2	91.6	0.8	1.0
Replicate 3	94.2	0.8	1.0
Replicate 4	97.5	0.8	0.9
TABLE OF A (Standing vs Rolled) MEANS			
1 Rolled/Crimped	93.6 a	0.6 b	1.0 a
2 Standing	89.8 a	0.9 a	1.0 a
LSD P=.05	3.83	0.25	0.08
Standard Deviation	6.53	0.43	0.14
CV	7.12	56.85	14.74
TABLE OF B (Planting Date) MEANS			
1 mid-Sept (112 lbs/A)	92.8 a	0.7 a	1.0 a
2 mid-Oct (84 lbs/A)	92.0 a	0.8 a	0.9 a
3 mid-Nov (56 lbs/A)	90.2 a	0.8 a	1.0 a
LSD P=.05	4.70	0.31	0.10
Standard Deviation	6.53	0.43	0.14
CV	7.12	56.85	14.74
TABLE OF C (Cover Crop) MEANS			
1 Cereal Rye	93.0 a	0.8 a	1.0 a
2 Wheat	90.3 a	0.8 a	1.0 a
LSD P=.05	3.83	0.25	0.08
Standard Deviation	6.53	0.43	0.14
CV	7.12	56.85	14.74
TABLE OF A (Standing vs Rolled) B (Planting Date) MEANS			
1 Rolled/Crimped	95.1 a	0.5 a	1.0 a
1 mid-Sept (112 lbs/A)			
2 Standing	90.5 a	0.9 a	1.0 a
1 mid-Sept (112 lbs/A)			
1 Rolled/Crimped	93.5 a	0.8 a	0.9 a
2 mid-Oct (84 lbs/A)			
2 Standing	90.5 a	0.9 a	1.0 a
2 mid-Oct (84 lbs/A)			
1 Rolled/Crimped	92.1 a	0.5 a	1.0 a
3 mid-Nov (56 lbs/A)			
2 Standing	88.3 a	1.0 a	1.0 a
3 mid-Nov (56 lbs/A)			
LSD P=.05	6.64	0.43	0.15
Standard Deviation	6.53	0.43	0.14

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Crop Name Description	IPOSS C - wholePlot Mornglry	AMASS C - 1WA roll PigwdSp	AMBEL C - 1WA roll C.ragwd	AMBEL C - 1WA roll C.ragwd
Rating Type Rating Unit Rating Date	Pres / Abse 1 / 0 05/23/19	Control % (plot) 05/30/19	Control % (micro) 05/30/19	Count 1m2 # (micro 05/30/19
Trt Treatment No. Name				
TABLE OF R MEANS				
Replicate 1	1.0	46.9	27.1	8.8
Replicate 2	0.7	42.1	24.8	7.8
Replicate 3	0.8	26.7	14.2	9.5
Replicate 4	0.7	26.3	21.3	7.1
TABLE OF A (Standing vs Rolled) MEANS				
1 Rolled/Crimped	0.6 b	35.2 a	15.8 b	8.8 a
2 Standing	0.9 a	35.8 a	27.8 a	7.8 a
LSD P=.05	0.25	11.79	9.49	1.63
Standard Deviation	0.42	20.08	16.15	2.78
CV	54.64	56.59	73.99	33.39
TABLE OF B (Planting Date) MEANS				
1 mid-Sept (112 lbs/A)	0.7 a	59.7 a	31.6 a	7.5 a
2 mid-Oct (84 lbs/A)	0.8 a	27.4 b	22.4 ab	7.9 a
3 mid-Nov (56 lbs/A)	0.8 a	19.4 b	11.6 b	9.5 a
LSD P=.05	0.30	14.44	11.62	2.00
Standard Deviation	0.42	20.08	16.15	2.78
CV	54.64	56.59	73.99	33.39
TABLE OF C (Cover Crop) MEANS				
1 Cereal Rye	0.8 a	35.1 a	24.3 a	8.1 a
2 Wheat	0.8 a	35.8 a	19.4 a	8.5 a
LSD P=.05	0.25	11.79	9.49	1.63
Standard Deviation	0.42	20.08	16.15	2.78
CV	54.64	56.59	73.99	33.39
TABLE OF A (Standing vs Rolled) B (Planting Date) MEANS				
1 Rolled/Crimped	0.5 a	54.9 a	15.6 bc	9.4 a
1 mid-Sept (112 lbs/A)	0.9 a	64.5 a	47.5 a	5.6 a
2 Standing				
1 mid-Sept (112 lbs/A)	0.6 a	26.3 a	14.4 bc	7.8 a
1 Rolled/Crimped				
2 mid-Oct (84 lbs/A)	1.0 a	28.5 a	30.4 b	8.1 a
2 Standing				
2 mid-Oct (84 lbs/A)	0.8 a	24.4 a	17.5 bc	9.4 a
3 mid-Nov (56 lbs/A)	0.9 a	14.4 a	5.6 c	9.6 a
LSD P=.05	0.43	20.42	16.43	2.82
Standard Deviation	0.42	20.08	16.15	2.78

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Crop Name Description	AMASS C - 2WA roll PigwdSp	AMASS C - 2WA roll PigwdSp	AMASS C - 2WA roll PigwdSp	IPOSS C - 2WA roll Mornlry
Rating Type Rating Unit Rating Date	Control % 06/06/19	density #/1m <sup>2</sup> 06/07/19	dryweight g/1m <sup>2</sup> 06/07/19	density #/1m <sup>2</sup> 06/07/19
Trt Treatment No. Name				
TABLE OF R MEANS				
Replicate 1	21.9	40.7	7.6261	10.6
Replicate 2	34.3	55.6	8.4807	18.6
Replicate 3	20.4	84.9	11.6973	14.5
Replicate 4	18.3	60.6	20.5511	14.3
TABLE OF A (Standing vs Rolled) MEANS				
1 Rolled/Crimped	16.3 b	55.7 a	13.0270 a	13.8 a
2 Standing	31.2 a	65.2 a	11.1505 a	15.2 a
LSD P=.05	10.97	29.89	3.97840	4.73
Standard Deviation	18.68	50.90	6.77389	8.06
CV	78.73	84.21	56.03446	55.63
TABLE OF B (Planting Date) MEANS				
1 mid-Sept (112 lbs/A)	37.1 a	54.3 a	10.9896 a	17.9 a
2 mid-Oct (84 lbs/A)	23.1 b	53.6 a	10.4744 a	16.3 a
3 mid-Nov (56 lbs/A)	11.0 b	73.4 a	14.8024 a	9.3 b
LSD P=.05	13.44	36.61	4.87252	5.79
Standard Deviation	18.68	50.90	6.77389	8.06
CV	78.73	84.21	56.03446	55.63
TABLE OF C (Cover Crop) MEANS				
1 Cereal Rye	23.0 a	53.3 a	12.0762 a	14.7 a
2 Wheat	24.5 a	67.6 a	12.1014 a	14.3 a
LSD P=.05	10.97	29.89	3.97840	4.73
Standard Deviation	18.68	50.90	6.77389	8.06
CV	78.73	84.21	56.03446	55.63
TABLE OF A (Standing vs Rolled) B (Planting Date) MEANS				
1 Rolled/Crimped	24.8 a	47.5 a	11.5470 a	15.8 a
1 mid-Sept (112 lbs/A)	49.4 a	61.1 a	10.4321 a	20.0 a
2 Standing	15.0 a	59.4 a	11.0805 a	14.8 a
1 mid-Sept (112 lbs/A)	31.3 a	47.9 a	9.8683 a	17.9 a
2 mid-Oct (84 lbs/A)	9.1 a	60.1 a	16.4536 a	10.8 a
1 Rolled/Crimped	12.9 a	86.6 a	13.1513 a	7.8 a
3 mid-Nov (56 lbs/A)	19.00	51.78	6.89079	8.19
2 Standing	18.68	50.90	6.77389	8.06
LSD P=.05				
Standard Deviation				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Crop Name Description	IPOSS C - 2WA roll Mornglry	AMBEL C - 2WA roll C.ragwd	AMBEL C - 2WA roll C.ragwd	AMASS C - 3WA roll PigwdSp
Rating Type Rating Unit Rating Date	dryweight g/1m <sup>2</sup> 06/07/19	density #/0.5m <sup>2</sup> 06/07/19	dryweight g/0.5m <sup>2</sup> 06/07/19	Control % 06/13/19
Trt Treatment No. Name				
TABLE OF R MEANS				
Replicate 1	2.0526	10.8	2.4133	17.8
Replicate 2	2.6212	5.6	1.7883	24.6
Replicate 3	1.5931	8.9	2.9438	20.7
Replicate 4	1.6911	6.3	2.8536	15.9
TABLE OF A (Standing vs Rolled) MEANS				
1 Rolled/Crimped	1.6729 a	8.1 a	1.9233 b	16.7 a
2 Standing	2.3061 a	7.8 a	3.0763 a	22.8 a
LSD P=.05	0.74641	2.18	0.83646	9.92
Standard Deviation	1.27089	3.72	1.42422	16.89
CV	63.88079	46.93	56.97434	85.62
TABLE OF B (Planting Date) MEANS				
1 mid-Sept (112 lbs/A)	2.7936 a	7.5 a	1.7619 b	33.9 a
2 mid-Oct (84 lbs/A)	2.0715 a	6.9 a	2.4876 ab	20.6 b
3 mid-Nov (56 lbs/A)	1.1034 b	9.4 a	3.2497 a	4.7 c
LSD P=.05	0.91417	2.67	1.02445	12.15
Standard Deviation	1.27089	3.72	1.42422	16.89
CV	63.88079	46.93	56.97434	85.62
TABLE OF C (Cover Crop) MEANS				
1 Cereal Rye	2.2869 a	7.8 a	2.6034 a	18.9 a
2 Wheat	1.6920 a	8.0 a	2.3961 a	20.6 a
LSD P=.05	0.74641	2.18	0.83646	9.92
Standard Deviation	1.27089	3.72	1.42422	16.89
CV	63.88079	46.93	56.97434	85.62
TABLE OF A (Standing vs Rolled) B (Planting Date) MEANS				
1 Rolled/Crimped	2.3079 a	9.3 a	1.1886 a	30.4 a
1 mid-Sept (112 lbs/A)	3.2793 a	5.8 a	2.3353 a	37.5 a
2 Standing	1.5014 a	6.0 a	1.3868 a	15.4 a
1 mid-Sept (112 lbs/A)	2.6416 a	7.8 a	3.5885 a	25.8 a
2 mid-Oct (84 lbs/A)	1.2094 a	9.0 a	3.1944 a	4.4 a
1 mid-Nov (56 lbs/A)	0.9974 a	9.8 a	3.3050 a	5.0 a
LSD P=.05	1.29283	3.78	1.44879	17.18
Standard Deviation	1.27089	3.72	1.42422	16.89

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code	IPOSS
Crop Type, Code	C -
Crop Name	3WA roll
Description	Mornlry
Rating Type	Control
Rating Unit	%
Rating Date	06/13/19
Trt Treatment	
No. Name	
TABLE OF R MEANS	
Replicate 1	2.8
Replicate 2	7.3
Replicate 3	6.7
Replicate 4	7.1
TABLE OF A (Standing vs Rolled) MEANS	
1 Rolled/Crimped	5.5 a
2 Standing	6.4 a
LSD P=.05	5.82
Standard Deviation	9.91
CV	166.39
TABLE OF B (Planting Date) MEANS	
1 mid-Sept (112 lbs/A)	11.9 a
2 mid-Oct (84 lbs/A)	4.7 b
3 mid-Nov (56 lbs/A)	1.3 b
LSD P=.05	7.13
Standard Deviation	9.91
CV	166.39
TABLE OF C (Cover Crop) MEANS	
1 Cereal Rye	5.8 a
2 Wheat	6.1 a
LSD P=.05	5.82
Standard Deviation	9.91
CV	166.39
TABLE OF A (Standing vs Rolled) B (Planting Date) MEANS	
1 Rolled/Crimped	14.8 a
1 mid-Sept (112 lbs/A)	
2 Standing	9.1 a
1 mid-Sept (112 lbs/A)	
1 Rolled/Crimped	1.9 a
2 mid-Oct (84 lbs/A)	
2 Standing	7.5 a
2 mid-Oct (84 lbs/A)	
1 Rolled/Crimped	0.0 a
3 mid-Nov (56 lbs/A)	
2 Standing	2.5 a
3 mid-Nov (56 lbs/A)	
LSD P=.05	10.09
Standard Deviation	9.91

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name	C - CovrCrop	C - CovrCrop biomass	C - CovrCrop	C - CoverCrop
Description	height inches 05/02/19	dryweight g/0.5m2 05/02/19	Control % 05/10/19	Control % 05/16/19
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name				
CV	10.25	21.35	3.76	1.39
TABLE OF A (Standing vs Rolled) C (Cover Crop) MEANS				
1 Rolled/Crimped 1 Cereal Rye	26.6 a	76.2 a	88.8 a	99.8 a
2 Standing 1 Cereal Rye	27.8 a	84.5 a	87.9 a	98.8 a
1 Rolled/Crimped 2 Wheat	21.0 a	100.3 a	86.3 a	99.8 a
2 Standing 2 Wheat	20.8 a	100.8 a	84.3 a	98.9 a
LSD P=.05	2.05	16.04	2.71	1.15
Standard Deviation	2.47	19.31	3.26	1.39
CV	10.25	21.35	3.76	1.39
TABLE OF B (Planting Date) C (Cover Crop) MEANS				
1 mid-Sept (112 lbs/A) 1 Cereal Rye	32.6 a	108.8 a	87.5 a	99.4 a
2 mid-Oct (84 lbs/A) 1 Cereal Rye	27.0 a	75.1 a	90.0 a	99.4 a
3 mid-Nov (56 lbs/A) 1 Cereal Rye	22.0 a	57.1 a	87.5 a	99.1 a
1 mid-Sept (112 lbs/A) 2 Wheat	24.5 a	144.1 a	83.8 a	98.8 a
2 mid-Oct (84 lbs/A) 2 Wheat	21.4 a	90.9 a	85.4 a	99.4 a
3 mid-Nov (56 lbs/A) 2 Wheat	16.8 a	66.6 a	86.6 a	100.0 a
LSD P=.05	2.51	19.64	3.32	1.41
Standard Deviation	2.47	19.31	3.26	1.39
CV	10.25	21.35	3.76	1.39
TABLE OF A (Standing vs Rolled) B (Planting Date) C (Cover Crop) MEANS				
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 1 Cereal Rye	31.8 a	97.0 a	86.3 a	99.5 a
2 Standing 1 mid-Sept (112 lbs/A) 1 Cereal Rye	33.5 a	120.5 a	88.8 a	99.3 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 1 Cereal Rye	26.8 a	77.5 a	90.0 a	100.0 a
2 Standing 2 mid-Oct (84 lbs/A) 1 Cereal Rye	27.3 a	72.8 a	90.0 a	98.8 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 1 Cereal Rye	21.3 a	54.0 a	90.0 a	100.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description	SOLCA C - HorseNtl	AMACH C - microplot SmthPgwd	AMBEL C - microplot C.ragwd
Rating Type	Control	Pres / Abse	Pres / Abse
Rating Unit	%	1 / 0	1 / 0
Rating Date	05/16/19	05/23/19	05/23/19
Trt Treatment No. Name			
CV	7.12	56.85	14.74
TABLE OF A (Standing vs Rolled) C (Cover Crop) MEANS			
1 Rolled/Crimped	94.8 a	0.7 a	1.0 a
1 Cereal Rye			
2 Standing	91.2 a	0.8 a	1.0 a
1 Cereal Rye			
1 Rolled/Crimped	92.3 a	0.5 a	0.9 a
2 Wheat			
2 Standing	88.3 a	1.0 a	1.0 a
2 Wheat			
LSD P=.05	5.42	0.35	0.12
Standard Deviation	6.53	0.43	0.14
CV	7.12	56.85	14.74
TABLE OF B (Planting Date) C (Cover Crop) MEANS			
1 mid-Sept (112 lbs/A)	93.6 a	0.8 a	1.0 a
1 Cereal Rye			
2 mid-Oct (84 lbs/A)	92.9 a	0.8 a	1.0 a
1 Cereal Rye			
3 mid-Nov (56 lbs/A)	92.5 a	0.8 a	1.0 a
1 Cereal Rye			
1 mid-Sept (112 lbs/A)	92.0 a	0.6 a	1.0 a
2 Wheat			
2 mid-Oct (84 lbs/A)	91.1 a	0.9 a	0.9 a
2 Wheat			
3 mid-Nov (56 lbs/A)	87.9 a	0.8 a	1.0 a
2 Wheat			
LSD P=.05	6.64	0.43	0.15
Standard Deviation	6.53	0.43	0.14
CV	7.12	56.85	14.74
TABLE OF A (Standing vs Rolled) B (Planting Date) C (Cover Crop) MEANS			
1 Rolled/Crimped	97.3 a	0.8 a	1.0 a
1 mid-Sept (112 lbs/A)			
1 Cereal Rye			
2 Standing	90.0 a	0.8 a	1.0 a
1 mid-Sept (112 lbs/A)			
1 Cereal Rye			
1 Rolled/Crimped	95.0 a	0.8 a	1.0 a
2 mid-Oct (84 lbs/A)			
1 Cereal Rye			
2 Standing	90.8 a	0.8 a	1.0 a
2 mid-Oct (84 lbs/A)			
1 Cereal Rye			
1 Rolled/Crimped	92.3 a	0.5 a	1.0 a
3 mid-Nov (56 lbs/A)			
1 Cereal Rye			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description	IPOSS C - wholePlot Morngly	AMASS C - 1WA roll PigwdSp	AMBEL C - 1WA roll C.ragwd	AMBEL C - 1WA roll C.ragwd
Rating Type Rating Unit Rating Date	Pres / Abse 1 / 0 05/23/19	Control % (plot) 05/30/19	Control % (micro) 05/30/19	Count 1m2 # (micro 05/30/19
Trt Treatment No. Name				
CV	54.64	56.59	73.99	33.39
TABLE OF A (Standing vs Rolled) C (Cover Crop) MEANS 1 Rolled/Crimped 1 Cereal Rye	0.7 a	39.5 a	18.8 a	8.8 a
2 Standing 1 Cereal Rye	0.8 a	30.8 a	29.8 a	7.5 a
1 Rolled/Crimped 2 Wheat	0.6 a	30.8 a	12.9 a	8.9 a
2 Standing 2 Wheat	1.0 a	40.8 a	25.8 a	8.1 a
LSD P=.05 Standard Deviation CV	0.35 0.42 54.64	16.67 20.08 56.59	13.42 16.15 73.99	2.31 2.78 33.39
TABLE OF B (Planting Date) C (Cover Crop) MEANS 1 mid-Sept (112 lbs/A) 1 Cereal Rye	0.6 a	65.6 a	31.3 a	7.5 a
2 mid-Oct (84 lbs/A) 1 Cereal Rye	0.9 a	26.0 a	29.1 a	7.6 a
3 mid-Nov (56 lbs/A) 1 Cereal Rye	0.8 a	13.8 a	12.5 a	9.3 a
1 mid-Sept (112 lbs/A) 2 Wheat	0.8 a	53.8 a	31.9 a	7.5 a
2 mid-Oct (84 lbs/A) 2 Wheat	0.8 a	28.8 a	15.6 a	8.3 a
3 mid-Nov (56 lbs/A) 2 Wheat	0.9 a	25.0 a	10.6 a	9.8 a
LSD P=.05 Standard Deviation CV	0.43 0.42 54.64	20.42 20.08 56.59	16.43 16.15 73.99	2.82 2.78 33.39
TABLE OF A (Standing vs Rolled) B (Planting Date) C (Cover Crop) MEANS 1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 1 Cereal Rye	0.5 a	61.0 a	12.5 a	9.8 a
2 Standing 1 mid-Sept (112 lbs/A) 1 Cereal Rye	0.8 a	70.3 a	50.0 a	5.3 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 1 Cereal Rye	0.8 a	30.0 a	25.0 a	7.8 a
2 Standing 2 mid-Oct (84 lbs/A) 1 Cereal Rye	1.0 a	22.0 a	33.3 a	7.5 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 1 Cereal Rye	0.8 a	27.5 a	18.8 a	8.8 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description	AMASS C - 2WA roll PigwdSp	AMASS C - 2WA roll PigwdSp	AMASS C - 2WA roll PigwdSp	IPOSS C - 2WA roll Morngly
Rating Type Rating Unit Rating Date	Control % 06/06/19	density #/1m <sup>2</sup> 06/07/19	dryweight g/1m <sup>2</sup> 06/07/19	density #/1m <sup>2</sup> 06/07/19
Trt Treatment No. Name				
CV	78.73	84.21	56.03446	55.63
TABLE OF A (Standing vs Rolled) C (Cover Crop) MEANS				
1 Rolled/Crimped 1 Cereal Rye	16.3 a	52.2 a	13.2683 a	11.7 a
2 Standing 1 Cereal Rye	29.6 a	54.4 a	10.8841 a	17.8 a
1 Rolled/Crimped 2 Wheat	16.3 a	59.2 a	12.7858 a	15.8 a
2 Standing 2 Wheat	32.8 a	76.0 a	11.4170 a	12.7 a
LSD P=.05	15.52	42.27	5.62631	6.69
Standard Deviation	18.68	50.90	6.77389	8.06
CV	78.73	84.21	56.03446	55.63
TABLE OF B (Planting Date) C (Cover Crop) MEANS				
1 mid-Sept (112 lbs/A) 1 Cereal Rye	45.4 a	38.8 a	10.5211 a	18.8 a
2 mid-Oct (84 lbs/A) 1 Cereal Rye	16.9 a	49.8 a	11.0981 a	15.9 a
3 mid-Nov (56 lbs/A) 1 Cereal Rye	6.6 a	71.4 a	14.6094 a	9.5 a
1 mid-Sept (112 lbs/A) 2 Wheat	28.8 a	69.9 a	11.4580 a	17.0 a
2 mid-Oct (84 lbs/A) 2 Wheat	29.4 a	57.5 a	9.8506 a	16.8 a
3 mid-Nov (56 lbs/A) 2 Wheat	15.4 a	75.4 a	14.9955 a	9.0 a
LSD P=.05	19.00	51.78	6.89079	8.19
Standard Deviation	18.68	50.90	6.77389	8.06
CV	78.73	84.21	56.03446	55.63
TABLE OF A (Standing vs Rolled) B (Planting Date) C (Cover Crop) MEANS				
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 1 Cereal Rye	30.8 a	58.3 ab	13.5380 a	12.8 a
2 Standing 1 mid-Sept (112 lbs/A) 1 Cereal Rye	60.0 a	19.3 b	7.5043 a	24.8 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 1 Cereal Rye	10.0 a	34.5 ab	9.1913 a	11.3 a
2 Standing 2 mid-Oct (84 lbs/A) 1 Cereal Rye	23.8 a	65.0 ab	13.0050 a	20.5 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 1 Cereal Rye	8.3 a	63.8 ab	17.0758 a	11.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description	IPOSS C - 2WA roll Mornglry	AMBEL C - 2WA roll C.ragwd	AMBEL C - 2WA roll C.ragwd	AMASS C - 3WA roll PigwdSp
Rating Type Rating Unit Rating Date	dryweight g/1m <sup>2</sup> 06/07/19	density #/0.5m <sup>2</sup> 06/07/19	dryweight g/0.5m <sup>2</sup> 06/07/19	Control % 06/13/19
Trt Treatment No. Name				
CV	63.88079	46.93	56.97434	85.62
TABLE OF A (Standing vs Rolled) C (Cover Crop) MEANS				
1 Rolled/Crimped 1 Cereal Rye	1.6371 a	7.8 a	1.7066 a	15.3 a
2 Standing 1 Cereal Rye	2.9368 a	7.9 a	3.5003 a	22.5 a
1 Rolled/Crimped 2 Wheat	1.7087 a	8.4 a	2.1399 a	18.2 a
2 Standing 2 Wheat	1.6754 a	7.6 a	2.6523 a	23.0 a
LSD P=.05	1.05559	3.09	1.18294	14.03
Standard Deviation	1.27089	3.72	1.42422	16.89
CV	63.88079	46.93	56.97434	85.62
TABLE OF B (Planting Date) C (Cover Crop) MEANS				
1 mid-Sept (112 lbs/A) 1 Cereal Rye	3.7928 a	7.5 a	1.9010 a	39.4 a
2 mid-Oct (84 lbs/A) 1 Cereal Rye	2.2149 b	7.0 a	2.8135 a	14.8 a
3 mid-Nov (56 lbs/A) 1 Cereal Rye	0.8531 c	9.0 a	3.0958 a	2.5 a
1 mid-Sept (112 lbs/A) 2 Wheat	1.7944 bc	7.5 a	1.6229 a	28.5 a
2 mid-Oct (84 lbs/A) 2 Wheat	1.9281 bc	6.8 a	2.1618 a	26.4 a
3 mid-Nov (56 lbs/A) 2 Wheat	1.3536 bc	9.8 a	3.4036 a	6.9 a
LSD P=.05	1.29283	3.78	1.44879	17.18
Standard Deviation	1.27089	3.72	1.42422	16.89
CV	63.88079	46.93	56.97434	85.62
TABLE OF A (Standing vs Rolled) B (Planting Date) C (Cover Crop) MEANS				
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 1 Cereal Rye	2.3015 bc	9.8 a	1.2048 a	33.8 a
2 Standing 1 mid-Sept (112 lbs/A) 1 Cereal Rye	5.2840 a	5.3 a	2.5973 a	45.0 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 1 Cereal Rye	1.6033 bc	5.8 a	1.4240 a	12.0 a
2 Standing 2 mid-Oct (84 lbs/A) 1 Cereal Rye	2.8265 b	8.3 a	4.2030 a	17.5 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 1 Cereal Rye	1.0065 bc	7.8 a	2.4910 a	0.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	IPOSS
Crop Type, Code	C -
Crop Name	3WA roll
Description	Mornlry
Rating Type	Control
Rating Unit	%
Rating Date	06/13/19
Trt Treatment	
No. Name	
CV	166.39
TABLE OF A (Standing vs Rolled) C (Cover Crop) MEANS	
1 Rolled/Crimped	6.7 a
1 Cereal Rye	
2 Standing	5.0 a
1 Cereal Rye	
1 Rolled/Crimped	4.4 a
2 Wheat	
2 Standing	7.8 a
2 Wheat	
LSD P=.05	8.23
Standard Deviation	9.91
CV	166.39
TABLE OF B (Planting Date) C (Cover Crop) MEANS	
1 mid-Sept (112 lbs/A)	10.6 a
1 Cereal Rye	
2 mid-Oct (84 lbs/A)	4.4 a
1 Cereal Rye	
3 mid-Nov (56 lbs/A)	2.5 a
1 Cereal Rye	
1 mid-Sept (112 lbs/A)	13.3 a
2 Wheat	
2 mid-Oct (84 lbs/A)	5.0 a
2 Wheat	
3 mid-Nov (56 lbs/A)	0.0 a
2 Wheat	
LSD P=.05	10.09
Standard Deviation	9.91
CV	166.39
TABLE OF A (Standing vs Rolled) B (Planting Date) C (Cover Crop) MEANS	
1 Rolled/Crimped	16.3 a
1 mid-Sept (112 lbs/A)	
1 Cereal Rye	
2 Standing	5.0 a
1 mid-Sept (112 lbs/A)	
1 Cereal Rye	
1 Rolled/Crimped	3.8 a
2 mid-Oct (84 lbs/A)	
1 Cereal Rye	
2 Standing	5.0 a
2 mid-Oct (84 lbs/A)	
1 Cereal Rye	
1 Rolled/Crimped	0.0 a
3 mid-Nov (56 lbs/A)	
1 Cereal Rye	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name	C - CovrCrop	C - CovrCrop biomass	C - CovrCrop	C - CoverCrop
Description	height inches	dryweight g/0.5m <sup>2</sup>	Control 05/10/19	Control 05/16/19
Rating Type				
Rating Unit				%
Rating Date	05/02/19	05/02/19	05/10/19	05/16/19
Trt Treatment No. Name				
2 Standing 3 mid-Nov (56 lbs/A) 1 Cereal Rye	22.8 a	60.3 a	85.0 a	98.3 a
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 2 Wheat	24.5 a	138.3 a	83.8 a	100.0 a
2 Standing 1 mid-Sept (112 lbs/A) 2 Wheat	24.5 a	150.0 a	83.8 a	97.5 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 2 Wheat	22.8 a	99.5 a	86.3 a	99.5 a
2 Standing 2 mid-Oct (84 lbs/A) 2 Wheat	20.0 a	82.3 a	84.5 a	99.3 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 2 Wheat	15.8 a	63.3 a	88.8 a	100.0 a
2 Standing 3 mid-Nov (56 lbs/A) 2 Wheat	17.8 a	70.0 a	84.5 a	100.0 a
LSD P=.05	3.55	27.77	4.69	1.99
Standard Deviation	2.47	19.31	3.26	1.39
CV	10.25	21.35	3.76	1.39

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description	SOLCA C - HorseNtl	AMACH C - microplot SmthPgwd	AMBEL C - microplot C.ragwd
Rating Type	Control	Pres / Abse	Pres / Abse
Rating Unit	%	1 / 0	1 / 0
Rating Date	05/16/19	05/23/19	05/23/19
Trt Treatment No. Name			
2 Standing 3 mid-Nov (56 lbs/A) 1 Cereal Rye	92.8 a	1.0 a	1.0 a
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 2 Wheat	93.0 a	0.3 a	1.0 a
2 Standing 1 mid-Sept (112 lbs/A) 2 Wheat	91.0 a	1.0 a	1.0 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 2 Wheat	92.0 a	0.8 a	0.8 a
2 Standing 2 mid-Oct (84 lbs/A) 2 Wheat	90.3 a	1.0 a	1.0 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 2 Wheat	92.0 a	0.5 a	1.0 a
2 Standing 3 mid-Nov (56 lbs/A) 2 Wheat	83.8 a	1.0 a	1.0 a
LSD P=.05 Standard Deviation CV	9.39 6.53 7.12	0.61 0.43 56.85	0.21 0.14 14.74

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description	IPOSS C - wholePlot Morngly	AMASS C - 1WA roll PigwdSp	AMBEL C - 1WA roll C.ragwd	AMBEL C - 1WA roll C.ragwd
Rating Type Rating Unit Rating Date	Pres / Abse 1 / 0 05/23/19	Control % (plot) 05/30/19	Control % (micro) 05/30/19	Count 1m2 # (micro) 05/30/19
Trt Treatment No. Name				
2 Standing 3 mid-Nov (56 lbs/A) 1 Cereal Rye	0.8 a	0.0 a	6.3 a	9.8 a
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 2 Wheat	0.5 a	48.8 a	18.8 a	9.0 a
2 Standing 1 mid-Sept (112 lbs/A) 2 Wheat	1.0 a	58.8 a	45.0 a	6.0 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 2 Wheat	0.5 a	22.5 a	3.8 a	7.8 a
2 Standing 2 mid-Oct (84 lbs/A) 2 Wheat	1.0 a	35.0 a	27.5 a	8.8 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 2 Wheat	0.8 a	21.3 a	16.3 a	10.0 a
2 Standing 3 mid-Nov (56 lbs/A) 2 Wheat	1.0 a	28.8 a	5.0 a	9.5 a
LSD P=.05 Standard Deviation CV	0.61 0.42 54.64	28.88 20.08 56.59	23.24 16.15 73.99	3.99 2.78 33.39

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description	AMASS C - 2WA roll PigwdSp	AMASS C - 2WA roll PigwdSp	AMASS C - 2WA roll PigwdSp	IPOSS C - 2WA roll Morngly
Rating Type Rating Unit Rating Date	Control % 06/06/19	density #/1m <sup>2</sup> 06/07/19	dryweight g/1m <sup>2</sup> 06/07/19	density #/1m <sup>2</sup> 06/07/19
Trt Treatment No. Name				
2 Standing 3 mid-Nov (56 lbs/A) 1 Cereal Rye	5.0 a	79.0 ab	12.1430 a	8.0 a
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 2 Wheat	18.8 a	36.8 ab	9.5560 a	18.8 a
2 Standing 1 mid-Sept (112 lbs/A) 2 Wheat	38.8 a	103.0 a	13.3600 a	15.3 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 2 Wheat	20.0 a	84.3 ab	12.9698 a	18.3 a
2 Standing 2 mid-Oct (84 lbs/A) 2 Wheat	38.8 a	30.8 ab	6.7315 a	15.3 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 2 Wheat	10.0 a	56.5 ab	15.8315 a	10.5 a
2 Standing 3 mid-Nov (56 lbs/A) 2 Wheat	20.8 a	94.3 a	14.1595 a	7.5 a
LSD P=.05 Standard Deviation CV	26.88 18.68 78.73	73.22 50.90 84.21	9.74505 6.77389 56.03446	11.59 8.06 55.63

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code Crop Name Description	IPOSS C - 2WA roll Mornglry	AMBEL C - 2WA roll C.ragwd	AMBEL C - 2WA roll C.ragwd	AMASS C - 3WA roll PigwdSp
Rating Type Rating Unit Rating Date	dryweight g/1m <sup>2</sup> 06/07/19	density #/0.5m <sup>2</sup> 06/07/19	dryweight g/0.5m <sup>2</sup> 06/07/19	Control % 06/13/19
Trt Treatment No. Name				
2 Standing 3 mid-Nov (56 lbs/A) 1 Cereal Rye	0.6998 c	10.3 a	3.7005 a	5.0 a
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 2 Wheat	2.3143 bc	8.8 a	1.1725 a	27.0 a
2 Standing 1 mid-Sept (112 lbs/A) 2 Wheat	1.2745 bc	6.3 a	2.0733 a	30.0 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 2 Wheat	1.3995 bc	6.3 a	1.3495 a	18.8 a
2 Standing 2 mid-Oct (84 lbs/A) 2 Wheat	2.4568 bc	7.3 a	2.9740 a	34.0 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 2 Wheat	1.4123 bc	10.3 a	3.8978 a	8.8 a
2 Standing 3 mid-Nov (56 lbs/A) 2 Wheat	1.2950 bc	9.3 a	2.9095 a	5.0 a
LSD P=.05 Standard Deviation CV	1.82833 1.27089 63.88079	5.34 3.72 46.93	2.04890 1.42422 56.97434	24.30 16.89 85.62

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	IPOSS
Crop Type, Code	C -
Crop Name	3WA roll
Description	Mornlry
Rating Type	Control
Rating Unit	%
Rating Date	06/13/19
Trt Treatment No. Name	
2 Standing 3 mid-Nov (56 lbs/A) 1 Cereal Rye	5.0 a
1 Rolled/Crimped 1 mid-Sept (112 lbs/A) 2 Wheat	13.3 a
2 Standing 1 mid-Sept (112 lbs/A) 2 Wheat	13.3 a
1 Rolled/Crimped 2 mid-Oct (84 lbs/A) 2 Wheat	0.0 a
2 Standing 2 mid-Oct (84 lbs/A) 2 Wheat	10.0 a
1 Rolled/Crimped 3 mid-Nov (56 lbs/A) 2 Wheat	0.0 a
2 Standing 3 mid-Nov (56 lbs/A) 2 Wheat	0.0 a
LSD P=.05 Standard Deviation CV	14.26 9.91 166.39

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

## FACTORIAL/POOLED ERROR AOV For C CovrCrop height inches 05/02/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	1501.916667				
R	3	90.416667	30.138889	4.958	0.0060	
A	1	3.000000	3.000000	0.494	0.4873	1.4
B	2	675.791667	337.895833	55.591	0.0001	1.8
AB	2	17.375000	8.687500	1.429	0.2539	2.5
C	1	481.333333	481.333333	79.189	0.0001	1.4
AC	1	6.750000	6.750000	1.111	0.2996	2.0
BC	2	19.541667	9.770833	1.607	0.2157	2.5
ABC	2	7.125000	3.562500	0.586	0.5622	3.5
ERROR	33	200.583333	6.078283			

FACTORIAL/POOLED ERROR AOV For C CovrCrop biomass dryweight g/0.5m<sup>2</sup> 05/02/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	62911.812500				
R	3	7388.729167	2462.909722	6.608	0.0013	
A	1	229.687500	229.687500	0.616	0.4381	11.3
B	2	34674.125000	17337.062500	46.514	0.0001	13.9
AB	2	1665.875000	832.937500	2.235	0.1230	19.6
C	1	4900.520833	4900.520833	13.148	0.0010	11.3
AC	1	188.020833	188.020833	0.504	0.4825	16.0
BC	2	1458.291667	729.145833	1.956	0.1574	19.6
ABC	2	106.541667	53.270833	0.143	0.8674	27.8
ERROR	33	12300.020833	372.727904			

## FACTORIAL/POOLED ERROR AOV For C CovrCrop Control % 05/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	813.916667				
R	3	177.416667	59.138889	5.559	0.0034	
A	1	24.083333	24.083333	2.264	0.1419	1.9
B	2	35.791667	17.895833	1.682	0.2015	2.3
AB	2	70.791667	35.395833	3.327	0.0483	3.3
C	1	114.083333	114.083333	10.723	0.0025	1.9
AC	1	4.083333	4.083333	0.384	0.5398	2.7
BC	2	30.791667	15.395833	1.447	0.2498	3.3
ABC	2	5.791667	2.895833	0.272	0.7634	4.7
ERROR	33	351.083333	10.638889			

## FACTORIAL/POOLED ERROR AOV For C CoverCrop Control % 05/16/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	110.666667				
R	3	18.666667	6.222222	3.242	0.0343	
A	1	12.000000	12.000000	6.253	0.0175	0.8
B	2	2.041667	1.020833	0.532	0.5924	1.0
AB	2	0.875000	0.437500	0.228	0.7974	1.4
C	1	0.083333	0.083333	0.043	0.8362	0.8
AC	1	0.083333	0.083333	0.043	0.8362	1.2
BC	2	4.541667	2.270833	1.183	0.3189	1.4
ABC	2	9.041667	4.520833	2.356	0.1106	2.0
ERROR	33	63.333333	1.919192			

## FACTORIAL/POOLED ERROR AOV For SOLCA C HorseNtl Control % 05/16/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	3164.666667				
R	3	1300.166667	433.388889	10.170	0.0001	
A	1	176.333333	176.333333	4.138	0.0500	3.8
B	2	57.791667	28.895833	0.678	0.5145	4.7
AB	2	5.291667	2.645833	0.062	0.9399	6.6
C	1	85.333333	85.333333	2.002	0.1664	3.8
AC	1	0.333333	0.333333	0.008	0.9301	5.4
BC	2	23.041667	11.520833	0.270	0.7648	6.6
ABC	2	110.041667	55.020833	1.291	0.2885	9.4
ERROR	33	1406.333333	42.616162			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## FACTORIAL/POOLED ERROR AOV For AMACH C microplot SmthPgwd Pres / Abse 1 / 0 05/23/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	9.000000				
R	3	0.500000	0.166667	0.917	0.4435	
A	1	1.333333	1.333333	7.333	0.0106	0.3
B	2	0.125000	0.062500	0.344	0.7116	0.3
AB	2	0.291667	0.145833	0.802	0.4569	0.4
C	1	0.000000	0.000000	0.000	1.0000	0.3
AC	1	0.333333	0.333333	1.833	0.1849	0.4
BC	2	0.125000	0.062500	0.344	0.7116	0.4
ABC	2	0.291667	0.145833	0.802	0.4569	0.6
ERROR	33	6.000000	0.181818			

## FACTORIAL/POOLED ERROR AOV For AMBEL C microplot C.ragwd Pres / Abse 1 / 0 05/23/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	0.979167				
R	3	0.062500	0.020833	1.000	0.4051	
A	1	0.020833	0.020833	1.000	0.3246	0.1
B	2	0.041667	0.020833	1.000	0.3788	0.1
AB	2	0.041667	0.020833	1.000	0.3788	0.1
C	1	0.020833	0.020833	1.000	0.3246	0.1
AC	1	0.020833	0.020833	1.000	0.3246	0.1
BC	2	0.041667	0.020833	1.000	0.3788	0.1
ABC	2	0.041667	0.020833	1.000	0.3788	0.2
ERROR	33	0.687500	0.020833			

## FACTORIAL/POOLED ERROR AOV For IPOSS C wholePlot Morngly Pres / Abse 1 / 0 05/23/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	8.479167				
R	3	0.895833	0.298611	1.683	0.1896	
A	1	1.020833	1.020833	5.754	0.0223	0.2
B	2	0.166667	0.083333	0.470	0.6293	0.3
AB	2	0.166667	0.083333	0.470	0.6293	0.4
C	1	0.020833	0.020833	0.117	0.7340	0.2
AC	1	0.187500	0.187500	1.057	0.3114	0.3
BC	2	0.166667	0.083333	0.470	0.6293	0.4
ABC	2	0.000000	0.000000	0.000	1.0000	0.6
ERROR	33	5.854167	0.177399			

## FACTORIAL/POOLED ERROR AOV For AMASS C 1WA roll PigwdSp Control % (plot) 05/30/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	35461.979167				
R	3	4047.229167	1349.076389	3.347	0.0307	
A	1	4.687500	4.687500	0.012	0.9148	11.8
B	2	14577.041667	7288.520833	18.084	0.0001	14.4
AB	2	786.125000	393.062500	0.975	0.3877	20.4
C	1	6.020833	6.020833	0.015	0.9035	11.8
AC	1	1054.687500	1054.687500	2.617	0.1153	16.7
BC	2	1094.541667	547.270833	1.358	0.2712	20.4
ABC	2	591.125000	295.562500	0.733	0.4880	28.9
ERROR	33	13300.520833	403.046086			

## FACTORIAL/POOLED ERROR AOV For AMBEL C 1WA roll C.ragwd Control % (micro 05/30/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	19732.666667				
R	3	1148.166667	382.722222	1.466	0.2416	
A	1	1728.000000	1728.000000	6.621	0.0148	9.5
B	2	3207.041667	1603.520833	6.144	0.0054	11.6
AB	2	3924.125000	1962.062500	7.518	0.0020	16.4
C	1	290.083333	290.083333	1.112	0.2994	9.5
AC	1	10.083333	10.083333	0.039	0.8454	13.4
BC	2	454.541667	227.270833	0.871	0.4280	16.4
ABC	2	358.291667	179.145833	0.686	0.5104	23.2
ERROR	33	8612.333333	260.979798			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## FACTORIAL/POOLED ERROR AOV For AMBEL C 1WA roll C.ragwd Count 1m2 # (micro 05/30/19)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	396.312500				
R	3	41.062500	13.687500	1.777	0.1707	
A	1	13.020833	13.020833	1.690	0.2026	1.6
B	2	35.375000	17.687500	2.296	0.1165	2.0
AB	2	44.041667	22.020833	2.859	0.0716	2.8
C	1	1.687500	1.687500	0.219	0.6428	1.6
AC	1	0.520833	0.520833	0.068	0.7965	2.3
BC	2	0.875000	0.437500	0.057	0.9449	2.8
ABC	2	5.541667	2.770833	0.360	0.7006	4.0
ERROR	33	254.187500	7.702652			

## FACTORIAL/POOLED ERROR AOV For AMASS C 2WA roll PigwdSp Control % 06/06/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	24689.479167				
R	3	1848.729167	616.243056	1.766	0.1729	
A	1	2655.187500	2655.187500	7.608	0.0094	11.0
B	2	5442.791667	2721.395833	7.798	0.0017	13.4
AB	2	882.875000	441.437500	1.265	0.2956	19.0
C	1	28.520833	28.520833	0.082	0.7768	11.0
AC	1	31.687500	31.687500	0.091	0.7651	15.5
BC	2	2008.291667	1004.145833	2.877	0.0705	19.0
ABC	2	274.875000	137.437500	0.394	0.6776	26.9
ERROR	33	11516.520833	348.985480			

## FACTORIAL/POOLED ERROR AOV For AMASS C 2WA roll PigwdSp density #/1m2 06/07/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	128571.812500				
R	3	12164.395833	4054.798611	1.565	0.2163	
A	1	1092.520833	1092.520833	0.422	0.5206	29.9
B	2	4020.875000	2010.437500	0.776	0.4684	36.6
AB	2	2988.041667	1494.020833	0.577	0.5673	51.8
C	1	2451.020833	2451.020833	0.946	0.3378	29.9
AC	1	638.020833	638.020833	0.246	0.6230	42.3
BC	2	1728.291667	864.145833	0.334	0.7187	51.8
ABC	2	18001.791667	9000.895833	3.475	0.0427	73.2
ERROR	33	85486.854167	2590.510732			

## FACTORIAL/POOLED ERROR AOV For AMASS C 2WA roll PigwdSp dryweight g/1m2 06/07/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	3222.716780				
R	3	1256.375419	418.791806	9.127	0.0002	
A	1	42.255027	42.255027	0.921	0.3442	3.9784
B	2	178.856314	89.428157	1.949	0.1585	4.8725
AB	2	12.217681	6.108840	0.133	0.8758	6.8908
C	1	0.007600	0.007600	0.000	0.9898	3.9784
AC	1	3.093721	3.093721	0.067	0.7967	5.6263
BC	2	10.324734	5.162367	0.113	0.8939	6.8908
ABC	2	205.362799	102.681399	2.238	0.1226	9.7450
ERROR	33	1514.223485	45.885560			

## FACTORIAL/POOLED ERROR AOV For IPOSS C 2WA roll Mornlry density #/1m2 06/07/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	3755.979167				
R	3	384.895833	128.298611	1.977	0.1365	
A	1	25.520833	25.520833	0.393	0.5349	4.7
B	2	675.791667	337.895833	5.207	0.0108	5.8
AB	2	121.791667	60.895833	0.938	0.4014	8.2
C	1	2.520833	2.520833	0.039	0.8450	4.7
AC	1	256.687500	256.687500	3.956	0.0551	6.7
BC	2	13.791667	6.895833	0.106	0.8995	8.2
ABC	2	133.625000	66.812500	1.030	0.3683	11.6
ERROR	33	2141.354167	64.889520			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## FACTORIAL/POOLED ERROR AOV For IPOSS C 2WA roll Mornlry dryweight g/1m2 06/07/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	126.807836				
R	3	7.790172	2.596724	1.608	0.2063	
A	1	4.811434	4.811434	2.979	0.0937	0.7464
B	2	23.015328	11.507664	7.125	0.0027	0.9142
AB	2	4.343300	2.171650	1.345	0.2746	1.2928
C	1	4.246515	4.246515	2.629	0.1144	0.7464
AC	1	5.330001	5.330001	3.300	0.0784	1.0556
BC	2	13.058399	6.529199	4.042	0.0269	1.2928
ABC	2	10.911961	5.455980	3.378	0.0463	1.8283
ERROR	33	53.300727	1.615174			

## FACTORIAL/POOLED ERROR AOV For AMBEL C 2WA roll C.ragwd density #/0.5m2 06/07/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	803.666667				
R	3	209.500000	69.833333	5.059	0.0054	
A	1	1.333333	1.333333	0.097	0.7579	2.2
B	2	54.166667	27.083333	1.962	0.1566	2.7
AB	2	62.166667	31.083333	2.252	0.1211	3.8
C	1	0.333333	0.333333	0.024	0.8775	2.2
AC	1	3.000000	3.000000	0.217	0.6441	3.1
BC	2	2.166667	1.083333	0.078	0.9247	3.8
ABC	2	15.500000	7.750000	0.561	0.5757	5.3
ERROR	33	455.500000	13.803030			

## FACTORIAL/POOLED ERROR AOV For AMBEL C 2WA roll C.ragwd dryweight g/0.5m2 06/07/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	128.172147				
R	3	10.033298	3.344433	1.649	0.1970	
A	1	15.952908	15.952908	7.865	0.0084	0.8365
B	2	17.710729	8.855364	4.366	0.0208	1.0245
AB	2	8.745851	4.372926	2.156	0.1318	1.4488
C	1	0.515845	0.515845	0.254	0.6174	0.8365
AC	1	4.925445	4.925445	2.428	0.1287	1.1829
BC	2	1.871829	0.935915	0.461	0.6344	1.4488
ABC	2	1.479348	0.739674	0.365	0.6972	2.0489
ERROR	33	66.936894	2.028391			

## FACTORIAL/POOLED ERROR AOV For AMASS C 3WA roll PigwdSp Control % 06/13/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	18757.479167				
R	3	514.729167	171.576389	0.601	0.6188	
A	1	438.020833	438.020833	1.535	0.2241	9.9
B	2	6861.166667	3430.583333	12.022	0.0001	12.2
AB	2	197.166667	98.583333	0.345	0.7104	17.2
C	1	35.020833	35.020833	0.123	0.7283	9.9
AC	1	17.520833	17.520833	0.061	0.8058	14.0
BC	2	1055.166667	527.583333	1.849	0.1733	17.2
ABC	2	222.166667	111.083333	0.389	0.6806	24.3
ERROR	33	9416.520833	285.349116			

## FACTORIAL/POOLED ERROR AOV For IPOSS C 3WA roll Mornlry Control % 06/13/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	4923.916667				
R	3	167.416667	55.805556	0.568	0.6402	
A	1	8.333333	8.333333	0.085	0.7727	5.8
B	2	952.541667	476.270833	4.846	0.0143	7.1
AB	2	269.791667	134.895833	1.372	0.2676	10.1
C	1	0.750000	0.750000	0.008	0.9309	5.8
AC	1	75.000000	75.000000	0.763	0.3887	8.2
BC	2	53.375000	26.687500	0.272	0.7639	10.1
ABC	2	153.125000	76.562500	0.779	0.4671	14.3
ERROR	33	3243.583333	98.290404			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Comparison of Cover Crop Seeding Rate and Ratio

Trial ID: Cover9-19      Location: REC Field# 26      Trial Year: 2019  
 Protocol ID: Cover9-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 Initiation Date: 09/01/18  
 Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

C  
 Attributes: All cover Crops  
 Planting Date: 10/04/18  
 Rows per Plot: 16  
 Row Spacing: 7 IN  
 Emergence Date: 10/10/18  
 Planting Method: DRILLE drilled  
 Planting Equipment: FE Field Equipment

**Site and Design**

Treated Plot Width: 10 FT Site Type: FIELD field  
 Treated Plot Length: 20 FT  
 Treated Plot Area: 200 FT<sup>2</sup> Treatments: 9 Tillage Type: CONTIL conventional-till  
 Replications: 4 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 26	% Sand: 81	% OM: 1.1	Texture: LS	loamy sand
	% Silt: 10	pH: 6.1	Soil Name: Rosedale	loamy sand, 0-2% slopes
	% Clay: 9	CEC: 4.9	Fert. Level: G	good
Soil Drainage: G				good

**Trial Comments**

11/01/18: First pass of planter (101, 104, 107 etc) the 7th planter unit did not drop seed. Other two passes were fine. Overall cover crop stand and growth look very good.

04/24/19: Based on visual observations Cereal rye at 30 lbs and crimson clover at 20 lbs/A look the best. Crimson clover with tillage radish looks larger and more robust than same rate with cereal rye.

05/15/19: Cover crop biomass collected.

## Comparison of Cover Crop Seeding Rate and Ratio

Trial ID: Cover9-19 Location: REC Field# 26 Trial Year: 2019

Protocol ID: Cover9-19 Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code Description Rating Type Rating Unit Rating Date	C SECCE Rye DryWght g/0.5m2 04/29/19	C TRFIN CrmsnClvr DryWght g/0.5m2 04/29/19	C RAPSR TilagRad DryWght g/0.5m2 04/29/19	C SECCE Rye DryWght g/0.5m2 05/15/19	C TRFIN CrmsnClvr DryWght g/0.5m2 05/15/19
Trt Treatment No. Name					
1 Cereal Rye 112 lbs/A	58.5 a			120.8 a	
2 Cereal Rye 80 lbs/A	71.5 a			113.5 a	
3 Cereal Rye 80 lbs/A Crimson Clover 10 lbs/A	47.8 a	57.8 a		83.8 a	147.8 bc
4 Cereal Rye 55 lbs/A Crimson Clover 15 lbs/A	35.5 a	46.0 a		66.8 a	112.0 c
5 Cereal Rye 30 lbs/A Crimson Clover 20 lbs/A	44.0 a	88.8 a		80.0 a	188.3 ab
6 Cereal Rye 30 lbs/A Crimson Clover 10 lbs/A	39.3 a	77.8 a		78.5 a	159.0 bc
7 Crimson Clover 20 lbs/A Tillage Radish 10 lbs/A		90.5 a	1.8250 a		248.0 a
8 Crimson Clover 20 lbs/A Tillage Radish 5 lbs/A		116.0 a	0.3968 a		248.8 a
9 Cereal Rye 80 lbs/A Tillage Radish 5 lbs/A	56.3 a		1.0150 a	156.8 a	
LSD P=.05	26.15	55.28	1.46443	59.15	68.12
Standard Deviation	17.60	36.68	0.84638	39.82	45.20
CV	34.93	46.16	78.45	39.82	24.57
Replicate F	5.831	1.241	5.831	6.077	2.757
Replicate Prob(F)	0.0058	0.3298	0.0327	0.0048	0.0788
Treatment F	2.021	1.866	2.865	2.550	6.043
Treatment Prob(F)	0.1157	0.1604	0.1339	0.0576	0.0029

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Comparison of Cover Crop Seeding Rate and Ratio**

Trial ID: Cover9b-19      Location: Middletown      Trial Year: 2019  
Protocol ID: Cover9-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
Initiation Date: 09/01/18  
Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Conducted Under GLP: No  
Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
Organization: University of Delaware  
Address: 16483 County Seat Hwy  
City+State/Prov: Georgetown, Delaware  
Postal Code: 19947 E-mail: mJV@udel.edu  
Country: USA United States

**Crop Description**

C  
Attributes: All Cover Crops  
Planting Date: 10/09/18  
Rows per Plot: 16      Planting Method: DRILLE drilled  
Row Spacing: 7 IN      Planting Equipment: FE Field Equipment  
Emergence Date: 10/14/18

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
Treated Plot Length: 20 FT  
Treated Plot Area: 200 FT<sup>2</sup> Treatments: 9      Tillage Type: CONTIL conventional-till  
Replications: 4      Study Design: RACOBL Randomized Complete Block (RCB)

**Trial Comments**

## Comparison of Cover Crop Seeding Rate and Ratio

Trial ID: Cover9b-19

Location: Middletown

Trial Year: 2019

Protocol ID: Cover9-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code Description Rating Type Rating Unit Rating Date	C SECCE Rye DryWght g/0.5m2 05/06/19	C TRFIN CrmsClvr DryWght g/0.5m2 05/06/19
Trt Treatment No. Name		
1 Cereal Rye 112 lbs/A	160.5 a	
2 Cereal Rye 80 lbs/A	163.3 a	
3 Cereal Rye 80 lbs/A Crimson Clover 10 lbs/A	180.5 a	77.0 c
4 Cereal Rye 55 lbs/A Crimson Clover 15 lbs/A	123.8 a	109.8 bc
5 Cereal Rye 30 lbs/A Crimson Clover 20 lbs/A	182.8 a	96.0 c
6 Cereal Rye 30 lbs/A Crimson Clover 10 lbs/A	163.0 a	86.8 c
7 Crimson Clover 20 lbs/A Tillage Radish 10 lbs/A		160.0 a
8 Crimson Clover 20 lbs/A Tillage Radish 5 lbs/A		143.8 ab
9 Cereal Rye 80 lbs/A Tillage Radish 5 lbs/A		
LSD P=.05	59.43	42.79
Standard Deviation	39.43	28.39
CV	24.3	25.3
Replicate F	0.984	3.697
Replicate Prob(F)	0.4266	0.0358
Treatment F	1.153	5.395
Treatment Prob(F)	0.3765	0.0049

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Cover Crop Legume Selection for Different Planting Dates**

Trial ID: Cover10-19      Location: REC #26      Trial Year: 2019  
 Protocol ID: Cover10-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 Initiation Date: 09/01/18  
 Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

C  
 Attributes: All cover crops  
 Planting Date: 10/04/18  
 Rows per Plot: 16  
 Row Spacing: 7 IN  
 Emergence Date: 10/10/18

C  
 Attributes: All cover crops  
 Planting Date: 10/25/18  
 Planting Method: DRILLE drilled  
 Planting Equipment: FE Field Equipment  
 Emergence Date: 10/31/18

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
 Treated Plot Length: 20 FT  
 Treated Plot Area: 200 FT<sup>2</sup> Treatments: 12      Tillage Type: CONTIL conventional-till  
 Replications: 4      Study Design: SPLPLO Split-Plot

**Soil Description**

Description Name: Field 26  
 % Sand: 81      % OM: 1.1      Texture: LS      loamy sand  
 % Silt: 10      pH: 6.1      Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 9      CEC: 4.9      Fert. Level: G      good  
 Soil Drainage: G      good

**Trial Comments**

11/10/18: The first planting (emergence and stand) looks very good.

04/24/19: Cover crop growth in relation to cereal rye growth. Ratings focus on growth more than stand establishment.  
 Rating scale 0 to 5 (0 is no cover crop and 5 is excellent growth).

Growth of late planted plots is quite variable.

Cover Crop Legume Selection for Different Planting Dates			
Trial ID: Cover10-19	Location: REC #26	Trial Year: 2019	
Protocol ID: Cover10-19	Investigator: Mark VanGessel		
Study Director:		Sponsor Contact:	
Crop Name	CoverCrop		
Rating Type	RelGrowth		
Rating Unit	0-5		
Rating Date	04/24/19		
Trt Treatment No. Name			
1 Plant October Rye+Austrian Winter Peas Low Seeding Rates 60 lbs rye + low legume rate	2.8 de		
2 Plant October Rye+Austrian Winter Peas High Seeding Rates 30 lbs rye + high legume rate	3.8 bc		
3 Plant October Rye+Crimson Clover Low Seeding Rates 60 lbs rye + low legume rate	4.5 ab		
4 Plant October Rye+Crimson Clover High Seeding Rates 30 lbs rye + high legume rate	4.8 a		
5 Plant October Rye+Hairy Vetch Low Seeding Rates 60 lbs rye + low legume rate	4.0 ab		
6 Plant October Rye+Hairy Vetch High Seeding Rates 30 lbs rye + high legume rate	3.8 bc		
7 Plant November Rye+Austrian Winter Peas Low Seeding Rates 60 lbs rye + low legume rate	3.0 cd		
8 Plant November Rye+Austrian Winter Peas High Seeding Rates 30 lbs rye + high legume rate	4.3 ab		
9 Plant November Rye+Crimson Clover Low Seeding Rates 60 lbs rye + low legume rate	2.0 e		
10 Plant November Rye+Crimson Clover High Seeding Rates 30 lbs rye + high legume rate	2.0 e		
11 Plant November Rye+Hairy Vetch Low Seeding Rates 60 lbs rye + low legume rate	2.5 de		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Crop Name	CoverCrop
Rating Type	RelGrowth
Rating Unit	0-5
Rating Date	04/24/19
Trt Treatment No. Name	
12 Plant November Rye+Hairy Vetch High Seeding Rates 30 lbs rye + high legume rate	3.8 bc
LSD P=.05	0.96
Standard Deviation	0.65
CV	18.89
Replicate F	5.733
Replicate Prob(F)	0.0062
Treatment F	8.545
Treatment Prob(F)	0.0001

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Cover Crop Legume Selection for Different Planting Dates

Trial ID: Cover10-19

Location: REC #26

Trial Year: 2019

Protocol ID: Cover10-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Name	CoverCrop
Rating Type	RelGrwth
Rating Unit	0-5
Rating Date	04/24/19
Trt Treatment	
No. Name	
TABLE OF R MEANS	
Replicate 1	3.8
Replicate 2	3.8
Replicate 3	3.2
Replicate 4	2.9
TABLE OF A (Planting Dates) MEANS	
1 Plant October	3.9 a
2 Plant November	2.9 b
LSD P=.05	0.59
Standard Deviation	1.01
CV	29.42
TABLE OF B (Legume Species) MEANS	
1 Rye+Austrian Winter Peas	3.4 a
2 Rye+Crimson Clover	3.3 a
3 Rye+Hairy Vetch	3.5 a
LSD P=.05	0.72
Standard Deviation	1.01
CV	29.42
TABLE OF C (Seeding Rates) MEANS	
1 Low Seeding Rates	3.1 a
1 60 lbs rye + low legume rate	
2 High Seeding Rates	3.7 a
2 30 lbs rye + high legume rate	
LSD P=.05	0.59
Standard Deviation	1.01
CV	29.42
TABLE OF A (Planting Dates) B (Legume Species) MEANS	
1 Plant October	3.3 b
1 Rye+Austrian Winter Peas	
2 Plant November	3.6 ab
1 Rye+Austrian Winter Peas	
1 Plant October	4.6 a
2 Rye+Crimson Clover	
2 Plant November	2.0 c
2 Rye+Crimson Clover	
1 Plant October	3.9 ab
3 Rye+Hairy Vetch	
2 Plant November	3.1 b
3 Rye+Hairy Vetch	
LSD P=.05	1.02
Standard Deviation	1.01
CV	29.42
TABLE OF A (Planting Dates) C (Seeding Rates) MEANS	
1 Plant October	3.8 a
1 Low Seeding Rates	
1 60 lbs rye + low legume rate	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Name		CoverCrop
Rating Type		RelGrwth
Rating Unit		0-5
Rating Date		04/24/19
Trt Treatment No. Name		
2 Plant November 1 Low Seeding Rates 1 60 lbs rye + low legume rate		2.5 a
1 Plant October 2 High Seeding Rates 2 30 lbs rye + high legume rate		4.1 a
2 Plant November 2 High Seeding Rates 2 30 lbs rye + high legume rate		3.3 a
LSD P=.05		0.83
Standard Deviation		1.01
CV		29.42
TABLE OF B (Legume Species) C (Seeding Rates) MEANS		
1 Rye+Austrian Winter Peas 1 Low Seeding Rates 1 60 lbs rye + low legume rate		2.9 a
2 Rye+Crimson Clover 1 Low Seeding Rates 1 60 lbs rye + low legume rate		3.3 a
3 Rye+Hairy Vetch 1 Low Seeding Rates 1 60 lbs rye + low legume rate		3.3 a
1 Rye+Austrian Winter Peas 2 High Seeding Rates 2 30 lbs rye + high legume rate		4.0 a
2 Rye+Crimson Clover 2 High Seeding Rates 2 30 lbs rye + high legume rate		3.4 a
3 Rye+Hairy Vetch 2 High Seeding Rates 2 30 lbs rye + high legume rate		3.8 a
LSD P=.05		1.02
Standard Deviation		1.01
CV		29.42
TABLE OF A (Planting Dates) B (Legume Species) C (Seeding Rates) MEANS		
1 Plant October 1 Rye+Austrian Winter Peas 1 Low Seeding Rates 1 60 lbs rye + low legume rate		2.8 a
2 Plant November 1 Rye+Austrian Winter Peas 1 Low Seeding Rates 1 60 lbs rye + low legume rate		3.0 a
1 Plant October 2 Rye+Crimson Clover 1 Low Seeding Rates 1 60 lbs rye + low legume rate		4.5 a
2 Plant November 2 Rye+Crimson Clover 1 Low Seeding Rates 1 60 lbs rye + low legume rate		2.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Name		CoverCrop
Rating Type		RelGrwth
Rating Unit		0-5
Rating Date		04/24/19
Trt Treatment No. Name		
1 Plant October 3 Rye+Hairy Vetch 1 Low Seeding Rates 1 60 lbs rye + low legume rate		4.0 a
2 Plant November 3 Rye+Hairy Vetch 1 Low Seeding Rates 1 60 lbs rye + low legume rate		2.5 a
1 Plant October 1 Rye+Austrian Winter Peas 2 High Seeding Rates 2 30 lbs rye + high legume rate		3.8 a
2 Plant November 1 Rye+Austrian Winter Peas 2 High Seeding Rates 2 30 lbs rye + high legume rate		4.3 a
1 Plant October 2 Rye+Crimson Clover 2 High Seeding Rates 2 30 lbs rye + high legume rate		4.8 a
2 Plant November 2 Rye+Crimson Clover 2 High Seeding Rates 2 30 lbs rye + high legume rate		2.0 a
1 Plant October 3 Rye+Hairy Vetch 2 High Seeding Rates 2 30 lbs rye + high legume rate		3.8 a
2 Plant November 3 Rye+Hairy Vetch 2 High Seeding Rates 2 30 lbs rye + high legume rate		3.8 a
LSD P=.05		1.45
Standard Deviation		1.01
CV		29.42

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

FACTORIAL/POOLED ERROR AOV For CoverCrop RelGrwth 0-5 04/24/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	79.666667				
R	3	7.166667	2.388889	2.365	0.0888	
A	1	12.000000	12.000000	11.880	0.0016	0.6
B	2	0.291667	0.145833	0.144	0.8661	0.7
AB	2	18.375000	9.187500	9.096	0.0007	1.0
C	1	4.083333	4.083333	4.043	0.0526	0.6
AC	1	0.750000	0.750000	0.743	0.3951	0.8
BC	2	2.041667	1.020833	1.011	0.3750	1.0
ABC	2	1.625000	0.812500	0.804	0.4559	1.4
ERROR	33	33.333333	1.010101			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Comparison of Various Cover Crop Species**

Trial ID: Cover11-19      Location: REC Fld #26      Trial Year: 2019  
 Protocol ID: Cover11-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 Initiation Date: 09/01/18  
 Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947      E-mail: mjv@udel.edu  
 Country: USA      United States

**Crop Description**

C  
 Attributes: All cover Crops  
 Planting Date: 10/04/18  
 Rows per Plot: 16      Planting Method: DRILLE drilled  
 Row Spacing: 7 IN      Planting Equipment: FE      Field Equipment  
 Emergence Date: 10/10/18

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
 Treated Plot Length: 20 FT  
 Treated Plot Area: 200 FT<sup>2</sup>      Treatments: 12      Tillage Type: CONTIL conventional-till  
 Replications: 4      Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 26  
 % Sand: 81      % OM: 1.1      Texture: LS      loamy sand  
 % Silt: 10      pH: 6.1      Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 9      CEC: 4.9      Fert. Level: G      good  
 Soil Drainage: G      good

**Trial Comments**

11/01/18: 7th unit on the drill did not drop seed throughout the trial. Winter rape stand is not very good. Radish and turnip emergence and early growth look very good. Overall the cover crops look good.

04/24/19: Plot 305 and 309 misplanted (305 is both rye and barley; 309 has nothing planted. Wheat looks poorer than barley, cereal rye or triticale. Annual ryegrass also looks poor.

Spring oats did not winter kill, they are short but very much alive. Vetch looks better than crimson clover (crimson clover looks good, but vetch looks great). Austrian winter peas look poor. Only about half of the rapeseed plants died in the winter. Forage radish did not winter kill, about one-third of the stand is still alive and flowering.

Biomass taken April 16 and May 8.

## Comparison of Various Cover Crop Species

Trial ID: Cover11-19      Location: REC Fld #26      Trial Year: 2019  
 Protocol ID: Cover11-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Crop Name	CovrCrop	CovrCrop	
Rating Type	Dry Wght	Dry Wght	
Rating Unit	g/0.5m2	g/0.5m2	
Rating Date	04/16/19	05/08/19	
Trt Treatment No. Name			
1 Annual Ryegrass			
2 Winter Barley	60.9 ab	154.6 a-d	
3 Cereal Rye	70.9 a	218.9 a	
4 Winter Wheat	39.3 cd	117.0 cd	
5 Triticale	49.3 bc	126.8 bcd	
6 Crimson Clover		197.3 ab	
7 Hairy Vetch		162.3 abc	
8 Spring Oats	33.8 d		
9 Austrian Winter Peas		80.0 d	
10 Winter Rape			
11 Forage Radish			
12 Forage Turnip			
LSD P=.05	13.21	79.01	.
Standard Deviation	8.38	52.71	.
CV	16.51	34.91	.
Replicate F	25.338	4.262	
Replicate Prob(F)	0.0001	0.0216	
Treatment F	13.230	3.282	
Treatment Prob(F)	0.0005	0.0267	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,2

Could not calculate LSD (% mean diff) for columns 3 because error mean square = 0.

**Comparison of Various Cover Crop Species**

Trial ID: Cover11b-19      Location: Middletown      Trial Year: 2019  
Protocol ID: Cover11b-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
Initiation Date: 09/01/18  
Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Conducted Under GLP: No  
Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
Organization: University of Delaware  
Address: 16483 County Seat Hwy  
City+State/Prov: Georgetown, Delaware  
Postal Code: 19947 E-mail: mJV@udel.edu  
Country: USA United States

**Crop Description**

C  
Attributes: All Cover Crops  
Planting Date: 10/09/18  
Rows per Plot: 16      Planting Method: DRILLE drilled  
Row Spacing: 7 IN      Planting Equipment: FE Field Equipment  
Emergence Date: 10/14/18

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
Treated Plot Length: 20 FT  
Treated Plot Area: 200 FT<sup>2</sup> Treatments: 12      Tillage Type: NOTILL no-till  
Replications: 4      Study Design: RACOBL Randomized Complete Block (RCB)

**Trial Comments**

## Comparison of Various Cover Crop Species

Trial ID: Cover11b-19 Location: Middletown Trial Year: 2019  
 Protocol ID: Cover11b-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Crop Name	CovrCrps
Rating Type	DryWght
Rating Unit	g/0.5m2
Rating Date	05/06/19
Trt Treatment No.	Name
1 Annual Ryegrass	193.8 ab
2 Winter Barley	183.0 ab
3 Cereal Rye	195.5 ab
4 Winter Wheat	144.0 bcd
5 Triticale	223.3 a
6 Crimson Clover	160.5 bc
7 Hairy Vetch	102.8 d
8 Spring Oats	
9 Austrian Winter Peas	114.0 cd
10 Winter Rape	
11 Forage Radish	
12 Forage Turnip	
LSD P=.05	52.14
Standard Deviation	35.46
CV	21.54
Replicate F	3.343
Replicate Prob(F)	0.0387
Treatment F	5.640
Treatment Prob(F)	0.0009

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**ERICA Management with Rye Cover**

Trial ID: Cover12-19      Location: Field #22      Trial Year: 2018  
 Protocol ID: Cover12-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Trial Status Date: 03/21/19      Last Changed By: Mark VanGessel  
 Initiation Date: 08/01/18  
 Completion Date: 11/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N      USA 49.376656 - 24.53833  
 Longitude of LL Corner °: 75.455834 W      -124.715843 - -66.968887  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947      E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C SECCE Secale cereale Rye	BBCH Scale: BCER
Variety: VNS	
Planting Date: 10/16/18	Planting Rate: 56
Depth: 0.75 IN	LB/A
Row Spacing: 7 IN	Planting Method: DRILLE drilled
	Planting Equipment: FE Field Equipment
	Seed Bed: MEDTRA medium/trashy
	Soil Moisture: NORMAL normal, adequate

Emergence Date: 10/22/18

**Pest Description**

Pest 1 Type: W Code: CERVU Cerastium fontanum vulgare  
 Common Name: Mouse-ear chickweed

Pest 2 Type: W Code: ARBTH Arabidopsis thaliana  
 Common Name: Mouse-ear cress

Pest 3 Type: W Code: OEOLA Oenothera laciniata  
 Common Name: Cutleaf eveningprimrose

Pest 4 Type: W Code: LAMAM Lamium amplexicaule  
 Common Name: Henbit

Pest 5 Type: W Code: PLAPR Plantago purshii  
 Common Name: Woolly plantain

**Site and Design**

Treated Plot Width: 10 FT	Site Type: FIELD field
Treated Plot Length: 25 FT	
Treated Plot Area: 250 FT <sup>2</sup>	Tillage Type: NOTILL no-till
Replications: 3	Study Design: SPLPLO Split-Plot

**Soil Description**

Description Name: Field 22D  
 % Sand: 80 % OM: 1.3 Texture: SL sandy loam  
 % Silt: 10 pH: 6.2 Soil Name: Hammonton loamy sand, 0-2% slopes  
 % Clay: 10 CEC: 4.5 Fert. Level: G good  
 Soil Drainage: F fair

**Application Description**

	A	B
Application Date	11/19/18	03/20/19
Appl. Start Time	11:00 AM	03:20 PM
Appl. Stop Time	11:20 AM	03:40 PM
Interval to Prev. Appl.		121 DAYS
Application Method	SPRAY	SPRAY
Application Timing	Fall	EaSpring
Application Placement	BROADC	BROADC
Applied By	VanGessel	Johnson
Air Temperature Start, Stop	56 56 F	53 51 F
% Relative Humidity Start, Stop	69 69	44 50
Wind Velocity+Dir. Start	5 mph SSW	6 mph E
Wind Velocity+Dir. Stop	5 mph SSW	6 mph E
Wind Velocity+Dir. Max	5 mph SSW	6 mph E
Wet Leaves (Y/N)	N no	N no
Soil Temperature	51 F	56 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	50	91
Moisture 6 Hours after Appl.	0 IN	0.01 IN
Moisture 1 Week after Appl.	1.45 IN	1.03 IN
Weather Source	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	SECCE BCER	SECCE BCER
Days after Emergence	28	149
Stage Scale Used	DESC	DESC
Stage Majority, Percent	3-leaf 100	4-leaf 65
Stage Minimum, Percent		4-leaf 65
Stage Maximum, Percent		2-tilr 35
Height Average	2.5 in	2 in
Height Minimum, Maximum	1 3	1 3

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	CERVU W	CERVU W
Stage Majority, Percent	veg 100	flower 100
Height Average	2 in	4 in
Height Minimum, Maximum		3 5
Density Average	40 m2	25 m2
Density Min, Max	30 60	0 50
Pest 2 Code, Type, Scale	ARBTH W	ARBTH W
Stage Majority, Percent	veg 100	flower 100
Diameter	0.5 in	
Height Average		2.5 in
Density Average	40 m2	40 m2
Density Min, Max	20 60	0 80
Pest 3 Code, Type, Scale	OEOLA W	OEOLA W
Stage Majority, Percent	rosett 100	rosett 100
Diameter	2 in	4 in
Height Minimum, Maximum	1 3	2 5
Density Average	15 m2	10 m2
Density Min, Max	10 20	0 20
Pest 4 Code, Type, Scale	LAMAM W	LAMAM W
Stage Majority, Percent	veg 100	veg 100
Height Average	1 in	1.5 in
Height Minimum, Maximum		1 2
Density Average	8 m2	8 m2
Density Min, Max	0 16	0 16
Pest 5 Code, Type, Scale	PLAPR W	PLAPR W
Stage Majority, Percent	rosett 100	rosett 100
Diameter	1.5 in	2.5 in
Height Minimum, Maximum	1 2	2 3
Density Average	3 m2	3 m2
Density Min, Max	0 5	0 5

**Application Equipment**

	A	B
Appl. Equipment	Bckpck4Nozl	Bckpck6Nozl
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	18 in
Boom Length	6 ft	9 ft
Boom Height	18 in	21 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Minimum Mix/Treatment	1.3035 L	1.3035 L
Propellant	COMCO2	COMCO2

## ERICCA Management with Rye Cover

Trial ID: Cover12-19      Location: Field #22      Trial Year: 2018  
Protocol ID: Cover12-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

## Trial Comments

10/01/19: Rye has emerged but stand is good.

05/08/19: Rye biomass very low, further reduction when weed control was poor. Poor control of yellow wood sorrel with treatments 1-7 and 10. Treatment 3 and 4 weak on Carolina geranium.

ERIC Management with Rye Cover									
Trial ID: Cover12-19		Location: Field #22		Trial Year: 2018					
Protocol ID: Cover12-19		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact:									
Pest Code				CERVU C - MEchkwd	OEOLA C - CEprmrse	C SECCE Rye	CERVU C - MEchkwd		
Crop Type, Code						Rye Vigor 0-5			
Description				03/26/19	03/26/19	04/22/19	Control %		
Rating Type							04/22/19		
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	2,4-D ester Fall (~3lvs)	3.8 L	0.5 lb ae/a	0.5 lb ae/a	Fall	A	53.3 b		
2	2,4-D ester Early Spring Applic	3.8 L	0.5 lb ae/a	EaSpring	B		98.3 a		
3	Clarity.....dicamba Nonionic Surfactant Fall (~3lvs)	4 L 100 L	0.25 lb ai/a 0.25 % v/v	Fall	A	60.0 ab	56.7 b		
4	Clarity.....dicamba Nonionic Surfactant Early Spring Applic	4 L 100 L	0.25 lb ai/a 0.25 % v/v	EaSpring	B		3.00 b		
5	Authority MTZ Premix ----sulfentrazone ----metribuzin 2,4-D ester Fall (~3lvs)	45 DF 18 27 3.8 L	0.338 lb ai/a 0.135 0.203 0.5 lb ae/a	Fall	A	66.7 ab	100.0 a		
6	Authority MTZ Premix ----sulfentrazone ----metribuzin 2,4-D ester Early Spring Applic	45 DF 18 27 3.8 L	0.338 lb ai/a 0.135 0.203 0.5 lb ae/a	EaSpring	B		4.33 a		
7	Canopy EX Premix ----chlorimuron ----tribenuron 2,4-D ester Nonionic Surfactant Fall (~3lvs)	29.5 WG 22.7 6.8 3.8 L 100 L	0.0406 lb ai/a 0.0312 0.0094 0.5 lb ae/a 0.25 % v/v	Fall	A	75.0 a	100.0 a		
8	Canopy EX Premix ----chlorimuron ----tribenuron 2,4-D ester Nonionic Surfactant Early Spring Applic	29.5 WG 22.7 6.8 3.8 L 100 L	0.0406 lb ai/a 0.0312 0.0094 0.5 lb ae/a 0.25 % v/v	EaSpring	B		4.67 a		
9	Untreated Check			0.0		2.67 bc	55.0 b		
10	2,4-D ester	3.8 L	1 lb ae/a	EaSpring	B		87.3 a		
LSD P=.05				16.22	5.70	1.317	15.15		
Comp. Trt. LSD				16.22	5.70	2.120	15.03		
Standard Deviation				8.61	3.03	0.700	8.05		
CV				16.89	4.26	23.99	19.67		
Replicate F				0.607	0.545	4.102	0.422		
Replicate Prob(F)				0.5684	0.5997	0.0594	0.6698		
Treatment F				35.483	628.000	5.570	25.806		
Treatment Prob(F)				0.0001	0.0001	0.0120	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=7

Pest Code Crop Type, Code Description		OEOLA C - CEprmrse	VIORA C - FldPansy	OEOLA C - CEprmrse	STEME C - C.chkwd	VIORA C - FldPansy
Rating Type	Control %	Control %	Control %	Control %	Control %	Control %
Rating Unit	04/22/19	04/22/19	05/08/19	05/08/19	05/08/19	05/08/19
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1 2,4-D ester Fall (~3lvs)	3.8 L	0.5 lb ae/a	0.5 lb ae/a	Fall	A	98.3 ab
2 2,4-D ester Early Spring Applic	3.8 L	0.5 lb ae/a	0.5 lb ae/a	EaSpring B		23.3 c
3 Clarity.....dicamba Nonionic Surfactant Fall (~3lvs)	4 L 100 L	0.25 lb ai/a 0.25 % v/v	0.25 lb ai/a 0.25 % v/v	Fall	A A	76.7 cd
4 Clarity.....dicamba Nonionic Surfactant Early Spring Applic	4 L 100 L	0.25 lb ai/a 0.25 % v/v	0.25 lb ai/a 0.25 % v/v	EaSpring B	EaSpring B	81.7 bcd
5 Authority MTZ Premix ----sulfentrazone ----metribuzin 2,4-D ester Fall (~3lvs)	45 DF 18 27 3.8 L	0.338 lb ai/a 0.135 0.203 0.5 lb ae/a	0.338 lb ai/a 0.135 0.203 0.5 lb ae/a	Fall	A	100.0 a
6 Authority MTZ Premix ----sulfentrazone ----metribuzin 2,4-D ester Early Spring Applic	45 DF 18 27 3.8 L	0.338 lb ai/a 0.135 0.203 0.5 lb ae/a	0.338 lb ai/a 0.135 0.203 0.5 lb ae/a	EaSpring B		97.3 ab
7 Canopy EX Premix ----chlorimuron ----tribenuron 2,4-D ester Nonionic Surfactant Fall (~3lvs)	29.5 WG 22.7 6.8 3.8 L 100 L	0.0406 lb ai/a 0.0312 0.0094 0.5 lb ae/a 0.25 % v/v	0.0406 lb ai/a 0.0312 0.0094 0.5 lb ae/a 0.25 % v/v	Fall	A A	100.0 a
8 Canopy EX Premix ----chlorimuron ----tribenuron 2,4-D ester Nonionic Surfactant Early Spring Applic	29.5 WG 22.7 6.8 3.8 L 100 L	0.0406 lb ai/a 0.0312 0.0094 0.5 lb ae/a 0.25 % v/v	0.0406 lb ai/a 0.0312 0.0094 0.5 lb ae/a 0.25 % v/v	EaSpring B	EaSpring B	70.0 d
9 Untreated Check			0.0	0.0	0.0	0.0
10 2,4-D ester	3.8 L	1 lb ae/a	1 lb ae/a	EaSpring B		91.7
LSD P=.05			18.10	17.30	9.49	14.89
Comp. Trt. LSD			14.00	15.24	7.02	13.92
Standard Deviation			9.62	9.19	4.75	7.91
CV			11.79	27.02	6.11	19.73
Replicate F			0.975	1.156	1.675	2.653
Replicate Prob(F)			0.4179	0.3624	0.2642	0.1306
Treatment F			30.507	22.720	166.340	38.935
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001
						0.210 0.8150 2.093 0.1559

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean separations are based on the complete error term.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=7

ERICA Management with Rye Cover						
Trial ID: Cover12-19		Location: Field #22		Trial Year: 2018		
Protocol ID: Cover12-19		Investigator: Mark VanGessel				
Study Director:					Sponsor Contact:	
Pest Code		CERVU	OEOLA	CERVU	OEOLA	
Crop Type, Code		C -	C -	C	C -	
Description		MEchkwd	CEprmrse	Rye	MEchkwd	CEprmrse
Rating Type				Rye Vigor	Control %	Control %
Rating Unit				0-5	04/22/19	04/22/19
Rating Date		03/26/19	03/26/19	04/22/19	04/22/19	04/22/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
		L	lb ae/a	Fall	A	
TABLE OF R MEANS						
Replicate 1					3.69	47.5
Replicate 2					3.00	47.1
Replicate 3					2.50	42.5
TABLE OF A (Herbicide Treatment) MEANS						
1 2,4-D ester	3.8 L	0.5 lb	ae/a	Fall	A	
2 Clarity.....dicamba	4 L	0.25 lb	ai/a	Fall	A	
2 Nonionic Surfactant	100 L	0.25 %	v/v	Fall	A	
3 Authority MTZ Premix	45 DF	0.338 lb	ai/a	Fall	A	
3 ----sulfentrazone	18	0.135				
3 ----metribuzin	27	0.203				
3 2,4-D ester	3.8 L	0.5 lb	ae/a	Fall	A	
4 Canopy EX Premix	29.5 WG	0.0406 lb	ai/a	Fall	A	
4 ----chlorimuron	22.7	0.0312				
4 ----tribenuron	6.8	0.0094				
4 2,4-D ester	3.8 L	0.5 lb	ae/a	Fall	A	
4 Nonionic Surfactant	100 L	0.25 %	v/v	Fall	A	
LSD P=.05					1.288	11.68
Standard Deviation					1.040	9.43
CV					33.963	20.63
TABLE OF B (Application Timing) MEANS						
1 Fall (~3lvs)					3.67 a	38.8 b
2 Early Spring Applic					2.46 b	52.7 a
LSD P=.05					0.911	8.26
Standard Deviation					1.040	9.43
CV					33.963	20.63
TABLE OF A (Herbicide Treatment) B (Application Timing) MEANS						
1 2,4-D ester	3.8 L	0.5 lb	ae/a	Fall	A	
1 Fall (~3lvs)					53.3 a	98.3 a
2 Clarity.....dicamba	4 L	0.25 lb	ai/a	Fall	A	
2 Nonionic Surfactant	100 L	0.25 %	v/v	Fall	A	
1 Fall (~3lvs)					60.0 a	56.7 a
3 Authority MTZ Premix	45 DF	0.338 lb	ai/a	Fall	A	
3 ----sulfentrazone	18	0.135				
3 ----metribuzin	27	0.203				
3 2,4-D ester	3.8 L	0.5 lb	ae/a	Fall	A	
1 Fall (~3lvs)					66.7 a	100.0 a
4 Canopy EX Premix	29.5 WG	0.0406 lb	ai/a	Fall	A	
4 ----chlorimuron	22.7	0.0312				
4 ----tribenuron	6.8	0.0094				
4 2,4-D ester	3.8 L	0.5 lb	ae/a	Fall	A	
4 Nonionic Surfactant	100 L	0.25 %	v/v	Fall	A	
1 Fall (~3lvs)					75.0 a	100.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Description		VIORA C - FldPansy	OEOLA C - CEprmrse	STEME C - C.chkwd	VIORA C - FldPansy
Rating Type Rating Unit Rating Date		Control % 04/22/19	Control % 05/08/19	Control % 05/08/19	Control % 05/08/19
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code	
TABLE OF R MEANS					
Replicate 1		31.9	85.6	49.9	32.5
Replicate 2		38.1	86.8	49.3	28.8
Replicate 3		37.5	82.1	41.8	28.8
TABLE OF A (Herbicide Treatment) MEANS					
1 2,4-D ester	3.8 L	0.5 lb ae/a	Fall	A	26.7 bc
2 Clarity.....dicamba	4 L	0.25 lb ai/a	Fall	A	20.0 c
2 Nonionic Surfactant	100 L	0.25 % v/v	Fall	A	
3 Authority MTZ Premix	45 DF	0.338 lb ai/a	Fall	A	33.3 b
3 ----sulfentrazone	18	0.135			
3 ----metribuzin	27	0.203			
3 2,4-D ester	3.8 L	0.5 lb ae/a	Fall	A	
4 Canopy EX Premix	29.5 WG	0.0406 lb ai/a	Fall	A	63.3 a
4 ----chlorimuron	22.7	0.0312			
4 ----tribenuron	6.8	0.0094			
4 2,4-D ester	3.8 L	0.5 lb ae/a	Fall	A	
4 Nonionic Surfactant	100 L	0.25 % v/v	Fall	A	
LSD P=.05		12.21	5.67	11.17	17.06
Standard Deviation		9.86	4.51	9.02	13.78
CV		27.51	5.32	19.21	45.93
TABLE OF B (Application Timing) MEANS					
1 Fall (~3lvs)		22.5 b	84.3 a	43.8 a	26.7 a
2 Early Spring Applic		49.2 a	85.3 a	50.2 a	33.3 a
LSD P=.05		8.63	4.01	7.90	12.07
Standard Deviation		9.86	4.51	9.02	13.78
CV		27.51	5.32	19.21	45.93
TABLE OF A (Herbicide Treatment) B (Application Timing) MEANS					
1 2,4-D ester	3.8 L	0.5 lb ae/a	Fall	A	23.3 b
1 Fall (~3lvs)					
2 Clarity.....dicamba	4 L	0.25 lb ai/a	Fall	A	0.0 c
2 Nonionic Surfactant	100 L	0.25 % v/v	Fall	A	
1 Fall (~3lvs)					
3 Authority MTZ Premix	45 DF	0.338 lb ai/a	Fall	A	26.7 b
3 ----sulfentrazone	18	0.135			
3 ----metribuzin	27	0.203			
3 2,4-D ester	3.8 L	0.5 lb ae/a	Fall	A	
1 Fall (~3lvs)					
4 Canopy EX Premix	29.5 WG	0.0406 lb ai/a	Fall	A	40.0 b
4 ----chlorimuron	22.7	0.0312			
4 ----tribenuron	6.8	0.0094			
4 2,4-D ester	3.8 L	0.5 lb ae/a	Fall	A	
4 Nonionic Surfactant	100 L	0.25 % v/v	Fall	A	
1 Fall (~3lvs)					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		CERVU C -	OEOLA C -	C SECCE	Rye	CERVU C -	OEOLA C -
Description		MEchkwd	CEprmrse			MEchkwd	CEprmrse
Rating Type				Rye Vigor 0-5		Control %	Control %
Rating Unit				04/22/19		04/22/19	04/22/19
Rating Date		03/26/19	03/26/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	2,4-D ester	3.8 L	0.5 lb ae/a	0.5 lb ae/a	Fall	A	
2	Early Spring Applic						.
2	Clarity.....dicamba	4 L	0.25 lb ai/a	0.25 lb ai/a	Fall	A	
2	Nonionic Surfactant	100 L	0.25 % v/v	0.25 % v/v	Fall	A	.
2	Early Spring Applic						.
3	Authority MTZ Premix	45 DF	0.338 lb ai/a	0.338 lb ai/a	Fall	A	
3	----sulfentrazone	18	0.135	0.135			.
3	----metribuzin	27	0.203	0.203			.
3	2,4-D ester	3.8 L	0.5 lb ae/a	0.5 lb ae/a	Fall	A	
2	Early Spring Applic						.
4	Canopy EX Premix	29.5 WG	0.0406 lb ai/a	0.0406 lb ai/a	Fall	A	
4	----chlorimuron	22.7	0.0312	0.0312			.
4	----tribenuron	6.8	0.0094	0.0094			.
4	2,4-D ester	3.8 L	0.5 lb ae/a	0.5 lb ae/a	Fall	A	
4	Nonionic Surfactant	100 L	0.25 % v/v	0.25 % v/v	Fall	A	
2	Early Spring Applic						.
LSD P=.05				16.22	5.70	1.821	16.52
Standard Deviation				8.61	3.03	1.040	9.43
CV				13.51	3.41	33.963	20.63
							15.00
							8.56
							9.46

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	VIORA C - FldPansy	OEOLA C - CEprmrse	STEME C - C.chkwd	VIORA C - FldPansy
Rating Type	Control %	Control %	Control %	Control %
Rating Unit	04/22/19	05/08/19	05/08/19	05/08/19
Rating Date				
Trt Treatment No. Name	Form Conc Form Type Rate	Appl Unit Appl Timing	Appl Code	
1 2,4-D ester 2 Early Spring Applic	3.8 L	0.5 lb ae/a	Fall A	30.0 b
2 Clarity.....dicamba 2 Nonionic Surfactant 2 Early Spring Applic	4 L 100 L	0.25 lb ai/a 0.25 % v/v	Fall A	40.0 b
3 Authority MTZ Premix 3 ----sulfentrazone 3 ----metribuzin 3 2,4-D ester 2 Early Spring Applic	45 DF 18 27 3.8 L	0.338 lb ai/a 0.135 0.203 0.5 lb ae/a	Fall A	40.0 b
4 Canopy EX Premix 4 ----chlorimuron 4 ----tribenuron 4 2,4-D ester 4 Nonionic Surfactant 2 Early Spring Applic	29.5 WG 22.7 6.8 3.8 L 100 L	0.0406 lb ai/a 0.0312 0.0094 0.5 lb ae/a 0.25 % v/v	Fall A	86.7 a
LSD P=.05 Standard Deviation CV				17.26 9.86 27.51
				8.02 4.51 5.32
				15.80 9.02 19.21
				24.13 13.78 45.93

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Randomized Complete Block (RCB) AOV For CERVU C MEchkwd 03/26/19 Missing factor B levels prevents analyzing column 1 as Split-Plot design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	14	11210.000000			
Replicate	2	90.000000	45.000000	0.607	0.5684
Treatment	4	10526.666667	2631.666667	35.483	0.0001
ERROR	8	593.333333	74.166667		

Randomized Complete Block (RCB) AOV For OEOLA C CEprmrse 03/26/19 Missing factor B levels prevents analyzing column 2 as Split-Plot design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	14	23110.000000			
Replicate	2	10.000000	5.000000	0.545	0.5997
Treatment	4	23026.666667	5756.666667	628.000	0.0001
ERROR	8	73.333333	9.166667		

FACTORIAL/POOLED ERROR AOV For C SECCE Rye Rye Vigor 0-5 04/22/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	40.156250				
R	2	5.687500	2.843750	2.629	0.1073	
A	3	4.114583	1.371528	1.268	0.3235	1.29
B	1	8.760417	8.760417	8.098	0.0130	0.91
AB	3	6.447917	2.149306	1.987	0.1623	1.82
ERROR	14	15.145833	1.081845			

FACTORIAL/POOLED ERROR AOV For CERVU C MEchkwd Control % 04/22/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	10816.958333				
R	2	124.083333	62.041667	0.698	0.5143	
A	3	7136.125000	2378.708333	26.743	0.0001	11.7
B	1	1162.041667	1162.041667	13.065	0.0028	8.3
AB	3	1149.458333	383.152778	4.308	0.0238	16.5
ERROR	14	1245.250000	88.946429			

FACTORIAL/POOLED ERROR AOV For OEOLA C CEprmrse Control % 04/22/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	4368.000000				
R	2	135.750000	67.875000	0.925	0.4193	
A	3	1803.000000	601.000000	8.193	0.0021	10.6
B	1	253.500000	253.500000	3.456	0.0842	7.5
AB	3	1148.833333	382.944444	5.221	0.0125	15.0
ERROR	14	1026.916667	73.351190			

FACTORIAL/POOLED ERROR AOV For VIORA C FldPansy Control % 04/22/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	14133.333333				
R	2	189.583333	94.791667	0.975	0.4012	
A	3	6583.333333	2194.444444	22.583	0.0001	12.2
B	1	4266.666667	4266.666667	43.908	0.0001	8.6
AB	3	1733.333333	577.777778	5.946	0.0078	17.3
ERROR	14	1360.416667	97.172619			

FACTORIAL/POOLED ERROR AOV For OEOLA C CEprmrse Control % 05/08/19 Missing values in column 7 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	21	13435.785211				
R	2	94.517646	47.258823	2.325	0.1402	
A	3	12954.048263	4318.016088	212.435	0.0001	5.7
B	1	5.767022	5.767022	0.284	0.6040	4.0
AB	3	137.536407	45.845469	2.255	0.1343	8.0
ERROR	12	243.915872	20.326323			

FACTORIAL/POOLED ERROR AOV For STEME C C.chkwd Control % 05/08/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	16730.958333				
R	2	327.083333	163.541667	2.009	0.1710	
A	3	11527.791667	3842.597222	47.207	0.0001	11.2
B	1	247.041667	247.041667	3.035	0.1034	7.9
AB	3	3489.458333	1163.152778	14.290	0.0002	15.8
ERROR	14	1139.583333	81.398810			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

FACTORIAL/POOLED ERROR AOV For VIORA C FldPansy Control % 05/08/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	5000.000000				
R	2	75.000000	37.500000	0.197	0.8230	
A	3	900.000000	300.000000	1.580	0.2386	17.1
B	1	266.666667	266.666667	1.404	0.2557	12.1
AB	3	1100.000000	366.666667	1.931	0.1710	24.1
ERROR	14	2658.333333	189.880952			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Rye Seeding Rates for Weed Management**

Trial ID: Cover13-19      Location: REC Fld #32      Trial Year: 2019  
 Protocol ID: Cover13-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 Trial Status Date: 03/21/19 Last Export Date: 12/11/19 Last Changed By: Mark VanGessel  
 Initiation Date: 08/01/18  
 Completion Date: 11/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N      USA 49.376656 - 24.53833  
 Longitude of LL Corner °: 75.455834 W      -124.715843 - -66.968887  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947      E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C      SECCE Secale cereale Rye	BBCH Scale: BCER
Variety: VNS	
Planting Date: 10/17/18	
Depth: 0.75 IN	
Rows per Plot: 16	Planting Method: DRILLE drilled
Row Spacing: 7 IN	Planting Equipment: CP Cone Planter
Soil Temperature: 64 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 09/23/18	Soil Moisture: NORMAL normal, adequate
% Standard Moisture: 13.0	Harvested Width: 5 FT
	Harvested Length: 20 FT
Crop 2: C      GLXMA Glycine max	Soybean
Variety: S43XS27	BBCH Scale: BSOY
Attributes: Xtend	
Planting Date: 05/09/19	Planting Rate: 180000 S/A
Depth: 1 IN	
Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 IN	Planting Equipment: FE Field Equipment
Soil Temperature: 75 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 05/16/19	Soil Moisture: NORMAL normal, adequate
Harvest Date: 10/30/19	Harvest Equipment: Plot combine
% Standard Moisture: 13.0	Harvested Width: 5 FT
	Harvested Length: 25 FT

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
 Treated Plot Length: 20 FT  
 Treated Plot Area: 200 FT<sup>2</sup> Treatments: 8      Tillage Type: NOTILL no-till  
 Replications: 4      Study Design: FACTOR Factorial

**Field Prep./Maintenance:**

Total preemergence burndown on 05/10/19. Total postemergence application Roundup PowerMax (1 qt/A) and XtendiMax (22 fl.oz/A) on 06/17/19.

**Soil Description**

Description Name: Field 32  
% Sand: 81 % OM: 1.1 Texture: LS loamy sand  
% Silt: 10 pH: 5.8 Soil Name: Hammonton loamy sand, 0-2% slopes  
% Clay: 9 CEC: 5.4 Fert. Level: G good  
Soil Drainage: F fair

**Application Description**

	A
Application Date	03/13/19
Appl. Stop Time	12:30 PM
Application Method	SPRAY
Application Timing	Spring
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	51 51 F
% Relative Humidity Start, Stop	36 36
Wind Velocity+Dir. Start	3 mph S
Wind Velocity+Dir. Stop	3 mph S
Wind Velocity+Dir. Max	3 mph S
Wet Leaves (Y/N)	N no
Soil Temperature	50 F
Soil Moisture	WET
% Cloud Cover	0
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	0.04 IN
Weather Source	ITERIS

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	SECCE BCER
Days after Emergence	171
Crop 2 Code, BBCH Scale	GLXMA BSOY
Days after Emergence	-64

**Application Equipment**

	A
Appl. Equipment	Tractr6Nozl
Equipment Type	TRMOSP
Operation Pressure	40 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	20 in
Boom Length	10 ft
Boom Height	20 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Minimum Mix/Treatment	0.3673 GAL
Propellant	COMAIR

Context	Date	By	Notes
STATUS	03/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

#### Trial Comments

10/01/19: Rye stand looks good, noticeable differences in rye stand as intended with the protocol.

04/22/19: Heavy weed pressure. Rye growth is not very good, looks as if its N-deficient with poor tillering.

05/09/19: Rye biomass taken 0.25m<sup>2</sup> area.

05/16/19: Rye height was similar across seeding rate and nitrogen levels. Average height per rep was 37", 44", 40", and 39".

05/23/19: Summer annual weeds just emerging (predominant emergence is morningglory species). Rating reflects control as follows - 5=excellent, 4=good, 3=fair, 2=poor, 1=no control.

Deer feeding - electric fence put up.

05/30/19: AMASS = ~75% Palmer amaranth, 25% smooth pigweed. IPOSS = Ivyleaf and Pitted morningglory.

06/12/19: At weed biomass - some deer feeding on ragweed from fence down for planting another trial. Annual grasses coming in rep 3; plot 406 has heavy grass pressure. Rye residue taken in 0.5m<sup>2</sup> area.

06/28/19: Rated soybean crop biomass reduction (some deer feeding in trial).

## Rye Seeding Rates for Weed Management

Trial ID: Cover13-19 Location: REC Fld #32 Trial Year: 2019  
 Protocol ID: Cover13-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code Crop Type, Code	C SECCE	C -	AMASS C -	IPOSS C -	AMBEL C -	AMASS C -
Description	RyeBioms	SpryCard	Amaranth	Mornlry	C.ragwd	Amaranth
Rating Type	DryWght	AvgCover	Control	Control	Count	Control
Rating Unit	g/0.25m <sup>2</sup>	%	1-5*	1-5*	#/1m <sup>2</sup>	%
Rating Date	05/09/19	05/09/19	05/23/19	05/23/19	05/23/19	05/30/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Timing
1	0 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring		
2	0 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring		
3	45 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	55.5 a	12.5 a
4	45 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	56.8 a	11.9 a
5	90 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	62.0 a	11.9 a
6	90 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	75.3 a	13.3 a
7	120 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	59.0 a	12.4 a
8	120 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	52.3 a	15.1 a
LSD P=.05			28.82	5.48	1.17	1.05
Standard Deviation			19.12	3.67	0.80	0.71
CV			31.81	28.63	24.09	25.61
Replicate F			2.347	0.168	1.636	0.718
Replicate Prob(F)			0.1139	0.9165	0.2114	0.5520
Treatment F			0.718	0.363	4.570	3.862
Treatment Prob(F)			0.6197	0.8922	0.0031	0.0075

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns: Yates=5,19,22

Pest Code Crop Type, Code	IPOSS C - Mornglry	AMASS C - Amaranth	IPOSS C - Mornglry	C SECCE RyeBioms	AMASS C - Amaranth	AMASS C - Amaranth
Description	Control % 05/30/19	Control % 06/12/19	Control % 06/12/19	DryWght g/0.5m <sup>2</sup> 06/12/19	DryWght g/0.5m <sup>2</sup> 06/12/19	Density #/0.5m <sup>2</sup> 06/12/19
Trt No. Treatment Name	Form Conc Type	Rate Rate Unit	Appl Timing			
1 0 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a Spring	0.0 d	0.0 d	0.0 c	5.3615 a
2 0 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a Spring	35.0 bc	28.8 c	14.5 bc	2.8290 a
3 45 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a Spring	31.5 c	21.3 cd	7.5 bc	93.8 a
4 45 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a Spring	53.8 a	55.0 ab	7.5 bc	86.0 a
5 90 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a Spring	48.8 abc	42.0 bc	12.5 bc	126.3 a
6 90 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a Spring	50.0 ab	58.8 ab	26.3 ab	2.0130 a
7 120 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a Spring	56.3 a	64.5 a	43.8 a	96.8 a
8 120 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a Spring	52.8 a	61.3 ab	30.0 ab	1.4343 a
LSD P=.05		17.38	22.24	25.91	54.89	5.86053
Standard Deviation		11.82	15.12	17.62	36.42	3.98537
CV		28.83	36.5	99.26	33.21	133.08
Replicate F		0.512	2.845	0.233	0.577	2.680
Replicate Prob(F)		0.6781	0.0623	0.8721	0.6390	0.0731
Treatment F		10.152	9.227	2.691	1.158	0.893
Treatment Prob(F)		0.0001	0.0001	0.0372	0.3740	0.5293
						0.9585

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=5,19,22

Pest Code Crop Type, Code	AMASS C - Amaranth	IPOSS C - Mornglry	IPOSS C - Mornglry	IPOSS C - Mornglry	AMBEL C - C.ragwd	AMBEL C - C.ragwd
Description	Height inches 06/12/19	DryWght g/0.5m2 06/12/19	Density #/0.5m2 06/12/19	Length inches 06/12/19	DryWght g/0.5m2 06/12/19	Density #/0.5m2 06/12/19
Rating Type Rating Unit Rating Date						
Trt Treatment No. Name	Form Form Conc Type	Rate Rate Unit Unit	Appl Timing			
1 0 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	5.563 a	4.1210 a	25.8 a
2 0 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	5.250 a	2.4720 a	14.8 a
3 45 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	4.750 a	1.7230 a	9.0 a
4 45 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	3.438 a	2.2813 a	9.0 a
5 90 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	4.625 a	2.4020 a	7.5 a
6 90 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	7.000 a	3.2160 a	7.5 a
7 120 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	5.375 a	3.0018 a	11.5 a
8 120 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	4.625 a	3.8910 a	11.0 a
LSD P=.05	3.6427	3.59687	16.31	3.17	1.03006	3.81
Standard Deviation	2.4772	2.44600	11.09	2.15	0.70048	2.59
CV	48.78	84.68	92.44	40.66	74.9	67.94
Replicate F	1.265	2.080	3.988	1.902	0.511	1.075
Replicate Prob(F)	0.3119	0.1334	0.0215	0.1618	0.6793	0.3812
Treatment F	0.676	0.457	1.190	1.421	1.026	1.413
Treatment Prob(F)	0.6906	0.8545	0.3502	0.2514	0.4422	0.2519

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=5,19,22

Pest Code Crop Type, Code	AMBEL C - C.ragwd	AMASS C - AftrPOST	IPOSS C - AftrPOST	C SECCE RyeResid	C GLXMA 2CntrRws	C GLXMA Soybean
Description	Height inches 06/12/19	Control % 06/28/19	Control % 06/28/19	GrndCvr % 06/28/19	BiomRed % 06/28/19	Yield Bu/A 10/30/19
Trt No. Treatment Name	Form Conc Type	Rate Rate Unit Unit	Appl Timing			
1 0 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	4.63 a	78.5 a	63.8 a
0.0 d					63.3 a	37.4 a
2 0 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	5.00 a	77.3 a	62.5 a
					0.0 d	62.5 a
3 45 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	5.38 a	78.8 a	68.3 a
					22.0 c	50.0 a
4 45 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	4.25 a	87.0 a	83.3 a
					32.5 bc	28.0 b
5 90 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	5.10 a	83.5 a	80.5 a
					49.5 a	30.5 b
6 90 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	4.75 a	82.0 a	71.8 a
					45.8 ab	24.5 b
7 120 lb Rye per acre 27-0-0-6	2.9 L	0 lb ai/a	Spring	4.75 a	87.0 a	80.0 a
					45.0 ab	22.5 b
8 120 lb Rye per acre 27-0-0-6	2.9 L	30 lb ai/a	Spring	4.75 a	83.8 a	81.3 a
					48.3 a	16.3 b
LSD P=.05		1.790	10.28	15.92	15.61	17.67
Standard Deviation		1.214	6.99	10.82	10.62	12.01
CV		25.16	8.5	14.65	34.96	32.31
Replicate F		1.162	3.082	2.736	4.262	2.417
Replicate Prob(F)		0.3489	0.0496	0.0692	0.0169	0.0949
Treatment F		0.308	1.173	2.399	15.486	9.614
Treatment Prob(F)		0.9420	0.3593	0.0570	0.0001	0.0001
						0.364
						0.7798
						0.824
						0.5785

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=5,19,22

## Rye Seeding Rates for Weed Management

Trial ID: Cover13-19

Location: REC Fld #32

Trial Year: 2019

Protocol ID: Cover13-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Crop Type, Code	C SECCE	C -	AMASS C -	IPOSS C -	AMBEL C -	AMASS C -	
Description	RyeBioms	SpryCard	Amaranth	Mornglry	C.ragwd	Amaranth	
Rating Type	DryWght	AvgCover	Control	Control	Count	Control	
Rating Unit	g/0.25m <sup>2</sup>	%	1-5*	1-5*	#/1m <sup>2</sup>	%	
Rating Date	05/09/19	05/09/19	05/23/19	05/23/19	05/23/19	05/30/19	
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Timing		
TABLE OF R MEANS							
Replicate 1		59.3		3.3	2.9	2.0	56.4
Replicate 2		68.3		3.4	2.8	2.6	56.9
Replicate 3		69.3		3.8	3.0	4.0	61.5
Replicate 4		43.5		2.9	2.5	4.3	43.9
TABLE OF A (Seeding rate) MEANS							
1 0 lb Rye per acre	.			2.1 c	1.8 b	4.4 a	21.9 c
2 45 lb Rye per acre		56.1 a		3.3 b	2.8 a	3.3 a	50.4 b
3 90 lb Rye per acre		68.6 a		3.8 ab	3.3 a	2.6 a	68.8 a
4 120 lb Rye per acre		55.6 a		4.1 a	3.4 a	2.6 a	77.6 a
LSD P=.05		20.38		0.83	0.74	1.50	15.68
Standard Deviation		19.12		0.80	0.71	1.44	15.08
CV		31.81		24.09	25.61	44.79	27.59
TABLE OF B (N rate) MEANS							
1 27-0-0-6 2.9 L	0 lb ai/a Spring	58.8 a		3.2 a	2.8 a	3.4 a	45.1 b
2 27-0-0-6 2.9 L	30 lb ai/a Spring	61.4 a		3.4 a	2.8 a	3.0 a	64.3 a
LSD P=.05		14.41		0.59	0.52	1.06	11.09
Standard Deviation		19.12		0.80	0.71	1.44	15.08
CV		31.81		24.09	25.61	44.79	27.59
TABLE OF A (Seeding rate) B (N rate) MEANS							
1 0 lb Rye per acre	.		12.7 a	2.3 a	1.8 a	5.5 a	0.0 d
1 27-0-0-6 2.9 L	0 lb ai/a Spring						
2 45 lb Rye per acre		55.5 a	12.5 a	2.8 a	2.5 a	2.3 bc	37.0 c
1 27-0-0-6 2.9 L	0 lb ai/a Spring						
3 90 lb Rye per acre		62.0 a	11.9 a	3.8 a	3.3 a	2.8 bc	65.5 ab
1 27-0-0-6 2.9 L	0 lb ai/a Spring						
4 120 lb Rye per acre		59.0 a	12.4 a	4.0 a	3.5 a	3.3 bc	77.8 a
1 27-0-0-6 2.9 L	0 lb ai/a Spring						
1 0 lb Rye per acre	.		.	2.0 a	1.8 a	3.3 bc	43.8 bc
2 27-0-0-6 2.9 L	30 lb ai/a Spring						
2 45 lb Rye per acre		56.8 a	11.9 a	3.8 a	3.0 a	4.3 ab	63.8 ab
2 27-0-0-6 2.9 L	30 lb ai/a Spring						
3 90 lb Rye per acre		75.3 a	13.3 a	3.8 a	3.3 a	2.5 bc	72.0 a
2 27-0-0-6 2.9 L	30 lb ai/a Spring						
4 120 lb Rye per acre		52.3 a	15.1 a	4.3 a	3.3 a	2.0 c	77.5 a
2 27-0-0-6 2.9 L	30 lb ai/a Spring						
LSD P=.05		28.82	5.48	1.17	1.05	2.12	22.17

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	IPOSS C - Morngly	AMASS C - Amaranth	IPOSS C - Morngly	C SECCE RyeBioms	AMASS C - Amaranth	AMASS C - Amaranth
Description						
Rating Type	Control	Control	Control	DryWght	DryWght	Density
Rating Unit	%	%	%	g/0.5m <sup>2</sup>	g/0.5m <sup>2</sup>	#/0.5m <sup>2</sup>
Rating Date	05/30/19	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19
Trt No.	Treatment Name	Form Conc	Form Rate	Rate Unit	Appl Timing	
TABLE OF R MEANS						
Replicate 1		45.1	33.1	16.9	115.5	1.4408
Replicate 2		41.0	45.0	18.8	122.3	2.2231
Replicate 3		39.8	52.5	14.1	97.5	1.8935
Replicate 4		38.1	35.1	21.3	103.3	6.4213
TABLE OF A (Seeding rate) MEANS						
1 0 lb Rye per acre		17.5 b	14.4 c	7.3 b	.	4.0953 a
2 45 lb Rye per acre		42.6 a	38.1 b	7.5 b	89.9 a	2.9720 a
3 90 lb Rye per acre		49.4 a	50.4 ab	19.4 ab	128.5 a	3.4458 a
4 120 lb Rye per acre		54.5 a	62.9 a	36.9 a	110.6 a	1.4656 a
LSD P=.05		12.29	15.73	18.32	38.81	4.14402
Standard Deviation		11.82	15.12	17.62	36.42	3.98537
CV		28.83	36.50	99.26	33.21	133.08278
TABLE OF B (N rate) MEANS						
1 27-0-0-6	2.9 L	0 lb ai/a Spring	34.1 b	31.9 b	15.9 a	4.2208 a
2 27-0-0-6	2.9 L	30 lb ai/a Spring	47.9 a	50.9 a	19.6 a	1.7685 a
LSD P=.05		8.69	11.12	12.95	27.44	2.93026
Standard Deviation		11.82	15.12	17.62	36.42	3.98537
CV		28.83	36.50	99.26	33.21	133.08278
TABLE OF A (Seeding rate) B (N rate) MEANS						
1 0 lb Rye per acre		0.0 d	0.0 a	0.0 a	.	5.3615 a
1 27-0-0-6	2.9 L	0 lb ai/a Spring				12.5 a
2 45 lb Rye per acre		31.5 c	21.3 a	7.5 a	93.8 a	5.2090 a
1 27-0-0-6	2.9 L	0 lb ai/a Spring				9.3 a
3 90 lb Rye per acre		48.8 abc	42.0 a	12.5 a	126.3 a	4.8785 a
1 27-0-0-6	2.9 L	0 lb ai/a Spring				9.5 a
4 120 lb Rye per acre		56.3 a	64.5 a	43.8 a	96.8 a	1.4343 a
1 27-0-0-6	2.9 L	0 lb ai/a Spring				4.5 a
1 0 lb Rye per acre		35.0 bc	28.8 a	14.5 a	.	2.8290 a
2 27-0-0-6	2.9 L	30 lb ai/a Spring				8.0 a
2 45 lb Rye per acre		53.8 a	55.0 a	7.5 a	86.0 a	0.7350 a
2 27-0-0-6	2.9 L	30 lb ai/a Spring				13.8 a
3 90 lb Rye per acre		50.0 ab	58.8 a	26.3 a	130.8 a	2.0130 a
2 27-0-0-6	2.9 L	30 lb ai/a Spring				8.3 a
4 120 lb Rye per acre		52.8 a	61.3 a	30.0 a	124.5 a	1.4970 a
2 27-0-0-6	2.9 L	30 lb ai/a Spring				6.5 a
LSD P=.05		17.38	22.24	25.91	54.89	5.86053
						16.97

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	AMASS C -	IPOSS C -	IPOSS C -	IPOSS C -	AMBEL C -	AMBEL C -
Description	Amaranth	Mornglry	Mornglry	Mornglry	C.ragwd	C.ragwd
Rating Type	Height inches	DryWght g/0.5m <sup>2</sup>	Density #/0.5m <sup>2</sup>	Length inches	DryWght g/0.5m <sup>2</sup>	Density #/0.5m <sup>2</sup>
Rating Unit	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Timing
TABLE OF R MEANS						
Replicate 1		3.688	1.7526	12.0	4.6	0.7613
Replicate 2		5.156	4.6584	23.0	5.8	0.8435
Replicate 3		5.500	2.7198	7.6	4.3	0.9683
Replicate 4		5.969	2.4233	5.4	6.5	1.1680
TABLE OF A (Seeding rate) MEANS						
1 0 lb Rye per acre		5.406 a	3.2965 a	20.3 a	3.9 a	1.1109 a
2 45 lb Rye per acre		4.094 a	2.0021 a	9.0 a	5.7 a	0.8456 a
3 90 lb Rye per acre		5.813 a	2.8090 a	7.5 a	6.5 a	0.6859 a
4 120 lb Rye per acre		5.000 a	3.4464 a	11.3 a	5.1 a	1.0986 a
LSD P=.05		2.5758	2.54337	11.53	2.24	0.72837
Standard Deviation		2.4772	2.44600	11.09	2.15	0.70048
CV		48.7818	84.68069	92.44	40.66	74.89775
2.69						
TABLE OF B (N rate) MEANS						
1 27-0-0-6	2.9 L	0 lb ai/a	Spring	5.078 a	2.8119 a	13.4 a
2 27-0-0-6	2.9 L	30 lb ai/a	Spring	5.078 a	2.9651 a	10.6 a
2.59						
LSD P=.05		1.8214	1.79843	8.16	1.59	0.51503
Standard Deviation		2.4772	2.44600	11.09	2.15	0.70048
CV		48.7818	84.68069	92.44	40.66	74.89775
2.59						
67.94						
TABLE OF A (Seeding rate) B (N rate) MEANS						
1 0 lb Rye per acre		5.563 a	4.1210 a	25.8 a	3.8 a	1.2805 a
1 27-0-0-6	2.9 L	0 lb ai/a	Spring			5.0 a
3.5 a						
2 45 lb Rye per acre		4.750 a	1.7230 a	9.0 a	5.1 a	1.1535 a
1 27-0-0-6	2.9 L	0 lb ai/a	Spring			
2.5 a						
3 90 lb Rye per acre		4.625 a	2.4020 a	7.5 a	5.5 a	0.9388 a
1 27-0-0-6	2.9 L	0 lb ai/a	Spring			
2.5 a						
4 120 lb Rye per acre		5.375 a	3.0018 a	11.5 a	4.3 a	1.4528 a
1 27-0-0-6	2.9 L	0 lb ai/a	Spring			
7.0 a						
1 0 lb Rye per acre		5.250 a	2.4720 a	14.8 a	4.0 a	0.9413 a
2 27-0-0-6	2.9 L	30 lb ai/a	Spring			
4.0 a						
2 45 lb Rye per acre		3.438 a	2.2813 a	9.0 a	6.3 a	0.5378 a
2 27-0-0-6	2.9 L	30 lb ai/a	Spring			
2.8 a						
3 90 lb Rye per acre		7.000 a	3.2160 a	7.5 a	7.5 a	0.4330 a
2 27-0-0-6	2.9 L	30 lb ai/a	Spring			
2.5 a						
4 120 lb Rye per acre		4.625 a	3.8910 a	11.0 a	6.0 a	0.7445 a
2 27-0-0-6	2.9 L	30 lb ai/a	Spring			
3.3 a						
LSD P=.05		3.6427	3.59687	16.31	3.17	1.03006
						3.81

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	AMBEL C - C.ragwd	AMASS C - AftrPOST	IPOSS C - AftrPOST	C SECCE RyeResid	C GLXMA 2CntrRws	C GLXMA Soybean
Description	Height inches 06/12/19	Control % 06/28/19	Control % 06/28/19	GrndCvr % 06/28/19	BiomRed % 06/28/19	Yield Bu/A 10/30/19
Trt No. Treatment Name	Form Conc Form Type Rate Unit	Appl Timing				
TABLE OF R MEANS						
Replicate 1	4.61	82.1	70.6	31.3	41.3	44.8
Replicate 2	5.38	85.0	66.6	40.4	30.0	40.1
Replicate 3	5.00	85.6	79.8	28.1	44.1	40.6
Replicate 4	4.31	76.1	78.6	21.8	33.4	45.2
TABLE OF A (Seeding rate) MEANS						
1 0 lb Rye per acre	4.81 a	77.9 a	63.1 b	0.0 c	62.9 a	38.1 a
2 45 lb Rye per acre	4.81 a	82.9 a	75.8 a	27.3 b	39.0 b	46.2 a
3 90 lb Rye per acre	4.92 a	82.8 a	76.1 a	47.6 a	27.5 bc	45.5 a
4 120 lb Rye per acre	4.75 a	85.4 a	80.6 a	46.6 a	19.4 c	41.0 a
LSD P=.05	1.266	7.27	11.25	11.04	12.49	13.25
Standard Deviation	1.214	6.99	10.82	10.62	12.01	12.74
CV	25.160	8.50	14.65	34.96	32.31	29.86
TABLE OF B (N rate) MEANS						
1 27-0-0-6 2.9 L	0 lb ai/a Spring	4.96 a	81.9 a	73.1 a	29.1 a	41.6 a
2 27-0-0-6 2.9 L	30 lb ai/a Spring	4.69 a	82.5 a	74.7 a	31.6 a	32.8 a
LSD P=.05	0.895	5.14	7.96	7.81	8.83	9.37
Standard Deviation	1.214	6.99	10.82	10.62	12.01	12.74
CV	25.160	8.50	14.65	34.96	32.31	29.86
TABLE OF A (Seeding rate) B (N rate) MEANS						
1 0 lb Rye per acre	4.63 a	78.5 a	63.8 a	0.0 a	63.3 a	37.4 a
1 27-0-0-6 2.9 L	0 lb ai/a Spring					
2 45 lb Rye per acre	5.38 a	78.8 a	68.3 a	22.0 a	50.0 a	54.5 a
1 27-0-0-6 2.9 L	0 lb ai/a Spring					
3 90 lb Rye per acre	5.10 a	83.5 a	80.5 a	49.5 a	30.5 a	43.7 a
1 27-0-0-6 2.9 L	0 lb ai/a Spring					
4 120 lb Rye per acre	4.75 a	87.0 a	80.0 a	45.0 a	22.5 a	40.7 a
1 27-0-0-6 2.9 L	0 lb ai/a Spring					
1 0 lb Rye per acre	5.00 a	77.3 a	62.5 a	0.0 a	62.5 a	38.8 a
2 27-0-0-6 2.9 L	30 lb ai/a Spring					
2 45 lb Rye per acre	4.25 a	87.0 a	83.3 a	32.5 a	28.0 a	37.8 a
2 27-0-0-6 2.9 L	30 lb ai/a Spring					
3 90 lb Rye per acre	4.75 a	82.0 a	71.8 a	45.8 a	24.5 a	47.3 a
2 27-0-0-6 2.9 L	30 lb ai/a Spring					
4 120 lb Rye per acre	4.75 a	83.8 a	81.3 a	48.3 a	16.3 a	41.3 a
2 27-0-0-6 2.9 L	30 lb ai/a Spring					
LSD P=.05	1.790	10.28	15.92	15.61	17.67	18.74

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C SECCE	C -	AMASS C -	IPOSS C -	AMBEL C -	AMASS C -
Description	RyeBioms	SpryCard	Amaranth	Mornglry	C.ragwd	Amaranth
Rating Type	DryWght	AvgCover	Control	Control	Count	Control
Rating Unit	g/0.25m <sup>2</sup>	%	1-5*	1-5*	#/1m <sup>2</sup>	%
Rating Date	05/09/19	05/09/19	05/23/19	05/23/19	05/23/19	05/30/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing		
Standard Deviation CV		19.12 31.81	3.67 28.63	0.80 24.09	0.71 25.61	1.44 44.79

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	IPOSS C -	AMASS C -	IPOSS C -	C SECCE	AMASS C -	AMASS C -
Description	Mornglry	Amaranth	Mornglry	RyeBioms	Amaranth	Amaranth
Rating Type	Control	Control	Control	DryWght	DryWght	Density
Rating Unit	%	%	%	g/0.5m <sup>2</sup>	g/0.5m <sup>2</sup>	#/0.5m <sup>2</sup>
Rating Date	05/30/19	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	
Standard Deviation		11.82		15.12	17.62	36.42
CV		28.83		36.50	99.26	33.21
						3.98537
						11.54
						127.81
						133.08278

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	AMASS C -	IPOSS C -	IPOSS C -	IPOSS C -	AMBEL C -	AMBEL C -
Description	Amaranth	Mornglry	Mornglry	Mornglry	C.ragwd	C.ragwd
Rating Type	Height inches	DryWght g/0.5m <sup>2</sup>	Density #/0.5m <sup>2</sup>	Length inches	DryWght g/0.5m <sup>2</sup>	Density #/0.5m <sup>2</sup>
Rating Unit	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19	06/12/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	
Standard Deviation		2.4772	2.44600	11.09	2.15	0.70048
CV		48.7818	84.68069	92.44	40.66	74.89775
						2.59
						67.94

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	AMBEL C -	AMASS C -	IPOSS C -	C SECCE	C GLXMA	C GLXMA
Description	C.ragwd	AftrPOST	AftrPOST	RyeResid	2CntrRws	Soybean
Rating Type	Height inches	Control %	Control %	GrndCvr %	BiomRed %	Yield Bu/A
Rating Unit	06/12/19	06/28/19	06/28/19	06/28/19	06/28/19	10/30/19
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing		
Standard Deviation			1.214	6.99	10.82	10.62
CV			25.160	8.50	14.65	34.96
					12.01	12.74
					32.31	29.86

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For C SECCE RyeBioms DryWght g/0.25m <sup>2</sup> 05/09/19 Analysis will skip factor level A1 for column 1 - all A1 treatments are missing						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	9374.625000				
R	3	2575.125000	858.375000	2.347	0.1139	
A	2	868.000000	434.000000	1.187	0.3323	20.4
B	1	40.041667	40.041667	0.109	0.7453	14.4
AB	2	405.333333	202.666667	0.554	0.5859	28.8
ERROR	15	5486.125000	365.741667			

Randomized Complete Block (RCB) AOV For C SpryCard AvgCover % 05/09/19 Missing factor A1 B2 levels prevents analyzing column 5 as Factorial design; Missing values in column 5 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	26	265.773757			
Replicate	3	6.805550	2.268517	0.168	0.9165
Treatment	6	29.414978	4.902496	0.363	0.8922
ERROR	17	229.553229	13.503131		

#### FACTORIAL/POOLED ERROR AOV For AMASS C Amaranth Control 1-5\* 05/23/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	36.875000				
R	3	3.125000	1.041667	1.636	0.2114	
A	3	18.125000	6.041667	9.486	0.0004	0.8
B	1	0.500000	0.500000	0.785	0.3856	0.6
AB	3	1.750000	0.583333	0.916	0.4502	1.2
ERROR	21	13.375000	0.636905			

#### FACTORIAL/POOLED ERROR AOV For IPOSS C Morngly Control 1-5\* 05/23/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	25.468750				
R	3	1.093750	0.364583	0.718	0.5520	
A	3	13.093750	4.364583	8.601	0.0006	0.7
B	1	0.031250	0.031250	0.062	0.8064	0.5
AB	3	0.593750	0.197917	0.390	0.7614	1.0
ERROR	21	10.656250	0.507440			

#### FACTORIAL/POOLED ERROR AOV For AMBEL C C.ragwd Count #/1m<sup>2</sup> 05/23/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	109.468750				
R	3	28.093750	9.364583	4.505	0.0137	
A	3	16.343750	5.447917	2.621	0.0775	1.5
B	1	1.531250	1.531250	0.737	0.4004	1.1
AB	3	19.843750	6.614583	3.182	0.0451	2.1
ERROR	21	43.656250	2.078869			

#### FACTORIAL/POOLED ERROR AOV For AMASS C Amaranth Control % 05/30/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	26039.218750				
R	3	1367.593750	455.864583	2.005	0.1441	
A	3	14553.093750	4851.031250	21.336	0.0001	15.7
B	1	2945.281250	2945.281250	12.954	0.0017	11.1
AB	3	2398.593750	799.531250	3.517	0.0329	22.2
ERROR	21	4774.656250	227.364583			

#### FACTORIAL/POOLED ERROR AOV For IPOSS C Morngly Control % 05/30/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	13074.000000				
R	3	214.750000	71.583333	0.512	0.6781	
A	3	6458.250000	2152.750000	15.412	0.0001	12.3
B	1	1512.500000	1512.500000	10.828	0.0035	8.7
AB	3	1955.250000	651.750000	4.666	0.0119	17.4
ERROR	21	2933.250000	139.678571			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For AMASS C Amaranth Control % 06/12/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	21531.875000				
R	3	1952.125000	650.708333	2.845	0.0623	
A	3	10262.375000	3420.791667	14.954	0.0001	15.7
B	1	2888.000000	2888.000000	12.625	0.0019	11.1
AB	3	1625.500000	541.833333	2.369	0.0996	22.2
ERROR	21	4803.875000	228.755952			

  

FACTORIAL/POOLED ERROR AOV For IPOSS C Morngly Control % 06/12/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	12582.000000				
R	3	217.250000	72.416667	0.233	0.8721	
A	3	4669.750000	1556.583333	5.015	0.0089	18.3
B	1	105.125000	105.125000	0.339	0.5668	13.0
AB	3	1071.625000	357.208333	1.151	0.3518	25.9
ERROR	21	6518.250000	310.392857			

  

FACTORIAL/POOLED ERROR AOV For C SECCE RyeBioms DryWght g/0.5m2 06/12/19 Analysis will skip factor level A1 for column 13 - all A1 treatments are missing						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	29867.333333				
R	3	2295.666667	765.222222	0.577	0.6390	
A	2	5978.583333	2989.291667	2.254	0.1393	38.8
B	1	400.166667	400.166667	0.302	0.5909	27.4
AB	2	1300.583333	650.291667	0.490	0.6219	54.9
ERROR	15	19892.333333	1326.155556			

  

FACTORIAL/POOLED ERROR AOV For AMASS C Amaranth DryWght g/0.5m2 06/12/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	560.575149				
R	3	127.711799	42.570600	2.680	0.0731	
A	3	30.025936	10.008645	0.630	0.6037	4.1440
B	1	48.110693	48.110693	3.029	0.0964	2.9303
AB	3	21.179827	7.059942	0.444	0.7237	5.8605
ERROR	21	333.546893	15.883185			

  

FACTORIAL/POOLED ERROR AOV For AMASS C Amaranth Density #/0.5m2 06/12/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	3432.968750				
R	3	382.093750	127.364583	0.956	0.4318	
A	3	160.593750	53.531250	0.402	0.7532	12.0
B	1	0.281250	0.281250	0.002	0.9638	8.5
AB	3	91.843750	30.614583	0.230	0.8746	17.0
ERROR	21	2798.156250	133.245536			

  

FACTORIAL/POOLED ERROR AOV For AMASS C Amaranth Height inches 06/12/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	181.179688				
R	3	23.289063	7.763021	1.265	0.3119	
A	3	12.976563	4.325521	0.705	0.5597	2.576
B	1	0.000000	0.000000	0.000	1.0000	1.821
AB	3	16.046875	5.348958	0.872	0.4714	3.643
ERROR	21	128.867188	6.136533			

  

FACTORIAL/POOLED ERROR AOV For IPOSS C Morngly DryWght g/0.5m2 06/12/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	182.107992				
R	3	37.340829	12.446943	2.080	0.1334	
A	3	10.157355	3.385785	0.566	0.6435	2.5434
B	1	0.187578	0.187578	0.031	0.8612	1.7984
AB	3	8.780833	2.926944	0.489	0.6935	3.5969
ERROR	21	125.641396	5.982924			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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## FACTORIAL/POOLED ERROR AOV For IPOSS C Morngly Density #/0.5m2 06/12/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	5082.000000				
R	3	1472.250000	490.750000	3.988	0.0215	
A	3	783.000000	261.000000	2.121	0.1280	11.5
B	1	66.125000	66.125000	0.537	0.4716	8.2
AB	3	176.375000	58.791667	0.478	0.7012	16.3
ERROR	21	2584.250000	123.059524			

## FACTORIAL/POOLED ERROR AOV For IPOSS C Morngly Length inches 06/12/19 Missing values in column 19 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	30	165.055556				
R	3	26.416667	8.805556	1.902	0.1618	
A	3	29.083333	9.694444	2.094	0.1331	2.2
B	1	13.347222	13.347222	2.883	0.1050	1.6
AB	3	3.625000	1.208333	0.261	0.8526	3.2
ERROR	20	92.583333	4.629167			

## FACTORIAL/POOLED ERROR AOV For AMBEL C C.ragwd DryWght g/0.5m2 06/12/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	14.581122				
R	3	0.751645	0.250548	0.511	0.6793	
A	3	1.022049	0.340683	0.694	0.5658	0.7284
B	1	2.352281	2.352281	4.794	0.0400	0.5150
AB	3	0.150999	0.050333	0.103	0.9576	1.0301
ERROR	21	10.304149	0.490674			

## FACTORIAL/POOLED ERROR AOV For AMBEL C C.ragwd Density #/0.5m2 06/12/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	228.875000				
R	3	21.625000	7.208333	1.075	0.3812	
A	3	35.125000	11.708333	1.745	0.1885	2.7
B	1	15.125000	15.125000	2.255	0.1481	1.9
AB	3	16.125000	5.375000	0.801	0.5071	3.8
ERROR	21	140.875000	6.708333			

## FACTORIAL/POOLED ERROR AOV For AMBEL C C.ragwd Height inches 06/12/19 Missing values in column 22 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	30	37.777494				
R	3	5.135629	1.711876	1.162	0.3489	
A	3	0.123724	0.041241	0.028	0.9935	1.27
B	1	0.599773	0.599773	0.407	0.5307	0.90
AB	3	2.451105	0.817035	0.555	0.6511	1.79
ERROR	20	29.467262	1.473363			

## FACTORIAL/POOLED ERROR AOV For AMASS C AftrPOST Control % 06/28/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	1879.468750				
R	3	451.843750	150.614583	3.082	0.0496	
A	3	236.343750	78.781250	1.612	0.2166	7.3
B	1	2.531250	2.531250	0.052	0.8222	5.1
AB	3	162.343750	54.114583	1.107	0.3684	10.3
ERROR	21	1026.406250	48.876488			

## FACTORIAL/POOLED ERROR AOV For IPOSS C AftrPOST Control % 06/28/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	5388.718750				
R	3	961.593750	320.531250	2.736	0.0692	
A	3	1357.593750	452.531250	3.863	0.0240	11.3
B	1	19.531250	19.531250	0.167	0.6872	8.0
AB	3	589.843750	196.614583	1.678	0.2021	15.9
ERROR	21	2460.156250	117.150298			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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FACTORIAL/POOLED ERROR AOV For C SECCE RyeResid GrndCvr % 06/28/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	16031.50000				
R	3	1441.750000	480.583333	4.262	0.0169	
A	3	11952.250000	3984.083333	35.336	0.0001	11.0
B	1	50.000000	50.000000	0.443	0.5127	7.8
AB	3	219.750000	73.250000	0.650	0.5919	15.6
ERROR	21	2367.750000	112.750000			

FACTORIAL/POOLED ERROR AOV For C GLXMA 2CntrRws BiomRed % 06/28/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	13790.875000				
R	3	1046.625000	348.875000	2.417	0.0949	
A	3	8594.125000	2864.708333	19.849	0.0001	12.5
B	1	612.500000	612.500000	4.244	0.0520	8.8
AB	3	506.750000	168.916667	1.170	0.3447	17.7
ERROR	21	3030.875000	144.327381			

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield Bu/A 10/30/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	4525.251415				
R	3	177.285251	59.095084	0.364	0.7798	
A	3	349.228299	116.409433	0.717	0.5531	13.3
B	1	62.887057	62.887057	0.387	0.5405	9.4
AB	3	524.879220	174.959740	1.077	0.3802	18.7
ERROR	21	3410.971588	162.427218			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Early-Season Weed Control in Conventional-Till Winter Wheat  
 Trial ID: SG1-19 Location: Field #4 Trial Year: 2019  
 Protocol ID: SG1-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Trial Status Date: 03/25/19 Last Export Date: 07/26/19 Last Changed By: Mark VanGessel

Initiation Date: 08/31/18

Completion Date: 06/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W USA 49.376656 - 24.53833  
 -124.715843 - -66.968887

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C TRZAW Triticum aestivum (winter) Winter wheat	BBCH Scale: BCER
Variety: Shirley	
Planting Date: 10/10/18	Planting Rate: 120 lb/A
Depth: 0.75 in	
Rows per Plot: 16	Planting Method: DRILLE drilled
Row Spacing: 7 in	Planting Equipment: FE Field Equipment
Soil Temperature: 84 F	Seed Bed: MEDIUM medium
Emergence Date: 10/16/18	Soil Moisture: NORMAL normal, adequate
Harvest Date: 06/24/19	Harvest Equipment: Plot combine
% Standard Moisture: 13.5	Harvested Width: 7 FT
	Harvested Length: 24 FT

**Site and Design**

Treated Plot Width: 10 FT Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 10 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 4			
% Sand: 79	% OM: 1.4	Texture: LS	loamy sand
% Silt: 13	pH: 6.3	Soil Name: Hammonton loamy sand, 0-2% slopes	
% Clay: 8	CEC: 6.4	Fert. Level: G	good
Soil Drainage: F	fair		

**Application Description**

	A	B
Application Date	10/19/18	10/19/18
Appl. Stop Time	09:40 AM	10:15 AM
Application Method	SPRAY	SPRAY
Application Timing	DPRE	Spike
Application Placement	BROADC	BROADC
Applied By	VanGessl	VanGessl
Air Temperature Start, Stop	54 54 F	54 54 F
% Relative Humidity Start, Stop	60 60	60 60
Wind Velocity+Dir. Start	2 mph WSW	2 mph WSW
Wind Velocity+Dir. Stop	2 mph WSW	2 mph WSW
Wind Velocity+Dir. Max	2 mph WSW	2 mph WSW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	53 F	53 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	0	0
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	0.26 IN	0.26 IN
Weather Source	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER
Days after Emergence	3	3
Stage Scale Used	DESC	DESC
Stage Majority, Percent	spiking 100	spiking 100
Height Average	2 in	2 in

**Application Equipment**

	A	B
Appl. Equipment	Bckpck4Nozl	Bckpck4Nozl
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIR MIX	AIR MIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	18 in
Boom Length	6 ft	6 ft
Boom Height	18 IN	18 IN
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Minimum Mix/Treatment	1.3035 L	1.3035 L
Propellant	COMCO2	COMCO2

## Trial Comments

3/25/19: No primrose was observed in treatments 2 and 9; primrose control was poor with treatments 3, 4, 5, 6, 7 8, 10; Treatment 2 was weak on jagged chickweed

4/23/19: Wheat looks very good. Trt 10 seems to be thinner but same height as all other plots. Plot 306 not sprayed.

Early-Season Weed Control in Conventional-Till Winter Wheat  
 Trial ID: SG1-19 Location: Field #4 Trial Year: 2019  
 Protocol ID: SG1-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code Crop Type, Code	C TRZAW	C TRZAW	C TRZAW	LAMAM C -						
Description	W.Wheat Stunting %	W.Wheat Stunting %	W.Wheat Stunting %	Henbit Control %						
Rating Type	10/18/18	11/01/18	03/25/19	03/25/19						
Rating Unit										
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1 Untreated Check							0.0 e	0.0 f	0.0 c	0.0 g
2 Sharpen.....saflufenacil	2.85	SC	0.067	lb ai/a	DPRE	A	6.7 bcd	8.0 cd	4.7 bc	91.7 ab
3 Zidua SC.....pyroxasulfone	4.17	SC	0.053	lb ai/a	Spike	B	2.3 de	2.3 ef	5.7 bc	51.0 f
4 Zidua SC.....pyroxasulfone	4.17	SC	0.08	lb ai/a	Spike	B	11.3 ab	9.7 bcd	8.3 b	56.7 ef
5 Anthem Flex Premix ----pyroxasulfone ----carfentrazone	4 SE 3.733 0.267		0.084	lb ai/a	Spike	B	1.7 de	12.3 bc	10.7 b	75.0 cd
6 Axiom Premix ----flufenacet ----metribuzin	68 WG 54 14		0.17	lb ai/a	Spike	B	2.3 de	6.3 de	9.7 b	63.3 def
7 Axiom Premix ----flufenacet ----metribuzin	68 WG 54 14		0.255	lb ai/a	Spike	B	9.0 b	9.3 bcd	10.5 b	81.0 bc
8 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Nonionic Surfactant	4 SE 3.733 0.267 100 L		0.084	lb ai/a	Spike	B	3.3 cde	13.3 b	4.7 bc	66.7 cde
9 Zidua SC.....pyroxasulfone Dimetric EXT....metribuzin	4.17 SC 75 WG		0.053	lb ai/a	Spike	B	8.0 bc	13.0 bc	10.7 b	75.0 cd
10 Valor SX.....flumioxazin	51 WG		0.064	lb ai/a	Spike	B	16.7 a	23.3 a	19.0 a	100.0 a
LSD P=.05			5.56		5.02		6.46		15.51	
Standard Deviation			3.23		2.92		3.75		8.96	
CV			52.68		29.87		44.71		13.57	
Replicate F			0.726		2.345		0.759		0.904	
Replicate Prob(F)			0.4981		0.1261		0.4832		0.4248	
Treatment F			7.799		14.876		5.564		28.554	
Treatment Prob(F)			0.0002		0.0001		0.0012		0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=1,2,3,4,6,8,9,10,11,14; Average=5,7

Pest Code Crop Type, Code		CERVU C -	VIORA C -	VERHE C -	C TRZAW
Description	ME chkwd	FldPansy	Ivy	Speedwell	W.Wheat
Rating Type	Control %	Control %	Control %	Control %	Stunting %
Rating Unit					
Rating Date	03/25/19	03/25/19	03/25/19	03/25/19	04/23/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1 Untreated Check				0.0 c	0.0 d
2 Sharpen.....saflufenacil	2.85	SC	0.067 lb ai/a	DPRE A	82.5 b
3 Zidua SC.....pyroxasulfone	4.17	SC	0.053 lb ai/a	Spike B	30.0 b
4 Zidua SC.....pyroxasulfone	4.17	SC	0.08 lb ai/a	Spike B	100.0 a
5 Anthem Flex Premix ----pyroxasulfone ----carfentrazone	4 3.733 0.267	SE	0.084 lb ai/a 0.0784 0.0056	Spike B	43.3 b
6 Axiom Premix ----flufenacet ----metribuzin	68 54 14	WG	0.17 lb ai/a	Spike B	100.0 a
7 Axiom Premix ----flufenacet ----metribuzin	68 54 14	WG	0.255 lb ai/a	Spike B	36.7 b
8 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Nonionic Surfactant	4 SE 3.733 0.267 100 L		0.084 lb ai/a 0.0784 0.0056 0.25 % v/v	Spike B	21.9 bc
9 Zidua SC.....pyroxasulfone Dimetric EXT....metribuzin	4.17	SC	0.053 lb ai/a	Spike B	100.0 a
10 Valor SX.....flumioxazin	75	WG	0.0525 lb ai/a	Spike B	43.3 b
LSD P=.05			4.89	26.89	27.06
Standard Deviation			2.77	15.53	15.34
CV			3.19	39.02	44.46
Replicate F			0.813	0.474	0.266
Replicate Prob(F)			0.4651	0.6307	0.7708
Treatment F			427.646	7.837	9.320
Treatment Prob(F)			0.0001	0.0002	0.0002
					0.546
					0.5890
					1.672
					0.1728

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2,3,4,6,8,9,10,11,14; Average=5,7

Pest Code Crop Type, Code	LAMAM C -	CERVU C -	VIORA C -	C TRZAW						
Description	Henbit Control %	ME chkwd Control %	FldPansy Control %	W.Wheat Yield Bu/A						
Rating Type	04/23/19	04/23/19	04/30/19	06/24/19						
Rating Unit										
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1 Untreated Check							0.0 f	0.0 g	0.0 d	72.9 d
2 Sharpen.....saflufenacil	2.85	SC	0.067	lb ai/a	DPRE	A	60.0 de	56.7 f	40.0 b	83.8 bc
3 Zidua SC.....pyroxasulfone	4.17	SC	0.053	lb ai/a	Spike	B	54.5 e	71.7 de	6.7 d	81.5 bcd
4 Zidua SC.....pyroxasulfone	4.17	SC	0.08	lb ai/a	Spike	B	68.3 cde	85.0 bc	10.0 cd	84.2 bc
5 Anthem Flex Premix		4 SE	0.084	lb ai/a	Spike	B	78.3 bc	78.3 cd	36.7 b	80.3 cd
----pyroxasulfone	3.733		0.0784							
----carfentrazone	0.267		0.0056							
6 Axiom Premix	68	WG	0.17	lb ai/a	Spike	B	70.0 bcd	63.3 ef	10.0 cd	86.3 abc
----flufenacet	54		0.135							
----metribuzin	14		0.035							
7 Axiom Premix	68	WG	0.255	lb ai/a	Spike	B	84.5 b	94.2 ab	17.4 cd	89.1 ab
----flufenacet	54		0.202							
----metribuzin	14		0.0525							
8 Anthem Flex Premix		4 SE	0.084	lb ai/a	Spike	B	71.7 bcd	85.0 bc	26.7 bc	87.7 abc
----pyroxasulfone	3.733		0.0784							
----carfentrazone	0.267		0.0056							
Nonionic Surfactant	100	L	0.25	% v/v	Spike	B				
9 Zidua SC.....pyroxasulfone	4.17	SC	0.053	lb ai/a	Spike	B	65.0 cde	80.0 cd	6.7 d	85.2 abc
Dimetric EXT....metribuzin	75	WG	0.0525	lb ai/a	Spike	B				
10 Valor SX.....flumioxazin	51	WG	0.064	lb ai/a	Spike	B	100.0 a	100.0 a	100.0 a	93.8 a
LSD P=.05			15.15		12.75		18.61		8.73	
Standard Deviation			8.75		7.37		10.80		5.07	
CV			13.42		10.31		42.52		6.0	
Replicate F			0.506		2.101		1.576		1.311	
Replicate Prob(F)			0.6122		0.1548		0.2356		0.2956	
Treatment F			27.077		44.296		22.259		3.679	
Treatment Prob(F)			0.0001		0.0001		0.0001		0.0100	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=1,2,3,4,6,8,9,10,11,14; Average=5,7

## Postemergence Weed Control for Winter Wheat

Trial ID: SG2-19

Location: Field #4

Trial Year: 2019

Protocol ID: SG2-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Trial Status Date: 03/25/19

Last Changed By: Mark VanGessel

Initiation Date: 08/31/18

Completion Date: 10/01/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

USA 49.376656 - 24.53833

-124.715843 - -66.968887

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C TRZAW Triticum aestivum (winter) Winter wheat BBCH Scale: BCER

Variety: Shirley

Planting Date: 10/10/18

Planting Rate: 120

lb/A

Depth: 0.75 in

Rows per Plot: 16

Planting Method: DRILLE drilled

Row Spacing: 7 in

Planting Equipment: FE Field Equipment

Soil Temperature: 84 F

Seed Bed: MEDIUM medium

Emergence Date: 10/16/18

Soil Moisture: NORMAL normal, adequate

Harvest Date: 06/24/19

Harvest Equipment: Plot combine

Harvested Width: 7 FT

Harvested Length: 24 FT

% Standard Moisture: 13.5

Crop 2: C GLXMA Glycine max BBCH Scale: BSOY

Variety: S43XS27

Attributes: Xtend

Planting Date: 07/08/19

Planting Rate: 185000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Planting Equipment: FE Field Equipment

Soil Temperature: 79 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 07/13/19

Soil Moisture: NORMAL normal, adequate

**Pest Description**

Pest 1 Type: W Code: LAMAM Lamium amplexicaule

Common Name: Henbit

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 10

Tillage Type: CONTIL conventional-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 4  
 % Sand: 79 % OM: 1.4 Texture: LS loamy sand  
 % Silt: 13 pH: 6.3 Soil Name: Hammonton loamy sand, 0-2% slopes  
 % Clay: 8 CEC: 6.4 Fert. Level: G good  
 Soil Drainage: F fair

**Application Description**

	A	B
Application Date	11/19/18	03/20/19
Appl. Stop Time	11:00 AM	02:40 PM
Interval to Prev. Appl.		121 DAYS
Application Method	SPRAY	SPRAY
Application Timing	3-lvs	Spring
Application Placement	BROADC	BROADC
Applied By	VanGessel	Johnson
Air Temperature Start, Stop	56 56 F	53 53 F
% Relative Humidity Start, Stop	69 69	43 44
Wind Velocity+Dir. Start	4 mph SSW	5 mph ESE
Wind Velocity+Dir. Stop	4 mph SSW	6 mph E
Wind Velocity+Dir. Max	4 mph SSW	6 mph E
Wet Leaves (Y/N)	N no	N no
Soil Temperature	51 F	55 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	50	74
Moisture 6 Hours after Appl.	0 IN	0.01 IN
Moisture 1 Week after Appl.	1.45 IN	1.03 IN
Weather Source	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER
Days after Emergence	34	155
Stage Scale Used	DESC	DESC
Stage Majority, Percent	3-tilr 100	tillered 100
Height Average	4 in	7 in
Height Minimum, Maximum		5 9
Crop 2 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-236	-115

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	LAMAM W	LAMAM W
Stage Majority, Percent	veg 100	veg 70
Stage Minimum, Percent		veg 70
Stage Maximum, Percent		flower 30
Height Average	1.5 in	5 in
Height Minimum, Maximum	1 2	3 6
Density Average	200 m2	50 m2
Density Min, Max		40 60

**Application Equipment**

	A	B
Appl. Equipment	Bckpck4Nozl	Bckpck6Nozl
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	18 in
Boom Length	6 ft	9 ft
Boom Height	20 IN	26 IN
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Minimum Mix/Treatment	1.3035 L	1.3035 L
Propellant	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	03/25/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

**Trial Comments**

03/20/19: Some plots in rep1 have been affected by sand deposition from wind erosion from the adjacent field.

Postemergence Weed Control for Winter Wheat		University of Delaware									
Trial ID: SG2-19	Location: Field #4	Trial Year: 2019									
Protocol ID: SG2-19	Investigator: Mark VanGessel										
Study Director:											
Sponsor Contact:											
Pest Code	Crop Type, Code	C TRZAW	LAMAM C - C TRZAW								
Description	W.Wheat Stunting %	Henbit Control %	W.Wheat Stunting %								
Rating Type	03/12/19	03/12/19	03/28/19								
Rating Unit											
Rating Date			04/24/19								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1	Untreated Check							0.0 b	0.0 c	0.0 c	0.0 c
2	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Spring B				0.0 c		2.3 bc
	----thifensulfuron	33	0.0154								
	----tribenuron	17	0.00796								
	Nonionic Surfactant	100 L	0.25 %	v/v	Spring B						
	30% Urea Ammonium Nitrate	100 L	1.25 %	v/v	Spring B						
3	Harmony Extra SG Premix	50 SG	0.028	lb ai/a	Spring B				9.0 a	9.0 a	
	----thifensulfuron	33	0.0185								
	----tribenuron	17	0.0095								
	Nonionic Surfactant	100 L	0.25 %	v/v	Spring B						
	30% Urea Ammonium Nitrate	100 L	1.25 %	v/v	Spring B						
4	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Spring B				0.0 c	5.7 ab	
	----thifensulfuron	33	0.0154								
	----tribenuron	17	0.00796								
	Starane Ultra....fluroxypyr	2.8 EC	0.14	lb ae/a	Spring B						
	Nonionic Surfactant	100 L	0.25 %	v/v	Spring B						
	30% Urea Ammonium Nitrate	100 L	1.25 %	v/v	Spring B						
5	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Spring B				9.0 a	4.7 abc	
	----thifensulfuron	33	0.0154								
	----tribenuron	17	0.00796								
	Dimetric EXT....metribuzin	75 WG	0.188	lb ai/a	Spring B						
	Nonionic Surfactant	100 L	0.25 %	v/v	Spring B						
	30% Urea Ammonium Nitrate	100 L	1.25 %	v/v	Spring B						
6	Osprey.....mesosulfuron	4.5 WG	0.0134	lb ai/a	3-lvs A			6.7 a	74.3 b	4.7 b	0.0 c
	Nonionic Surfactant	100 L	0.5 %	v/v	3-lvs A						
	30% Urea Ammonium Nitrate	100 L	1.25 %	v/v	3-lvs A						
7	PowerFlex HL....pyroxasulam	13.1 WG	0.0164	lb ai/a	3-lvs A			9.0 a	84.3 a	6.7 ab	0.0 c
	Nonionic Surfactant	100 L	0.25 %	v/v	3-lvs A						
	30% Urea Ammonium Nitrate	100 L	1.25 %	v/v	3-lvs A						
8	Huskie Premix	2.05 EC	0.208	lb ai/a	Spring B				0.0 c	1.7 bc	
	----pyrasulfotole	0.3	0.0304								
	----bromoxynil	1.75	0.178								
	Nonionic Surfactant	100 L	0.25 %	v/v	Spring B						
	30% Urea Ammonium Nitrate	100 L	1.25 %	v/v	Spring B						
9	Huskie Premix	2.05 EC	0.176	lb ai/a	Spring B				6.3 ab	0.0 c	
	----pyrasulfotole	0.3	0.0258								
	----bromoxynil	1.75	0.15								
	Glory.....metribuzin	75 DF	0.188	lb ai/a	Spring B						
	Nonionic Surfactant	100 L	0.25 %	v/v	Spring B						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Means followed by same letter or symbol do not significantly differ ( $P < 0.05$ , LSD). Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL. Missing data estimates are included in columns: Yates=6,7

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	LAMAM C - Henbit Control % 04/24/19	VIORA C - FldPansy Control % 04/24/19	CERVU C - ME chkwd Control % 04/24/19	C TRZAW W.Wheat Yield Bu/A 06/24/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check				0.0 c	0.0 e	0.0 d	73.7 e	
2	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 100 L 100 L	lb ai/a 0.0154 0.00796 0.25 % v/v 1.25 % v/v	0.0234 0.0154 0.0095 Spring B Spring B	60.0 b	61.7 c	99.0 a	78.8 cde	
3	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 100 L 100 L	lb ai/a 0.0185 0.0095 0.25 % v/v 1.25 % v/v	0.028 0.0185 0.0095 Spring B Spring B	58.3 b	100.0 a	95.7 a	76.0 cde	
4	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluoroxypr Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 2.8 EC 100 L 100 L	lb ai/a 0.0154 0.00796 0.14 lb ae/a 0.25 % v/v 1.25 % v/v	0.0234 0.0154 0.00796 Spring B Spring B Spring B	71.7 b	74.8 bc	91.2 a	75.5 de	
5	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 75 WG 100 L 100 L	lb ai/a 0.0154 0.00796 0.188 lb ai/a 0.25 % v/v 1.25 % v/v	0.0234 0.0154 0.00796 Spring B Spring B Spring B	96.0 a	95.0 ab	100.0 a	71.9 e	
6	Osprey.....mesosulfuron Nonionic Surfactant 30% Urea Ammonium Nitrate	4.5 WG 100 L 100 L	lb ai/a 0.5 % v/v 1.25 % v/v	0.0134 0.25 % v/v 1.25 % v/v	3-lvs A 3-lvs A 3-lvs A	71.7 b	0.0 e	98.0 a	87.9 ab
7	PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate	13.1 WG 100 L 100 L	lb ai/a 0.25 % v/v 1.25 % v/v	0.0164 0.25 % v/v 1.25 % v/v	3-lvs A 3-lvs A 3-lvs A	60.0 b	90.0 ab	100.0 a	90.8 a
8	Huskie Premix ----pyrasulfotole ----bromoxynil Nonionic Surfactant 30% Urea Ammonium Nitrate	2.05 EC 0.3 1.75 100 L 100 L	lb ai/a 0.0304 0.178 0.25 % v/v 1.25 % v/v	0.208 0.0304 0.178 Spring B Spring B	60.0 b	6.7 de	53.3 c	81.9 bcd	
9	Huskie Premix ----pyrasulfotole ----bromoxynil Glory.....metribuzin Nonionic Surfactant	2.05 EC 0.3 1.75 75 DF 100 L	lb ai/a 0.0258 0.15 0.188 lb ai/a 0.25 % v/v	0.176 0.0258 0.15 Spring B Spring B	95.0 a	28.3 d	96.7 a	76.9 cde	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=6,7

Pest Code					C	GLXMA
Crop Type, Code					Soybean	
Description					Stunting	%
Rating Type						
Rating Unit						
Rating Date						08/03/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Untreated Check					0.0 a
2	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 100 L 100 L		0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 1.25 % v/v	Spring B	2.3 a
3	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 100 L 100 L		0.028 lb ai/a 0.0185 0.0095 0.25 % v/v 1.25 % v/v	Spring B	4.0 a
4	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluoroxypr Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 2.8 EC 100 L 100 L		0.0234 lb ai/a 0.0154 0.00796 0.14 lb ae/a 0.25 % v/v 1.25 % v/v	Spring B	5.7 a
5	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 75 WG 100 L 100 L		0.0234 lb ai/a 0.0154 0.00796 0.188 lb ai/a 0.25 % v/v 1.25 % v/v	Spring B	7.0 a
6	Osprey.....mesosulfuron Nonionic Surfactant 30% Urea Ammonium Nitrate	4.5 WG 100 L 100 L		0.0134 lb ai/a 0.5 % v/v 1.25 % v/v	3-lvs A	7.0 a
7	PowerFlex HL....pyroxsulam Nonionic Surfactant 30% Urea Ammonium Nitrate	13.1 WG 100 L 100 L		0.0164 lb ai/a 0.25 % v/v 1.25 % v/v	3-lvs A	4.7 a
8	Huskie Premix ----pyrasulfotole ----bromoxynil Nonionic Surfactant 30% Urea Ammonium Nitrate	2.05 EC 0.3 1.75 100 L 100 L		0.208 lb ai/a 0.0304 0.178 0.25 % v/v 1.25 % v/v	Spring B	3.3 a
9	Huskie Premix ----pyrasulfotole ----bromoxynil Glory.....metribuzin Nonionic Surfactant	2.05 EC 0.3 1.75 75 DF 100 L		0.176 lb ai/a 0.0258 0.15 0.188 lb ai/a 0.25 % v/v	Spring B	4.7 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=6,7

## University of Delaware

Pest Code Crop Type, Code	C TRZAW	LAMAM C -	C TRZAW	C TRZAW
Description	W.Wheat Stunting %	Henbit Control %	W.Wheat Stunting %	W.Wheat Stunting %
Rating Type				
Rating Unit				
Rating Date	03/12/19	03/12/19	03/28/19	04/24/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
10 Quelex Premix ----florasulam ----halauxifen	20 WG 10 10	0.0094 0.0047 0.0047	lb ai/a v/v v/v	Spring B Spring B Spring B
Nonionic Surfactant 30% Urea Ammonium Nitrate	100 L 100 L	0.25 % 1.25 %	v/v v/v	Spring B Spring B
LSD P=.05 Standard Deviation CV			6.25 2.76 52.83	5.29 2.33 4.41
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)			1.328 0.3611 8.599 0.0356	4.000 0.1111 1169.776 0.0001
				3.20 1.87 41.8 0.0001
				5.14 3.00 116.84 0.0206

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=6,7

## University of Delaware

Pest Code Crop Type, Code	LAMAM C -	VIORA C -	CERVU C -	C TRZAW
Description	Henbit	FldPansy	ME chkwd	W.Wheat
Rating Type	Control	Control	Control	Yield
Rating Unit	%	%	%	Bu/A
Rating Date	04/24/19	04/24/19	04/24/19	06/24/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit
10 Quelex Premix	20 WG	0.0094	lb ai/a	Spring B
----florasulam	10	0.0047		
----halauxifen	10	0.0047		
Nonionic Surfactant	100 L	0.25 %	v/v	Spring B
30% Urea Ammonium Nitrate	100 L	1.25 %	v/v	Spring B
LSD P=.05		13.52	23.30	9.73
Standard Deviation		7.88	13.53	5.65
CV		11.72	29.2	7.09
Replicate F		0.622	0.019	0.848
Replicate Prob(F)		0.5482	0.9809	0.4455
Treatment F		40.052	29.093	99.410
Treatment Prob(F)		0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=6,7

## University of Delaware

Pest Code	C	GLXMA					
Crop Type, Code		Soybean					
Description		Stunting					
Rating Type		%					
Rating Unit							
Rating Date		08/03/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
10	Quelex Premix	20	WG	0.0094	lb ai/a	Spring	B
	----florasulam	10		0.0047			
	----halauxifen	10		0.0047			
	Nonionic Surfactant	100	L	0.25	% v/v	Spring	B
	30% Urea Ammonium Nitrate	100	L	1.25	% v/v	Spring	B
LSD P=.05							6.17
Standard Deviation							3.59
CV							87.68
Replicate F							1.679
Replicate Prob(F)							0.2144
Treatment F							1.124
Treatment Prob(F)							0.3958

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=6,7

Anthem Flex and Finesse Use in Winter Wheat  
 Trial ID: SG3-19 Location: Field #28 Trial Year: 2019  
 Protocol ID: SG3-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established

Last Export Date: 10/22/19 Last Changed By: Mark VanGessel

Initiation Date: 08/31/18

Completion Date: 06/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W USA 49.376656 - 24.53833

-124.715843 - -66.968887

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C TRZAW Triticum aestivum (winter) Winter wheat	BBCH Scale: BCER
Variety: Shirley	
Planting Date: 10/10/18	Planting Rate: 120
Depth: 0.75 in	lb/A
Rows per Plot: 16	Planting Method: DRILLE drilled
Row Spacing: 7 in	Planting Equipment: FE Field Equipment
Soil Temperature: 84 F	Seed Bed: MEDIUM medium
Emergence Date: 10/15/18	Soil Moisture: NORMAL normal, adequate
Harvest Date: 06/25/19	Harvest Equipment: Plot combine
% Standard Moisture: 13.5	Harvested Width: 7 FT
	Harvested Length: 24 FT

**Pest Description**

Pest 1 Type: W Code: LAMAM Lamium amplexicaule

Common Name: Henbit

Pest 2 Type: W Code: HLOUM Holosteum umbellatum

Common Name: Jagged chickweed

Pest 3 Type: W Code: SCRAN Scleranthus annuus

Common Name: Annual knawel

Pest 4 Type: W Code: PLAPR Plantago purshii

Common Name: Woolly plantain

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 14

Tillage Type: CONTIL conventional-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 28  
 % Sand: 81 % OM: 1.2 Texture: SL sandy loam  
 % Silt: 2 pH: 6.1 Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 17 CEC: 3.2 Fert. Level: F fair  
 Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	10/19/18	11/19/18	03/20/19
Appl. Stop Time	11:15 AM	10:35 AM	02:00 PM
Interval to Prev. Appl.		31 DAYS	121 DAYS
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	DPRE	Nov 20	Spring
Application Placement	BROADC	BROADC	BROADC
Applied By	VanGessl	VanGessl	Johnson
Air Temperature Start, Stop	58 58 F	54 56 F	53 53 F
% Relative Humidity Start, Stop	52 52	75 69	43 43
Wind Velocity+Dir. Start	2 mph SSW	4 mph SSW	6 mph ESE
Wind Velocity+Dir. Stop	2 mph SSW	4 mph SSW	6 mph ESE
Wind Velocity+Dir. Max	2 mph SSW	4 mph SSW	6 mph ESE
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	57 F	47 F	55 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	0	22	74
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	0.26 IN	1.45 IN	1.03 IN
Weather Source	ITERIS	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER	TRZAW BCER
Days after Emergence	4	35	156
Stage Scale Used	DESC	DESC	DESC
Stage Majority, Percent	spiking 100	3-tilr 100	4-5 tilr 100
Height Average	2 in	5 in	6 in
Height Minimum, Maximum		4 5	5 6

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	LAMAM W	LAMAM W	LAMAM W
Stage Majority, Percent		veg 100	veg 100
Height Average		1.5 in	2.5 in
Height Minimum, Maximum		1 2	2 3
Density Average		50 m2	50 m2
Pest 2 Code, Type, Scale	HLOUM W	HLOUM W	HLOUM W
Stage Majority, Percent		veg 100	flower 100
Height Average		1 in	4 in
Density Average		70 m2	70 m2
Pest 3 Code, Type, Scale	SCRAN W	SCRAN W	SCRAN W
Stage Majority, Percent		veg 100	veg 100
Diameter		1.5 in	3 in
Density Average		20 m2	30 m2
Pest 4 Code, Type, Scale	PLAPR W	PLAPR W	PLAPR W
Stage Majority, Percent		rosett 100	rosett 100
Diameter		1 in	1.2 in
Height Minimum, Maximum		0.5 1.3	0.7 1.5
Density Average		20 m2	20 m2

**Application Equipment**

	A	B	C
Appl. Equipment	Bckpck4Nozl	Bckpck4Nozl	Bckpck6Nozl
Equipment Type	SPRBAC	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	18 in	18 in	18 in
Boom Length	6 ft	6 ft	9 ft
Boom Height	18 in	18 in	18 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Minimum Mix/Treatment	1.3035 L	1.3035 L	1.3035 L
Propellant	COMCO2	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	12/04/18	Kurt Vollme	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

10/24/18: wheat 1-2 lvs, no weeds present

12/04/18: Wheat in plots 113 and 202 appears to be lighter green in color compared to others.

04/17/19: No crop injury observed.

Anthem Flex and Finesse Use in Winter Wheat								
Trial ID: SG3-19	Location: Field #28	Trial Year: 2019						
Protocol ID: SG3-19	Investigator: Mark VanGessel							
Study Director:	Sponsor Contact:							
Pest Code Crop Type, Code	C TRZAW	C TRZAW	LAMAM C -	HLOUM C -	SCRAN C -	C TRZAW	LAMAM C -	
Description	W.Wheat	W.Wheat	Henbit	JagChkwD	Knawel	W.Wheat	Henbit	
Rating Type	Stunting %	Stunting %	Control %	Control %	Control %	Stunting %	Control %	
Rating Unit	10/24/18	11/27/18	11/27/18	11/27/18	11/27/18	12/04/18	12/04/18	
Rating Date								
Trt Treatment No. Name								
1 Untreated Check 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 a	0.0 a	0.0 c	0.0 c	0.0 b	0.0 a	0.0 e	
2 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 a	2.0 a	95.0 ab	98.0 ab	95.3 a	0.0 a	98.3 abc	
3 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Finesse Premix ----chlorsulfuron ----metsulfuron 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 a	0.0 a	100.0 a	100.0 a	100.0 a	0.0 a	100.0 a	
4 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 a	1.7 a	99.3 a	99.3 a	100.0 a	0.0 a	99.3 ab	
5 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron NIS 30% Urea Ammonium Nitrate	0.0 a	1.0 a	96.7 ab	96.3 ab	98.3 a	0.0 a	95.3 cd	
6 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	0.0 a	1.7 a	97.0 ab	100.0 a	99.0 a	0.0 a	97.3 a-d	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

Pest Code Crop Type, Code	HLOUM C - JagChwd	CERVU C - ME Chkwd	SCRAN C - Knaewel	C TRZAW W.Wheat	LAMAM C - Stunting % 03/13/19	HLOUM C - Henbit	OEOLA C - JagChwd	CEpmrse
Description								
Rating Type	Control %	Control %	Control %	Stunting %	Control %	Control %	Control %	Control %
Rating Unit								
Rating Date	12/04/18	12/04/18	12/04/18	03/13/19	03/13/19	03/13/19	03/13/19	03/13/19
Trt Treatment No. Name								
1 Untreated Check 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 d	0.0 b	0.0 d	0.0 a	0.0 c	0.0 d	0.0 e	
2 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	98.3 abc	100.0 a	95.7 c	0.0 a	96.7 ab	81.0 bc	96.0 abc	
3 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Finesse Premix ----chlorsulfuron ----metsulfuron 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	100.0 a	100.0 a	0.0 a	100.0 a	100.0 a	100.0 a	
4 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	99.7 a	100.0 a	100.0 a	0.0 a	99.0 a	100.0 a	94.7 a-d	
5 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron NIS 30% Urea Ammonium Nitrate	100.0 a	100.0 a	98.3 abc	0.0 a	94.0 ab	81.0 bc	96.3 abc	
6 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyrr Nonionic Surfactant 30% Urea Ammonium Nitrate	98.3 abc	100.0 a	100.0 a	0.0 a	98.3 ab	81.0 bc	85.7 d	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

Pest Code Crop Type, Code	SCRAN C - C	TRZAW	C TRZAW	C TRZAW	C TRZAW	C TRZAW	CERVU C -	HLOUM C -
Description	Knawel	W.Wheat	W.Wheat	W.Wheat	W.Wheat	ME Chkwd	JagChkwd	
Rating Type	Control	Chorosis	Lf burn	Chlorosis	Stunting	Control	Control	
Rating Unit	%	%	%	%	%	%	%	
Rating Date	03/13/19	03/29/19	03/29/19	04/03/19	04/03/19	04/03/19	04/03/19	
Trt Treatment No. Name								
1 Untreated Check 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 d	0.0 d	0.0 c	0.0 a	0.0 a	0.0 b	0.0 f	
2 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	96.3 bc	0.0 d	0.0 c	0.0 a	0.0 a	100.0 a	86.0 e	
3 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Finesse Premix ----chlorsulfuron ----metsulfuron 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	0.0 d	0.0 c	0.0 a	0.0 a	100.0 a	100.0 a	
4 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	0.0 d	0.0 c	0.0 a	0.0 a	100.0 a	100.0 a	
5 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron NIS 30% Urea Ammonium Nitrate	97.3 abc	0.0 d	0.0 c	0.0 a	0.0 a	100.0 a	90.0 cde	
6 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyrr Nonionic Surfactant 30% Urea Ammonium Nitrate	94.3 c	13.3 ab	6.0 a	1.7 a	1.7 a	100.0 a	91.7 bcd	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

Pest Code Crop Type, Code	LAMAM C -	SCRAN C -	STEME C -	ANTCO C -	CERVU C -	HLOUM C -	LAMAM C -	SCRAN C -
Description	Henbit	Knawel	C.chkwd	MywdCham	ME Chkwd	JagChkwd	Henbit	Knawel
Rating Type	Control							
Rating Unit	%	%	%	%	%	%	%	%
Rating Date	04/03/19	04/03/19	04/03/19	04/17/19	04/17/19	04/17/19	04/17/19	04/17/19
Trt Treatment No. Name								
1 Untreated Check 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 g	0.0 c	0.0 b	0.0 d	0.0 c	0.0 b	0.0 e	0.0 c
2 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	76.7 f	95.7 a	96.7 a	26.7 c	100.0 a	93.3 a	65.0 d	0.0 c
3 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Finesse Premix ----chlorsulfuron ----metsulfuron 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a							
4 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	95.7 abc	100.0 a	100.0 a	100.0 a	100.0 a	98.3 a	87.7 a-d	100.0 a
5 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron NIS 30% Urea Ammonium Nitrate	94.7 abc	96.7 a	100.0 a	100.0 a	100.0 a	100.0 a	95.0 abc	100.0 a
6 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyrr Nonionic Surfactant 30% Urea Ammonium Nitrate	92.3 bcd	87.7 b	96.7 a	100.0 a	100.0 a	100.0 a	96.0 ab	98.3 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

Pest Code Crop Type, Code	STEME C - C.chkwd Control %	VIORA C - FldPansy Control %	C TRZAW W.Wheat Yield Bu/A 06/25/19
Trt Treatment No. Name			
1 Untreated Check 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 b	0.0 c	56.2 a
2 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	0.0 c	61.3 a
3 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Finesse Premix ----chlorsulfuron ----metsulfuron 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	100.0 a	59.4 a
4 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	100.0 a	60.9 a
5 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron NIS 30% Urea Ammonium Nitrate	100.0 a	100.0 a	63.3 a
6 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyrr Nonionic Surfactant 30% Urea Ammonium Nitrate	100.0 a	100.0 a	59.7 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	C TRZAW	C TRZAW	LAMAM C -	HLOUM C -	SCRAN C -	C TRZAW	LAMAM C -
Description	W.Wheat	W.Wheat	Henbit	JagChkwrd	Knawel	W.Wheat	Henbit
Rating Type	Stunting %	Stunting %	Control %	Control %	Control %	Stunting %	Control %
Rating Unit							
Rating Date	10/24/18	11/27/18	11/27/18	11/27/18	11/27/18	12/04/18	12/04/18
Trt Treatment No. Name							
7 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 a	3.3 a	98.7 ab	99.3 a	100.0 a	3.3 a	97.0 a-d
8 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	0.0 a	0.0 a	100.0 a	100.0 a	99.3 a	0.0 a	96.3 bcd
9 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	0.0 a	1.0 a	93.7 b	94.3 b	95.0 a	0.0 a	96.0 bcd
10 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	0.0 a	1.0 a	99.3 a	96.3 ab	97.7 a	0.0 a	97.7 a-d
11 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 a	1.7 a	99.3 a	100.0 a	99.3 a	0.0 a	99.3 ab

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	HLOUM C -	CERVU C -	SCRAN C -	C TRZAW	LAMAM C -	HLOUM C -	OEOLA C -
Description	JagChkwd	ME Chkwd	Knawel	W.Wheat	Henbit	JagChkwd	CEprmrse
Rating Type	Control %	Control %	Control %	Stunting %	Control %	Control %	Control %
Rating Unit	12/04/18	12/04/18	12/04/18	03/13/19	03/13/19	03/13/19	03/13/19
Rating Date							
Trt Treatment No. Name							
7 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	100.0 a	99.3 ab	3.3 a	92.3 b	98.0 a	90.7 a-d
8 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	96.3 bc	100.0 a	100.0 a	0.0 a	95.0 ab	85.0 b	88.3 cd
9 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	97.0 abc	100.0 a	96.7 bc	0.0 a	92.3 b	83.0 bc	90.0 bcd
10 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	95.3 c	100.0 a	98.3 abc	0.0 a	100.0 a	79.3 c	88.3 cd
11 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	100.0 a	99.3 ab	0.0 a	100.0 a	100.0 a	99.0 ab

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	SCRAN C -	C TRZAW	C TRZAW	C TRZAW	C TRZAW	CERVU C -	HLOUM C -
Description	Knawel	W.Wheat	W.Wheat	W.Wheat	W.Wheat	ME Chkwd	JagChkwd
Rating Type	Control	Chorosis	Lf burn	Chlorosis	Stunting	Control	Control
Rating Unit	%	%	%	%	%	%	%
Rating Date	03/13/19	03/29/19	03/29/19	04/03/19	04/03/19	04/03/19	04/03/19
Trt Treatment No. Name							
7 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	0.0 d	0.0 c	0.0 a	0.0 a	100.0 a	100.0 a
8 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	96.3 bc	5.0 c	3.7 b	0.0 a	0.0 a	100.0 a	86.7 e
9 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	97.3 abc	12.3 b	5.0 ab	0.0 a	0.0 a	100.0 a	95.7 ab
10 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	100.0 a	5.0 c	0.0 c	0.0 a	0.0 a	100.0 a	95.0 b
11 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	0.0 d	0.0 c	0.0 a	0.0 a	100.0 a	100.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	LAMAM C -	SCRAN C -	STEME C -	ANTCO C -	CERVU C -	HLOUM C -	LAMAM C -	SCRAN C -
Description	Henbit	Knawel	C.chkwd	MywdCham	ME Chkwd	JagChkwd	Henbit	Knawel
Rating Type	Control							
Rating Unit	%	%	%	%	%	%	%	%
Rating Date	04/03/19	04/03/19	04/03/19	04/17/19	04/17/19	04/17/19	04/17/19	04/17/19
Trt Treatment No. Name								
7 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	86.7 de	100.0 a	96.7 a	66.7 b	70.0 b	100.0 a	73.3 bcd	70.0 b
8 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	87.3 de	94.7 a	100.0 a	83.3 ab	100.0 a	100.0 a	90.0 a-d	98.3 a
9 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	94.7 abc	100.0 a	97.7 a					
10 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	98.3 ab	96.7 a	100.0 a	100.0 a	100.0 a	70.0 a	70.0 cd	100.0 a
11 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a							

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	STEME C - C.chkwd Control %	VIORA C - FldPansy Control % 04/17/19	C TRZAW W.Wheat Yield Bu/A 06/25/19
Trt Treatment No. Name			
7 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	100.0 a	63.8 a
8 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	100.0 a	100.0 a	63.3 a
9 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Sentrallas Premix ----thifensulfuron ----fluroxypyr Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	100.0 a	100.0 a	62.9 a
10 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	100.0 a	100.0 a	55.2 a
11 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	96.7 b	69.1 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	C TRZAW	C TRZAW	LAMAM C -	HLOUM C -	SCRAN C -	C TRZAW	LAMAM C -
Description	W.Wheat	W.Wheat	Henbit	JagChkwD	Knawel	W.Wheat	Henbit
Rating Type	Stunting %	Stunting %	Control %	Control %	Control %	Stunting %	Control %
Rating Unit	10/24/18	11/27/18	11/27/18	11/27/18	11/27/18	12/04/18	12/04/18
Rating Date							
Trt Treatment No. Name							
12 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate	0.0 a	1.0 a	97.3 ab	100.0 a	100.0 a	0.0 a	94.7 d
13 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Aim.....carfentrazone Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	0.0 a	2.0 a	100.0 a	100.0 a	100.0 a	0.0 a	100.0 a
14 Axiom Premix ----flufenacet ----metribuzin 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluoroxypr Nonionic Surfactant 30% Urea Ammonium Nitrate	0.0 a	1.0 a	100.0 a	100.0 a	100.0 a	0.0 a	99.3 ab
LSD P=.05	.	4.07	5.17	3.92	5.16	2.59	3.51
Standard Deviation	0.00	2.42	3.08	2.33	3.07	1.54	2.09
CV	0.0	195.69	3.38	2.54	3.35	648.07	2.3
Replicate F	0.000	0.515	2.076	0.529	0.212	1.000	2.326
Replicate Prob(F)	1.0000	0.6034	0.1457	0.5953	0.8104	0.3816	0.1177
Treatment F	0.000	0.432	218.529	385.553	222.450	1.000	470.351
Treatment Prob(F)	1.0000	0.9425	0.0001	0.0001	0.0001	0.4786	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	HLOUM C -	CERVU C -	SCRAN C -	C TRZAW	LAMAM C -	HLOUM C -	OEOLA C -
Description	JagChkwd	ME Chkwd	Knawel	W.Wheat	Henbit	JagChkwd	CEprmrse
Rating Type	Control	Control	Control	Stunting	Control	Control	Control
Rating Unit	%	%	%	%	%	%	%
Rating Date	12/04/18	12/04/18	12/04/18	03/13/19	03/13/19	03/13/19	03/13/19
Trt Treatment No. Name							
12 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate	97.7 abc	100.0 a	98.7 abc	0.0 a	96.7 ab	81.7 bc	93.0 a-d
13 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Aim.....carfentrazone Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	99.7 a	100.0 a	100.0 a	0.0 a	100.0 a	96.7 a	97.3 abc
14 Axiom Premix ----flufenacet ----metribuzin 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluoroxypr Nonionic Surfactant 30% Urea Ammonium Nitrate	99.3 ab	100.0 a	100.0 a	0.0 a	94.7 ab	85.0 b	100.0 a
LSD P=.05	3.06	.	3.06	2.59	6.53	4.92	9.83
Standard Deviation	1.82	0.00	1.83	1.54	3.89	2.93	5.86
CV	1.99	0.0	1.99	648.07	4.32	3.57	6.72
Replicate F	0.715	0.000	1.508	1.000	3.263	1.405	2.555
Replicate Prob(F)	0.4985	1.0000	0.2401	0.3816	0.0544	0.2634	0.0971
Treatment F	627.622	0.000	631.402	1.000	134.451	219.706	56.861
Treatment Prob(F)	0.0001	1.0000	0.0001	0.4786	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	SCRAN C -	C TRZAW	C TRZAW	C TRZAW	C TRZAW	CERVU C -	HLOUM C -
Description	Knawel	W.Wheat	W.Wheat	W.Wheat	W.Wheat	ME Chkwd	JagChkwd
Rating Type	Control	Chorosis	Lf burn	Chlorosis	Stunting	Control	Control
Rating Unit	%	%	%	%	%	%	%
Rating Date	03/13/19	03/29/19	03/29/19	04/03/19	04/03/19	04/03/19	04/03/19
Trt Treatment No. Name							
12 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate	99.0 ab	5.0 c	0.0 c	0.0 a	0.0 a	100.0 a	87.3 de
13 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Aim.....carfentrazone Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	0.0 d	0.0 c	0.0 a	0.0 a	100.0 a	100.0 a
14 Axiom Premix ----flufenacet ----metribuzin 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluoroxypr Nonionic Surfactant 30% Urea Ammonium Nitrate	100.0 a	15.0 a	5.0 ab	0.0 a	0.0 a	100.0 a	92.3 bc
LSD P=.05	3.05	1.71	1.66	1.29	1.29	.	4.54
Standard Deviation	1.82	1.02	0.99	0.77	0.77	0.00	2.70
CV	1.99	25.63	70.47	648.07	648.07	0.0	3.09
Replicate F	0.224	1.123	1.628	1.000	1.000	0.000	0.238
Replicate Prob(F)	0.8012	0.3404	0.2157	0.3816	0.3816	1.0000	0.7899
Treatment F	632.938	90.788	16.914	1.000	1.000	0.000	272.111
Treatment Prob(F)	0.0001	0.0001	0.0001	0.4786	0.4786	1.0000	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	LAMAM C -	SCRAN C -	STEME C -	ANTCO C -	CERVU C -	HLOUM C -	LAMAM C -	SCRAN C -
Description	Henbit	Knawel	C.chkwd	MywdCham	ME Chkwd	JagChkwd	Henbit	Knawel
Rating Type	Control							
Rating Unit	%	%	%	%	%	%	%	%
Rating Date	04/03/19	04/03/19	04/03/19	04/17/19	04/17/19	04/17/19	04/17/19	04/17/19
Trt Treatment No. Name								
12 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate	85.7 e	100.0 a	100.0 a	100.0 a	100.0 a	70.0 a	98.3 ab	100.0 a
13 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Aim.....carfentrazone Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	97.3 ab	100.0 a						
14 Axiom Premix ----flufenacet ----metribuzin 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluoxypyrr Nonionic Surfactant 30% Urea Ammonium Nitrate	90.0 cde	100.0 a	96.7 ab	100.0 a				
LSD P=.05	6.35	6.19	4.13	17.13	23.31	31.37	25.98	23.62
Standard Deviation	3.78	3.69	2.46	10.21	13.89	18.69	15.48	14.07
CV	4.42	4.06	2.67	12.15	15.31	21.24	18.49	16.92
Replicate F	4.201	1.032	3.545	1.394	1.000	2.864	0.809	0.803
Replicate Prob(F)	0.0262	0.3704	0.0435	0.2661	0.3816	0.0751	0.4564	0.4587
Treatment F	136.269	153.514	350.091	29.239	11.598	6.490	9.080	19.748
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=34

Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	STEME C - C.chkwd	VIORA C - FldPansy	C TRZAW W.Wheat Yield Bu/A
Description	Control %	Control %	04/17/19
Rating Type			04/17/19
Rating Unit			Bu/A
Rating Date			06/25/19
Trt Treatment No. Name			
12 Anthem Flex Premix ----pyroxasulfone ----carfentrazone 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant 30% Urea Ammonium Nitrate	100.0 a	100.0 a	62.7 a
13 Anthem Flex Premix ----pyroxasulfone ----carfentrazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Aim.....carfentrazone Nonionic Surfactant 30% Urea Ammonium Nitrate 30% Urea Ammonium Nitrate	100.0 a	100.0 a	67.1 a
14 Axiom Premix ----flufenacet ----metribuzin 30% Urea Ammonium Nitrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	100.0 a	100.0 a	62.6 a
LSD P=.05	.	2.59	10.30
Standard Deviation	0.00	1.54	6.13
CV	0.0	1.81	9.88
Replicate F	0.000	1.000	0.623
Replicate Prob(F)	1.0000	0.3816	0.5444
Treatment F	0.000	1653.308	1.089
Treatment Prob(F)	1.0000	0.0001	0.4105

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=34  
 Could not calculate LSD (% mean diff) for columns 1,9,20,30 because error mean square = 0.

Quelex and PowerFlex Programs in Winter Wheat

Trial ID: SG4-19

Location: Field #30

Trial Year: 2019

Protocol ID: SG4-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Corteva

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

ARM Trial Created On: 04/08/19

Initiation Date: 08/01/18

Completion Date: 06/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C TRZAW Triticum aestivum (winter) Winter wheat

Entry Date: 07/15/19

Variety: Shirley

Planting Date: 10/25/18

Planting Rate: 120 lb/A

Depth: 0.75 in

Rows per Plot: 16

Planting Method: DRILLE drilled

Row Spacing: 7 in

Planting Equipment: FE Field Equipment

Soil Temperature: 55 F

Seed Bed: MEDIUM medium

Emergence Date: 10/31/18

Soil Moisture: NORMAL normal, adequate

Harvest Date: 06/25/19

Harvest Equipment: Plot combine

% Standard Moisture: 13.5

Harvested Width: 7 FT

Harvested Length: 24 FT

**Pest Description**

Pest 1 Type: W Code: HLOUM Holosteum umbellatum

Common Name: Jagged chickweed Entry Date: 07/18/19

Pest 2 Type: W Code: LAMAM Lamium amplexicaule

Common Name: Henbit Entry Date: 07/18/19

Pest 3 Type: W Code: ARBTH Arabidopsis thaliana

Common Name: Mouse-ear cress Entry Date: 07/18/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 12

Tillage Type: CONTIL conventional-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 30

% Sand: 83

% OM: 1.2

Texture: LS

loamy sand

% Silt: 8

pH: 6.1

Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 9

CEC: 3.2

Fert. Level: F fair

Soil Drainage: G

good

**Application Description**

	A
Application Date	04/10/19
Appl. Stop Time	10:05 AM
Application Method	SPRAY
Application Timing	Spring
Application Placement	BROADC
Applied By	Johnson
Appl. Entry Date	05/22/19
Air Temperature Start, Stop	69 63 F
% Relative Humidity Start, Stop	22 35
Wind Velocity+Dir. Start	0 mph N
Wind Velocity+Dir. Stop	1 mph WNW
Wind Velocity+Dir. Max	2 mph N
Wet Leaves (Y/N)	Y yes
Soil Temperature	64 F
Soil Moisture	NORMAL
% Cloud Cover	79
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.28 IN
Weather Source	ITERIS

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	TRZAW BCER
Days after Emergence	161
Stage Majority, Percent	3-tiller 60
Stage Minimum, Percent	2-tiller 10
Stage Maximum, Percent	4-tiller 30
Height Average	7 in
Height Minimum, Maximum	6 8

**Pest Stage At Each Application**

	A
Pest 1 Code, Type, Scale	HLOUM W
Stage Majority, Percent	flower 100
Height Average	7 in
Height Minimum, Maximum	6 8
Density Average	10 m2
Density Min, Max	5 15
Pest 2 Code, Type, Scale	LAMAM W
Stage Majority, Percent	flower 100
Height Average	6 in
Height Minimum, Maximum	5 7
Density Average	30 m2
Density Min, Max	20 40
Pest 3 Code, Type, Scale	ARBTH W
Stage Majority, Percent	flower 100
Height Average	5 in
Density Average	10 m2
Density Min, Max	5 15

**Application Equipment**

	A
Appl. Equipment	Bckpck6Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	9 ft
Boom Height	24 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	04/08/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	04/08/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

05/03/19. Half of the plots in the first range are stunted. Poor stand of wheat resulted in high densities of knawel. Knawel particularly dense in plot 206.

Quelex and PowerFlex Programs in Winter Wheat		Location: Field #30		Trial Year: 2019	
Trial ID: SG4-19	Protocol ID: SG4-19	Investigator: Mark VanGessel		Sponsor Contact: Corteva	
Pest Code		C	TRZAW	SCRAN C -	ANTCO C -
Crop Type, Code			W.Wheat	Knawel	FldPansy
Description					
Rating Type			Stunting %	Control %	Control %
Rating Unit				04/22/19	05/03/19
Rating Date				05/03/19	05/03/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
		20 WG	0.0094 lb ai/a	Spring A	
1	Quelex Premix	10	0.0047		0.0 e
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	Crop Oil Concentrate	100 L	1 % v/v	Spring A	
2	PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Spring A	8.7 cd
	Crop Oil Concentrate	100 L	1 % v/v	Spring A	40.0 cd
3	Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	8.0 cd
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Spring A	
	Crop Oil Concentrate	100 L	1 % v/v	Spring A	
4	Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	16.7 a
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Spring A	
	2,4-D ester	3.8 L	0.475 lb ae/a	Spring A	
	Crop Oil Concentrate	100 L	1 % v/v	Spring A	
5	Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	11.7 bc
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Spring A	
	Starane Ultra...fluoxypyrr	2.8 EC	0.109 lb ae/a	Spring A	
	Crop Oil Concentrate	100 L	1 % v/v	Spring A	
6	PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Spring A	16.3 a
	2,4-D ester	3.8 L	0.475 lb ae/a	Spring A	
	Crop Oil Concentrate	100 L	1 % v/v	Spring A	60.0 bcd
7	PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Spring A	13.3 ab
	Starane Ultra...fluoxypyrr	2.8 EC	0.109 lb ae/a	Spring A	
	Crop Oil Concentrate	100 L	1 % v/v	Spring A	78.3 ab
8	Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	4.7 d
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	Axial XL.....pinoxaden	0.42 L	0.054 lb ai/a	Spring A	
	Crop Oil Concentrate	100 L	1 % v/v	Spring A	
9	Osprey.....mesosulfuron	4.5 WG	0.0134 lb ai/a	Spring A	16.7 a
	Starane Ultra...fluoxypyrr	2.8 EC	0.14 lb ae/a	Spring A	
	Methylated Seed Oil	100 L	1 % v/v	Spring A	70.0 abc
10	Axial XL.....pinoxaden	0.42 L	0.054 lb ai/a	Spring A	0.0 e
	Starane Ultra...fluoxypyrr	2.8 EC	0.109 lb ae/a	Spring A	36.7 d
11	Harmony Extra SG Premix	50 SG	0.028 lb ai/a	Spring A	4.7 d
	----thifensulfuron	33	0.0185		
	----tribenuron	17	0.0095		
	Starane Ultra...fluoxypyrr	2.8 EC	0.109 lb ae/a	Spring A	
	Nonionic Surfactant	100 L	0.25 % v/v	Spring A	
	30% Urea Ammonium Nitrate	100 L	1.25 % v/v	Spring A	93.3 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	SCRAN C - Knavel	ANTCO C - MywdCham	VIORA C - FldPansy	C TRZAW W.Wheat
Description	Control % 05/20/19	Control % 05/20/19	Control % 05/20/19	Yield Bu/A 06/25/19
Trt No. Treatment Name	Form Conc Type Rate	Appl Unit Timing	Appl Code	
1 Quelex Premix ----florasulam ----halauxifen Crop Oil Concentrate	20 WG 10 10 100 L	0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Spring A	50.0 bcd 83.3 a 16.7 c 55.2 a
2 PowerFlex HL....pyroxsulam Crop Oil Concentrate	13.1 WG 100 L	0.0164 lb ai/a 1 % v/v	Spring A	16.7 de 33.3 b 100.0 a 42.7 a
3 Quelex Premix ----florasulam ----halauxifen PowerFlex HL....pyroxsulam Crop Oil Concentrate	20 WG 10 10 13.1 WG 100 L	0.0094 lb ai/a 0.0047 0.0047 0.0164 lb ai/a 1 % v/v	Spring A	50.0 bcd 100.0 a 100.0 a 54.4 a
4 Quelex Premix ----florasulam ----halauxifen PowerFlex HL....pyroxsulam 2,4-D ester Crop Oil Concentrate	20 WG 10 10 13.1 WG 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.0164 lb ai/a 0.475 lb ae/a 1 % v/v	Spring A	33.3 cde 100.0 a 66.7 b 41.1 a
5 Quelex Premix ----florasulam ----halauxifen PowerFlex HL....pyroxsulam Starane Ultra...fluoxypyrr Crop Oil Concentrate	20 WG 10 10 13.1 WG 2.8 EC 100 L	0.0094 lb ai/a 0.0047 0.0047 0.0164 lb ai/a 0.109 lb ae/a 1 % v/v	Spring A	75.0 ab 100.0 a 100.0 a 41.5 a
6 PowerFlex HL....pyroxsulam 2,4-D ester Crop Oil Concentrate	13.1 WG 3.8 L 100 L	0.0164 lb ai/a 0.475 lb ae/a 1 % v/v	Spring A	23.3 cde 80.0 a 90.0 ab 47.6 a
7 PowerFlex HL....pyroxsulam Starane Ultra...fluoxypyrr Crop Oil Concentrate	13.1 WG 2.8 EC 100 L	0.0164 lb ai/a 0.109 lb ae/a 1 % v/v	Spring A	60.0 abc 0.0 b 100.0 a 41.6 a
8 Quelex Premix ----florasulam ----halauxifen Axial XL.....pinoxaden Crop Oil Concentrate	20 WG 10 10 0.42 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.054 lb ai/a 1 % v/v	Spring A	33.3 cde 100.0 a 0.0 c 46.5 a
9 Osprey.....mesosulfuron Starane Ultra...fluoxypyrr Methylated Seed Oil	4.5 WG 2.8 EC 100 L	0.0134 lb ai/a 0.14 lb ae/a 1 % v/v	Spring A	33.3 cde 0.0 b 0.0 c 38.8 a
10 Axial XL.....pinoxaden Starane Ultra...fluoxypyrr	0.42 L 2.8 EC	0.054 lb ai/a 0.109 lb ae/a	Spring A	33.3 cde 0.0 b 0.0 c 47.3 a
11 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluoxypyrr Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 2.8 EC 100 L 100 L	0.028 lb ai/a 0.0185 0.0095 0.109 lb ae/a 0.25 % v/v 1.25 % v/v	Spring A	95.0 a 100.0 a 93.3 ab 45.6 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C TRZAW	SCRAN C -	ANTCO C -	VIORA C -							
Description	W.Wheat	Knawel	MywdCham	FldPansy							
Rating Type	Stunting	Control	Control	Control							
Rating Unit	%	%	%	%							
Rating Date	04/22/19	05/03/19	05/03/19	05/03/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
12	Untreated Check							0.0 e	0.0 e	0.0 d	0.0 e
LSD P=.05								4.51	31.03	15.19	26.35
Standard Deviation								2.67	18.32	8.97	15.56
CV								31.77	30.65	13.05	22.68
Replicate F								0.074	3.560	1.941	0.218
Replicate Prob(F)								0.9286	0.0458	0.1673	0.8059
Treatment F								18.214	6.165	63.118	18.675
Treatment Prob(F)								0.0001	0.0002	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	SCRAN C - Knewel	ANTCO C - MywdCham	VIORA C - FldPansy	C TRZAW W.Wheat		
Rating Type	Control	Control	Control	Yield		
Rating Unit	%	%	%	Bu/A		
Rating Date	05/20/19	05/20/19	05/20/19	06/25/19		
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit		
				Appl Timing Code		
12 Untreated Check			0.0 e	0.0 b	0.0 c	57.4 a
LSD P=.05			38.25	33.44	32.28	24.28
Standard Deviation			22.59	19.75	19.06	14.34
CV			53.85	34.01	34.31	30.74
Replicate F			2.182	0.456	1.659	1.633
Replicate Prob(F)			0.1366	0.6397	0.2133	0.2182
Treatment F			3.958	16.795	18.385	0.545
Treatment Prob(F)			0.0029	0.0001	0.0001	0.8515

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**New Herbicide Evaluation for Small Grains**

Trial ID: SG5-19

Location: Field #30

Trial Year: 2019

Protocol ID: SG5-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Bayer CropScience

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Trial Status Date: 03/25/19 Last Export Date: 07/26/19 Last Changed By: Mark VanGessel

Initiation Date: 08/31/18

Completion Date: 06/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W USA 49.376656 - 24.53833

-124.715843 - -66.968887

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C	TRZAW Triticum aestivum (winter) Winter wheat	BBCH Scale: BCER
Variety: Shirley		
Planting Date: 10/10/18	Planting Rate: 120	lb/A
Depth: 0.75 in		
Rows per Plot: 16	Planting Method: DRILLE	drilled
Row Spacing: 7 in	Planting Equipment: FE	Field Equipment
Soil Temperature: 84 F	Seed Bed: MEDIUM	medium
Emergence Date: 10/16/18	Soil Moisture: NORMAL	normal, adequate
Harvest Date: 06/25/19	Harvest Equipment: Plot combine	
% Standard Moisture: 13.5	Harvested Width: 7 FT	
	Harvested Length: 24 FT	

**Pest Description**

Pest 1 Type: W Code: LAMAM Lamium amplexicaule

Common Name: Henbit

Pest 2 Type: W Code: HLOUM Holosteum umbellatum

Common Name: Jagged chickweed

Pest 3 Type: W Code: PLAPR Plantago purshii

Common Name: Woolly plantain

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 16 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 30

% Sand: 83 % OM: 1.2 Texture: LS loamy sand

% Silt: 8 pH: 6.1 Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 9 CEC: 3.2 Fert. Level: F fair

Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	11/12/18	03/29/19	03/29/19
Appl. Stop Time	12:10 PM	10:30 AM	03:00 PM
Interval to Prev. Appl.		137 DAYS	4 HOURS
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	DPRE	Spring	Spring
Application Placement	BROADC	BROADC	BROADC
Applied By	VanGessel	Johnson	Johnson
Air Temperature Start, Stop	51 51 F	61 61 F	72 72 F
% Relative Humidity Start, Stop	53 53	51 51	38 38
Wind Velocity+Dir. Start	4 mph ESE	2 mph SSW	1 mph WNW
Wind Velocity+Dir. Stop	4 mph ESE	2 mph SSW	1 mph WNW
Wind Velocity+Dir. Max	4 mph ESE	2 mph SSW	1 mph WNW
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	51 F	54 F	68 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	96	96	20
Moisture 6 Hours after Appl.	0.04 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.68 IN	0.06 IN	0.06 IN
Weather Source	ITERIS	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER	TRZAW BCER
Days after Emergence	27	164	164
Stage Scale Used	DESC	DESC	DESC
Stage Majority, Percent	2-leaf 100	2-3 til 100	2-3 til 100
Height Average	1.5 in	3.5 in	3.5 in
Height Minimum, Maximum		3 4	3 4

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	LAMAM W	LAMAM W	LAMAM W
Stage Majority, Percent		flower 100	flower 100
Height Average		3.5 in	3.5 in
Height Minimum, Maximum		3 4	3 4
Density Average		65 m2	65 m2
Density Min, Max		50 80	50 80
Pest 2 Code, Type, Scale	HLOUM W	HLOUM W	HLOUM W
Stage Majority, Percent		EaFlwr 100	EaFlwr 100
Height Average		4 in	4 in
Height Minimum, Maximum		3 5	3 5
Density Average		50 m2	50 m2
Density Min, Max		40 60	40 60
Pest 3 Code, Type, Scale	PLAPR W	PLAPR W	PLAPR W
Stage Majority, Percent		Flower 100	Flower 100
Height Average		3.5 in	3.5 in
Height Minimum, Maximum		3 4	3 4
Density Average		35 m2	35 m2
Density Min, Max		30 40	30 40

**Application Equipment**

	A	B	C
Appl. Equipment	Bckpck4Nozl	Bckpck4Nozl	Bckpck4Nozl
Equipment Type	SPRBAC	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	18 in	18 in	18 in
Boom Length	6 ft	6 ft	6 ft
Boom Height	18 in	21 in	21 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Minimum Mix/Treatment	1.3035 L	1.3035 L	1.3035 L
Propellant	COMCO2	COMCO2	COMCO2

**Trial Comments**

Treatments were applied to very large weeds, larger than we recommend for effective control (late applications)

04/22/19: Poor mouseear chickweed control observed with treatments 4, 6, 7, 8, & 10; Poor common chickweed control with treatments 7 and only fair with treatment 6; Very poor ivyleaf speedwell control with treatment 1; Redstem filaree control was weak with treatments 12 and 13, poor with treatment 6, and none with treatments 1 and 3.

Ragweed seedlings emerging throughout the plots even 4 oz of metribuzin in spring did not seem to have impact on ragweed emergence (trts 1, 2, 10, & 14).

05/07/19: Henbit and jagged chickweed were starting to senesce and difficult to determine effect of herbicide versus senescing so they were not rated  
Poor stand of wheat in plots 216, 308, 313, 314, 315, and 316 - Overall the stand of wheat is thinner in the center of the plots (harvest area) than the outside 4 rows; stand is variable.

Based on scattered weed observations: Treatment 1 and 5 were poor on ivyleaf speedwell; Treatment 4, 10, and 13 were weak on jagged chickweed; Treatment 1, 4, and 7 were weak on common chickweed.

Mayweed chamomile control was:

None to poor: Trts 1, 3, 6, 7

Fair: Trt 12

Good: Trt 9, 10, 13, 14

Excellent: Trts 2, 4, 5, 8, 11

New Herbicide Evaluation for Small Grains						
Trial ID: SG5-19		Location: Field #30		Trial Year: 2019		
Protocol ID: SG5-19		Investigator: Mark VanGessel				
Study Director:			Sponsor Contact: Bayer CropScience			
Pest Code				C TRZAW	HLOUM	C TRZAW
Crop Type, Code				W.Wheat	C -	W.Wheat
Description				Stunting %	Control %	Leafburn %
Rating Type				03/12/19	03/12/19	04/08/19
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Huskie Premix	2.05 EC		0.24 lb ai/a	Spring B	
	----pyrasulfotole	0.3		0.035		
	----bromoxynil	1.75		0.205		
	Dry Ammonium Sulfate	100 D		0.3 % w/v	Spring B	
	No Tankmix Partner					
2	Huskie Premix	2.05 EC		0.24 lb ai/a	Spring B	
	----pyrasulfotole	0.3		0.035		
	----bromoxynil	1.75		0.205		
	Harmony Extra SG Premix	50 SG		0.0234 lb ai/a	Spring B	
	----thifensulfuron	33		0.0154		
	----tribenuron	17		0.00796		
	Nonionic Surfactant	100 L		0.25 % v/v	Spring B	
	30% Urea Ammonium Nitrate	100 L		2.5 % v/v	Spring B	
3	Huskie Premix	2.05 EC		0.24 lb ai/a	Spring B	
	----pyrasulfotole	0.3		0.035		
	----bromoxynil	1.75		0.205		
	Dimetric EXT....metribuzin	75 WG		0.188 lb ai/a	Spring B	
	Nonionic Surfactant	100 L		0.25 % v/v	Spring B	
4	Quelex Premix	20 WG		0.0094 lb ai/a	Spring B	
	----florasulam	10		0.0047		
	----halauxifen	10		0.0047		
	Nonionic Surfactant	100 L		0.25 % v/v	Spring B	
	No Tankmix Partner					
5	Quelex Premix	20 WG		0.0094 lb ai/a	Spring B	
	----florasulam	10		0.0047		
	----halauxifen	10		0.0047		
	Harmony Extra SG Premix	50 SG		0.0234 lb ai/a	Spring B	
	----thifensulfuron	33		0.0154		
	----tribenuron	17		0.00796		
	Nonionic Surfactant	100 L		0.25 % v/v	Spring B	
	30% Urea Ammonium Nitrate	100 L		2.5 % v/v	Spring B	
6	Quelex Premix	20 WG		0.0094 lb ai/a	Spring B	
	----florasulam	10		0.0047		
	----halauxifen	10		0.0047		
	Dimetric EXT....metribuzin	75 WG		0.188 lb ai/a	Spring B	
	Nonionic Surfactant	100 L		0.25 % v/v	Spring B	
7	Talinor Premix	1.77 EC		0.221 lb ai/a	Spring C	
	----bicyclopyrone	0.31		0.0387		
	----bromoxynil	1.46		0.182		
	Coact+ Sodium Bicarbonate	2.67 SL		0.067 lb ai/a	Spring C	
	Crop Oil Concentrate	100 L		1 % v/v	Spring C	
	No Tankmix Partner					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=6,8,9,14,15; Average=13

Pest Code Crop Type, Code		C	TRZAW	LAMAM C -	SCRAN C -	HLOUM C -
Description			W.Wheat	Henbit	Knawel	JagChkwD
Rating Type			Stunting %	Control %	Control %	Control %
Rating Unit			04/22/19	04/22/19	04/22/19	04/22/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
1	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate No Tankmix Partner	2.05 EC 0.3 1.75 100 D	0.24 lb ai/a 0.035 0.205 0.3 % w/v	Spring B	2.3 fg	94.0 a
					82.3 cd	89.0 b
2	Huskie Premix ----pyrasulfotole ----bromoxynil Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	2.05 EC 0.3 1.75 50 SG 33 17 100 L 100 L	0.24 lb ai/a 0.035 0.205 0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring B	0.0 g	94.0 a
					96.3 ab	90.7 ab
3	Huskie Premix ----pyrasulfotole ----bromoxynil Dimetric EXT....metribuzin Nonionic Surfactant	2.05 EC 0.3 1.75 75 WG 100 L	0.24 lb ai/a 0.035 0.205 0.188 lb ai/a 0.25 % v/v	Spring B	16.3 ab	98.3 a
					99.0 a	100.0 a
4	Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant No Tankmix Partner	20 WG 10 10 100 L	0.0094 lb ai/a 0.0047 0.0047 0.25 % v/v	Spring B	0.0 g	98.0 a
					53.3 e	40.0 ef
5	Quelex Premix ----florasulam ----halauxifen Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	20 WG 10 10 50 SG 33 17 100 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring B	8.3 def	98.0 a
					89.0 abc	66.7 c
6	Quelex Premix ----florasulam ----halauxifen Dimetric EXT....metribuzin Nonionic Surfactant	20 WG 10 10 75 WG 100 L	0.0094 lb ai/a 0.0047 0.0047 0.188 lb ai/a 0.25 % v/v	Spring B	17.3 ab	99.0 a
					99.0 a	100.0 a
7	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate No Tankmix Partner	1.77 EC 0.31 1.46 2.67 SL 100 L	0.221 lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v	Spring C	4.7 efg	71.7 b
					91.7 abc	33.3 f

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=6,8,9,14,15; Average=13

Pest Code Crop Type, Code		OEOLA C -	VIORA C -	SCRAN C -	OEOLA C -
Description	CEprmrse	FldPansy	Knawel	CEprmrse	
Rating Type	Control %	Control %	Control %	Control %	
Rating Unit	04/22/19	04/22/19	05/07/19	05/07/19	
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
1	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate No Tankmix Partner	2.05 EC 0.3 1.75 100 D	0.24 lb ai/a 0.035 0.205 0.3 % w/v	Spring B	50.0 g
2	Huskie Premix ----pyrasulfotole ----bromoxynil Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	2.05 EC 0.3 1.75 50 SG 33 17 100 L 100 L	0.24 lb ai/a 0.035 0.205 0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring B	82.3 cde
3	Huskie Premix ----pyrasulfotole ----bromoxynil Dimetric EXT....metribuzin Nonionic Surfactant	2.05 EC 0.3 1.75 75 WG 100 L	0.24 lb ai/a 0.035 0.205 0.188 lb ai/a 0.25 % v/v	Spring B	98.3 a
4	Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant No Tankmix Partner	20 WG 10 10 100 L	0.0094 lb ai/a 0.0047 0.0047 0.25 % v/v	Spring B	52.6 g
5	Quelex Premix ----florasulam ----halauxifen Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	20 WG 10 10 50 SG 33 17 100 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring B	76.0 def
6	Quelex Premix ----florasulam ----halauxifen Dimetric EXT....metribuzin Nonionic Surfactant	20 WG 10 10 75 WG 100 L	0.0094 lb ai/a 0.0047 0.0047 0.188 lb ai/a 0.25 % v/v	Spring B	81.7 cde
7	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate No Tankmix Partner	1.77 EC 0.31 1.46 2.67 SL 100 L	0.221 lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v	Spring C	46.7 g
					23.3 e
					78.3 b
					50.0 de

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=6,8,9,14,15; Average=13

Pest Code Crop Type, Code		VIORA C - C	TRZAW	C TRZAW			
Description	FldPansy	Control %	W.Wheat Yield lb/plot	W.Wheat Yield Bu/A			
Rating Type	05/07/19	06/25/19	06/25/19				
Rating Unit							
Rating Date							
Trt No. Name	Form Conc	Form Type	Rate Unit	Appl Timing			
1 Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate No Tankmix Partner	2.05 EC 0.3 1.75 100 D	lb ai/a	0.24 0.035 0.205 0.3 % w/v	Spring B	0.0 g	10.473 bc	46.0 bc
2 Huskie Premix ----pyrasulfotole ----bromoxynil Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	2.05 EC 0.3 1.75 50 SG 33 17 100 L 100 L	lb ai/a	0.24 0.035 0.205 0.0234 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring B	68.3 cd	11.833 b	52.0 b
3 Huskie Premix ----pyrasulfotole ----bromoxynil Dimetric EXT....metribuzin Nonionic Surfactant	2.05 EC 0.3 1.75 75 WG 100 L	lb ai/a	0.24 0.035 0.205 0.188 0.25 % v/v	Spring B	26.7 ef	9.633 bcd	42.4 bcd
4 Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant No Tankmix Partner	20 WG 10 10 100 L	lb ai/a	0.0094 0.0047 0.0047 0.25 % v/v	Spring B	25.0 f	9.117 cd	40.1 cd
5 Quelex Premix ----florasulam ----halauxifen Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	20 WG 10 10 50 SG 33 17 100 L 100 L	lb ai/a	0.0094 0.0047 0.0047 0.0234 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring B	96.7 a	7.357 de	32.3 de
6 Quelex Premix ----florasulam ----halauxifen Dimetric EXT....metribuzin Nonionic Surfactant	20 WG 10 10 75 WG 100 L	lb ai/a	0.0094 0.0047 0.0047 0.188 0.25 % v/v	Spring B	26.7 ef	10.369 bc	45.6 bc
7 Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate No Tankmix Partner	1.77 EC 0.31 1.46 2.67 SL 100 L	lb ai/a	0.221 0.0387 0.182 0.067 1 % v/v	Spring C	26.7 ef	9.480 cd	41.7 cd

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=6,8,9,14,15; Average=13

## University of Delaware

Pest Code Crop Type, Code		C TRZAW	HLOUM C -	C TRZAW	C TRZAW				
Description		W.Wheat		W.Wheat	W.Wheat				
Rating Type		Stunting %	Control %	Stunting %	Leafburn %				
Rating Unit									
Rating Date		03/12/19	03/12/19	04/08/19	04/08/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit				
8	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 30% Urea Ammonium Nitrate	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17 100 L	lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.0234 lb ai/a 0.0154 0.00796 2.5 % v/v	0.221 0.0387 0.182 Spring C Spring C Spring C Spring C Spring C Spring C	Spring C			5.7 fgh	0.0 c
9	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Dimetric EXT....metribuzin	1.77 EC 0.31 1.46 2.67 SL 100 L 75 WG	lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.188 lb ai/a	0.221 0.0387 0.182 Spring C Spring C Spring C	Spring C			11.3 def	13.3 a
10	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate No Tankmix Partner	6 WG 4.5 1.5 100 L 100 L	lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	0.0178 0.0133 0.00445 Spring B Spring B	Spring B			20.0 abc	0.0 c
11	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	6 WG 4.5 1.5 50 SG 33 17 100 L 100 L	lb ai/a 0.0133 0.00445 0.0234 lb ai/a 0.0154 0.00796 0.5 % v/v 2.5 % v/v	0.0178 0.0133 0.00445 Spring B Spring B Spring B Spring B	Spring B			21.7 ab	0.0 c
12	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate Dimetric EXT....metribuzin	6 WG 4.5 1.5 100 L 100 L 75 WG	lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v 0.188 lb ai/a	0.0178 0.0133 0.00445 Spring B Spring B Spring B	Spring B			19.0 abc	4.7 bc
13	Axiom Premix ----flufenacet ----metribuzin Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate	68 WG 54 14 6 WG 4.5 1.5 100 L 100 L	lb ai/a 0.202 0.0525 0.0234 lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	0.255 0.202 0.0525 Spring B Spring B Spring B Spring B	DPRE A	10.7 a	53.3 a	24.0 a	0.0 c
14	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 75 WG 100 L 100 L	lb ai/a 0.0154 0.00796 0.188 lb ai/a 0.25 % v/v 2.5 % v/v	0.0234 0.0154 0.00796 Spring B Spring B Spring B	Spring B			14.7 bcd	6.3 b

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=6,8,9,14,15; Average=13

## University of Delaware

Pest Code Crop Type, Code		C TRZAW	LAMAM C -	SCRAN C -	HLOUM C -				
Description		W.Wheat	Henbit	Knawel	JagChkwd				
Rating Type		Stunting %	Control %	Control %	Control %				
Rating Unit		04/22/19	04/22/19	04/22/19	04/22/19				
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code		
8	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 30% Urea Ammonium Nitrate	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17 100 L	lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.0234 lb ai/a 0.0154 0.00796 2.5 % v/v	0.221 0.0387 0.182 Spring C Spring C Spring C Spring C Spring C Spring C	10.0	cde	76.7 b	95.0 abc	53.3 d
9	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Dimetric EXT....metribuzin	1.77 EC 0.31 1.46 2.67 SL 100 L 75 WG	lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.188 lb ai/a	0.221 0.0387 0.182 Spring C Spring C Spring C	14.0	a-d	99.8 a	99.0 a	100.0 a
10	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate No Tankmix Partner	6 WG 4.5 1.5 100 L 100 L	lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	0.0178 0.0133 0.00445 Spring B Spring B	15.0	abc	79.3 b	85.0 bcd	40.0 ef
11	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	6 WG 4.5 1.5 50 SG 33 17 100 L 100 L	lb ai/a 0.0133 0.00445 0.0234 lb ai/a 0.0154 0.00796 0.5 % v/v 2.5 % v/v	0.0178 0.0133 0.00445 Spring B Spring B Spring B Spring B	11.3	bcd	92.3 a	81.7 cd	46.7 de
12	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate Dimetric EXT....metribuzin	6 WG 4.5 1.5 100 L 100 L 75 WG	lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v 0.188 lb ai/a	0.0178 0.0133 0.00445 Spring B Spring B Spring B	18.3	a	98.0 a	98.0 ab	98.0 ab
13	Axiom Premix ----flufenacet ----metribuzin Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate	68 WG 54 14 6 WG 4.5 1.5 100 L 100 L	lb ai/a 0.202 0.0525 0.0178 lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	0.255 0.202 0.0525 Spring B Spring B Spring B Spring B	19.0	a	95.7 a	89.0 abc	46.7 de
14	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 75 WG 100 L 100 L	lb ai/a 0.0154 0.00796 0.188 lb ai/a 0.25 % v/v 2.5 % v/v	0.0234 0.0154 0.00796 Spring B Spring B Spring B	14.0	a-d	98.0 a	98.0 ab	98.0 ab

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=6,8,9,14,15; Average=13

## University of Delaware

Pest Code Crop Type, Code		OEOLA C -	VIORA C -	SCRAN C -	OEOLA C -		
Description	CEprmrse	FldPansy	Knawel	CEprmrse			
Rating Type	Control %	Control %	Control %	Control %			
Rating Unit	04/22/19	04/22/19	05/07/19	05/07/19			
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code
8	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 30% Urea Ammonium Nitrate	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17 100 L	lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.0234 lb ai/a 0.0154 0.00796 2.5 % v/v	0.221 0.0387 0.182 Spring C Spring C Spring C Spring C Spring C Spring C	ef ef ef ef ef ef ef ef ef	75.0 76.7 95.0 73.3	abc a bc
9	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Dimetric EXT....metribuzin	1.77 EC 0.31 1.46 2.67 SL 100 L 75 WG	lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.188 lb ai/a	0.221 0.0387 0.182 Spring C Spring C Spring C	ef ef ef ef ef ef	66.7 33.3 100.0 65.0	f e a cd
10	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate No Tankmix Partner	6 WG 4.5 1.5 100 L 100 L	lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	0.0178 0.0133 0.00445 Spring B Spring B	cde cde cde cde cde	84.0 73.3 96.7 73.3	bcd a a bc
11	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	6 WG 4.5 1.5 50 SG 33 17 100 L 100 L	lb ai/a 0.0133 0.00445 0.0234 lb ai/a 0.0154 0.00796 0.5 % v/v 2.5 % v/v	0.0178 0.0133 0.00445 Spring B Spring B Spring B Spring B Spring B	cde cde cde cde cde cde cde cde	85.3 85.0 93.3 86.0	a a a ab
12	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate Dimetric EXT....metribuzin	6 WG 4.5 1.5 100 L 100 L 75 WG	lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v 0.188 lb ai/a	0.0178 0.0133 0.00445 Spring B Spring B Spring B	ab ab ab ab ab	98.0 66.7 100.0 96.7	cd a a a
13	Axiom Premix ----flufenacet ----metribuzin Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate	68 WG 54 14 6 WG 4.5 1.5 100 L 100 L	lb ai/a 0.202 0.0525 0.0178 lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	0.255 0.202 0.0525 Spring B Spring B Spring B Spring B Spring B	a d a d a d a d	100.0 63.3 92.7 100.0	a d a a
14	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 75 WG 100 L 100 L	lb ai/a 0.0154 0.00796 0.188 lb ai/a 0.25 % v/v 2.5 % v/v	0.0234 0.0154 0.00796 Spring B Spring B Spring B	abc ab ab ab ab ab	89.3 80.0 100.0 95.0	abc ab a a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=6,8,9,14,15; Average=13

## University of Delaware

Pest Code Crop Type, Code		VIORA C -	C TRZAW	C TRZAW
Description	FldPansy	W.Wheat	W.Wheat	
Rating Type	Control	Yield	Yield	
Rating Unit	%	lb/plot	Bu/A	
Rating Date	05/07/19	06/25/19	06/25/19	
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing
8 Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 30% Urea Ammonium Nitrate	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17 100 L	lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.0234 lb ai/a 0.0154 0.00796 2.5 % v/v	Spring C Spring C Spring C Spring C Spring C Spring C	40.0 e 9.761 bc 42.9 bc
9 Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Dimetric EXT....metribuzin	1.77 EC 0.31 1.46 2.67 SL 100 L 75 WG	lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.188 lb ai/a	Spring C Spring C Spring C Spring C	33.3 ef 8.465 cd 37.2 cd
10 Osprey Xtra Premix ----mesosulfuron ----thienecarbazone Nonionic Surfactant 30% Urea Ammonium Nitrate No Tankmix Partner	6 WG 4.5 1.5 100 L 100 L	lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	Spring B Spring B	60.0 d 9.297 cd 40.9 cd
11 Osprey Xtra Premix ----mesosulfuron ----thienecarbazone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	6 WG 4.5 1.5 50 SG 33 17 100 L 100 L	lb ai/a 0.0133 0.00445 0.0234 lb ai/a 0.0154 0.00796 0.5 % v/v 2.5 % v/v	Spring B Spring B Spring B Spring B	100.0 a 10.273 bc 45.2 bc
12 Osprey Xtra Premix ----mesosulfuron ----thienecarbazone Nonionic Surfactant 30% Urea Ammonium Nitrate Dimetric EXT....metribuzin	6 WG 4.5 1.5 100 L 100 L 75 WG	lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v 0.188 lb ai/a	Spring B Spring B Spring B Spring B	75.0 bc 10.430 bc 45.9 bc
13 Axiom Premix ----flufenacet ----metribuzin Osprey Xtra Premix ----mesosulfuron ----thienecarbazone Nonionic Surfactant 30% Urea Ammonium Nitrate	68 WG 54 14 6 WG 4.5 1.5 100 L 100 L	lb ai/a 0.202 0.0525 0.0178 lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	DPRE A Spring B Spring B Spring B	100.0 a 14.823 a 65.2 a
14 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 75 WG 100 L 100 L	lb ai/a 0.0154 0.00796 0.188 lb ai/a 0.25 % v/v 2.5 % v/v	Spring B Spring B Spring B Spring B	86.7 ab 10.604 bc 46.6 bc

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=6,8,9,14,15; Average=13

## University of Delaware

Pest Code Crop Type, Code	C TRZAW	HLOUM C -	C TRZAW	C TRZAW
Description	W.Wheat		W.Wheat	W.Wheat
Rating Type	Stunting %	Control %	Stunting %	Leafburn %
Rating Unit				
Rating Date	03/12/19	03/12/19	04/08/19	04/08/19
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
15 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B	
----thifensulfuron	33	0.0154		
----tribenuron	17	0.00796		
Starane Ultra...fluoroxypr	2.8 EC	0.12 lb ae/a	Spring B	
Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B	
16 Untreated Check			0.0 b	0.0 b
LSD P=.05			10.04	14.34
Standard Deviation			2.86	4.08
CV			53.58	15.31
Replicate F			1.000	0.744
Replicate Prob(F)			0.5000	0.4838
Treatment F			20.898	256.000
Treatment Prob(F)			0.0447	0.0039
				0.0001
				0.0002

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=6,8,9,14,15; Average=13

## University of Delaware

Pest Code	C	TRZAW	LAMAM C -	SCRAN C -	HLOUM C -						
Crop Type, Code		W.Wheat	Henbit	Knawel	JagChkwd						
Description		Stunting %	Control %	Control %	Control %						
Rating Type											
Rating Unit											
Rating Date	04/22/19	04/22/19	04/22/19	04/22/19	04/22/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
15	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Spring	B		8.7 de	76.7 b	73.3 d	75.3 c
	----thifensulfuron	33	0.0154								
	----tribenuron	17	0.00796								
	Starane Ultra...fluoroxypr	2.8 EC	0.12	lb ae/a	Spring	B					
	Nonionic Surfactant	100 L	0.25	% v/v	Spring	B					
	30% Urea Ammonium Nitrate	100 L	2.5	% v/v	Spring	B					
16	Untreated Check				0.0 g		0.0 c	0.0 f	0.0 g		
LSD P=.05					6.12		8.07	13.34	10.04		
Standard Deviation					3.67		4.83	8.00	6.01		
CV					36.84		5.65	9.63	8.93		
Replicate F					0.280		0.554	1.898	3.013		
Replicate Prob(F)					0.7576		0.5807	0.1675	0.0647		
Treatment F					10.325		78.515	29.846	79.621		
Treatment Prob(F)					0.0001		0.0001	0.0001	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=6,8,9,14,15; Average=13

## University of Delaware

Pest Code Crop Type, Code		OEOLA C - CEprmrse	VIORA C - FldPansy	SCRAN C - Knawel	OEOLA C - CEprmrse						
Description		Control %	Control %	Control %	Control %						
Rating Type											
Rating Unit											
Rating Date		04/22/19	04/22/19	05/07/19	05/07/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
15	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Spring	B					
	----thifensulfuron	33	0.0154								
	----tribenuron	17	0.00796								
	Starane Ultra...fluoroxypr	2.8 EC	0.12	lb ae/a	Spring	B					
	Nonionic Surfactant	100 L	0.25	% v/v	Spring	B					
	30% Urea Ammonium Nitrate	100 L	2.5	% v/v	Spring	B					
16	Untreated Check			0.0	h	0.0	f	0.0	d	0.0	g
LSD P=.05				11.46		10.23		9.62		17.88	
Standard Deviation				6.86		6.14		5.77		10.72	
CV				9.36		13.24		6.96		15.42	
Replicate F				0.021		4.041		0.644		0.466	
Replicate Prob(F)				0.9794		0.0279		0.5325		0.6323	
Treatment F				42.061		100.346		75.159		19.750	
Treatment Prob(F)				0.0001		0.0001		0.0001		0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=6,8,9,14,15; Average=13

## University of Delaware

Pest Code Crop Type, Code	VIORA C -	C TRZAW	C TRZAW						
Description	FldPansy	W.Wheat	W.Wheat						
Rating Type	Control	Yield	Yield						
Rating Unit	%	lb/plot	Bu/A						
Rating Date	05/07/19	06/25/19	06/25/19						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
15 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 2.8 EC 100 L 100 L	0.0234 0.0154 0.00796 0.12 lb 0.25 % 2.5 %	lb ai/a ae/a v/v v/v	Spring B Spring B Spring B Spring B	98.3 a	8.767 cd	38.5 cd		
16 Untreated Check				0.0 g	5.436 e	23.9 e			
LSD P=.05				13.80	2.3144	10.17			
Standard Deviation				8.24	1.3734	6.04			
CV				15.27	14.08	14.08			
Replicate F				1.481	5.084	5.084			
Replicate Prob(F)				0.2453	0.0144	0.0144			
Treatment F				56.894	6.372	6.372			
Treatment Prob(F)				0.0001	0.0001	0.0001			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=6,8,9,14,15; Average=13

New Herbicide Evaluation for Small Grains		Location: Field #30		Trial Year: 2019	
Trial ID: SG5-19	Protocol ID: SG5-19	Investigator: Mark VanGessel		Sponsor Contact: Bayer CropScience	
Pest Code		C TRZAW	HLOUM C -	C TRZAW	C TRZAW
Crop Type, Code		W.Wheat Stunting %	Control %	W.Wheat Stunting %	W.Wheat Leafburn %
Description		03/12/19	03/12/19	04/08/19	04/08/19
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code
TABLE OF R MEANS					
Replicate 1				13.0	1.8
Replicate 2				13.7	2.8
Replicate 3				11.1	1.3
TABLE OF A (Main Herbicide) MEANS					
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B		9.1 b
1 ----pyrasulfotole	0.3	0.035			1.3 b
1 ----bromoxynil	1.75	0.205			
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B		
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring B		10.9 b
2 ----florasulam	10	0.0047			0.6 b
2 ----halauxifen	10	0.0047			
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring C		10.1 b
3 ----bicyclopyrone	0.31	0.0387			4.4 a
3 ----bromoxynil	1.46	0.182			
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring C		
3 Crop Oil Concentrate	100 L	1 % v/v	Spring C		
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B		20.2 a
4 ----mesosulfuron	4.5	0.0133			1.6 b
4 ----thienencarbazone	1.5	0.00445			
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B		
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		
LSD P=.05				3.84	2.77
Standard Deviation				3.92	2.83
CV				31.19	143.66
TABLE OF B (Tankmix Partners) MEANS					
1 No Tankmix Partner				10.8 a	0.0 b
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B		13.3 a
2 ----thifensulfuron	33	0.0154			1.0 b
2 ----tribenuron	17	0.00796			
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B		13.8 a
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		4.9 a
LSD P=.05				3.32	2.40
Standard Deviation				3.92	2.83
CV				31.19	143.66
TABLE OF A (Main Herbicide) B (Tankmix Partners) MEANS					
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B	.	2.3 g
1 ----pyrasulfotole	0.3	0.035			0.0 b
1 ----bromoxynil	1.75	0.205			
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B		
1 No Tankmix Partner					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	C TRZAW	LAMAM C - W.Wheat Stunting % 04/22/19	SCRAN C - Henbit Control % 04/22/19	HLOUM C - Knavel Control % 04/22/19	JagChkwd Control % 04/22/19		
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
<b>TABLE OF R MEANS</b>							
Replicate 1			9.1	90.9	88.4	69.9	
Replicate 2			10.3	91.5	86.8	69.8	
Replicate 3			10.1	92.4	92.1	74.8	
<b>TABLE OF A (Main Herbicide) MEANS</b>							
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B	6.2 b	95.4 a	92.6 a	93.2 a
1 ----pyrasulfotole	0.3	0.035					
1 ----bromoxynil	1.75	0.205					
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B				
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring B	8.6 b	98.3 a	80.4 b	68.9 b
2 ----florasulam	10	0.0047					
2 ----halauxifen	10	0.0047					
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B				
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring C	9.6 b	82.7 c	95.2 a	62.2 c
3 ----bicyclopyrone	0.31	0.0387					
3 ----bromoxynil	1.46	0.182					
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring C				
3 Crop Oil Concentrate	100 L	1 % v/v	Spring C				
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B	14.9 a	89.9 b	88.2 ab	61.6 c
4 ----mesosulfuron	4.5	0.0133					
4 ----thienencarbazone	1.5	0.00445					
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B				
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B				
LSD P=.05		3.57	5.30	7.86	6.62		
Standard Deviation		3.65	5.40	8.04	6.75		
CV		37.22	5.90	9.02	9.45		
<b>TABLE OF B (Tankmix Partners) MEANS</b>							
1 No Tankmix Partner		5.5 b	85.8 b	78.1 c	50.6 c		
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B	7.4 b	90.3 b	90.5 b	64.3 b
2 ----thifensulfuron	33	0.0154					
2 ----tribenuron	17	0.00796					
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B				
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B				
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B	16.5 a	98.8 a	98.8 a	99.5 a
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B				
LSD P=.05		3.09	4.59	6.81	5.73		
Standard Deviation		3.65	5.40	8.04	6.75		
CV		37.22	5.90	9.02	9.45		
<b>TABLE OF A (Main Herbicide) B (Tankmix Partners) MEANS</b>							
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B	2.3 fg	94.0 a	82.3 c	89.0 a
1 ----pyrasulfotole	0.3	0.035					
1 ----bromoxynil	1.75	0.205					
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B				
1 No Tankmix Partner							

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	OEOLA C -	VIORA C -	SCRAN C -	OEOLA C -
Description	CEprmrse Control %	FldPansy Control %	Knawel Control %	CEprmrse Control %
Rating Type	04/22/19	04/22/19	05/07/19	05/07/19
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code
TABLE OF R MEANS				
Replicate 1		75.0	45.4	85.4
Replicate 2		74.2	43.8	87.5
Replicate 3		75.0	39.2	87.9
TABLE OF A (Main Herbicide) MEANS				
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B	
1 ----pyrasulfotole	0.3	0.035		
1 ----bromoxynil	1.75	0.205		
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B	
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring B	
2 ----florasulam	10	0.0047		
2 ----halauxifen	10	0.0047		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring C	
3 ----bicyclopyrone	0.31	0.0387		
3 ----bromoxynil	1.46	0.182		
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring C	
3 Crop Oil Concentrate	100 L	1 % v/v	Spring C	
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B	
4 ----mesosulfuron	4.5	0.0133		
4 ----thienencarbazone	1.5	0.00445		
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B	
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B	
LSD P=.05		7.54	6.48	6.22
Standard Deviation		7.69	6.62	6.36
CV		10.30	15.48	7.32
11.70				11.96
TABLE OF B (Tankmix Partners) MEANS				
1 No Tankmix Partner		58.3 b	24.2 b	65.4 b
1 No Tankmix Partner				49.6 c
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B	
2 ----thifensulfuron	33	0.0154		
2 ----tribenuron	17	0.00796		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B	
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B	
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
LSD P=.05		6.53	5.61	5.39
Standard Deviation		7.69	6.62	6.36
CV		10.30	15.48	7.32
10.13				11.96
TABLE OF A (Main Herbicide) B (Tankmix Partners) MEANS				
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B	
1 ----pyrasulfotole	0.3	0.035		
1 ----bromoxynil	1.75	0.205		
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B	
1 No Tankmix Partner				
30.0 e				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	VIORA C - FldPansy Control % 05/07/19	C TRZAW	C TRZAW
Description	W.Wheat Yield lb/plot	W.Wheat Yield Bu/A	W.Wheat Yield Bu/A
Rating Type			
Rating Unit			
Rating Date			
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Appl Timing Code
<b>TABLE OF R MEANS</b>			
Replicate 1		50.4	8.761 38.5
Replicate 2		50.0	10.334 45.4
Replicate 3		44.2	10.026 44.1
<b>TABLE OF A (Main Herbicide) MEANS</b>			
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B
1 ----pyrasulfotole	0.3	0.035	
1 ----bromoxynil	1.75	0.205	
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring B
2 ----florasulam	10	0.0047	
2 ----halauxifen	10	0.0047	
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring C
3 ----bicyclopyrone	0.31	0.0387	
3 ----bromoxynil	1.46	0.182	
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring C
3 Crop Oil Concentrate	100 L	1 % v/v	Spring C
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B
4 ----mesosulfuron	4.5	0.0133	
4 ----thienencarbazone	1.5	0.00445	
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B
LSD P=.05		5.80	1.3369 5.88
Standard Deviation		5.88	1.3499 5.93
CV		12.20	13.9057 13.91
<b>TABLE OF B (Tankmix Partners) MEANS</b>			
1 No Tankmix Partner		27.9 c	9.592 a 42.2 a
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B
2 ----thifensulfuron	33	0.0154	
2 ----tribenuron	17	0.00796	
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B
LSD P=.05		5.02	1.1578 5.09
Standard Deviation		5.88	1.3499 5.93
CV		12.20	13.9057 13.91
<b>TABLE OF A (Main Herbicide) B (Tankmix Partners) MEANS</b>			
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B
1 ----pyrasulfotole	0.3	0.035	
1 ----bromoxynil	1.75	0.205	
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B
1 No Tankmix Partner		0.0 f	10.473 a 46.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C TRZAW	HLOUM C	C TRZAW	C TRZAW
					W.Wheat Stunting %	Control %	W.Wheat Stunting %	W.Wheat Leafburn %
					03/12/19	03/12/19	04/08/19	04/08/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
2 Quelex Premix	20 WG		0.0094	lb ai/a	Spring B	.	7.3 efg	0.0 b
2 ----florasulam	10		0.0047			.		
2 ----halauxifen	10		0.0047			.		
2 Nonionic Surfactant	100 L		0.25 %	v/v	Spring B			
1 No Tankmix Partner								
3 Talinor Premix	1.77 EC		0.221	lb ai/a	Spring C	.	13.3 cde	0.0 b
3 ----bicyclopyrone	0.31		0.0387			.		
3 ----bromoxynil	1.46		0.182			.		
3 Coact+ Sodium Bicarbonate	2.67 SL		0.067	lb ai/a	Spring C			
3 Crop Oil Concentrate	100 L		1 %	v/v	Spring C			
1 No Tankmix Partner								
4 Osprey Xtra Premix	6 WG		0.0178	lb ai/a	Spring B	.	20.0 ab	0.0 b
4 ----mesosulfuron	4.5		0.0133			.		
4 ----thien carbazole	1.5		0.00445			.		
4 Nonionic Surfactant	100 L		0.5 %	v/v	Spring B			
4 30% Urea Ammonium Nitrate	100 L		2.5 %	v/v	Spring B			
1 No Tankmix Partner								
1 Huskie Premix	2.05 EC		0.24	lb ai/a	Spring B	.	11.7 def	4.0 b
1 ----pyrasulfotole	0.3		0.035			.		
1 ----bromoxynil	1.75		0.205			.		
1 Dry Ammonium Sulfate	100 D		0.3 %	w/v	Spring B			
2 Harmony Extra SG Premix	50 SG		0.0234	lb ai/a	Spring B			
2 ----thifensulfuron	33		0.0154					
2 ----tribenuron	17		0.00796					
2 Nonionic Surfactant	100 L		0.25 %	v/v	Spring B			
2 30% Urea Ammonium Nitrate	100 L		2.5 %	v/v	Spring B			
2 Quelex Premix	20 WG		0.0094	lb ai/a	Spring B	.	14.0 bcd	0.0 b
2 ----florasulam	10		0.0047			.		
2 ----halauxifen	10		0.0047			.		
2 Nonionic Surfactant	100 L		0.25 %	v/v	Spring B			
2 Harmony Extra SG Premix	50 SG		0.0234	lb ai/a	Spring B			
2 ----thifensulfuron	33		0.0154					
2 ----tribenuron	17		0.00796					
2 Nonionic Surfactant	100 L		0.25 %	v/v	Spring B			
2 30% Urea Ammonium Nitrate	100 L		2.5 %	v/v	Spring B			
3 Talinor Premix	1.77 EC		0.221	lb ai/a	Spring C	.	5.7 fg	0.0 b
3 ----bicyclopyrone	0.31		0.0387			.		
3 ----bromoxynil	1.46		0.182			.		
3 Coact+ Sodium Bicarbonate	2.67 SL		0.067	lb ai/a	Spring C			
3 Crop Oil Concentrate	100 L		1 %	v/v	Spring C			
2 Harmony Extra SG Premix	50 SG		0.0234	lb ai/a	Spring B			
2 ----thifensulfuron	33		0.0154					
2 ----tribenuron	17		0.00796					
2 Nonionic Surfactant	100 L		0.25 %	v/v	Spring B			
2 30% Urea Ammonium Nitrate	100 L		2.5 %	v/v	Spring B			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		C TRZAW	LAMAM C -	SCRAN C -	HLOUM C -
Description		W.Wheat Stunting %	Henbit Control %	Knawel Control %	JagChkwd Control %
Rating Type		04/22/19	04/22/19	04/22/19	04/22/19
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring B		
2 ----florasulam	10	0.0047			
2 ----halauxifen	10	0.0047			
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
1 No Tankmix Partner					
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring C		
3 ----bicyclopyrone	0.31	0.0387			
3 ----bromoxynil	1.46	0.182			
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring C		
3 Crop Oil Concentrate	100 L	1 % v/v	Spring C		
1 No Tankmix Partner					
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B		
4 ----mesosulfuron	4.5	0.0133			
4 ----thien carbazole	1.5	0.00445			
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B		
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		
1 No Tankmix Partner					
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B		
1 ----pyrasulfotole	0.3	0.035			
1 ----bromoxynil	1.75	0.205			
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B		
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B		
2 ----thifensulfuron	33	0.0154			
2 ----tribenuron	17	0.00796			
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring B		
2 ----florasulam	10	0.0047			
2 ----halauxifen	10	0.0047			
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B		
2 ----thifensulfuron	33	0.0154			
2 ----tribenuron	17	0.00796			
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring C		
3 ----bicyclopyrone	0.31	0.0387			
3 ----bromoxynil	1.46	0.182			
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring C		
3 Crop Oil Concentrate	100 L	1 % v/v	Spring C		
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B		
2 ----thifensulfuron	33	0.0154			
2 ----tribenuron	17	0.00796			
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		OEOLA C -	VIORA C -	SCRAN C -	OEOLA C -	
Description	CEprmrse Control %	FldPansy Control %	Knawel Control %	CEprmrse Control %		
Rating Type	04/22/19	04/22/19	05/07/19	05/07/19		
Rating Unit						
Rating Date						
Trt Treatment No. Name	Form Conc Form Type Rate	Rate Unit	Appl Timing	Appl Code		
2 Quelex Premix	20 WG	0.0094	lb ai/a	Spring B	52.6 d	0.0 d
2 ----florasulam	10	0.0047				
2 ----halauxifen	10	0.0047				
2 Nonionic Surfactant	100 L	0.25 %	v/v	Spring B		
1 No Tankmix Partner						
3 Talinor Premix	1.77 EC	0.221	lb ai/a	Spring C	46.7 d	23.3 c
3 ----bicyclopyrone	0.31	0.0387				
3 ----bromoxynil	1.46	0.182				
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067	lb ai/a	Spring C		
3 Crop Oil Concentrate	100 L	1 %	v/v	Spring C		
1 No Tankmix Partner						
4 Osprey Xtra Premix	6 WG	0.0178	lb ai/a	Spring B	84.0 b	73.3 b
4 ----mesosulfuron	4.5	0.0133				
4 ----thien carbazole	1.5	0.00445				
4 Nonionic Surfactant	100 L	0.5 %	v/v	Spring B		
4 30% Urea Ammonium Nitrate	100 L	2.5 %	v/v	Spring B		
1 Huskie Premix	2.05 EC	0.24	lb ai/a	Spring B	82.3 b	75.0 ab
1 ----pyrasulfotole	0.3	0.035				
1 ----bromoxynil	1.75	0.205				
1 Dry Ammonium Sulfate	100 D	0.3 %	w/v	Spring B		
2 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Spring B		
2 ----thifensulfuron	33	0.0154				
2 ----tribenuron	17	0.00796				
2 Nonionic Surfactant	100 L	0.25 %	v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L	2.5 %	v/v	Spring B		
2 Quelex Premix	20 WG	0.0094	lb ai/a	Spring B	76.0 bc	73.3 b
2 ----florasulam	10	0.0047				
2 ----halauxifen	10	0.0047				
2 Nonionic Surfactant	100 L	0.25 %	v/v	Spring B		
2 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Spring B		
2 ----thifensulfuron	33	0.0154				
2 ----tribenuron	17	0.00796				
2 Nonionic Surfactant	100 L	0.25 %	v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L	2.5 %	v/v	Spring B		
3 Talinor Premix	1.77 EC	0.221	lb ai/a	Spring C	75.0 bc	76.7 ab
3 ----bicyclopyrone	0.31	0.0387				
3 ----bromoxynil	1.46	0.182				
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067	lb ai/a	Spring C		
3 Crop Oil Concentrate	100 L	1 %	v/v	Spring C		
2 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Spring B		
2 ----thifensulfuron	33	0.0154				
2 ----tribenuron	17	0.00796				
2 Nonionic Surfactant	100 L	0.25 %	v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L	2.5 %	v/v	Spring B		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		VIORA C -	C TRZAW	C TRZAW
Description	FldPansy	W.Wheat	W.Wheat	
Rating Type	Control	Yield	Yield	
Rating Unit	%	lb/plot	Bu/A	
Rating Date	05/07/19	06/25/19	06/25/19	
Trt Treatment No. Name	Form Conc Form Type Rate	Rate Appl Unit	Appl Timing Code	
2 Quelex Premix 2 ----florasulam 2 ----halauxifen 2 Nonionic Surfactant 1 No Tankmix Partner	20 WG 10 10 100 L	0.0094 lb ai/a 0.0047 0.0047 0.25 % v/v	Spring B	25.0 e 9.117 a 40.1 a
3 Talinor Premix 3 ----bicyclopyrone 3 ----bromoxynil 3 Coact+ Sodium Bicarbonate 3 Crop Oil Concentrate 1 No Tankmix Partner	1.77 EC 0.31 1.46 2.67 SL 100 L	0.221 lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v	Spring C	26.7 e 9.480 a 41.7 a
4 Osprey Xtra Premix 4 ----mesosulfuron 4 ----thien carbazole 4 Nonionic Surfactant 4 30% Urea Ammonium Nitrate 1 No Tankmix Partner	6 WG 4.5 1.5 100 L 100 L	0.0178 lb ai/a 0.0133 0.00445 0.5 % v/v 2.5 % v/v	Spring B	60.0 c 9.297 a 40.9 a
1 Huskie Premix 1 ----pyrasulfotole 1 ----bromoxynil 1 Dry Ammonium Sulfate 2 Harmony Extra SG Premix 2 ----thifensulfuron 2 ----tribenuron 2 Nonionic Surfactant 2 30% Urea Ammonium Nitrate	2.05 EC 0.3 1.75 100 D 50 SG 33 17 100 L 100 L	0.24 lb ai/a 0.035 0.205 0.3 % w/v 0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring B	68.3 bc 11.833 a 52.0 a
2 Quelex Premix 2 ----florasulam 2 ----halauxifen 2 Nonionic Surfactant 2 Harmony Extra SG Premix 2 ----thifensulfuron 2 ----tribenuron 2 Nonionic Surfactant 2 30% Urea Ammonium Nitrate	20 WG 10 10 100 L 50 SG 33 17 100 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.25 % v/v 0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring B	96.7 a 7.357 a 32.3 a
3 Talinor Premix 3 ----bicyclopyrone 3 ----bromoxynil 3 Coact+ Sodium Bicarbonate 3 Crop Oil Concentrate 2 Harmony Extra SG Premix 2 ----thifensulfuron 2 ----tribenuron 2 Nonionic Surfactant 2 30% Urea Ammonium Nitrate	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17 100 L 100 L	0.221 lb ai/a 0.0387 0.182 0.067 lb ai/a 1 % v/v 0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 2.5 % v/v	Spring C	40.0 d 9.761 a 42.9 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		C TRZAW	HLOUM C -	C TRZAW	C TRZAW
Description		W.Wheat Stunting %	Control %	W.Wheat Stunting %	W.Wheat Leafburn %
Rating Type		03/12/19	03/12/19	04/08/19	04/08/19
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code		
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B	.	21.7 a
4 ----mesosulfuron	4.5	0.0133			0.0 b
4 ----thienecarbazone	1.5	0.00445			
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B		
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B		
2 ----thifensulfuron	33	0.0154			
2 ----tribenuron	17	0.00796			
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B	.	13.3 cde
1 ----pyrasulfotole	0.3	0.035			0.0 b
1 ----bromoxynil	1.75	0.205			
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B		
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring B	.	20.0 a
2 ----florasulam	10	0.0047			11.3 def
2 ----halauxifen	10	0.0047			1.7 b
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B		
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring C	.	21.7 a
3 ----bicyclopyrone	0.31	0.0387			11.3 def
3 ----bromoxynil	1.46	0.182			13.3 a
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring C		
3 Crop Oil Concentrate	100 L	1 % v/v	Spring C		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B		
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B	.	19.0 a
4 ----mesosulfuron	4.5	0.0133			19.0 abc
4 ----thienecarbazone	1.5	0.00445			4.7 b
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B		
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B		
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B		
LSD P=.05		10.04	14.34	6.65	4.80
Standard Deviation		2.86	4.08	3.92	2.83
CV		0.00	20.19	31.19	143.66

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C TRZAW	LAMAM C -	SCRAN C -	HLOUM C -
Description	W.Wheat Stunting %	Henbit Control %	Knawel Control %	JagChkwd Control %
Rating Type	04/22/19	04/22/19	04/22/19	04/22/19
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Form Type Rate	Appl Unit Appl Timing	Code	
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B	
4 ----mesosulfuron	4.5	0.0133		
4 ----thien carbazole	1.5	0.00445		
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B	
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B	
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B	
2 ----thifensulfuron	33	0.0154		
2 ----tribenuron	17	0.00796		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B	
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring B	
1 ----pyrasulfotole	0.3	0.035		
1 ----bromoxynil	1.75	0.205		
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring B	
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B	
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring B	
2 ----florasulam	10	0.0047		
2 ----halauxifen	10	0.0047		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B	
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring C	
3 ----bicycloprylene	0.31	0.0387		
3 ----bromoxynil	1.46	0.182		
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring C	
3 Crop Oil Concentrate	100 L	1 % v/v	Spring C	
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B	
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	Spring B	
4 ----mesosulfuron	4.5	0.0133		
4 ----thien carbazole	1.5	0.00445		
4 Nonionic Surfactant	100 L	0.5 % v/v	Spring B	
4 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring B	
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a	Spring B	
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring B	
LSD P=.05		6.18	9.17	13.61
Standard Deviation		3.65	5.40	8.04
CV		37.22	5.90	9.02
				11.47
				6.75
				9.45

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		OEOLA C -	VIORA C -	SCRAN C -	OEOLA C -	
Description	CEprmrse Control %	FldPansy Control %	Knawel Control %	CEprmrse Control %		
Rating Type	04/22/19	04/22/19	05/07/19	05/07/19		
Rating Unit						
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a	0.5 % v/v	Spring B		
4 ----mesosulfuron	4.5	0.0133				
4 ----thienecarbazone	1.5	0.00445				
4 Nonionic Surfactant	100 L		2.5 % v/v	Spring B		
4 30% Urea Ammonium Nitrate	100 L			Spring B		
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a		Spring B		
2 ----thifensulfuron	33	0.0154				
2 ----tribenuron	17	0.00796				
2 Nonionic Surfactant	100 L		0.25 % v/v	Spring B		
2 30% Urea Ammonium Nitrate	100 L		2.5 % v/v	Spring B		
1 Huskie Premix	2.05 EC		0.24 lb ai/a	Spring B		
1 ----pyrasulfotole	0.3	0.035				
1 ----bromoxynil	1.75	0.205				
1 Dry Ammonium Sulfate	100 D		0.3 % w/v	Spring B		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a		Spring B		
3 Nonionic Surfactant	100 L		0.25 % v/v	Spring B		
2 Quelex Premix	20 WG	0.0094 lb ai/a		Spring B		
2 ----florasulam	10	0.0047				
2 ----halauxifen	10	0.0047				
2 Nonionic Surfactant	100 L		0.25 % v/v	Spring B		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a		Spring B		
3 Nonionic Surfactant	100 L		0.25 % v/v	Spring B		
3 Talinor Premix	1.77 EC	0.221 lb ai/a		Spring C		
3 ----bicyclopyrone	0.31	0.0387				
3 ----bromoxynil	1.46	0.182				
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a		Spring C		
3 Crop Oil Concentrate	100 L		1 % v/v	Spring C		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a		Spring B		
3 Nonionic Surfactant	100 L		0.25 % v/v	Spring B		
4 Osprey Xtra Premix	6 WG	0.0178 lb ai/a		Spring B		
4 ----mesosulfuron	4.5	0.0133				
4 ----thienecarbazone	1.5	0.00445				
4 Nonionic Surfactant	100 L		0.5 % v/v	Spring B		
4 30% Urea Ammonium Nitrate	100 L		2.5 % v/v	Spring B		
3 Dimetric EXT....metribuzin	75 WG	0.188 lb ai/a		Spring B		
3 Nonionic Surfactant	100 L		0.25 % v/v	Spring B		
LSD P=.05		13.06	11.22	10.77	20.26	
Standard Deviation		7.69	6.62	6.36	11.96	
CV		10.30	15.48	7.32	16.93	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		VIORA C -	C TRZAW	C TRZAW
Description	FldPansy	W.Wheat	W.Wheat	
Rating Type	Control	Yield	Yield	
Rating Unit	%	lb/plot	Bu/A	
Rating Date	05/07/19	06/25/19	06/25/19	
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code	
4 Osprey Xtra Premix	6 WG	0.0178	lb ai/a Spring B	100.0 a
4 ----mesosulfuron	4.5	0.0133		
4 ----thienecarbazone	1.5	0.00445		
4 Nonionic Surfactant	100 L	0.5 %	v/v Srping B	
4 30% Urea Ammonium Nitrate	100 L	2.5 %	v/v Spring B	
2 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a Spring B	
2 ----thifensulfuron	33	0.0154		
2 ----tribenuron	17	0.00796		
2 Nonionic Surfactant	100 L	0.25 %	v/v Spring B	
2 30% Urea Ammonium Nitrate	100 L	2.5 %	v/v Spring B	
1 Huskie Premix	2.05 EC	0.24	lb ai/a Spring B	26.7 e
1 ----pyrasulfotole	0.3	0.035		
1 ----bromoxynil	1.75	0.205		
1 Dry Ammonium Sulfate	100 D	0.3 %	w/v Spring B	
3 Dimetric EXT....metribuzin	75 WG	0.188	lb ai/a Spring B	
3 Nonionic Surfactant	100 L	0.25 %	v/v Spring B	
2 Quelex Premix	20 WG	0.0094	lb ai/a Spring B	26.7 e
2 ----florasulam	10	0.0047		
2 ----halauxifen	10	0.0047		
2 Nonionic Surfactant	100 L	0.25 %	v/v Spring B	
3 Dimetric EXT....metribuzin	75 WG	0.188	lb ai/a Spring B	
3 Nonionic Surfactant	100 L	0.25 %	v/v Spring B	
3 Talinor Premix	1.77 EC	0.221	lb ai/a Spring C	33.3 de
3 ----bicyclopyrone	0.31	0.0387		
3 ----bromoxynil	1.46	0.182		
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067	lb ai/a Spring C	
3 Crop Oil Concentrate	100 L	1 %	v/v Spring C	
3 Dimetric EXT....metribuzin	75 WG	0.188	lb ai/a Spring B	
3 Nonionic Surfactant	100 L	0.25 %	v/v Spring B	
4 Osprey Xtra Premix	6 WG	0.0178	lb ai/a Spring B	75.0 b
4 ----mesosulfuron	4.5	0.0133		
4 ----thienecarbazone	1.5	0.00445		
4 Nonionic Surfactant	100 L	0.5 %	v/v Srping B	
4 30% Urea Ammonium Nitrate	100 L	2.5 %	v/v Spring B	
3 Dimetric EXT....metribuzin	75 WG	0.188	lb ai/a Spring B	
3 Nonionic Surfactant	100 L	0.25 %	v/v Spring B	
LSD P=.05		10.05	2.3156	10.18
Standard Deviation		5.88	1.3499	5.93
CV		12.20	13.9057	13.91

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Randomized Complete Block (RCB) AOV For C TRZAW W.Wheat Stunting % 03/12/19 Missing factor A levels prevents analyzing column 1 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	5	203.33333			
Replicate	2	16.333333	8.166667	1.000	0.5000
Treatment	1	170.666667	170.666667	20.898	0.0447
ERROR	2	16.333333	8.166667		

Randomized Complete Block (RCB) AOV For HLOUM C Control % 03/12/19 Missing factor A levels prevents analyzing column 2 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	5	4333.33333			
Replicate	2	33.333333	16.666667	1.000	0.5000
Treatment	1	4266.666667	4266.666667	256.000	0.0039
ERROR	2	33.333333	16.666667		

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Stunting % 04/08/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	1480.750000				
R	2	43.166667	21.583333	1.401	0.2674	
A	3	714.527778	238.175926	15.464	0.0001	3.8
B	2	62.000000	31.000000	2.013	0.1575	3.3
AB	6	322.222222	53.703704	3.487	0.0141	6.6
ERROR	22	338.833333	15.401515			

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Leafburn % 04/08/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	706.972222				
R	2	15.388889	7.694444	0.958	0.3989	
A	3	78.305556	26.101852	3.251	0.0412	2.8
B	2	162.055556	81.027778	10.093	0.0008	2.4
AB	6	274.611111	45.768519	5.701	0.0011	4.8
ERROR	22	176.611111	8.027778			

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Stunting % 04/22/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	1789.638889				
R	2	9.555556	4.777778	0.359	0.7027	
A	3	362.750000	120.916667	9.076	0.0004	3.6
B	2	828.722222	414.361111	31.101	0.0001	3.1
AB	6	295.500000	49.250000	3.697	0.0108	6.2
ERROR	22	293.111111	13.323232			

FACTORIAL/POOLED ERROR AOV For LAMAM C Henbit Control % 04/22/19 Missing values in column 6 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	34	3845.802469				
R	2	14.672840	7.336420	0.251	0.7801	
A	3	1279.703704	426.567901	14.614	0.0001	5.3
B	2	1050.783951	525.391975	18.000	0.0001	4.6
AB	6	887.685185	147.947531	5.069	0.0023	9.2
ERROR	21	612.956790	29.188419			

FACTORIAL/POOLED ERROR AOV For SCRAN C Knawel Control % 04/22/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	7187.555556				
R	2	174.055556	87.027778	1.347	0.2806	
A	3	1126.000000	375.333333	5.810	0.0044	7.9
B	2	2597.388889	1298.694444	20.103	0.0001	6.8
AB	6	1868.833333	311.472222	4.821	0.0028	13.6
ERROR	22	1421.277778	64.603535			

FACTORIAL/POOLED ERROR AOV For HLOUM C JagChkwd Control % 04/22/19 Missing values in column 8 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	34	25824.008488				
R	2	193.451914	96.725957	2.121	0.1449	
A	3	5974.200093	1991.400031	43.664	0.0001	6.6
B	2	15272.996358	7636.498179	167.441	0.0001	5.7
AB	6	3425.611296	570.935216	12.519	0.0001	11.5
ERROR	21	957.748827	45.607087			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For OEOLA C CEprmrse Control % 04/22/19 Missing values in column 9 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	34	11328.343056				
R	2	5.393889	2.696944	0.046	0.9556	
A	3	3383.774167	1127.924722	19.054	0.0001	7.5
B	2	5098.060556	2549.030278	43.060	0.0001	6.5
AB	6	1597.981667	266.330278	4.499	0.0044	13.1
ERROR	21	1243.132778	59.196799			

FACTORIAL/POOLED ERROR AOV For VIORA C FldPansy Control % 04/22/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	42222.222222				
R	2	251.388889	125.694444	2.865	0.0784	
A	3	14550.000000	4850.000000	110.538	0.0001	6.5
B	2	21738.888889	10869.444444	247.730	0.0001	5.6
AB	6	4716.666667	786.111111	17.917	0.0001	11.2
ERROR	22	965.277778	43.876263			

FACTORIAL/POOLED ERROR AOV For SCRAN C Knewel Control % 05/07/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	15913.888889				
R	2	43.055556	21.527778	0.532	0.5948	
A	3	1875.000000	625.000000	15.445	0.0001	6.2
B	2	8468.055556	4234.027778	104.629	0.0001	5.4
AB	6	4637.500000	772.916667	19.100	0.0001	10.8
ERROR	22	890.277778	40.467172			

FACTORIAL/POOLED ERROR AOV For OEOLA C CEprmrse Control % 05/07/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	17984.305556				
R	2	57.722222	28.861111	0.202	0.8189	
A	3	2715.194444	905.064815	6.325	0.0029	11.7
B	2	9073.555556	4536.777778	31.703	0.0001	10.1
AB	6	2989.555556	498.259259	3.482	0.0142	20.3
ERROR	22	3148.277778	143.103535			

FACTORIAL/POOLED ERROR AOV For VIORA C FldPansy Control % 05/07/19 Missing values in column 13 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	32	33457.638889				
R	2	293.055556	146.527778	4.238	0.0301	
A	3	12635.416667	4211.805556	121.813	0.0001	5.8
B	2	15105.555556	7552.777778	218.440	0.0001	5.0
AB	6	4766.666667	794.444444	22.977	0.0001	10.0
ERROR	19	656.944444	34.576023			

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Yield lb/plot 06/25/19 Missing values in column 14 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	91.581851				
R	2	16.681350	8.340675	4.577	0.0247	
A	3	15.913454	5.304485	2.911	0.0627	1.337
B	2	0.281205	0.140602	0.077	0.9260	1.158
AB	6	25.907257	4.317876	2.370	0.0728	2.316
ERROR	18	32.798585	1.822144			

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Yield Bu/A 06/25/19 Missing values in column 15 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	1770.097939				
R	2	322.417849	161.208925	4.577	0.0247	
A	3	307.575923	102.525308	2.911	0.0627	5.9
B	2	5.435135	2.717567	0.077	0.9260	5.1
AB	6	500.736568	83.456095	2.370	0.0728	10.2
ERROR	18	633.932463	35.218470			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Control of common broadleaf weeds: fall vs spring

Trial ID: SG8-19

Location: Field #30

Trial Year: 2019

Protocol ID: SG8-19

Investigator: Mark VanGessel

Study Director: Mark VanGessel

Sponsor Contact:

**General Trial Information**

Study Director: Mark VanGessel

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Trial Status Date: 03/20/19 Last Changed By: Mark VanGessel

Initiation Date: 08/31/18

Completion Date: 06/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W USA 49.376656 - 24.53833

-124.715843 - -66.968887

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

**Contacts**

Study Director: Mark VanGessel

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C TRZAW Triticum aestivum (winter) Winter wheat BBCH Scale: BCER

Variety: Shirley

Planting Date: 10/10/18

Planting Rate: 120 lb/A

Depth: 0.75 in

Rows per Plot: 16

Planting Method: DRILLE drilled

Row Spacing: 7 in

Planting Equipment: FE Field Equipment

Soil Temperature: 84 F

Seed Bed: MEDIUM medium

Emergence Date: 10/15/18

Soil Moisture: NORMAL normal, adequate

Harvest Date: 06/25/19

Harvest Equipment: Plot combine

Harvested Width: 7 FT

Harvested Length: 24 FT

% Standard Moisture: 13.5

**Pest Description**

Pest 1 Type: W Code: LAMAM Lamium amplexicaule

Common Name: Henbit

Pest 2 Type: W Code: HLOUM Holosteum umbellatum

Common Name: Jagged chickweed

Pest 3 Type: W Code: SCRAN Scleranthus annuus

Common Name: Annual knawel

Pest 4 Type: W Code: PLAPR Plantago purshii

Common Name: Woolly plantain

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 14 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 30  
% Sand: 83 % OM: 1.2 Texture: LS loamy sand  
% Silt: 8 pH: 6.1 Soil Name: Rosedale loamy sand, 0-2% slopes  
% Clay: 9 CEC: 3.2 Fert. Level: F fair  
Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	10/19/18	11/19/18	03/20/19
Appl. Stop Time	11:05 AM	11:40 AM	01:30 PM
Interval to Prev. Appl.		31 DAYS	121 DAYS
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	DPRE	Fall	Spring
Application Placement	BROADC	BROADC	BROADC
Applied By	VanGessel	VanGessel	Johnson
Air Temperature Start, Stop	58 58 F	56 58 F	53 53 F
% Relative Humidity Start, Stop	52 52	69 66	41 41
Wind Velocity+Dir. Start	2 mph SSW	8 mph SSW	6 mph ESE
Wind Velocity+Dir. Stop	2 mph SSW	4 mph SW	6 mph ESE
Wind Velocity+Dir. Max	2 mph SSW	8 mph SSW	6 mph ESE
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	57 F	51 F	53 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	0	50	49
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	0.26 IN	1.62 IN	1.03 IN
Weather Source	ITERIS	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER	TRZAW BCER
Days after Emergence	4	35	156
Stage Scale Used	DESC	DESC	DESC
Stage Majority, Percent	Spike 100	3-tilr 100	4-5 tilr 100
Height Average	2 in	5 in	6 in
Height Minimum, Maximum		4 5	5 6

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	LAMAM W	LAMAM W	LAMAM W
Stage Majority, Percent		veg 100	veg 100
Height Average		1.5 in	2.5 in
Height Minimum, Maximum		1 2	2 3
Density Average		50 m2	50 m2
Pest 2 Code, Type, Scale	HLOUM W	HLOUM W	HLOUM W
Stage Majority, Percent		veg 100	flower 100
Height Average		1 in	4 in
Density Average		70 m2	70 m2
Pest 3 Code, Type, Scale	SCRAN W	SCRAN W	SCRAN W
Stage Majority, Percent		veg 100	veg 100
Diameter		1.5 in	3 in
Density Average		20 m2	30 m2
Pest 4 Code, Type, Scale	PLAPR W	PLAPR W	PLAPR W
Stage Majority, Percent		rosett 100	rosett 100
Diameter		1 in	1.2 in
Height Minimum, Maximum		0.5 1.3	0.7 1.5
Density Average		20 m2	20 m2

**Application Equipment**

	A	B	C
Appl. Equipment	Bckpck4Nozl	Bckpck4Nozl	Bckpck6Nozl
Equipment Type	SPRBAC	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	18 in	18 in	18 in
Boom Length	6 ft	6 ft	9 ft
Boom Height	18 in	20 IN	22 IN
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Minimum Mix/Treatment	1.3035 L	1.3035 L	1.3035 L
Propellant	COMCO2	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	03/20/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

11/01/19: Good stand of wheat

11/18/19: No stunting observed from DPRE application of Zidua (treatment 14)

04/19/19: Treatment 6 (Powerflex in the Spring) was very weak on chamomile; Treatment 11 (Elevore in Fall) was weak on mustards and mouseear chickweed; Treatment 2 (Huskie in the spring) was very weak on common chickweed.

05/10/19: Field pansy density is low. Chickweed, henbit and knawel have begun to senesce. Powerflex in spring still showing signs of stunting (~15%).

Control of common broadleaf weeds: fall vs spring							
Trial ID: SG8-19		Location: Field #30		Trial Year: 2019			
Protocol ID: SG8-19		Investigator: Mark VanGessel					
Study Director: Mark VanGessel							
Sponsor Contact:							
Pest Code		C	TRZAW	C	TRZAW	LAMAM	HLOUM
Crop Type, Code			W.Wheat		W.Wheat	C -	C -
Description						Henbit	JagChkwD
Rating Type			Stunting		Stunting	Control	Control
Rating Unit			%		%	%	%
Rating Date			11/01/18		03/20/19	03/20/19	03/20/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Huskie Premix	2.05	EC	0.2 lb	ai/a	Fall	B
	----pyrasulfotole	0.3		0.0293			
	----bromoxynil	1.75		0.17			
	Dry Ammonium Sulfate	100	D	0.4 %	w/v	Fall	B
	Fall Applic (Nov 15)						
2	Huskie Premix	2.05	EC	0.2 lb	ai/a	Spring	C
	----pyrasulfotole	0.3		0.0293			
	----bromoxynil	1.75		0.17			
	Dry Ammonium Sulfate	100	D	0.4 %	w/v	Spring	C
	Spring Applic (Feb 20)						
3	Quelex Premix	20	WG	0.0094	lb ai/a	Fall	B
	----florasulam	10		0.0047			
	----halauxifen	10		0.0047			
	Methylated Seed Oil	100	L	1 %	v/v	Fall	B
	Fall Applic (Nov 15)						
4	Quelex Premix	20	WG	0.0094	lb ai/a	Spring	C
	----florasulam	10		0.0047			
	----halauxifen	10		0.0047			
	Methylated Seed Oil	100	L	1 %	v/v	Spring	C
	Spring Applic (Feb 20)						
5	PowerFlex HL....pyroxslam	13.1	WG	0.0164	lb ai/a	Fall	B
	Nonionic Surfactant	100	L	0.25	% v/v	Fall	B
	30% Urea Ammonium Nitrate	100	L	1 %	v/v	Fall	B
	Fall Applic (Nov 15)						
6	PowerFlex HL....pyroxslam	13.1	WG	0.0164	lb ai/a	Spring	C
	Nonionic Surfactant	100	L	0.25	% v/v	Spring	C
	30% Urea Ammonium Nitrate	100	L	1 %	v/v	Spring	C
	Spring Applic (Feb 20)						
7	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Fall	B
	----thifensulfuron	33		0.0154			
	----tribenuron	17		0.00796			
	2,4-D ester	3.8	L	0.238	lb ae/a	Fall	B
	Nonionic Surfactant	100	L	0.25	% v/v	Fall	B
	30% Urea Ammonium Nitrate	100	L	1 %	v/v	Fall	B
	Fall Applic (Nov 15)						
8	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Spring	C
	----thifensulfuron	33		0.0154			
	----tribenuron	17		0.00796			
	2,4-D ester	3.8	L	0.238	lb ae/a	Spring	C
	Nonionic Surfactant	100	L	0.25	% v/v	Spring	C
	30% Urea Ammonium Nitrate	100	L	1 %	v/v	Spring	C
	Spring Applic (Feb 20)						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=4,7,11; Average=5

Pest Code Crop Type, Code		VIORA C -	OEOLA C -	SCRAN C -	C TRZAW	
Description	FldPansy	CEprmrse	Knawel	W.Wheat		
Rating Type	Control %	Control %	Control %	Stunting %		
Rating Unit						
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code	
1 Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Fall Applic (Nov 15)	2.05 EC 0.3 1.75 100 D		0.2 lb ai/a 0.0293 0.17 0.4 % w/v	Fall	B	53.3 d
2 Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Spring Applic (Feb 20)	2.05 EC 0.3 1.75 100 D		0.2 lb ai/a 0.0293 0.17 0.4 % w/v	Spring C		73.3 b
3 Quelex Premix ----florasulam ----halauxifen Methylated Seed Oil Fall Applic (Nov 15)	20 WG 10 10 100 L		0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Fall	B	63.3 c
4 Quelex Premix ----florasulam ----halauxifen Methylated Seed Oil Spring Applic (Feb 20)	20 WG 10 10 100 L		0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Spring C		83.3 b
5 PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	13.1 WG 100 L 100 L		0.0164 lb ai/a 0.25 % v/v 1 % v/v	Fall	B	100.0 a
6 PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	13.1 WG 100 L 100 L		0.0164 lb ai/a 0.25 % v/v 1 % v/v	Spring C		100.0 a
7 Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	50 SG 33 17 3.8 L 100 L 100 L		0.0234 lb ai/a 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	Fall	B	98.3 a
8 Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	50 SG 33 17 3.8 L 100 L 100 L		0.0234 lb ai/a 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	Spring C		2.3 def
						8.0 bc
						8.0 bc
						4.7 cde
						11.3 ab

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=4,7,11; Average=5

Pest Code Crop Type, Code		C TRZAW	LAMAM C -	HLOUM C -	VIORA C -
Description		W.Wheat Stunting %	Henbit Control %	JagChkwd Control %	FldPansy Control %
Rating Type		04/19/19	04/19/19	04/19/19	04/19/19
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
1	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Fall Applic (Nov 15)	2.05 EC 0.3 1.75 100 D	0.2 lb ai/a 0.0293 0.17 0.4 % w/v	Fall	B
2	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Spring Applic (Feb 20)	2.05 EC 0.3 1.75 100 D	0.2 lb ai/a 0.0293 0.17 0.4 % w/v	Spring C	
3	Quelex Premix ----florasulam ----halauxifen Methylated Seed Oil Fall Applic (Nov 15)	20 WG 10 10 100 L	0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Fall	B
4	Quelex Premix ----florasulam ----halauxifen Methylated Seed Oil Spring Applic (Feb 20)	20 WG 10 10 100 L	0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Spring C	
5	PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	13.1 WG 100 L 100 L	0.0164 lb ai/a 0.25 % v/v 1 % v/v	Fall	B
6	PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	13.1 WG 100 L 100 L	0.0164 lb ai/a 0.25 % v/v 1 % v/v	Spring C	
7	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	50 SG 33 17 3.8 L 100 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	Fall	B
8	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	50 SG 33 17 3.8 L 100 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	Spring C	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=4,7,11; Average=5

Pest Code Crop Type, Code	Description	OEOLA C -	SCRAN C -	VIORA C -	OEOLA C -					
Rating Type	CEprmrse Control %	Knawel Control %	FldPansy Control %	CEprmrse Control %						
Rating Unit	04/19/19	04/19/19	05/10/19	05/10/19						
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code				
1	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Fall Applic (Nov 15)	2.05 0.3 1.75 100 D	EC 0.0293 0.17 0.4 % w/v	0.2 lb ai/a 0.0293 0.17 0.4 % w/v	Fall	B	68.3 b	100.0 a	26.7 b	43.3 c
2	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Spring Applic (Feb 20)	2.05 0.3 1.75 100 D	EC 0.0293 0.17 0.4 % w/v	0.2 lb ai/a 0.0293 0.17 0.4 % w/v	Spring	C	53.3 c	56.7 d	0.0 d	40.0 c
3	Quelex Premix ----florasulam ----halauxifen Methylated Seed Oil Fall Applic (Nov 15)	20 10 10 100 L	WG 0.0047 0.0047 1 % v/v	0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Fall	B	60.0 c	100.0 a	28.3 b	40.0 c
4	Quelex Premix ----florasulam ----halauxifen Methylated Seed Oil Spring Applic (Feb 20)	20 10 10 100 L	WG 0.0047 0.0047 1 % v/v	0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Spring	C	100.0 a	56.7 d	0.0 d	63.3 b
5	PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	13.1 100 L 100 L	WG 0.25 % v/v 1 % v/v	0.0164 lb ai/a 0.25 % v/v 1 % v/v	Fall	B	100.0 a	100.0 a	99.0 a	99.0 a
6	PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	13.1 100 L 100 L	WG 0.25 % v/v 1 % v/v	0.0164 lb ai/a 0.25 % v/v 1 % v/v	Spring	C	100.0 a	66.7 c	99.0 a	91.0 a
7	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	50 33 17 3.8 L 100 L 100 L	SG 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	0.0234 lb ai/a 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	Fall	B	71.7 b	100.0 a	99.0 a	56.7 b
8	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	50 33 17 3.8 L 100 L 100 L	SG 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	0.0234 lb ai/a 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	Spring	C	94.0 a	86.7 b	99.0 a	99.0 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=4,7,11; Average=5

Pest Code Crop Type, Code		SCRAN C -	C TRZAW	C TRZAW					
Description		Knawel Control %	W.Wheat Yield lb/plot	W.Wheat Yield Bu/A					
Rating Type		05/10/19	06/25/19	06/25/19					
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Fall Applic (Nov 15)	2.05 0.3 1.75 100 D	EC 0.0293 0.17 0.4 % w/v	0.2 lb ai/a 0.0293 0.17 0.4 % w/v	Fall	B	94.3 a	14.513 a	62.7 a
2	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Spring Applic (Feb 20)	2.05 0.3 1.75 100 D	EC 0.0293 0.17 0.4 % w/v	0.2 lb ai/a 0.0293 0.17 0.4 % w/v	Spring	C	60.0 b	16.003 a	69.2 a
3	Quelex Premix ----florasulam ----halauxifen Methylated Seed Oil Fall Applic (Nov 15)	20 10 10 100 L	WG 0.0047 0.0047 1 % v/v	0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Fall	B	99.0 a	16.203 a	70.0 a
4	Quelex Premix ----florasulam ----halauxifen Methylated Seed Oil Spring Applic (Feb 20)	20 10 10 100 L	WG 0.0047 0.0047 1 % v/v	0.0094 lb ai/a 0.0047 0.0047 1 % v/v	Spring	C	58.3 b	16.950 a	73.2 a
5	PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	13.1 100 L 100 L	WG 0.25 % v/v 1 % v/v	0.0164 lb ai/a 0.25 % v/v 1 % v/v	Fall	B	99.0 a	17.140 a	74.1 a
6	PowerFlex HL....pyroxslam Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	13.1 100 L 100 L	WG 0.25 % v/v 1 % v/v	0.0164 lb ai/a 0.25 % v/v 1 % v/v	Spring	C	65.0 b	16.090 a	69.5 a
7	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	50 33 17 3.8 L 100 L 100 L	SG 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	0.0234 lb ai/a 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	Fall	B	99.0 a	15.073 a	65.1 a
8	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	50 33 17 3.8 L 100 L 100 L	SG 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	0.0234 lb ai/a 0.0154 0.00796 0.238 lb ae/a 0.25 % v/v 1 % v/v	Spring	C	97.7 a	16.320 a	70.5 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=4,7,11; Average=5

## University of Delaware

Pest Code Crop Type, Code		C TRZAW	C TRZAW	LAMAM C -	HLOUM C -				
Description		W.Wheat	W.Wheat	Henbit	JagChkwd				
Rating Type		Stunting %	Stunting %	Control %	Control %				
Rating Unit									
Rating Date		11/01/18	03/20/19	03/20/19	03/20/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing				
9	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	50 SG 33 17 75 WG 100 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.14 lb ai/a 0.25 % v/v 1 % v/v	Ib ai/a Fall B Fall B Fall B		5.7 b	99.3 a	99.3 a	
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	50 SG 33 17 75 WG 100 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.14 lb ai/a 0.25 % v/v 1 % v/v	Ib ai/a Spring C Fall B Spring C Spring C					
11	Elevore.....halauxifen Crop Oil Concentrate Fall Applic (Nov 15)	0.57 SC 100 L	0.0047 lb ae/a 1 % v/v	Fall B		0.0 c	83.3 b	0.0 d	
12	Elevore.....halauxifen Crop Oil Concentrate Spring Applic (Feb 20)	0.57 SC 100 L	0.0047 lb ae/a 1 % v/v	Spring C Spring C					
13	Untreated Check					0.0 b	0.0 c	0.0 f	0.0 d
14	Zidua SC.....pyroxasulfone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	4.17 SC 50 SG 33 17 2.8 EC 100 L 100 L	0.09 lb ai/a 0.0234 lb ai/a 0.0154 0.00796 0.142 lb ae/a 0.25 % v/v 1 % v/v	DPRE A Spring C Spring C Spring C Spring C		6.3 a	0.0 c	53.3 e	50.0 c
LSD P=.05 Standard Deviation CV						2.87 0.82 25.78	3.77 2.15 62.94	4.58 2.61 3.58	8.69 4.93 7.69
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						1.000 0.5000 90.250 0.0109	2.225 0.1448 10.147 0.0002	0.372 0.6958 502.897 0.0001	0.728 0.5017 234.751 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=4,7,11; Average=5

## University of Delaware

Pest Code Crop Type, Code		VIORA C -	OEOLA C -	SCRAN C -	C TRZAW						
Description	FldPansy	CEprmrse	Knawel	W.Wheat							
Rating Type	Control	Control	Control	Stunting							
Rating Unit	%	%	%	%							
Rating Date	03/20/19	03/20/19	03/20/19	03/28/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
9	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	0.0234 lb ai/a 0.0154 0.00796	lb ai/a	Fall	B	99.3 a	99.3 a	99.3 a	0.0 f	
	Dimetric EXT....metribuzin	75 WG	0.14 lb ai/a	lb ai/a	Fall	B					
	Nonionic Surfactant	100 L	0.25 % v/v	% v/v	Fall	B					
	30% Urea Ammonium Nitrate Fall Applic (Nov 15)	100 L	1 % v/v	% v/v	Fall	B					
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	0.0234 lb ai/a 0.0154 0.00796	lb ai/a	Spring	C				15.0 a	
	Dimetric EXT....metribuzin	75 WG	0.14 lb ai/a	lb ai/a	Spring	C					
	Nonionic Surfactant	100 L	0.25 % v/v	% v/v	Spring	C					
	30% Urea Ammonium Nitrate Spring Applic (Feb 20)	100 L	1 % v/v	% v/v	Spring	C					
11	Elevore.....halauxifen Crop Oil Concentrate Fall Applic (Nov 15)	0.57 SC 100 L	0.0047 lb ae/a 1 % v/v	lb ae/a	Fall	B	0.0 f	28.3 d	0.0 d	0.0 f	
12	Elevore.....halauxifen Crop Oil Concentrate Spring Applic (Feb 20)	0.57 SC 100 L	0.0047 lb ae/a 1 % v/v	lb ae/a	Spring	C				0.0 f	
13	Untreated Check						0.0 f	0.0 e	0.0 d	0.0 f	
14	Zidua SC.....pyroxasulfone Harmony Extra SG Premix ----thifensulfuron ----tribenuron	4.17 SC 50 SG 33 17	0.09 lb ai/a 0.0234 lb ai/a 0.0154 0.00796	lb ai/a	DPRE	A	40.0 e	50.0 c	39.6 c	2.3 def	
	Starane Ultra...fluroxypyr	2.8 EC	0.142 lb ae/a	lb ae/a	Spring	C					
	Nonionic Surfactant	100 L	0.25 % v/v	% v/v	Spring	C					
	30% Urea Ammonium Nitrate	100 L	1 % v/v	% v/v	Spring	C					
LSD P=.05					9.89		11.54		6.94		4.13
Standard Deviation					5.44		6.59		3.93		2.46
CV					10.13		10.22		6.05		57.7
Replicate F					1.778		2.409		1.092		0.394
Replicate Prob(F)					0.2185		0.1262		0.3644		0.6785
Treatment F					154.555		87.615		392.286		11.551
Treatment Prob(F)					0.0001		0.0001		0.0001		0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4,7,11; Average=5

## University of Delaware

Pest Code Crop Type, Code		C TRZAW	LAMAM C -	HLOUM C -	VIORA C -				
Description		W.Wheat Stunting %	Henbit Control %	JagChkwd Control %	FldPansy Control %				
Rating Type		04/19/19	04/19/19	04/19/19	04/19/19				
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
9	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	0.0234 lb ai/a 0.0154 0.00796	lb ai/a	Fall	B	0.0 c	100.0 a	100.0 a
	Dimetric EXT....metribuzin	75 WG	0.14 lb ai/a	lb ai/a	Fall	B			
	Nonionic Surfactant	100 L	0.25 % v/v	% v/v	Fall	B			
	30% Urea Ammonium Nitrate Fall Applic (Nov 15)	100 L	1 % v/v	% v/v	Fall	B			
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	0.0234 lb ai/a 0.0154 0.00796	lb ai/a	Spring	C	5.7 b	100.0 a	96.7 ab
	Dimetric EXT....metribuzin	75 WG	0.14 lb ai/a	lb ai/a	Spring	C			
	Nonionic Surfactant	100 L	0.25 % v/v	% v/v	Spring	C			
	30% Urea Ammonium Nitrate Spring Applic (Feb 20)	100 L	1 % v/v	% v/v	Spring	C			
11	Elevore.....halauxifen Crop Oil Concentrate Fall Applic (Nov 15)	0.57 SC 100 L	0.0047 lb ae/a 1 % v/v	lb ae/a	Fall	B	0.0 c	100.0 a	0.0 f
12	Elevore.....halauxifen Crop Oil Concentrate Spring Applic (Feb 20)	0.57 SC 100 L	0.0047 lb ae/a 1 % v/v	lb ae/a	Spring	C	0.0 c	100.0 a	0.0 f
13	Untreated Check						0.0 c	0.0 e	0.0 f
14	Zidua SC.....pyroxasulfone Harmony Extra SG Premix ----thifensulfuron ----tribenuron	4.17 SC 50 SG 33 17	0.09 lb ai/a 0.0234 lb ai/a 0.0154 0.00796	lb ai/a	DPRE	A	0.0 c	90.0 ab	90.0 abc
	Starane Ultra...fluroxypyr	2.8 EC	0.142 lb ae/a	lb ae/a	Spring	C			
	Nonionic Surfactant	100 L	0.25 % v/v	% v/v	Spring	C			
	30% Urea Ammonium Nitrate	100 L	1 % v/v	% v/v	Spring	C			
LSD P=.05							3.36	11.02	15.57
Standard Deviation							2.00	6.56	9.26
CV							103.92	8.2	13.42
Replicate F							0.445	0.539	0.152
Replicate Prob(F)							0.6459	0.5898	0.8594
Treatment F							14.800	51.209	54.513
Treatment Prob(F)							0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=4,7,11; Average=5

## University of Delaware

Pest Code Crop Type, Code		OEOLA C -	SCRAN C -	VIORA C -	OEOLA C -						
Description	CEprmrse Control %	Knawel Control %	FldPansy Control %	CEprmrse Control %							
Rating Type	04/19/19	04/19/19	05/10/19	05/10/19							
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
9	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	50 SG 33 17 75 WG 100 L 100 L	0.0234 0.0154 0.00796 0.14 lb ai/a 0.25 % v/v 1 % v/v	lb ai/a Fall	B	100.0 a	100.0 a	96.0 a	99.0 a		
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	50 SG 33 17 75 WG 100 L 100 L	0.0234 0.0154 0.00796 0.14 lb ai/a 0.25 % v/v 1 % v/v	lb ai/a Spring C		100.0 a	97.3 a	99.0 a	99.0 a		
11	Elevore.....halauxifen Crop Oil Concentrate Fall Applic (Nov 15)	0.57 SC 100 L	0.0047 1 % v/v	lb ae/a Fall	B	0.0 e	26.7 e	13.3 c	0.0 d		
12	Elevore.....halauxifen Crop Oil Concentrate Spring Applic (Feb 20)	0.57 SC 100 L	0.0047 1 % v/v	lb ae/a Spring C		21.7 d	33.3 e	6.7 cd	0.0 d		
13	Untreated Check					0.0 e	0.0 f	0.0 d	0.0 d		
14	Zidua SC.....pyroxasulfone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	4.17 SC 50 SG 33 17 2.8 EC 100 L 100 L	0.09 0.0234 0.0154 0.00796 0.142 lb ae/a 0.25 % v/v 1 % v/v	lb ai/a Spring C	DPRE A	100.0 a	100.0 a	99.0 a	99.0 a		
LSD P=.05						7.95	8.80	8.44	9.94		
Standard Deviation						4.74	5.24	5.03	5.92		
CV						6.84	7.17	9.2	10.0		
Replicate F						2.001	1.410	0.274	1.029		
Replicate Prob(F)						0.1555	0.2622	0.7623	0.3714		
Treatment F						190.274	123.974	255.383	134.619		
Treatment Prob(F)						0.0001	0.0001	0.0001	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=4,7,11; Average=5

## University of Delaware

Pest Code Crop Type, Code	SCRAN C -	C TRZAW	C TRZAW					
Description	Knawel	W.Wheat	W.Wheat					
Rating Type	Control	Yield	Yield					
Rating Unit	%	lb/plot	Bu/A					
Rating Date	05/10/19	06/25/19	06/25/19					
Trt Treatment No. Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code		
9 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate Fall Applic (Nov 15)	50 SG 33 17 75 WG 100 L 100 L	0.0234 0.0154 0.00796 0.14 0.25 % 1 %	lb ai/a v/v v/v	Fall B	99.0 a	17.520 a	75.7 a	
10 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Dimetric EXT....metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate Spring Applic (Feb 20)	50 SG 33 17 75 WG 100 L 100 L	0.0234 0.0154 0.00796 0.14 0.25 % 1 %	lb ai/a v/v v/v	Spring C Fall B	99.0 a	14.543 a	62.8 a	
11 Elevore.....halauxifen Crop Oil Concentrate Fall Applic (Nov 15)	0.57 SC 100 L	0.0047 1 %	lb ae/a v/v	Fall B	33.3 c	15.827 a	68.4 a	
12 Elevore.....halauxifen Crop Oil Concentrate Spring Applic (Feb 20)	0.57 SC 100 L	0.0047 1 %	lb ae/a v/v	Spring C Spring C	33.3 c	15.370 a	66.4 a	
13 Untreated Check					0.0 d	15.180 a	65.6 a	
14 Zidua SC.....pyroxasulfone Harmony Extra SG Premix ----thifensulfuron ----tribenuron Starane Ultra...fluroxypyr Nonionic Surfactant 30% Urea Ammonium Nitrate	4.17 SC 50 SG 33 17 2.8 EC 100 L 100 L	0.09 0.0234 0.0154 0.00796 0.142 0.25 % 1 %	lb ai/a lb ai/a v/v v/v	DPRE A Spring C Spring C Spring C Spring C	99.0 a	15.963 a	69.0 a	
LSD P=.05 Standard Deviation CV					14.37 8.56 11.57	2.5885 1.5423 9.7	11.19 6.66 9.7	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					0.246 0.7840 44.180 0.0001	3.467 0.0463 1.051 0.4378	3.467 0.0463 1.051 0.4378	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=4,7,11; Average=5

Control of common broadleaf weeds: fall vs spring							
Trial ID: SG8-19		Location: Field #30		Trial Year: 2019			
Protocol ID: SG8-19		Investigator: Mark VanGessel					
Study Director: Mark VanGessel							
Sponsor Contact:							
Pest Code		C	TRZAW	C	TRZAW	LAMAM	HLOUM
Crop Type, Code						C -	C -
Description			W.Wheat		W.Wheat	Henbit	JagChkwD
Rating Type				Stunting	Stunting	Control	Control
Rating Unit				%	%	%	%
Rating Date				11/01/18	03/20/19	03/20/19	03/20/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
TABLE OF R MEANS							
Replicate 1							
Replicate 2							
Replicate 3							
TABLE OF A (Herbicide) MEANS							
1 Huskie Premix	2.05 EC	0.2 lb	ai/a	Fall	B		
1 ----pyrasulfotole	0.3	0.0293					
1 ----bromoxynil	1.75	0.17					
1 Dry Ammonium Sulfate	100 D	0.4 %	w/v	Fall	B		
2 Quelex Premix	20 WG	0.0094	lb ai/a	Fall	B		
2 ----florasulam	10	0.0047					
2 ----halauxifen	10	0.0047					
2 Methylated Seed Oil	100 L	1 %	v/v	Fall	B		
3 PowerFlex HL....pyroxsulam	13.1 WG	0.0164	lb ai/a	Fall	B		
3 Nonionic Surfactant	100 L	0.25 %	v/v	Fall	B		
3 30% Urea Ammonium Nitrate	100 L	1 %	v/v	Fall	B		
4 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B		
4 ----thifensulfuron	33	0.0154					
4 ----tribenuron	17	0.00796					
4 2,4-D ester	3.8 L	0.238	lb ae/a	Fall	B		
4 Nonionic Surfactant	100 L	0.25 %	v/v	Fall	B		
4 30% Urea Ammonium Nitrate	100 L	1 %	v/v	Fall	B		
5 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B		
5 ----thifensulfuron	33	0.0154					
5 ----tribenuron	17	0.00796					
5 Dimetric EXT....metribuzin	75 WG	0.14	lb ai/a	Fall	B		
5 Nonionic Surfactant	100 L	0.25 %	v/v	Fall	B		
5 30% Urea Ammonium Nitrate	100 L	1 %	v/v	Fall	B		
6 Elevore.....halauxifen	0.57 SC	0.0047	lb ae/a	Fall	B		
6 Crop Oil Concentrate	100 L	1 %	v/v	Fall	B		
LSD P=.05							
Standard Deviation							
CV							
TABLE OF B (Applic Timing) MEANS							
1 Fall Applic (Nov 15)							
2 Spring Applic (Feb 20)							
LSD P=.05							
Standard Deviation							
CV							
TABLE OF A (Herbicide) B (Applic Timing) MEANS							

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		VIORA C -	OEOLA C -	SCRAN C -	C TRZAW	
Description	FldPansy	CEprmrse	Knawel	W.Wheat		
Rating Type	Control %	Control %	Control %	Stunting %		
Rating Unit						
Rating Date						
03/20/19			03/20/19			
03/20/19			03/20/19			
03/28/19						
Trt Treatment No. Name	Form Form Conc Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
TABLE OF R MEANS						
Replicate 1						5.3
Replicate 2						4.7
Replicate 3						4.4
TABLE OF A (Herbicide) MEANS						
1 Huskie Premix	2.05 EC	0.2 lb ai/a	Fall	B		4.0 b
1 ----pyrasulfotole	0.3	0.0293				
1 ----bromoxynil	1.75	0.17				
1 Dry Ammonium Sulfate	100 D	0.4 % w/v	Fall	B		
2 Quelex Premix	20 WG	0.0094 lb ai/a	Fall	B		4.0 b
2 ----florasulam	10	0.0047				
2 ----halauxifen	10	0.0047				
2 Methylated Seed Oil	100 L	1 % v/v	Fall	B		
3 PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Fall	B		5.2 ab
3 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B		
3 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B		
4 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Fall	B		8.0 a
4 ----thifensulfuron	33	0.0154				
4 ----tribenuron	17	0.00796				
4 2,4-D ester	3.8 L	0.238 lb ae/a	Fall	B		
4 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B		
4 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B		
5 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Fall	B		7.5 a
5 ----thifensulfuron	33	0.0154				
5 ----tribenuron	17	0.00796				
5 Dimetric EXT....metribuzin	75 WG	0.14 lb ai/a	Fall	B		
5 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B		
5 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B		
6 Elevore.....halauxifen	0.57 SC	0.0047 lb ae/a	Fall	B		0.0 c
6 Crop Oil Concentrate	100 L	1 % v/v	Fall	B		
LSD P=.05						2.85
Standard Deviation						2.38
CV						49.88
TABLE OF B (Applic Timing) MEANS						
1 Fall Applic (Nov 15)						2.2 b
2 Spring Applic (Feb 20)						7.3 a
LSD P=.05						1.65
Standard Deviation						2.38
CV						49.88
TABLE OF A (Herbicide) B (Applic Timing) MEANS						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		C TRZAW	LAMAM C -	HLOUM C -	VIORA C -
Description		W.Wheat	Henbit	JagChkwd	FldPansy
Rating Type		Stunting	Control	Control	Control
Rating Unit	%	%	%	%	%
Rating Date	04/19/19	04/19/19	04/19/19	04/19/19	04/19/19
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
TABLE OF R MEANS					
Replicate 1			1.8	86.7	72.1
Replicate 2			2.3	84.6	74.6
Replicate 3			2.7	86.3	72.3
TABLE OF A (Herbicide) MEANS					
1 Huskie Premix	2.05 EC	0.2 lb ai/a	Fall	B	
1 ----pyrasulfotole	0.3	0.0293			
1 ----bromoxynil	1.75	0.17			
1 Dry Ammonium Sulfate	100 D	0.4 % w/v	Fall	B	
2 Quelex Premix	20 WG	0.0094 lb ai/a	Fall	B	
2 ----florasulam	10	0.0047			
2 ----halauxifen	10	0.0047			
2 Methylated Seed Oil	100 L	1 % v/v	Fall	B	
3 PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Fall	B	
3 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B	
3 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B	
4 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Fall	B	
4 ----thifensulfuron	33	0.0154			
4 ----tribenuron	17	0.00796			
4 2,4-D ester	3.8 L	0.238 lb ae/a	Fall	B	
4 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B	
4 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B	
5 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Fall	B	
5 ----thifensulfuron	33	0.0154			
5 ----tribenuron	17	0.00796			
5 Dimetric EXT....metribuzin	75 WG	0.14 lb ai/a	Fall	B	
5 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B	
5 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B	
6 Elevore.....halauxifen	0.57 SC	0.0047 lb ae/a	Fall	B	
6 Crop Oil Concentrate	100 L	1 % v/v	Fall	B	
LSD P=.05			2.60	8.02	11.64
Standard Deviation			2.17	6.70	9.69
CV			96.55	7.81	13.28
TABLE OF B (Applic Timing) MEANS					
1 Fall Applic (Nov 15)			0.0 b	84.4 a	78.3 a
2 Spring Applic (Feb 20)			4.5 a	87.2 a	67.7 b
LSD P=.05			1.50	4.63	6.72
Standard Deviation			2.17	6.70	9.69
CV			96.55	7.81	13.28
TABLE OF A (Herbicide) B (Applic Timing) MEANS					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	OEOLA C -	SCRAN C -	VIORA C -	OEOLA C -						
Description	CEprmrse Control %	Knawel Control %	FldPansy Control %	CEprmrse Control %						
Rating Type	04/19/19	04/19/19	05/10/19	05/10/19						
Rating Unit										
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
TABLE OF R MEANS										
Replicate 1							74.6	79.2	56.2	62.9
Replicate 2							70.4	76.4	55.8	60.4
Replicate 3							72.3	75.4	54.6	59.3
TABLE OF A (Herbicide) MEANS										
1 Huskie Premix	2.05 EC		0.2 lb ai/a	Fall	B		60.8 c	78.3 b	13.3 b	41.7 d
1 ----pyrasulfotole	0.3	0.0293								
1 ----bromoxynil	1.75	0.17								
1 Dry Ammonium Sulfate	100 D	0.4 % w/v	Fall	B						
2 Quelex Premix	20 WG	0.0094	lb ai/a	Fall	B		80.0 b	78.3 b	14.2 b	51.7 c
2 ----florasulam	10	0.0047								
2 ----halauxifen	10	0.0047								
2 Methylated Seed Oil	100 L	1 % v/v	Fall	B						
3 PowerFlex HL....pyroxsulam	13.1 WG	0.0164	lb ai/a	Fall	B		100.0 a	83.3 b	99.0 a	95.0 a
3 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B						
3 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B						
4 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B		82.8 b	93.3 a	99.0 a	77.8 b
4 ----thifensulfuron	33	0.0154								
4 ----tribenuron	17	0.00796								
4 2,4-D ester	3.8 L	0.238	lb ae/a	Fall	B					
4 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B						
4 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B						
5 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B		100.0 a	98.7 a	97.5 a	99.0 a
5 ----thifensulfuron	33	0.0154								
5 ----tribenuron	17	0.00796								
5 Dimetric EXT....metribuzin	75 WG	0.14	lb ai/a	Fall	B					
5 Nonionic Surfactant	100 L	0.25 % v/v	Fall	B						
5 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B						
6 Elevore.....halauxifen	0.57 SC	0.0047	lb ae/a	Fall	B		10.8 d	30.0 c	10.0 b	0.0 e
6 Crop Oil Concentrate	100 L	1 % v/v	Fall	B						
LSD P=.05							6.08	6.76	6.53	7.66
Standard Deviation							5.08	5.65	5.45	6.40
CV							7.02	7.34	9.83	10.51
TABLE OF B (Applic Timing) MEANS										
1 Fall Applic (Nov 15)							66.7 b	87.8 a	60.4 a	56.3 b
2 Spring Applic (Feb 20)							78.2 a	66.2 b	50.6 b	65.4 a
LSD P=.05							3.51	3.91	3.77	4.42
Standard Deviation							5.08	5.65	5.45	6.40
CV							7.02	7.34	9.83	10.51
TABLE OF A (Herbicide) B (Applic Timing) MEANS										

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	SCRAN C -	C TRZAW	C TRZAW
Description	Knawel	W.Wheat	W.Wheat
Rating Type	Control %	Yield lb/plot	Yield Bu/A
Rating Unit	05/10/19	06/25/19	06/25/19
Rating Date			
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Appl Timing Code
TABLE OF R MEANS			
Replicate 1		78.6	16.235
Replicate 2		76.6	16.431
Replicate 3		79.1	15.223
TABLE OF A (Herbicide) MEANS			
1 Huskie Premix	2.05 EC	0.2 lb ai/a	Fall B
1 ----pyrasulfotole	0.3	0.0293	
1 ----bromoxynil	1.75	0.17	
1 Dry Ammonium Sulfate	100 D	0.4 % w/v	Fall B
2 Quelex Premix	20 WG	0.0094 lb ai/a	Fall B
2 ----florasulam	10	0.0047	
2 ----halauxifen	10	0.0047	
2 Methylated Seed Oil	100 L	1 % v/v	Fall B
3 PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Fall B
3 Nonionic Surfactant	100 L	0.25 % v/v	Fall B
3 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall B
4 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Fall B
4 ----thifensulfuron	33	0.0154	
4 ----tribenuron	17	0.00796	
4 2,4-D ester	3.8 L	0.238 lb ae/a	Fall B
4 Nonionic Surfactant	100 L	0.25 % v/v	Fall B
4 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall B
5 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Fall B
5 ----thifensulfuron	33	0.0154	
5 ----tribenuron	17	0.00796	
5 Dimetric EXT....metribuzin	75 WG	0.14 lb ai/a	Fall B
5 Nonionic Surfactant	100 L	0.25 % v/v	Fall B
5 30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall B
6 Elevore.....halauxifen	0.57 SC	0.0047 lb ae/a	Fall B
6 Crop Oil Concentrate	100 L	1 % v/v	Fall B
LSD P=.05		11.13	1.9077
Standard Deviation		9.29	1.5933
CV		11.90	9.9812
TABLE OF B (Applic Timing) MEANS			
1 Fall Applic (Nov 15)		87.3 a	16.046 a
2 Spring Applic (Feb 20)		68.9 b	15.879 a
LSD P=.05		6.42	1.1014
Standard Deviation		9.29	1.5933
CV		11.90	9.9812
TABLE OF A (Herbicide) B (Applic Timing) MEANS			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Pest Code		C	TRZAW	C	TRZAW	LAMAM	HLOUM
Crop Type, Code		-	-	-	-	C	C
Description		W.Wheat	W.Wheat	Henbit	JagChkwd		
Rating Type	Stunting		Stunting	Control	Control		
Rating Unit	%		%	%	%		
Rating Date	11/01/18		03/20/19	03/20/19	03/20/19		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code
1	Huskie Premix	2.05	EC	0.2 lb	ai/a	Fall	B
1	----pyrasulfotole	0.3		0.0293			
1	----bromoxynil	1.75		0.17			
1	Dry Ammonium Sulfate	100	D	0.4 %	w/v	Fall	B
1	Fall Applic (Nov 15)						
2	Quelex Premix	20	WG	0.0094	lb ai/a	Fall	B
2	----florasulam	10		0.0047			
2	----halauxifen	10		0.0047			
2	Methylated Seed Oil	100	L	1 %	v/v	Fall	B
2	Fall Applic (Nov 15)						
3	PowerFlex HL....pyroxslam	13.1	WG	0.0164	lb ai/a	Fall	B
3	Nonionic Surfactant	100	L	0.25 %	v/v	Fall	B
3	30% Urea Ammonium Nitrate	100	L	1 %	v/v	Fall	B
3	Fall Applic (Nov 15)						
4	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Fall	B
4	----thifensulfuron	33		0.0154			
4	----tribenuron	17		0.00796			
4	2,4-D ester	3.8	L	0.238	lb ae/a	Fall	B
4	Nonionic Surfactant	100	L	0.25 %	v/v	Fall	B
4	30% Urea Ammonium Nitrate	100	L	1 %	v/v	Fall	B
4	Fall Applic (Nov 15)						
5	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Fall	B
5	----thifensulfuron	33		0.0154			
5	----tribenuron	17		0.00796			
5	Dimetric EXT....metribuzin	75	WG	0.14	lb ai/a	Fall	B
5	Nonionic Surfactant	100	L	0.25 %	v/v	Fall	B
5	30% Urea Ammonium Nitrate	100	L	1 %	v/v	Fall	B
5	Fall Applic (Nov 15)						
6	Elevore.....halauxifen	0.57	SC	0.0047	lb ae/a	Fall	B
6	Crop Oil Concentrate	100	L	1 %	v/v	Fall	B
6	Fall Applic (Nov 15)						
1	Huskie Premix	2.05	EC	0.2 lb	ai/a	Fall	B
1	----pyrasulfotole	0.3		0.0293			
1	----bromoxynil	1.75		0.17			
1	Dry Ammonium Sulfate	100	D	0.4 %	w/v	Fall	B
1	Spring Applic (Feb 20)						
2	Quelex Premix	20	WG	0.0094	lb ai/a	Fall	B
2	----florasulam	10		0.0047			
2	----halauxifen	10		0.0047			
2	Methylated Seed Oil	100	L	1 %	v/v	Fall	B
2	Spring Applic (Feb 20)						
3	PowerFlex HL....pyroxslam	13.1	WG	0.0164	lb ai/a	Fall	B
3	Nonionic Surfactant	100	L	0.25 %	v/v	Fall	B
3	30% Urea Ammonium Nitrate	100	L	1 %	v/v	Fall	B
3	Spring Applic (Feb 20)						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code			VIORA C -	OEOLA C -	SCRAN C -	C TRZAW
Description		FldPansy	CEprmrse	Knawel	W.Wheat	
Rating Type		Control %	Control %	Control %	Stunting %	
Rating Unit						
Rating Date		03/20/19	03/20/19	03/20/19	03/28/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
1	Huskie Premix	2.05 EC		0.2 lb ai/a	Fall	B
1	----pyrasulfotole	0.3		0.0293		
1	----bromoxynil	1.75		0.17		
1	Dry Ammonium Sulfate	100 D		0.4 % w/v	Fall	B
1	Fall Applic (Nov 15)					
2	Quelex Premix	20 WG		0.0094 lb ai/a	Fall	B
2	----florasulam	10		0.0047		
2	----halauxifen	10		0.0047		
2	Methylated Seed Oil	100 L		1 % v/v	Fall	B
2	Fall Applic (Nov 15)					
3	PowerFlex HL....pyroxsulam	13.1 WG		0.0164 lb ai/a	Fall	B
3	Nonionic Surfactant	100 L		0.25 % v/v	Fall	B
3	30% Urea Ammonium Nitrate	100 L		1 % v/v	Fall	B
3	Fall Applic (Nov 15)					
4	Harmony Extra SG Premix	50 SG		0.0234 lb ai/a	Fall	B
4	----thifensulfuron	33		0.0154		
4	----tribenuron	17		0.00796		
4	2,4-D ester	3.8 L		0.238 lb ae/a	Fall	B
4	Nonionic Surfactant	100 L		0.25 % v/v	Fall	B
4	30% Urea Ammonium Nitrate	100 L		1 % v/v	Fall	B
4	Fall Applic (Nov 15)					
5	Harmony Extra SG Premix	50 SG		0.0234 lb ai/a	Fall	B
5	----thifensulfuron	33		0.0154		
5	----tribenuron	17		0.00796		
5	Dimetric EXT....metribuzin	75 WG		0.14 lb ai/a	Fall	B
5	Nonionic Surfactant	100 L		0.25 % v/v	Fall	B
5	30% Urea Ammonium Nitrate	100 L		1 % v/v	Fall	B
5	Fall Applic (Nov 15)					
6	Elevore.....halauxifen	0.57 SC		0.0047 lb ae/a	Fall	B
6	Crop Oil Concentrate	100 L		1 % v/v	Fall	B
6	Fall Applic (Nov 15)					
1	Huskie Premix	2.05 EC		0.2 lb ai/a	Fall	B
1	----pyrasulfotole	0.3		0.0293		
1	----bromoxynil	1.75		0.17		
1	Dry Ammonium Sulfate	100 D		0.4 % w/v	Fall	B
1	Spring Applic (Feb 20)					
2	Quelex Premix	20 WG		0.0094 lb ai/a	Fall	B
2	----florasulam	10		0.0047		
2	----halauxifen	10		0.0047		
2	Methylated Seed Oil	100 L		1 % v/v	Fall	B
2	Spring Applic (Feb 20)					
3	PowerFlex HL....pyroxsulam	13.1 WG		0.0164 lb ai/a	Fall	B
3	Nonionic Surfactant	100 L		0.25 % v/v	Fall	B
3	30% Urea Ammonium Nitrate	100 L		1 % v/v	Fall	B
3	Spring Applic (Feb 20)					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		C TRZAW	LAMAM C -	HLOUM C -	VIORA C -					
Description		W.Wheat Stunting %	Henbit Control %	JagChkwd Control %	FldPansy Control %					
Rating Type		04/19/19	04/19/19	04/19/19	04/19/19					
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code				
1	Huskie Premix	2.05 EC		0.2 lb ai/a	Fall	B	0.0 c	80.0 bc	91.7 abc	56.7 b
1	----pyrasulfotole	0.3		0.0293						
1	----bromoxynil	1.75		0.17						
1	Dry Ammonium Sulfate	100 D		0.4 % w/v	Fall	B				
1	Fall Applic (Nov 15)									
2	Quelex Premix	20 WG		0.0094 lb ai/a	Fall	B	0.0 c	96.7 a	100.0 a	33.3 c
2	----florasulam	10		0.0047						
2	----halauxifen	10		0.0047						
2	Methylated Seed Oil	100 L		1 % v/v	Fall	B				
2	Fall Applic (Nov 15)									
3	PowerFlex HL....pyroxsulam	13.1 WG		0.0164 lb ai/a	Fall	B	0.0 c	60.0 d	78.3 cd	95.0 a
3	Nonionic Surfactant	100 L		0.25 % v/v	Fall	B				
3	30% Urea Ammonium Nitrate	100 L		1 % v/v	Fall	B				
3	Fall Applic (Nov 15)									
4	Harmony Extra SG Premix	50 SG		0.0234 lb ai/a	Fall	B	0.0 c	70.0 cd	100.0 a	94.0 a
4	----thifensulfuron	33		0.0154						
4	----tribenuron	17		0.00796						
4	2,4-D ester	3.8 L		0.238 lb ae/a	Fall	B				
4	Nonionic Surfactant	100 L		0.25 % v/v	Fall	B				
4	30% Urea Ammonium Nitrate	100 L		1 % v/v	Fall	B				
4	Fall Applic (Nov 15)									
5	Harmony Extra SG Premix	50 SG		0.0234 lb ai/a	Fall	B	0.0 c	100.0 a	100.0 a	100.0 a
5	----thifensulfuron	33		0.0154						
5	----tribenuron	17		0.00796						
5	Dimetric EXT....metribuzin	75 WG		0.14 lb ai/a	Fall	B				
5	Nonionic Surfactant	100 L		0.25 % v/v	Fall	B				
5	30% Urea Ammonium Nitrate	100 L		1 % v/v	Fall	B				
5	Fall Applic (Nov 15)									
6	Elevore.....halauxifen	0.57 SC		0.0047 lb ae/a	Fall	B	0.0 c	100.0 a	0.0 f	100.0 a
6	Crop Oil Concentrate	100 L		1 % v/v	Fall	B				
6	Fall Applic (Nov 15)									
1	Huskie Premix	2.05 EC		0.2 lb ai/a	Fall	B	0.0 c	61.7 d	100.0 a	33.3 c
1	----pyrasulfotole	0.3		0.0293						
1	----bromoxynil	1.75		0.17						
1	Dry Ammonium Sulfate	100 D		0.4 % w/v	Fall	B				
1	Spring Applic (Feb 20)									
2	Quelex Premix	20 WG		0.0094 lb ai/a	Fall	B	5.7 b	98.3 a	71.0 de	33.3 c
2	----florasulam	10		0.0047						
2	----halauxifen	10		0.0047						
2	Methylated Seed Oil	100 L		1 % v/v	Fall	B				
2	Spring Applic (Feb 20)									
3	PowerFlex HL....pyroxsulam	13.1 WG		0.0164 lb ai/a	Fall	B	15.7 a	80.0 bc	56.7 e	100.0 a
3	Nonionic Surfactant	100 L		0.25 % v/v	Fall	B				
3	30% Urea Ammonium Nitrate	100 L		1 % v/v	Fall	B				
3	Spring Applic (Feb 20)									

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code			OEOLA C -	SCRAN C -	VIORA C -	OEOLA C -
Description		CEprmrse Control	Knawel Control	FldPansy Control	CEprmrse Control	
Rating Type		%	%	%	%	
Rating Unit						
Rating Date		04/19/19	04/19/19	05/10/19	05/10/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
1	Huskie Premix	2.05 EC	0.2 lb ai/a	Fall	B	68.3 bc
1	----pyrasulfotole	0.3	0.0293			
1	----bromoxynil	1.75	0.17			
1	Dry Ammonium Sulfate	100 D	0.4 % w/v	Fall	B	
1	Fall Applic (Nov 15)					
2	Quelex Premix	20 WG	0.0094 lb ai/a	Fall	B	60.0 cd
2	----florasulam	10	0.0047			
2	----halauxifen	10	0.0047			
2	Methylated Seed Oil	100 L	1 % v/v	Fall	B	
2	Fall Applic (Nov 15)					
3	PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Fall	B	100.0 a
3	Nonionic Surfactant	100 L	0.25 % v/v	Fall	B	
3	30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B	
3	Fall Applic (Nov 15)					
4	Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Fall	B	71.7 b
4	----thifensulfuron	33	0.0154			
4	----tribenuron	17	0.00796			
4	2,4-D ester	3.8 L	0.238 lb ae/a	Fall	B	
4	Nonionic Surfactant	100 L	0.25 % v/v	Fall	B	
4	30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B	
4	Fall Applic (Nov 15)					
5	Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Fall	B	100.0 a
5	----thifensulfuron	33	0.0154			
5	----tribenuron	17	0.00796			
5	Dimetric EXT....metribuzin	75 WG	0.14 lb ai/a	Fall	B	
5	Nonionic Surfactant	100 L	0.25 % v/v	Fall	B	
5	30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B	
5	Fall Applic (Nov 15)					
6	Elevore.....halauxifen	0.57 SC	0.0047 lb ae/a	Fall	B	0.0 f
6	Crop Oil Concentrate	100 L	1 % v/v	Fall	B	
6	Fall Applic (Nov 15)					
1	Huskie Premix	2.05 EC	0.2 lb ai/a	Fall	B	53.3 d
1	----pyrasulfotole	0.3	0.0293			
1	----bromoxynil	1.75	0.17			
1	Dry Ammonium Sulfate	100 D	0.4 % w/v	Fall	B	
1	Spring Applic (Feb 20)					
2	Quelex Premix	20 WG	0.0094 lb ai/a	Fall	B	100.0 a
2	----florasulam	10	0.0047			
2	----halauxifen	10	0.0047			
2	Methylated Seed Oil	100 L	1 % v/v	Fall	B	
2	Spring Applic (Feb 20)					
3	PowerFlex HL....pyroxsulam	13.1 WG	0.0164 lb ai/a	Fall	B	100.0 a
3	Nonionic Surfactant	100 L	0.25 % v/v	Fall	B	
3	30% Urea Ammonium Nitrate	100 L	1 % v/v	Fall	B	
3	Spring Applic (Feb 20)					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	SCRAN C -	C TRZAW	C TRZAW						
Description	Knawel	W.Wheat	W.Wheat						
Rating Type	Control %	Yield lb/plot	Yield Bu/A						
Rating Unit	05/10/19	06/25/19	06/25/19						
Rating Date									
Trt No. Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code			
1 Huskie Premix	2.05 EC		0.2 lb	ai/a	Fall	B	94.3 a	14.513 a	62.7 a
1 ----pyrasulfotole	0.3		0.0293						
1 ----bromoxynil	1.75		0.17						
1 Dry Ammonium Sulfate	100 D		0.4 %	w/v	Fall	B			
1 Fall Applic (Nov 15)									
2 Quelex Premix	20 WG		0.0094	lb ai/a	Fall	B	99.0 a	16.203 a	70.0 a
2 ----florasulam	10		0.0047						
2 ----halauxifen	10		0.0047						
2 Methylated Seed Oil	100 L		1 %	v/v	Fall	B			
1 Fall Applic (Nov 15)									
3 PowerFlex HL....pyroxsulam	13.1 WG		0.0164	lb ai/a	Fall	B	99.0 a	17.140 a	74.1 a
3 Nonionic Surfactant	100 L		0.25 %	v/v	Fall	B			
3 30% Urea Ammonium Nitrate	100 L		1 %	v/v	Fall	B			
1 Fall Applic (Nov 15)									
4 Harmony Extra SG Premix	50 SG		0.0234	lb ai/a	Fall	B	99.0 a	15.073 a	65.1 a
4 ----thifensulfuron	33		0.0154						
4 ----tribenuron	17		0.00796						
4 2,4-D ester	3.8 L		0.238	lb ae/a	Fall	B			
4 Nonionic Surfactant	100 L		0.25 %	v/v	Fall	B			
4 30% Urea Ammonium Nitrate	100 L		1 %	v/v	Fall	B			
1 Fall Applic (Nov 15)									
5 Harmony Extra SG Premix	50 SG		0.0234	lb ai/a	Fall	B	99.0 a	17.520 a	75.7 a
5 ----thifensulfuron	33		0.0154						
5 ----tribenuron	17		0.00796						
5 Dimetric EXT....metribuzin	75 WG		0.14	lb ai/a	Fall	B			
5 Nonionic Surfactant	100 L		0.25 %	v/v	Fall	B			
5 30% Urea Ammonium Nitrate	100 L		1 %	v/v	Fall	B			
1 Fall Applic (Nov 15)									
6 Elevore.....halauxifen	0.57 SC		0.0047	lb ae/a	Fall	B	33.3 c	15.827 a	68.4 a
6 Crop Oil Concentrate	100 L		1 %	v/v	Fall	B			
1 Fall Applic (Nov 15)									
1 Huskie Premix	2.05 EC		0.2 lb	ai/a	Fall	B	60.0 b	16.003 a	69.2 a
1 ----pyrasulfotole	0.3		0.0293						
1 ----bromoxynil	1.75		0.17						
1 Dry Ammonium Sulfate	100 D		0.4 %	w/v	Fall	B			
2 Spring Applic (Feb 20)									
2 Quelex Premix	20 WG		0.0094	lb ai/a	Fall	B	58.3 b	16.950 a	73.2 a
2 ----florasulam	10		0.0047						
2 ----halauxifen	10		0.0047						
2 Methylated Seed Oil	100 L		1 %	v/v	Fall	B			
2 Spring Applic (Feb 20)									
3 PowerFlex HL....pyroxsulam	13.1 WG		0.0164	lb ai/a	Fall	B	65.0 b	16.090 a	69.5 a
3 Nonionic Surfactant	100 L		0.25 %	v/v	Fall	B			
3 30% Urea Ammonium Nitrate	100 L		1 %	v/v	Fall	B			
2 Spring Applic (Feb 20)									

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	C	TRZAW	C	TRZAW	LAMAM	HLOUM	
Crop Type, Code	-	-	-	-	C	C	
Description	W.Wheat	W.Wheat	Henbit	JagChkwd			
Rating Type	Stunting	Stunting	Control	Control			
Rating Unit	%	%	%	%			
Rating Date	11/01/18	03/20/19	03/20/19	03/20/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
4	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B	
4	----thifensulfuron	33	0.0154				
4	----tribenuron	17	0.00796				
4	2,4-D ester	3.8 L	0.238	lb ae/a	Fall	B	
4	Nonionic Surfactant	100 L	0.25	% v/v	Fall	B	
4	30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B	
2	Spring Applic (Feb 20)						
5	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B	
5	----thifensulfuron	33	0.0154				
5	----tribenuron	17	0.00796				
5	Dimetric EXT....metribuzin	75 WG	0.14	lb ai/a	Fall	B	
5	Nonionic Surfactant	100 L	0.25	% v/v	Fall	B	
5	30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B	
2	Spring Applic (Feb 20)						
6	Elevore.....halauxifen	0.57 SC	0.0047	lb ae/a	Fall	B	
6	Crop Oil Concentrate	100 L	1	% v/v	Fall	B	
2	Spring Applic (Feb 20)						
LSD P=.05				2.87	3.77	4.58	8.69
Standard Deviation				0.82	2.15	2.61	4.93
CV				0.00	47.21	2.95	6.39

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		VIORA C -	OEOLA C -	SCRAN C -	C TRZAW					
Description	FldPansy	CEprmrse	Knawel	W.Wheat						
Rating Type	Control	Control	Control	Stunting						
Rating Unit	%	%	%	%						
Rating Date	03/20/19	03/20/19	03/20/19	03/28/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code				
4	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B	.	.	.	11.3 ab
4	----thifensulfuron	33	0.0154							
4	----tribenuron	17	0.00796							
4	2,4-D ester	3.8 L	0.238	lb ae/a	Fall	B				
4	Nonionic Surfactant	100 L	0.25	% v/v	Fall	B				
4	30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B				
2	Spring Applic (Feb 20)									
5	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B	.	.	.	15.0 a
5	----thifensulfuron	33	0.0154							
5	----tribenuron	17	0.00796							
5	Dimetric EXT....metribuzin	75 WG	0.14	lb ai/a	Fall	B				
5	Nonionic Surfactant	100 L	0.25	% v/v	Fall	B				
5	30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B				
2	Spring Applic (Feb 20)									
6	Elevore.....halauxifen	0.57 SC	0.0047	lb ae/a	Fall	B	.	.	.	0.0 f
6	Crop Oil Concentrate	100 L	1	% v/v	Fall	B				
2	Spring Applic (Feb 20)									
LSD P=.05							9.89	11.54	6.94	4.04
Standard Deviation							5.44	6.59	3.93	2.38
CV							8.38	8.49	4.91	49.88

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C TRZAW	LAMAM C -	HLOUM C -	VIORA C -							
Description	W.Wheat	Henbit	JagChkwd	FldPansy							
Rating Type	Stunting	Control	Control	Control							
Rating Unit	%	%	%	%							
Rating Date	04/19/19	04/19/19	04/19/19	04/19/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
4	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B		0.0 c	83.3 b	81.7 bcd	92.7 a
4	----thifensulfuron	33	0.0154								
4	----tribenuron	17	0.00796								
4	2,4-D ester	3.8 L	0.238	lb ae/a	Fall	B					
4	Nonionic Surfactant	100 L	0.25	% v/v	Fall	B					
4	30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B					
2	Spring Applic (Feb 20)										
5	Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B		5.7 b	100.0 a	96.7 ab	98.3 a
5	----thifensulfuron	33	0.0154								
5	----tribenuron	17	0.00796								
5	Dimetric EXT....metribuzin	75 WG	0.14	lb ai/a	Fall	B					
5	Nonionic Surfactant	100 L	0.25	% v/v	Fall	B					
5	30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B					
2	Spring Applic (Feb 20)										
6	Elevore.....halauxifen	0.57 SC	0.0047	lb ae/a	Fall	B		0.0 c	100.0 a	0.0 f	28.3 c
6	Crop Oil Concentrate	100 L	1	% v/v	Fall	B					
2	Spring Applic (Feb 20)										
LSD P=.05								3.68	11.34	16.46	9.58
Standard Deviation								2.17	6.70	9.69	5.66
CV								96.55	7.81	13.28	7.85

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		OEOLA C -	SCRAN C -	VIORA C -	OEOLA C -	
Description	CEprmrse Control	Knawel Control	FldPansy Control	CEprmrse Control		
Rating Type	%	%	%	%		
Rating Unit						
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
4 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B	94.0 a
4 ----thifensulfuron	33	0.0154				
4 ----tribenuron	17	0.00796				
4 2,4-D ester	3.8 L	0.238	lb ae/a	Fall	B	
4 Nonionic Surfactant	100 L	0.25	% v/v	Fall	B	
4 30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B	
2 Spring Applic (Feb 20)						
5 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B	100.0 a
5 ----thifensulfuron	33	0.0154				
5 ----tribenuron	17	0.00796				
5 Dimetric EXT....metribuzin	75 WG	0.14	lb ai/a	Fall	B	
5 Nonionic Surfactant	100 L	0.25	% v/v	Fall	B	
5 30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B	
2 Spring Applic (Feb 20)						
6 Elevore.....halauxifen	0.57 SC	0.0047	lb ae/a	Fall	B	21.7 e
6 Crop Oil Concentrate	100 L	1	% v/v	Fall	B	
2 Spring Applic (Feb 20)						
LSD P=.05						8.60
Standard Deviation						5.08
CV						7.02
						9.57
						5.65
						7.34
						9.24
						10.83
						6.40
						9.83
						10.51

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	SCRAN C -	C TRZAW	C TRZAW						
Description	Knawel	W.Wheat	W.Wheat						
Rating Type	Control	Yield	Yield						
Rating Unit	%	lb/plot	Bu/A						
Rating Date	05/10/19	06/25/19	06/25/19						
Trt Treatment No. Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code			
4 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B		97.7 a	16.320 a	70.5 a
4 ----thifensulfuron	33	0.0154							
4 ----tribenuron	17	0.00796							
4 2,4-D ester	3.8 L	0.238	lb ae/a	Fall	B				
4 Nonionic Surfactant	100 L	0.25	% v/v	Fall	B				
4 30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B				
2 Spring Applic (Feb 20)									
5 Harmony Extra SG Premix	50 SG	0.0234	lb ai/a	Fall	B		99.0 a	14.543 a	62.8 a
5 ----thifensulfuron	33	0.0154							
5 ----tribenuron	17	0.00796							
5 Dimetric EXT....metribuzin	75 WG	0.14	lb ai/a	Fall	B				
5 Nonionic Surfactant	100 L	0.25	% v/v	Fall	B				
5 30% Urea Ammonium Nitrate	100 L	1	% v/v	Fall	B				
2 Spring Applic (Feb 20)									
6 Elevore.....halauxifen	0.57 SC	0.0047	lb ae/a	Fall	B		33.3 c	15.370 a	66.4 a
6 Crop Oil Concentrate	100 L	1	% v/v	Fall	B				
2 Spring Applic (Feb 20)									
LSD P=.05							15.73	2.6979	11.66
Standard Deviation							9.29	1.5933	6.89
CV							11.90	9.9812	9.98

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Randomized Complete Block (RCB) AOV For C TRZAW W.Wheat Stunting % 11/01/18 Missing factor A levels prevents analyzing column 1 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	5	62.833333			
Replicate	2	1.333333	0.666667	1.000	0.5000
Treatment	1	60.166667	60.166667	90.250	0.0109
ERROR	2	1.333333	0.666667		

Randomized Complete Block (RCB) AOV For C TRZAW W.Wheat Stunting % 03/20/19 Missing factor B levels prevents analyzing column 2 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	413.833333			
Replicate	2	20.583333	10.291667	2.225	0.1448
Treatment	7	328.500000	46.928571	10.147	0.0002
ERROR	14	64.750000	4.625000		

Randomized Complete Block (RCB) AOV For LAMAM C Henbit Control % 03/20/19 Missing factor B levels prevents analyzing column 3 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	24134.958333			
Replicate	2	5.083333	2.541667	0.372	0.6958
Treatment	7	24034.291667	3433.470238	502.897	0.0001
ERROR	14	95.583333	6.827381		

Randomized Complete Block (RCB) AOV For HLOUM C JagChkw Control % 03/20/19 Missing factor B levels prevents analyzing column 4 as Factorial design; Missing values in column 4 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	22	40241.707270			
Replicate	2	35.327806	17.663903	0.728	0.5017
Treatment	7	39890.799107	5698.685587	234.751	0.0001
ERROR	13	315.580357	24.275412		

Randomized Complete Block (RCB) AOV For VIORA C FldPansy Control % 03/20/19 Missing factor B levels prevents analyzing column 5 as Factorial design; Missing values in column 5 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	19	32379.333333			
Replicate	2	105.083333	52.541667	1.778	0.2185
Treatment	7	31978.666667	4568.380952	154.555	0.0001
ERROR	10	295.583333	29.558333		

Randomized Complete Block (RCB) AOV For OEOLA C CEprmrse Control % 03/20/19 Missing factor B levels prevents analyzing column 6 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	27456.000000			
Replicate	2	209.250000	104.625000	2.409	0.1262
Treatment	7	26638.666667	3805.523810	87.615	0.0001
ERROR	14	608.083333	43.434524		

Randomized Complete Block (RCB) AOV For SCRAN C Knawel Control % 03/20/19 Missing factor B levels prevents analyzing column 7 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	22	42752.816327			
Replicate	2	33.816327	16.908163	1.092	0.3644
Treatment	7	42517.714286	6073.959184	392.286	0.0001
ERROR	13	201.285714	15.483516		

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Stunting % 03/28/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	962.222222				
R	2	4.388889	2.194444	0.386	0.6840	
A	5	251.888889	50.377778	8.870	0.0001	2.9
B	1	235.111111	235.111111	41.398	0.0001	1.6
AB	5	345.888889	69.177778	12.181	0.0001	4.0
ERROR	22	124.944444	5.679293			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Stunting % 04/19/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	854.750000				
R	2	4.166667	2.083333	0.441	0.6487	
A	5	282.250000	56.450000	11.961	0.0001	2.6
B	1	182.250000	182.250000	38.615	0.0001	1.5
AB	5	282.250000	56.450000	11.961	0.0001	3.7
ERROR	22	103.833333	4.719697			

## FACTORIAL/POOLED ERROR AOV For LAMAM C Henbit Control % 04/19/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	8975.000000				
R	2	29.166667	14.583333	0.325	0.7260	
A	5	6583.333333	1316.666667	29.333	0.0001	8.0
B	1	69.444444	69.444444	1.547	0.2267	4.6
AB	5	1305.555556	261.111111	5.817	0.0014	11.3
ERROR	22	987.500000	44.886364			

FACTORIAL/POOLED ERROR AOV For HLOUM C JagChkw Control % 04/19/19 Missing values in column 11 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	34	46590.000000				
R	2	45.500000	22.750000	0.242	0.7872	
A	5	41980.000000	8396.000000	89.327	0.0001	11.6
B	1	1024.000000	1024.000000	10.895	0.0034	6.7
AB	5	1566.666667	313.333333	3.334	0.0226	16.5
ERROR	21	1973.833333	93.992063			

## FACTORIAL/POOLED ERROR AOV For VIORA C FldPansy Control % 04/19/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	34096.750000				
R	2	54.166667	27.083333	0.846	0.4427	
A	5	24772.916667	4954.583333	154.721	0.0001	6.8
B	1	2162.250000	2162.250000	67.522	0.0001	3.9
AB	5	6402.916667	1280.583333	39.990	0.0001	9.6
ERROR	22	704.500000	32.022727			

## FACTORIAL/POOLED ERROR AOV For OEOLA C CEprmrse Control % 04/19/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	38548.750000				
R	2	104.666667	52.333333	2.027	0.1556	
A	5	33686.250000	6737.250000	260.950	0.0001	6.1
B	1	1190.250000	1190.250000	46.101	0.0001	3.5
AB	5	2999.583333	599.916667	23.236	0.0001	8.6
ERROR	22	568.000000	25.818182			

## FACTORIAL/POOLED ERROR AOV For SCRAN C Knavel Control % 04/19/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	26370.000000				
R	2	90.500000	45.250000	1.418	0.2635	
A	5	17933.333333	3586.666667	112.376	0.0001	6.8
B	1	4181.777778	4181.777778	131.022	0.0001	3.9
AB	5	3462.222222	692.444444	21.695	0.0001	9.6
ERROR	22	702.166667	31.916667			

## FACTORIAL/POOLED ERROR AOV For VIORA C FldPansy Control % 05/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	69653.000000				
R	2	16.166667	8.083333	0.272	0.7646	
A	5	66631.333333	13326.266667	447.942	0.0001	6.5
B	1	860.444444	860.444444	28.923	0.0001	3.8
AB	5	1490.555556	298.111111	10.021	0.0001	9.2
ERROR	22	654.500000	29.750000			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

## FACTORIAL/POOLED ERROR AOV For OEOLA C CEprmrse Control % 05/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	46992.305556				
R	2	84.222222	42.111111	1.030	0.3737	
A	5	42390.805556	8478.161111	207.295	0.0001	7.7
B	1	738.027778	738.027778	18.045	0.0003	4.4
AB	5	2879.472222	575.894444	14.081	0.0001	10.8
ERROR	22	899.777778	40.898990			

## FACTORIAL/POOLED ERROR AOV For SCRAN C Knawel Control % 05/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	25126.750000				
R	2	42.000000	21.000000	0.243	0.7862	
A	5	17199.916667	3439.983333	39.845	0.0001	11.1
B	1	3043.361111	3043.361111	35.251	0.0001	6.4
AB	5	2942.138889	588.427778	6.816	0.0006	15.7
ERROR	22	1899.333333	86.333333			

## FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Yield lb/plot 06/25/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	96.737922				
R	2	10.094306	5.047153	1.988	0.1608	
A	5	9.041256	1.808251	0.712	0.6207	1.908
B	1	0.250000	0.250000	0.098	0.7566	1.101
AB	5	21.505067	4.301013	1.694	0.1779	2.698
ERROR	22	55.847294	2.538513			

## FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Yield Bu/A 06/25/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	1806.556378				
R	2	188.508619	94.254309	1.988	0.1608	
A	5	168.843175	33.768635	0.712	0.6207	8.2
B	1	4.668687	4.668687	0.098	0.7566	4.8
AB	5	401.601714	80.320343	1.694	0.1779	11.7
ERROR	22	1042.934184	47.406099			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Management of large Palmer amaranth plants in soybeans

Trial ID: DSB1-19

Location: Field #3

Trial Year: 2019

Protocol ID: DSB1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Delaware Soybean Board

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/14/19

Initiation Date: 03/01/19

Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max

Soybean

Entry Date: 12/03/19

Variety: S43XS27: CZ4539GTLL

Attributes: Xtend; GT/LL

Planting Date: 06/03/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 16

Planting Method: DRILLE drilled

Row Spacing: 7 IN

Planting Equipment: FE Field Equipment

Soil Temperature: 75 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 06/09/19

Soil Moisture: NORMAL normal, adequate

Harvest Date: 10/30/19

Harvest Equipment: Plot combine

% Standard Moisture: 13.0

Harvested Width: 7 FT

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth Entry Date: 12/03/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 20

Tillage Type: NOTILL no-till

Replications: 3

Study Design: FACTOR Factorial

**Field Prep./Maintenance:**

Early PrePlant applications of Roundup PowerMax (1.5 qt/A) + Liberty 280 (1 qt) + Outlook (12 fl.oz/A) on 05/23/19 and Roundup PowerMax (1.5 qt/A) + Liberty 280 (1 qt) on 06/06/19.

**Soil Description**

Description Name: Field 3

% Sand: 80

% OM: 0.8

Texture: LS

loamy sand

% Silt: 12

pH: 6.6

Soil Name: Rockawalkin loamy sand, 0-2% slopes

% Clay: 8

CEC: 4.0

Fert. Level: E

excellent

Soil Drainage: F

fair

**Application Description**

	A	B	C	D
Application Date	06/06/19	07/09/19	07/12/19	07/25/19
Appl. Stop Time	11:10 AM	10:45 AM	12:30 PM	12:15 PM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	4WAP	16" Palmer	+7 days
Application Placement	BROADC	BROADC	BROADC	BROADC
Applied By	VanGessel	Volmer	VanGessel	VanGessel
Appl. Entry Date	12/13/19	12/13/19	12/13/19	12/13/19
Air Temperature Start, Stop	80 80 F	82 82 F	82 85 F	85 85 F
% Relative Humidity Start, Stop	68 68	63 63	74 68	46 46
Wind Velocity+Dir. Start	3 mph	2 mph	2 mph	3 mph
Wind Velocity+Dir. Stop	3 mph	2 mph	9 mph WNW	3 mph
Wind Velocity+Dir. Max	3 mph	2 mph	9 mph WNW	3 mph
Wet Leaves (Y/N)	N no	N no	N no	N no
Soil Temperature	80 F	81 F	83 F	85 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	64	0	28	29
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.9 IN	0.33 IN	0.14 IN	0.31 IN

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-3	30	33	46
Stage Scale Used		DESC	DESC	DESC
Stage Majority, Percent		V2-3 100	veg 100	R1 100
Height Average		6 in	15 in	22 in

**Pest Stage At Each Application**

	A	B	C	D
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent			veg 100	veg 100
Height Average			13 in	24 in
Height Minimum, Maximum			10 16	12 30
Density Average			10 plot	10 plot
Density Min, Max			2 75	2 75

**Application Equipment**

	A	B	C	D
Appl. Equipment	Bckpck4Nozl	Bckpck4Nozl	Bckpck4Nozl	Bckpck4Nozl
Equipment Type	SPRBAC	SPRBAC	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi	31 psi	31 psi
Nozzle Type	AIRMX/TTI	AIRMX/TTI	AIRMX/TTI	AIRMX/TTI
Nozzle Size	11002	11002	11002	11002
Nozzle Spacing	18 in	18 in	18 in	18 in
Boom Length	6 ft	6 ft	6 ft	6 ft
Boom Height	18 in	24 in	32 in	40 in
Ground Speed	3 mph	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	05/14/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	09/27/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

#### Trial Comments

07/12/19: Palmer amaranth plants are larger (14-16") and more dense in rep 1 than reps 2 & 3 (10-12"). AirMix tips were used for Liberty and Reflex treatments; TTI tips were used for Enlist and Engenia treatments.

07/25/19: TTI tips were used for Enlist and Engenia treatments; AirMix tips were used for other treatments. Palmer amaranth was injured from first POST applications. Most Palmer plants were less than 16 inches tall.

08/03/19: Treatments with Enlist herbicide have no soybeans so these treatments lack crop competition, thus control is lower than treatments where soybeans are present. Treatments 6 and 19 had chlorotic leaves on the new leaves that have developed since 2nd application; but no stunting unless noted (i.e. Cobra).

08/26/19: Ratings based on biomass above canopy.

09/27/19: Palmer amaranth counts at or above crop canopy. 5 largest plants cut and separated by male / female.

Management of large Palmer amaranth plants in soybeans		Trial ID: DSB1-19	Location: Field #3	Trial Year: 2019
Protocol ID: DSB1-19		Investigator: Mark VanGessel		
Study Director:				
Sponsor Contact: Delaware Soybean Board				

Pest Code	C	GLXMA	AMAPA C -	AMAPA C -						
Crop Type, Code	Soybean		PalmerAm	PalmerAm						
Description	Stunting %		Control %	Control %						
Rating Type	08/03/18		08/03/18	08/26/18						
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Single Application									
	Engenia.....dicamba	5 SL		0.5 lb ae/a		16"	Palmer C	0.0 c	79.3 efg	99.0 a
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v		16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C			
2	Single Application							99.0 a	75.0 g	
	Enlist Duo Premix	3.34 SL		2 lb ae/a		16"	Palmer C			
	----2,4-D choline	1.63		0.98						
	----glyphosate	1.71		1.02						
3	Single Application							0.2 c	80.0 efg	73.3 d
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a		16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C			
4	Single Application							0.0 c	75.0 g	75.0 cd
	Reflex.....fomesafen	2 L		0.375 lb ai/a		16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v		16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C			
5	Single Application							0.0 c	83.3 c-g	71.0 d
	Flexstar GT Premix	3.3 L		1.86 lb ai/a		16"	Palmer C			
	----fomesafen	0.66		0.372						
	----glyphosate	2.64		1.49						
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C			
6	1st Application							0.0 c	87.3 a-e	99.0 a
	Engenia.....dicamba	5 SL		0.5 lb ae/a		16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v		16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C			
	Sequential Application									
	Engenia.....dicamba	5 SL		0.5 lb ae/a	+7 days	D				
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	+7 days	D				
	Nonionic Surfactant	100 L		0.25 % v/v	+7 days	D				
	Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days	D				
7	1st Application							99.0 a	91.0 a-d	70.7 d
	Enlist Duo Premix	3.34 SL		2 lb ae/a	16"	Palmer C				
	----2,4-D choline	1.63		0.98						
	----glyphosate	1.71		1.02						
	Sequential Application									
	Enlist Duo Premix	3.34 SL		2 lb ae/a	+7 days	D				
	----2,4-D choline	1.63		0.98						
	----glyphosate	1.71		1.02						

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm	AMAPA C - PalmerAm			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code		
1	Single Application								
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer C		2.0 d	2.0 cd
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
2	Single Application							211.7 a	5.0 a
	Enlist Duo Premix	3.34 SL		2 lb ae/a	16"	Palmer C			
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					
3	Single Application							49.3 bcd	5.0 a
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
4	Single Application							29.7 bcd	5.0 a
	Reflex.....fomesafen	2 L		0.375 lb ai/a	16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
5	Single Application							24.7 bcd	4.3 ab
	Flexstar GT Premix	3.3 L		1.86 lb ai/a	16"	Palmer C			
	----fomesafen	0.66		0.372					
	----glyphosate	2.64		1.49					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
6	1st Application							0.7 d	2.0 cd
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
	Sequential Application								
	Engenia.....dicamba	5 SL		0.5 lb ae/a	+7 days	D			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	+7 days	D			
	Nonionic Surfactant	100 L		0.25 % v/v	+7 days	D			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days	D			
7	1st Application							90.0 b	5.0 a
	Enlist Duo Premix	3.34 SL		2 lb ae/a	16"	Palmer C			
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					
	Sequential Application								
	Enlist Duo Premix	3.34 SL		2 lb ae/a	+7 days	D			
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code Crop Type, Code		AMAPA C -						
Description Rating Type Rating Unit Rating Date		PalmerAm Wt/plant grams 09/27/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
1	Single Application							7.356889624577780 cde
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C		
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C		
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C		
2	Single Application							23.066668973333300 ab
	Enlist Duo Premix	3.34 SL		2 lb ae/a	16"	Palmer C		
	----2,4-D choline	1.63		0.98				
	----glyphosate	1.71		1.02				
3	Single Application							4.385333771866670 de
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	16"	Palmer C		
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C		
4	Single Application							7.066667373333330 cde
	Reflex.....fomesafen	2 L		0.375 lb ai/a	16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C		
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C		
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C		
5	Single Application							4.663467133013330 de
	Flexstar GT Premix	3.3 L		1.86 lb ai/a	16"	Palmer C		
	----fomesafen	0.66		0.372				
	----glyphosate	2.64		1.49				
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C		
6	1st Application							1.475500147550000 e
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C		
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C		
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C		
	Sequential Application							
	Engenia.....dicamba	5 SL		0.5 lb ae/a	+7 days	D		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	+7 days	D		
	Nonionic Surfactant	100 L		0.25 % v/v	+7 days	D		
	Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days	D		
7	1st Application							14.680001468000000 bcd
	Enlist Duo Premix	3.34 SL		2 lb ae/a	16"	Palmer C		
	----2,4-D choline	1.63		0.98				
	----glyphosate	1.71		1.02				
	Sequential Application							
	Enlist Duo Premix	3.34 SL		2 lb ae/a	+7 days	D		
	----2,4-D choline	1.63		0.98				
	----glyphosate	1.71		1.02				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -						
Description		PalmerAm TtlSeedWt grams	PalmerAm seed/0.5g #						
Rating Type		09/27/19	09/27/19						
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Single Application							2.0307 d	784.0 abc
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
2	Single Application							5.0907 bcd	1208.7 a
	Enlist Duo Premix	3.34 SL		2 lb ae/a	16"	Palmer C			
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					
3	Single Application							3.2790 bcd	959.3 abc
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
4	Single Application							4.5163 bcd	581.0 c
	Reflex.....fomesafen	2 L		0.375 lb ai/a	16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
5	Single Application							1.9637 d	1126.3 ab
	Flexstar GT Premix	3.3 L		1.86 lb ai/a	16"	Palmer C			
	----fomesafen	0.66		0.372					
	----glyphosate	2.64		1.49					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
6	1st Application							0.0000 d	0.0 e
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C			
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
	Sequential Application								
	Engenia.....dicamba	5 SL		0.5 lb ae/a	+7 days	D			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	+7 days	D			
	Nonionic Surfactant	100 L		0.25 % v/v	+7 days	D			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days	D			
7	1st Application							11.9977 ab	931.7 abc
	Enlist Duo Premix	3.34 SL		2 lb ae/a	16"	Palmer C			
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					
	Sequential Application								
	Enlist Duo Premix	3.34 SL		2 lb ae/a	+7 days	D			
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code Crop Type, Code		AMAPA C - C	GLXMA						
Description		PalmerAm Seeds/plnt #	Soybean Yield Bu/A						
Rating Type		09/27/19	10/30/19						
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Appl Timing	Appl Code		
1	Single Application								
	Engenia.....dicamba	5 SL		0.5 lb ae/a		16"	Palmer C	2233.44022334400000 a	19.6 a
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		16"	Palmer C		
	Nonionic Surfactant	100 L		0.25 % v/v		16"	Palmer C		
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C		
2	Single Application							3188.67851886782000 a	
	Enlist Duo Premix	3.34 SL		2 lb ae/a		16"	Palmer C		
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					
3	Single Application							1983.09419830940000 a	21.4 a
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a		16"	Palmer C		
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C		
4	Single Application							1885.19032185235000 a	22.4 a
	Reflex.....fomesafen	2 L		0.375 lb ai/a		16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		16"	Palmer C		
	Nonionic Surfactant	100 L		0.25 % v/v		16"	Palmer C		
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C		
5	Single Application							1827.30440495264000 a	23.7 a
	Flexstar GT Premix	3.3 L		1.86 lb ai/a		16"	Palmer C		
	----fomesafen	0.66		0.372					
	----glyphosate	2.64		1.49					
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C		
6	1st Application							0.0000000000000000 a	24.7 a
	Engenia.....dicamba	5 SL		0.5 lb ae/a		16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		16"	Palmer C		
	Nonionic Surfactant	100 L		0.25 % v/v		16"	Palmer C		
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C		
	Sequential Application								
	Engenia.....dicamba	5 SL		0.5 lb ae/a		+7 days	D		
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		+7 days	D		
	Nonionic Surfactant	100 L		0.25 % v/v		+7 days	D		
	Dry Ammonium Sulfate	100 D		1.02 % w/v		+7 days	D		
7	1st Application							7218.16005514927000 a	
	Enlist Duo Premix	3.34 SL		2 lb ae/a		16"	Palmer C		
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					
	Sequential Application								
	Enlist Duo Premix	3.34 SL		2 lb ae/a		+7 days	D		
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=1,3; Average=7,10,14

## University of Delaware

Pest Code Crop Type, Code		C	GLXMA	AMAPA C -	AMAPA C -
Description		Soybean	PalmerAm	PalmerAm	
Rating Type		Stunting %	Control %	Control %	
Rating Unit		08/03/18	08/03/18	08/26/18	
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
8	1st Application				
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16"	Palmer C
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
	Sequential Application				
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	+7 days	D
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D
9	1st Application				
	Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C
	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
	Sequential Application				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D
	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	D
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D
10	1st Application				
	Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C
	----fomesafen	0.66	0.372		
	----glyphosate	2.64	1.49		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
	Sequential Application				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D
	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	D
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D
11	1st Application				
	Sequential + Cobra				
	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D
	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D
	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C
	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
12	1st Application				
	Sequential + Cobra				
	Enlist Duo Premix	3.34 SL	2 lb ae/a	+7 days	D
	----2,4-D choline	1.63	0.98		
	----glyphosate	1.71	1.02		
	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D
	Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C
	----2,4-D choline	1.63	0.98		
	----glyphosate	1.71	1.02		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

## University of Delaware

Pest Code Crop Type, Code	Description	AMAPA C -	AMAPA C -						
Rating Type		Count # plot	TtlPlant #						
Rating Unit		09/27/19	09/27/19						
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
8	1st Application								
	Liberty 280....glufosinate	2.34	SL	0.585 lb ai/a		16"	Palmer C	7.0 cd	5.0 a
	Dry Ammonium Sulfate	100	D	1.02 % w/v		16"	Palmer C		
	Sequential Application								
	Liberty 280....glufosinate	2.34	SL	0.585 lb ai/a	+7 days		D		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	+7 days		D		
9	1st Application							22.0 bcd	4.3 ab
	Reflex.....fomesafen	2	L	0.375 lb ai/a		16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a		16"	Palmer C		
	Nonionic Surfactant	100	L	0.25 % v/v		16"	Palmer C		
	Dry Ammonium Sulfate	100	D	1.02 % w/v		16"	Palmer C		
	Sequential Application								
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	+7 days		D		
	Nonionic Surfactant	100	L	0.25 % v/v	+7 days		D		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	+7 days		D		
10	1st Application							19.0 bcd	4.0 ab
	Flexstar GT Premix	3.3	L	1.86 lb ai/a		16"	Palmer C		
	----fomesafen	0.66		0.372					
	----glyphosate	2.64		1.49					
	Dry Ammonium Sulfate	100	D	1.02 % w/v		16"	Palmer C		
	Sequential Application								
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	+7 days		D		
	Nonionic Surfactant	100	L	0.25 % v/v	+7 days		D		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	+7 days		D		
11	1st Application							1.0 d	3.0 bc
	Sequential + Cobra								
	Engenia.....dicamba	5	SL	0.5 lb ae/a	+7 days		D		
	Cobra.....lactofen	2	EC	0.195 lb ai/a	+7 days		D		
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	+7 days		D		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	+7 days		D		
	Crop Oil Concentrate	100	L	4.7 qt/100 gal	+7 days		D		
	Engenia.....dicamba	5	SL	0.5 lb ae/a		16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a		16"	Palmer C		
	Nonionic Surfactant	100	L	0.25 % v/v		16"	Palmer C		
	Dry Ammonium Sulfate	100	D	1.02 % w/v		16"	Palmer C		
12	1st Application							25.3 bcd	5.0 a
	Sequential + Cobra								
	Enlist Duo Premix	3.34	SL	2 lb ae/a	+7 days		D		
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					
	Cobra.....lactofen	2	EC	0.195 lb ai/a	+7 days		D		
	Crop Oil Concentrate	100	L	4.7 qt/100 gal	+7 days		D		
	Enlist Duo Premix	3.34	SL	2 lb ae/a		16"	Palmer C		
	----2,4-D choline	1.63		0.98					
	----glyphosate	1.71		1.02					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code Crop Type, Code		AMAPA C -						
Description		PalmerAm						
Rating Type		Wt/plant						
Rating Unit		grams						
Rating Date		09/27/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
8	1st Application							5.759400575940000 de
	Liberty 280....glufosinate	2.34	SL	0.585 lb ai/a	16"	Palmer C		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	16"	Palmer C		
	Sequential Application							
	Liberty 280....glufosinate	2.34	SL	0.585 lb ai/a	+7 days	D		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	+7 days	D		
9	1st Application							3.609022583124450 de
	Reflex.....fomesafen	2	L	0.375 lb ai/a	16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	16"	Palmer C		
	Nonionic Surfactant	100	L	0.25 % v/v	16"	Palmer C		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	16"	Palmer C		
	Sequential Application							
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	+7 days	D		
	Nonionic Surfactant	100	L	0.25 % v/v	+7 days	D		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	+7 days	D		
10	1st Application							4.652167131883330 de
	Flexstar GT Premix	3.3	L	1.86 lb ai/a	16"	Palmer C		
	----fomesafen	0.66		0.372				
	----glyphosate	2.64		1.49				
	Dry Ammonium Sulfate	100	D	1.02 % w/v	16"	Palmer C		
	Sequential Application							
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	+7 days	D		
	Nonionic Surfactant	100	L	0.25 % v/v	+7 days	D		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	+7 days	D		
11	1st Application							5.333333866666660 de
	Sequential + Cobra							
	Engenia.....dicamba	5	SL	0.5 lb ae/a	+7 days	D		
	Cobra.....lactofen	2	EC	0.195 lb ai/a	+7 days	D		
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	+7 days	D		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	+7 days	D		
	Crop Oil Concentrate	100	L	4.7 qt/100 gal	+7 days	D		
	Engenia.....dicamba	5	SL	0.5 lb ae/a	16"	Palmer C		
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	16"	Palmer C		
	Nonionic Surfactant	100	L	0.25 % v/v	16"	Palmer C		
	Dry Ammonium Sulfate	100	D	1.02 % w/v	16"	Palmer C		
12	1st Application							28.200002820000000 a
	Sequential + Cobra							
	Enlist Duo Premix	3.34	SL	2 lb ae/a	+7 days	D		
	----2,4-D choline	1.63		0.98				
	----glyphosate	1.71		1.02				
	Cobra.....lactofen	2	EC	0.195 lb ai/a	+7 days	D		
	Crop Oil Concentrate	100	L	4.7 qt/100 gal	+7 days	D		
	Enlist Duo Premix	3.34	SL	2 lb ae/a	16"	Palmer C		
	----2,4-D choline	1.63		0.98				
	----glyphosate	1.71		1.02				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -						
Description		PalmerAm	PalmerAm						
Rating Type		TtlSeedWt	seed/0.5g						
Rating Unit		grams	#						
Rating Date		09/27/19	09/27/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
8	1st Application								
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a		16"	Palmer C		3.5727 bcd	948.0 abc
	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C			
	Sequential Application								
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	+7 days	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
9	1st Application							1.5283 d	633.0 c
	Reflex.....fomesafen	2 L	0.375 lb ai/a		16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a		16"	Palmer C			
	Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer C			
	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C			
	Sequential Application								
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
10	1st Application							1.7633 d	979.7 abc
	Flexstar GT Premix	3.3 L	1.86 lb ai/a		16"	Palmer C			
	----fomesafen	0.66	0.372						
	----glyphosate	2.64	1.49						
	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C			
	Sequential Application								
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
11	1st Application							0.1850 d	58.3 de
	Sequential + Cobra								
	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D				
	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D				
	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C				
	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
12	1st Application							11.5610 abc	782.0 abc
	Sequential + Cobra								
	Enlist Duo Premix	3.34 SL	2 lb ae/a	+7 days	D				
	----2,4-D choline	1.63	0.98						
	----glyphosate	1.71	1.02						
	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D				
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D				
	Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C				
	----2,4-D choline	1.63	0.98						
	----glyphosate	1.71	1.02						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - C	GLXMA			
					PalmerAm Seeds/plnt # 09/27/19	Soybean Yield Bu/A 10/30/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
8	1st Application								
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a		16"	Palmer C			
	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C			
	Sequential Application								
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a		+7 days	D			
	Dry Ammonium Sulfate	100 D	1.02 % w/v		+7 days	D			
9	1st Application								
	Reflex.....fomesafen	2 L	0.375 lb ai/a		16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a		16"	Palmer C			
	Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer C			
	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C			
	Sequential Application								
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a		+7 days	D			
	Nonionic Surfactant	100 L	0.25 % v/v		+7 days	D			
	Dry Ammonium Sulfate	100 D	1.02 % w/v		+7 days	D			
10	1st Application								
	Flexstar GT Premix	3.3 L	1.86 lb ai/a		16"	Palmer C			
	----fomesafen	0.66	0.372						
	----glyphosate	2.64	1.49						
	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C			
	Sequential Application								
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a		+7 days	D			
	Nonionic Surfactant	100 L	0.25 % v/v		+7 days	D			
	Dry Ammonium Sulfate	100 D	1.02 % w/v		+7 days	D			
11	1st Application								
	Sequential + Cobra								
	Engenia.....dicamba	5 SL	0.5 lb ae/a		+7 days	D			
	Cobra.....lactofen	2 EC	0.195 lb ai/a		+7 days	D			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a		+7 days	D			
	Dry Ammonium Sulfate	100 D	1.02 % w/v		+7 days	D			
	Crop Oil Concentrate	100 L	4.7 qt/100 gal		+7 days	D			
	Engenia.....dicamba	5 SL	0.5 lb ae/a		16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a		16"	Palmer C			
	Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer C			
	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C			
12	1st Application								
	Sequential + Cobra								
	Enlist Duo Premix	3.34 SL	2 lb ae/a		+7 days	D			
	----2,4-D choline	1.63	0.98						
	----glyphosate	1.71	1.02						
	Cobra.....lactofen	2 EC	0.195 lb ai/a		+7 days	D			
	Crop Oil Concentrate	100 L	4.7 qt/100 gal		+7 days	D			
	Enlist Duo Premix	3.34 SL	2 lb ae/a		16"	Palmer C			
	----2,4-D choline	1.63	0.98						
	----glyphosate	1.71	1.02						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

## University of Delaware

Pest Code	Crop Type, Code		C GLXMA	AMAPA C -	AMAPA C -				
Description		Soybean	PalmerAm	PalmerAm					
Rating Type		Stunting %	Control %	Control %					
Rating Unit		08/03/18	08/03/18	08/26/18					
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit				
					Appl Timing				
					Appl Code				
13	1st Application Sequential + Cobra Liberty 280....glufosinate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D 2 EC 100 L 2.34 SL 100 D	SL 100 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.585 lb ai/a 1.02 % w/v	0.585 lb ai/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.585 lb ai/a 1.02 % w/v	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C	D D D D Palmer C Palmer C			
14	1st Application Sequential + Cobra Roundup PowerMax..glyphosate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	4.5 AS 100 D 2 EC 100 L 2 L 4.5 AS 100 L 100 D	AS 100 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	1.13 lb ae/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.375 lb ai/a 1.13 lb ae/a 16" Palmer C 16" Palmer C	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C 16" Palmer C 16" Palmer C	D D D D Palmer C Palmer C Palmer C Palmer C			
15	1st Application Sequential + Cobra Roundup PowerMax..glyphosate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Flexstar GT Premix ----fomesafen ----glyphosate Dry Ammonium Sulfate	4.5 AS 100 D 2 EC 100 L 3.3 L 0.66 2.64 100 D	AS 100 % w/v 0.195 lb ai/a 4.7 qt/100 gal 1.86 lb ai/a 0.372 1.49 1.02 % w/v	1.13 lb ae/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 1.86 lb ai/a 0.372 1.49 1.02 % w/v	+7 days +7 days +7 days +7 days 16" Palmer C	D D D D Palmer C			
16	Untreated Check								
17	Liberty 280....glufosinate Enlist One.....2,4-D choline Dry Ammonium Sulfate	2.34 SL 3.8 SL 100 D	SL SL D	0.585 lb ai/a 0.95 lb ae/a 1.02 % w/v	16" Palmer C 16" Palmer C 16" Palmer C		99.0 a	82.3 d-g	55.0 e
18	Authority Elite Premix ----sulfentrazone ----s-metolachlor Reflex.....fomesafen Roundup PowerMax..glyphosate	7 EC 0.7 6.3 2 L 4.5 AS	EC 0.164 1.48 0.375 lb ai/a 1.13 lb ae/a	1.64 lb ai/a 0.164 1.48 0.375 lb ai/a 1.13 lb ae/a	PRE 4WAP 4WAP	A B B	2.3 c	96.3 a	99.0 a
19	Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Engenia.....dicamba Cobra.....lactofen Crop Oil Concentrate	5 SL 4.5 AS 100 L 100 D 5 SL 2 EC 100 L	SL AS L D SL EC L	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 0.5 lb ae/a 0.195 lb ai/a 4.7 qt/100 gal	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C 16" Palmer C	D D D D Palmer C Palmer C Palmer C	16.3 b	92.3 abc	99.0 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

## University of Delaware

Pest Code Crop Type, Code	Description	AMAPA C - PalmerAm	AMAPA C - PalmerAm						
Rating Type		Count # plot	TtlPlant #						
Rating Unit		09/27/19	09/27/19						
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
13	1st Application Sequential + Cobra							9.7 cd	5.0 a
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	+7 days	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D				
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D				
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C					
14	1st Application Sequential + Cobra							18.3 bcd	5.0 a
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D				
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D				
	Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C					
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C					
	Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C					
15	1st Application Sequential + Cobra							15.3 bcd	5.0 a
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D				
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D				
	Flexstar GT Premix	3.3 L	1.86 lb ai/a	16" Palmer C					
	----fomesafen	0.66	0.372						
	----glyphosate	2.64	1.49						
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C					
16	Untreated Check							23.7 bcd	3.7 abc
17	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C				77.7 bc	4.3 ab
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	16" Palmer C					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C					
18	Authority Elite Premix	7 EC	1.64 lb ai/a	PRE	A			0.3 d	1.0 d
	----sulfentrazone	0.7	0.164						
	----s-metolachlor	6.3	1.48						
	Reflex.....fomesafen	2 L	0.375 lb ai/a	4WAP	B				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4WAP	B				
19	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D			0.0 d	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
	Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C					
	Cobra.....lactofen	2 EC	0.195 lb ai/a	16" Palmer C					
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	16" Palmer C					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -			
Description		PalmerAm			
Rating Type		Wt/plant			
Rating Unit		grams			
Rating Date		09/27/19			
Trt Treatment No. Name	Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
13 1st Application Sequential + Cobra Liberty 280.....glufosinate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Liberty 280.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D 2 EC 100 L 2.34 SL 100 D	0.585 lb ai/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.585 lb ai/a 1.02 % w/v	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C	D D D D Palmer C Palmer C	3.812533714586670 de
14 1st Application Sequential + Cobra Roundup PowerMax..glyphosate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	4.5 AS 100 D 2 EC 100 L 2 L 4.5 AS 100 L 100 D	1.13 lb ae/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C 16" Palmer C 16" Palmer C	D D D D Palmer C Palmer C Palmer C Palmer C	8.420267508693330 cde
15 1st Application Sequential + Cobra Roundup PowerMax..glyphosate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Flexstar GT Premix ----fomesafen ----glyphosate Dry Ammonium Sulfate	4.5 AS 100 D 2 EC 100 L 3.3 L 0.66 2.64 100 D	1.13 lb ae/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 1.86 lb ai/a 0.372 1.49 1.02 % w/v	+7 days +7 days +7 days +7 days 16" Palmer C	D D D D Palmer C	5.361533869486670 de
16 Untreated Check					5.119267178593330 de
17 Liberty 280.....glufosinate Enlist One.....2,4-D choline Dry Ammonium Sulfate	2.34 SL 3.8 SL 100 D	0.585 lb ai/a 0.95 lb ae/a 1.02 % w/v	16" Palmer C 16" Palmer C 16" Palmer C		18.222224044444400 abc
18 Authority Elite Premix ----sulfentrazone ----s-metolachlor Reflex.....fomesafen Roundup PowerMax..glyphosate	7 EC 0.7 6.3 2 L 4.5 AS	1.64 lb ai/a 0.164 1.48 0.375 lb ai/a 1.13 lb ae/a	PRE 4WAP 4WAP	A B B	4.470000447000000 de
19 Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Engenia.....dicamba Cobra.....lactofen Crop Oil Concentrate	5 SL 4.5 AS 100 L 100 D 5 SL 2 EC 100 L	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 0.5 lb ae/a 0.195 lb ai/a 4.7 qt/100 gal	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C 16" Palmer C	D D D D Palmer C Palmer C Palmer C	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

University of Delaware							AMAPA C -	AMAPA C -
Pest Code							PalmerAm TtlSeedWt grams	PalmerAm seed/0.5g #
Crop Type, Code							09/27/19	09/27/19
Description								
Rating Type								
Rating Unit								
Rating Date								
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Unit	Appl Timing	Appl Code		
13 1st Application Sequential + Cobra Liberty 280....glufosinate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D 2 EC 100 L 2.34 SL 100 D	SL 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.585 lb ai/a 1.02 % w/v	0.585 lb ai/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.585 lb ai/a 1.02 % w/v	lb ai/a w/v lb ai/a gal lb ai/a w/v	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C	D D D D C C	1.2100 d	716.7 bc
14 1st Application Sequential + Cobra Roundup PowerMax..glyphosate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	4.5 AS 100 D 2 EC 100 L 2 L 4.5 AS 100 L 100 D	AS D EC L L AS L D	1.13 lb ae/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	lb ae/a w/v lb ai/a gal lb ai/a lb ae/a v/v w/v	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C 16" Palmer C 16" Palmer C	D D D D C C C C	3.8337 bcd	958.0 abc
15 1st Application Sequential + Cobra Roundup PowerMax..glyphosate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Flexstar GT Premix ----fomesafen ----glyphosate Dry Ammonium Sulfate	4.5 AS 100 D 2 EC 100 L 3.3 L 0.66 2.64 100 D	AS D EC L L 0.372 1.49 D	1.13 lb ae/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 1.86 lb ai/a 0.372 2.64 1.02 % w/v	lb ae/a w/v lb ai/a gal lb ai/a ---- ---- w/v	+7 days +7 days +7 days +7 days 16" Palmer C	D D D D C	2.7207 d	992.0 abc
16 Untreated Check							3.0697 cd	796.0 abc
17 Liberty 280....glufosinate Enlist One.....2,4-D choline Dry Ammonium Sulfate	2.34 SL 3.8 SL 100 D	SL SL D	0.585 lb ai/a 0.95 lb ae/a 1.02 % w/v	lb ai/a lb ae/a w/v	16" Palmer C 16" Palmer C 16" Palmer C	C C C	15.0277 a	830.0 abc
18 Authority Elite Premix ----sulfentrazone ----s-metolachlor Reflex.....fomesafen Roundup PowerMax..glyphosate	7 EC 0.7 6.3 2 L 4.5 AS	EC 0.164 6.3 L AS	1.64 lb ai/a 0.164 1.48 0.375 lb ai/a 1.13 lb ae/a	lb ai/a ---- ---- lb ai/a lb ae/a	PRE 4WAP 4WAP	A B B	0.0000 d	0.0 e
19 Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Engenia.....dicamba Cobra.....lactofen Crop Oil Concentrate	5 SL 4.5 AS 100 L 100 D 5 SL 2 EC 100 L	SL AS L D SL EC L	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 0.5 lb ae/a 0.195 lb ai/a 4.7 qt/100 gal	lb ae/a lb ae/a v/v w/v lb ae/a lb ai/a gal	+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C 16" Palmer C	D D D D C C C	0.0000 d	0.0 e

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Means followed by same letter(s) by superscript are significant at P < 0.05, LSD.

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - C	GLXMA	
					PalmerAm Seeds/plnt # 09/27/19	Soybean Yield Bu/A 10/30/19	
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
13 1st Application Sequential + Cobra Liberty 280.....glufosinate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Liberty 280.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D 2 EC 100 L 2.34 SL 100 D	0.585 lb ai/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.585 lb ai/a 1.02 % w/v		+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C		868.79497576837900 a 16.6 a	
14 1st Application Sequential + Cobra Roundup PowerMax..glyphosate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	4.5 AS 100 D 2 EC 100 L 2 L 4.5 AS 100 L 100 D	1.13 lb ae/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v		+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C 16" Palmer C 16" Palmer C		2091.74894250821000 a 19.5 a	
15 1st Application Sequential + Cobra Roundup PowerMax..glyphosate Dry Ammonium Sulfate Cobra.....lactofen Crop Oil Concentrate Flexstar GT Premix ----fomesafen ----glyphosate Dry Ammonium Sulfate	4.5 AS 100 D 2 EC 100 L 3.3 L 0.66 2.64 100 D	1.13 lb ae/a 1.02 % w/v 0.195 lb ai/a 4.7 qt/100 gal 1.86 lb ai/a 0.372 1.49 1.02 % w/v		+7 days +7 days +7 days +7 days 16" Palmer C		1379.02644901374000 a 22.0 a	
16 Untreated Check						1624.52482911913000 a 22.4 a	
17 Liberty 280.....glufosinate Enlist One.....2,4-D choline Dry Ammonium Sulfate	2.34 SL 3.8 SL 100 D	0.585 lb ai/a 0.95 lb ae/a 1.02 % w/v		16" Palmer C 16" Palmer C 16" Palmer C		5988.83139888308000 a	
18 Authority Elite Premix ----sulfentrazone ----s-metolachlor Reflex.....fomesafen Roundup PowerMax..glyphosate	7 EC 0.7 6.3 2 L 4.5 AS	1.64 lb ai/a 0.164 1.48 0.375 lb ai/a 1.13 lb ae/a		PRE A 4WAP 4WAP		0.0000000000000000 a 33.0 a	
19 Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Engenia.....dicamba Cobra.....lactofen Crop Oil Concentrate	5 SL 4.5 AS 100 L 100 D 5 SL 2 EC 100 L	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 0.5 lb ae/a 0.195 lb ai/a 4.7 qt/100 gal		+7 days +7 days +7 days +7 days 16" Palmer C 16" Palmer C 16" Palmer C			19.3 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	AMAPA C -	AMAPA C -
Description		Soybean	PalmerAm	PalmerAm
Rating Type		Stunting %	Control %	Control %
Rating Unit				
Rating Date	08/03/18	08/03/18	08/26/18	
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit
20 Flexstar GT Premix	3.3 L	1.86 lb ai/a	+7 days	Appl D
----fomesafen	0.66	0.372		
----glyphosate	2.64	1.49		
Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D
Cobra.....lactofen	2 EC	0.195 lb ai/a	16"	Palmer C
Crop Oil Concentrate	100 L	4.7 qt/100 gal	16"	Palmer C
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C
Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
LSD P=.05			4.92	9.81
Standard Deviation			2.98	5.93
CV			11.88	7.3
Replicate F			1.112	9.155
Replicate Prob(F)			0.3398	0.0006
Treatment F			502.595	35.074
Treatment Prob(F)			0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

## University of Delaware

Pest Code		AMAPA	AMAPA						
Crop Type, Code		C -	C -						
Description		PalmerAm	PalmerAm						
Rating Type		Count	TtlPlant						
Rating Unit		# plot	#						
Rating Date	09/27/19	09/27/19	09/27/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
20	Flexstar GT Premix	3.3 L		1.86 lb ai/a	+7 days	D		12.3 cd	3.0 bc
	----fomesafen	0.66		0.372					
	----glyphosate	2.64		1.49					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days	D			
	Cobra.....lactofen	2 EC		0.195 lb ai/a	16"	Palmer C			
	Crop Oil Concentrate	100 L		4.7 qt/100 gal	16"	Palmer C			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer C			
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C			
LSD P=.05								74.76	1.80
Standard Deviation								45.23	1.08
CV								141.42	26.71
Replicate F								2.396	0.423
Replicate Prob(F)								0.1047	0.6591
Treatment F								3.497	4.078
Treatment Prob(F)								0.0005	0.0004

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code					AMAPA
Crop Type, Code					C -
Description					PalmerAm
Rating Type					Wt/plant
Rating Unit					grams
Rating Date					09/27/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code
20	Flexstar GT Premix	3.3 L		1.86 lb ai/a	+7 days D
	----fomesafen	0.66		0.372	
	----glyphosate	2.64		1.49	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days D
	Cobra.....lactofen	2 EC		0.195 lb ai/a	16" Palmer C
	Crop Oil Concentrate	100 L		4.7 qt/100 gal	16" Palmer C
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16" Palmer C
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16" Palmer C
LSD P=.05					11.3174989568891000
Standard Deviation					6.7772579268779200
CV					79.44
Replicate F					2.880
Replicate Prob(F)					0.0723
Treatment F					3.401
Treatment Prob(F)					0.0017

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

## University of Delaware

Pest Code		AMAPA C -	AMAPA C -						
Crop Type, Code									
Description		PalmerAm	PalmerAm						
Rating Type		TtlSeedWt	seed/0.5g						
Rating Unit		grams	#						
Rating Date		09/27/19	09/27/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
20	Flexstar GT Premix	3.3 L	1.86 lb ai/a	+7 days	D	0.7570 d	510.7 cd		
	----fomesafen	0.66	0.372						
	----glyphosate	2.64	1.49						
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
	Cobra.....lactofen	2 EC	0.195 lb ai/a	16"	Palmer C				
	Crop Oil Concentrate	100 L	4.7 qt/100 gal	16"	Palmer C				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
LSD P=.05						8.81221	490.70		
Standard Deviation						5.33133	296.87		
CV						143.88	43.04		
Replicate F						1.997	4.128		
Replicate Prob(F)						0.1497	0.0239		
Treatment F						1.920	5.065		
Treatment Prob(F)						0.0429	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Pest Code			AMAPA	C	-	C	GLXMA
Crop Type, Code			PalmerAm			Soybean	
Description			Seeds/plnt			Yield	
Rating Type			#			Bu/A	
Rating Unit			09/27/19			10/30/19	
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
20	Flexstar GT Premix	3.3 L		1.86 lb ai/a		+7 days	D
	----fomesafen	0.66		0.372			
	----glyphosate	2.64		1.49			
	Dry Ammonium Sulfate	100 D		1.02 % w/v		+7 days	D
	Cobra.....lactofen	2 EC		0.195 lb ai/a		16" Palmer	C
	Crop Oil Concentrate	100 L		4.7 qt/100 gal		16" Palmer	C
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		16" Palmer	C
	Dry Ammonium Sulfate	100 D		1.02 % w/v		16" Palmer	C
LSD P=.05						4703.222113188460000	12.62
Standard Deviation						2816.430509063260000	7.57
CV						124.44	31.7
Replicate F						1.540	6.110
Replicate Prob(F)						0.2313	0.0059
Treatment F						1.675	1.104
Treatment Prob(F)						0.1049	0.3937

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,3; Average=7,10,14

Management of large Palmer amaranth plants in soybeans

Trial ID: DSB1-19

Location: Field #3

Trial Year: 2019

Protocol ID: DSB1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Delaware Soybean Board

Pest Code Crop Type, Code		C GLXMA	AMAPA C -	AMAPA C -
Description	Soybean	PalmerAm	PalmerAm	
Rating Type	Stunting	Control	Control	
Rating Unit	%	%	%	
Rating Date	08/03/18	08/03/18	08/26/18	
Trt No. Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
TABLE OF R MEANS				
Replicate 1			24.5	80.7
Replicate 2			24.6	84.3
Replicate 3			24.8	89.1
TABLE OF A (Application) MEANS				
1 Single Application			19.8 b	78.5 b
2 1st Application			21.3 b	85.6 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C	
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
2 Sequential Application				
3 1st Application			32.8 a	89.9 a
3 Sequential + Cobra				
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D
LSD P=.05			2.02	4.76
Standard Deviation			2.69	6.36
CV			10.92	7.51
TABLE OF B (Base herbicide) MEANS				
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C	
1 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C	
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16" Palmer C	
2 ----2,4-D choline	1.63	0.98		
2 ----glyphosate	1.71	1.02		
3 Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C	
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C	
4 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C	
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
5 Flexstar GT Premix	3.3 L	1.86 lb ai/a	16" Palmer C	
5 ----fomesafen	0.66	0.372		
5 ----glyphosate	2.64	1.49		
5 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
LSD P=.05			2.60	6.14
Standard Deviation			2.69	6.36
CV			10.92	7.51

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code		AMAPA	AMAPA						
Crop Type, Code		C -	C -						
Description		PalmerAm	PalmerAm						
Rating Type		Count	TtlPlant						
Rating Unit		# plot	#						
Rating Date	09/27/19	09/27/19	09/27/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
<b>TABLE OF R MEANS</b>									
Replicate 1									
59.4 4.3									
Replicate 2									
18.1 4.3									
Replicate 3									
27.7 4.4									
<b>TABLE OF A (Application) MEANS</b>									
1 Single Application									
63.5 a 4.3 a									
2 1st Application									
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C			27.7 b	4.1 a	
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C					
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C					
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C					
2 Sequential Application									
3 1st Application							13.9 b	4.6 a	
3 Sequential + Cobra									
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D					
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D					
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D					
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D					
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D					
LSD P=.05							34.71	0.56	
Standard Deviation							46.40	0.74	
CV							132.40	17.17	
<b>TABLE OF B (Base herbicide) MEANS</b>									
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C			1.2 b	2.3 b	
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C					
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C					
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C					
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C			109.0 a	5.0 a	
2 ----2,4-D choline	1.63	0.98							
2 ----glyphosate	1.71	1.02							
3 Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	16"	Palmer C			22.0 b	5.0 a	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C					
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C			23.3 b	4.8 a	
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C					
4 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C					
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C					
5 Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C			19.7 b	4.4 a	
5 ----fomesafen	0.66	0.372							
5 ----glyphosate	2.64	1.49							
5 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C					
LSD P=.05							44.81	0.72	
Standard Deviation							46.40	0.74	
CV							132.40	17.17	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -				
Description Rating Type		PalmerAm Wt/plant	PalmerAm TtlSeedWt				
Rating Unit Rating Date		grams 09/27/19	grams 09/27/19				
Trt No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
TABLE OF R MEANS							
Replicate 1						11.270316682587100	4.4343
Replicate 2						8.512416406797110	4.3807
Replicate 3						5.785825023026890	2.2356
TABLE OF A (Application) MEANS							
1 Single Application						9.307805375224890 a	3.3761 a
2 1st Application						6.035218381299550 a	3.7724 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C			
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2 Sequential Application							
3 1st Application						10.225534355886700 a	3.9021 a
3 Sequential + Cobra							
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D			
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D			
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D			
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D			
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D			
LSD P=.05						5.3624553907515800	3.22457
Standard Deviation						7.1155090558641000	4.31109
CV						83.4874192294923000	117.03745
TABLE OF B (Base herbicide) MEANS							
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C		4.721907879598150 b	0.7386 b
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C		21.982224420444400 a	9.5498 a
2 ----2,4-D choline	1.63	0.98					
2 ----glyphosate	1.71	1.02					
3 Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16"	Palmer C		4.652422687464450 b	2.6872 b
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C		6.365319155050370 b	3.2928 b
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
4 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
5 Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C		4.892389378127780 b	2.1492 b
5 ----fomesafen	0.66	0.372					
5 ----glyphosate	2.64	1.49					
5 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
LSD P=.05						6.9229001410536900	4.16291
Standard Deviation						7.1155090558641000	4.31109
CV						83.4874192294923000	117.03745

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		AMAPA C - PalmerAm seed/0.5g # 09/27/19	AMAPA C - PalmerAm Seeds/plnt # 09/27/19	
Description				
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Unit	Appl Timing Appl Code	
TABLE OF R MEANS				
Replicate 1		822.3	2565.29273652925000	
Replicate 2		847.5	2818.46813962456000	
Replicate 3		662.0	1494.09223829810000	
TABLE OF A (Application) MEANS				
1 Single Application		931.9 a	2223.54153346524000 a	
2 1st Application		698.5 a	2448.22670704487000 a	
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C	
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
2 Sequential Application				
3 1st Application		701.4 a	2206.08487394180000 a	
3 Sequential + Cobra				
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days D	
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days D	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days D	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days D	
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days D	
LSD P=.05		219.79	2117.582028074340000	
Standard Deviation		293.85	2809.846049868240000	
CV		37.81	122.560613788716000	
TABLE OF B (Base herbicide) MEANS				
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C	
1 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C	
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16" Palmer C	
2 ----2,4-D choline	1.63	0.98		
2 ----glyphosate	1.71	1.02		
3 Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C	
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C	
4 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C	
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
5 Flexstar GT Premix	3.3 L	1.86 lb ai/a	16" Palmer C	
5 ----fomesafen	0.66	0.372		
5 ----glyphosate	2.64	1.49		
5 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
LSD P=.05		283.75	2733.786642986680000	
Standard Deviation		293.85	2809.846049868240000	
CV		37.81	122.560613788716000	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code					C GLXMA
Crop Type, Code					Soybean Yield Bu/A
Description					10/30/19
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
TABLE OF R MEANS					
Replicate 1					28.0
Replicate 2					23.8
Replicate 3					18.6
TABLE OF A (Application) MEANS					
1 Single Application					21.8 a
2 1st Application					27.6 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C	
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C	
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
2 Sequential Application					
3 1st Application					21.0 a
3 Sequential + Cobra					
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D	
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D	
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D	
LSD P=.05					6.21
Standard Deviation					8.19
CV					34.90
TABLE OF B (Base herbicide) MEANS					
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C	23.5 a
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C	
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C	
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C	.
2 ----2,4-D choline	1.63	0.98			
2 ----glyphosate	1.71	1.02			
3 Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	16"	Palmer C	20.8 a
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C	23.7 a
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C	
4 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C	
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
5 Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C	26.0 a
5 ----fomesafen	0.66	0.372			
5 ----glyphosate	2.64	1.49			
5 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
LSD P=.05					8.01
Standard Deviation					8.19
CV					34.90

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		C	GLXMA	AMAPA C -	AMAPA C -
Description		Soybean	PalmerAm	PalmerAm	
Rating Type		Stunting	Control	Control	
Rating Unit		%	%	%	
Rating Date	08/03/18	08/03/18	08/26/18		
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
					Code
<b>TABLE OF A (Application) B (Base herbicide) MEANS</b>					
1 Single Application					
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C	0.0 c
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C	
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C	
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
2 1st Application					
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C	0.0 c
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C	
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
2 Sequential Application					
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C	
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C	
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C	
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
3 1st Application					
3 Sequential + Cobra					
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D	15.0 b
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D	
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D	
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C	
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C	
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C	
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
1 Single Application					
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C	99.0 a
2 ----2,4-D choline	1.63	0.98			75.0 a
2 ----glyphosate	1.71	1.02			.
2 1st Application					
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C	99.0 a
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C	
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C	
2 Sequential Application					
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C	
2 ----2,4-D choline	1.63	0.98			
2 ----glyphosate	1.71	1.02			
3 1st Application					
3 Sequential + Cobra					
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D	99.0 a
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D	
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D	
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C	
2 ----2,4-D choline	1.63	0.98			
2 ----glyphosate	1.71	1.02			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -					
Description	PalmerAm	PalmerAm						
Rating Type	Count	TtlPlant						
Rating Unit	# plot	#						
Rating Date	09/27/19	09/27/19						
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
<b>TABLE OF A (Application) B (Base herbicide) MEANS</b>								
1 Single Application							2.0 a	2.0 a
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C				
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C				
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C				
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
2 1st Application							0.7 a	2.0 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C				
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C				
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C				
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
2 Sequential Application								
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C				
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C				
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C				
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
3 1st Application							1.0 a	3.0 a
3 Sequential + Cobra								
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D				
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D				
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D				
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C				
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C				
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C				
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
1 Single Application							211.7 a	5.0 a
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C				
2 ----2,4-D choline	1.63	0.98						
2 ----glyphosate	1.71	1.02						
2 1st Application							90.0 a	5.0 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C				
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C				
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C				
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
2 Sequential Application								
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C				
2 ----2,4-D choline	1.63	0.98						
2 ----glyphosate	1.71	1.02						
3 1st Application							25.3 a	5.0 a
3 Sequential + Cobra								
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D				
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D				
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D				
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C				
2 ----2,4-D choline	1.63	0.98						
2 ----glyphosate	1.71	1.02						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -				
Description		PalmerAm	PalmerAm				
Rating Type		Wt/plant	TtlSeedWt				
Rating Unit		grams	grams				
Rating Date		09/27/19	09/27/19				
Trt No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
TABLE OF A (Application) B (Base herbicide) MEANS							
1 Single Application							
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C		7.356889624577780 a	2.0307 a
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2 1st Application						1.475500147550000 a	0.0000 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C			
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2 Sequential Application							
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C			
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
3 1st Application						5.3333338666666660 a	0.1850 a
3 Sequential + Cobra							
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D			
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D			
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D			
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D			
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D			
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C			
1 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
1 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
1 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
1 Single Application						23.066668973333300 a	5.0907 a
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C			
2 ----2,4-D choline	1.63	0.98					
2 ----glyphosate	1.71	1.02					
2 1st Application						14.680001468000000 a	11.9977 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C			
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2 Sequential Application							
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C			
2 ----2,4-D choline	1.63	0.98					
2 ----glyphosate	1.71	1.02					
3 1st Application						28.200002820000000 a	11.5610 a
3 Sequential + Cobra							
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D			
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D			
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D			
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D			
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D			
2 Enlist Duo Premix	3.34 SL	2 lb ae/a	16"	Palmer C			
2 ----2,4-D choline	1.63	0.98					
2 ----glyphosate	1.71	1.02					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -						
Description		PalmerAm	PalmerAm						
Rating Type		seed/0.5g	Seeds/plnt						
Rating Unit		#	#						
Rating Date		09/27/19	09/27/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
TABLE OF A (Application) B (Base herbicide) MEANS									
1 Single Application									
1 Engenia.....dicamba		5 SL	0.5 lb ae/a	16"	Palmer C			784.0 a	2233.44022334400000 a
1 Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	16"	Palmer C				
1 Nonionic Surfactant		100 L	0.25 % v/v	16"	Palmer C				
1 Dry Ammonium Sulfate		100 D	1.02 % w/v	16"	Palmer C				
2 1st Application								0.0 a	0.0000000000000000 a
2 Engenia.....dicamba		5 SL	0.5 lb ae/a	16"	Palmer C				
2 Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	16"	Palmer C				
2 Nonionic Surfactant		100 L	0.25 % v/v	16"	Palmer C				
2 Dry Ammonium Sulfate		100 D	1.02 % w/v	16"	Palmer C				
2 Sequential Application									
1 Engenia.....dicamba		5 SL	0.5 lb ae/a	16"	Palmer C				
1 Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	16"	Palmer C				
1 Nonionic Surfactant		100 L	0.25 % v/v	16"	Palmer C				
1 Dry Ammonium Sulfate		100 D	1.02 % w/v	16"	Palmer C				
3 1st Application								58.3 a	58.33333916666660 a
3 Sequential + Cobra									
3 Engenia.....dicamba		5 SL	0.5 lb ae/a	+7 days	D				
3 Cobra.....lactofen		2 EC	0.195 lb ai/a	+7 days	D				
3 Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	+7 days	D				
3 Dry Ammonium Sulfate		100 D	1.02 % w/v	+7 days	D				
3 Crop Oil Concentrate		100 L	4.7 qt/100 gal	+7 days	D				
1 Engenia.....dicamba		5 SL	0.5 lb ae/a	16"	Palmer C				
1 Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	16"	Palmer C				
1 Nonionic Surfactant		100 L	0.25 % v/v	16"	Palmer C				
1 Dry Ammonium Sulfate		100 D	1.02 % w/v	16"	Palmer C				
1 Single Application								1208.7 a	3188.67851886782000 a
2 Enlist Duo Premix		3.34 SL	2 lb ae/a	16"	Palmer C				
2 ----2,4-D choline		1.63	0.98						
2 ----glyphosate		1.71	1.02						
2 1st Application								931.7 a	7218.16005514927000 a
2 Engenia.....dicamba		5 SL	0.5 lb ae/a	16"	Palmer C				
2 Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	16"	Palmer C				
2 Nonionic Surfactant		100 L	0.25 % v/v	16"	Palmer C				
2 Dry Ammonium Sulfate		100 D	1.02 % w/v	16"	Palmer C				
2 Sequential Application									
2 Enlist Duo Premix		3.34 SL	2 lb ae/a	16"	Palmer C				
2 ----2,4-D choline		1.63	0.98						
2 ----glyphosate		1.71	1.02						
3 1st Application								782.0 a	6632.52066325200000 a
3 Sequential + Cobra									
3 Engenia.....dicamba		5 SL	0.5 lb ae/a	+7 days	D				
3 Cobra.....lactofen		2 EC	0.195 lb ai/a	+7 days	D				
3 Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	+7 days	D				
3 Dry Ammonium Sulfate		100 D	1.02 % w/v	+7 days	D				
3 Crop Oil Concentrate		100 L	4.7 qt/100 gal	+7 days	D				
2 Enlist Duo Premix		3.34 SL	2 lb ae/a	16"	Palmer C				
2 ----2,4-D choline		1.63	0.98						
2 ----glyphosate		1.71	1.02						

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		C GLXMA						
Description		Soybean						
Rating Type		Yield						
Rating Unit		Bu/A						
Rating Date		10/30/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
TABLE OF A (Application) B (Base herbicide) MEANS								
1 Single Application								19.6 a
1 Engenia.....dicamba		5 SL		0.5 lb ae/a		16"	Palmer C	
1 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a		16"	Palmer C	
1 Nonionic Surfactant		100 L		0.25 % v/v		16"	Palmer C	
1 Dry Ammonium Sulfate		100 D		1.02 % w/v		16"	Palmer C	
2 1st Application								24.7 a
2 Engenia.....dicamba		5 SL		0.5 lb ae/a		16"	Palmer C	
2 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a		16"	Palmer C	
2 Nonionic Surfactant		100 L		0.25 % v/v		16"	Palmer C	
2 Dry Ammonium Sulfate		100 D		1.02 % w/v		16"	Palmer C	
2 Sequential Application								
1 Engenia.....dicamba		5 SL		0.5 lb ae/a		16"	Palmer C	
1 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a		16"	Palmer C	
1 Nonionic Surfactant		100 L		0.25 % v/v		16"	Palmer C	
1 Dry Ammonium Sulfate		100 D		1.02 % w/v		16"	Palmer C	
3 1st Application								26.1 a
3 Sequential + Cobra								
3 Engenia.....dicamba		5 SL		0.5 lb ae/a	+7 days		D	
3 Cobra.....lactofen		2 EC		0.195 lb ai/a	+7 days		D	
3 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	+7 days		D	
3 Dry Ammonium Sulfate		100 D		1.02 % w/v	+7 days		D	
3 Crop Oil Concentrate		100 L		4.7 qt/100 gal	+7 days		D	
1 Engenia.....dicamba		5 SL		0.5 lb ae/a	16"	Palmer C		
1 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	16"	Palmer C		
1 Nonionic Surfactant		100 L		0.25 % v/v	16"	Palmer C		
1 Dry Ammonium Sulfate		100 D		1.02 % w/v	16"	Palmer C		
1 Single Application								
2 Enlist Duo Premix		3.34 SL		2 lb ae/a	16"	Palmer C		
2 ----2,4-D choline		1.63		0.98				
2 ----glyphosate		1.71		1.02				
2 1st Application								
2 Engenia.....dicamba		5 SL		0.5 lb ae/a	16"	Palmer C		
2 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	16"	Palmer C		
2 Nonionic Surfactant		100 L		0.25 % v/v	16"	Palmer C		
2 Dry Ammonium Sulfate		100 D		1.02 % w/v	16"	Palmer C		
2 Sequential Application								
2 Enlist Duo Premix		3.34 SL		2 lb ae/a	16"	Palmer C		
2 ----2,4-D choline		1.63		0.98				
2 ----glyphosate		1.71		1.02				
3 1st Application								
3 Sequential + Cobra								
3 Engenia.....dicamba		5 SL		0.5 lb ae/a	+7 days		D	
3 Cobra.....lactofen		2 EC		0.195 lb ai/a	+7 days		D	
3 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	+7 days		D	
3 Dry Ammonium Sulfate		100 D		1.02 % w/v	+7 days		D	
3 Crop Oil Concentrate		100 L		4.7 qt/100 gal	+7 days		D	
2 Enlist Duo Premix		3.34 SL		2 lb ae/a	16"	Palmer C		
2 ----2,4-D choline		1.63		0.98				
2 ----glyphosate		1.71		1.02				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		C	GLXMA	AMAPA C -	AMAPA C -
Description		Soybean	PalmerAm	PalmerAm	
Rating Type		Stunting	Control	Control	
Rating Unit		%	%	%	
Rating Date		08/03/18	08/03/18	08/26/18	
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Timing	Appl Code
1 Single Application					
3 Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C	0.2 c	80.0 a
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		73.3 a
2 1st Application					
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	0.0 c	93.0 a
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		90.7 a
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
2 Sequential Application					
3 Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
3 1st Application					
3 Sequential + Cobra					
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D	
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D	
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D	
3 Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
1 Single Application					
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C	0.0 c	75.0 a
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		75.0 a
4 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
2 1st Application					
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	4.0 c	80.0 a
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		83.3 a
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
2 Sequential Application					
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C		
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		
4 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
3 1st Application					
3 Sequential + Cobra					
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D	
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D	
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D	
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C		
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		
4 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code			AMAPA C -	AMAPA C -
Description		PalmerAm	PalmerAm	
Rating Type		Count	TtlPlant	
Rating Unit		# plot	#	
Rating Date		09/27/19	09/27/19	
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Appl
			Unit	Timing Code
1 Single Application				
3 Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16"	Palmer C
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
2 1st Application				
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
2 Sequential Application				
3 Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16"	Palmer C
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
3 1st Application				
3 Sequential + Cobra				
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D
3 Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16"	Palmer C
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
1 Single Application				
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C
4 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
2 1st Application				
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
2 Sequential Application				
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C
4 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C
3 1st Application				
3 Sequential + Cobra				
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C
4 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code			AMAPA C -	AMAPA C -				
Description			PalmerAm Wt/plant	PalmerAm TtlSeedWt				
Rating Unit			grams	grams				
Rating Date			09/27/19	09/27/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
1	Single Application							
3	Liberty 280....glufosinate	2.34 SL 100 D	0.585 lb ai/a 1.02 % w/v		16"	Palmer C	4.385333771866670 a	3.2790 a
3	Dry Ammonium Sulfate				16"	Palmer C		
2	1st Application							
2	Engenia.....dicamba	5 SL	0.5 lb ae/a		16"	Palmer C	5.759400575940000 a	3.5727 a
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a		16"	Palmer C		
2	Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer C		
2	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C		
2	Sequential Application							
3	Liberty 280....glufosinate	2.34 SL 100 D	0.585 lb ai/a 1.02 % w/v		16"	Palmer C	3.812533714586670 a	1.2100 a
3	Dry Ammonium Sulfate				16"	Palmer C		
3	1st Application							
3	Sequential + Cobra							
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days		D		
3	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days		D		
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days		D		
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days		D		
3	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days		D		
3	Liberty 280....glufosinate	2.34 SL 100 D	0.585 lb ai/a 1.02 % w/v	16"	Palmer C			
3	Dry Ammonium Sulfate			16"	Palmer C			
1	Single Application							
4	Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C		7.066667373333330 a	4.5163 a
4	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
4	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
4	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2	1st Application							
2	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C		3.609022583124450 a	1.5283 a
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
2	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
2	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2	Sequential Application							
4	Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C			
4	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
4	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
4	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
3	1st Application							
3	Sequential + Cobra						8.420267508693330 a	3.8337 a
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days		D		
3	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days		D		
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days		D		
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days		D		
3	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days		D		
4	Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C			
4	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
4	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
4	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -		
Description		PalmerAm seed/0.5g #	PalmerAm Seeds/plnt #		
Rating Type		09/27/19	09/27/19		
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code		
1 Single Application				959.3 a	1983.09419830940000 a
3 Liberty 280....glufosinate	2.34 SL 100 D	0.585 lb ai/a 1.02 % w/v	16" Palmer C 16" Palmer C		
3 Dry Ammonium Sulfate					
2 1st Application				948.0 a	1798.70760209296000 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C		
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
2 Sequential Application					
3 Liberty 280....glufosinate	2.34 SL 100 D	0.585 lb ai/a 1.02 % w/v	16" Palmer C 16" Palmer C		
3 Dry Ammonium Sulfate					
3 1st Application				716.7 a	868.79497576837900 a
3 Sequential + Cobra					
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days D		
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days D		
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days D		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days D		
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days D		
3 Liberty 280....glufosinate	2.34 SL 100 D	0.585 lb ai/a 1.02 % w/v	16" Palmer C 16" Palmer C		
3 Dry Ammonium Sulfate					
1 Single Application				581.0 a	1885.19032185235000 a
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C		
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		
4 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
2 1st Application				633.0 a	1544.33015443300000 a
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C		
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
2 Sequential Application					
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C		
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		
4 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
3 1st Application				958.0 a	2091.74894250821000 a
3 Sequential + Cobra					
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days D		
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days D		
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days D		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days D		
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days D		
4 Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C		
4 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer C		
4 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer C		
4 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		C GLXMA						
Description		Soybean						
Rating Type		Yield						
Rating Unit		Bu/A						
Rating Date		10/30/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Single Application							21.4 a
3	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a		16"	Palmer C		
3	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C		
2	1st Application							24.3 a
2	Engenia.....dicamba	5 SL	0.5 lb ae/a		16"	Palmer C		
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a		16"	Palmer C		
2	Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer C		
2	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C		
2	Sequential Application							
3	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a		16"	Palmer C		
3	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C		
3	1st Application							16.6 a
3	Sequential + Cobra							
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days		D		
3	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days		D		
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days		D		
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days		D		
3	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days		D		
3	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a		16"	Palmer C		
3	Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer C		
1	Single Application							22.4 a
4	Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C			
4	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
4	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
4	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2	1st Application							29.2 a
2	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C			
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
2	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
2	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2	Sequential Application							
4	Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C			
4	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
4	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
4	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
3	1st Application							19.5 a
3	Sequential + Cobra							
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days		D		
3	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days		D		
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days		D		
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days		D		
3	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days		D		
4	Reflex.....fomesafen	2 L	0.375 lb ai/a	16"	Palmer C			
4	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
4	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
4	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	AMAPA C -	AMAPA C -					
Description		Soybean	PalmerAm	PalmerAm					
Rating Type		Stunting	Control	Control					
Rating Unit		%	%	%					
Rating Date	08/03/18	08/03/18	08/26/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1	Single Application								
5	Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C		0.0 c	83.3 a	71.0 a
5	----fomesafen	0.66	0.372						
5	----glyphosate	2.64	1.49						
5	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
2	1st Application						3.3 c	76.7 a	84.0 a
2	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C				
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C				
2	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C				
2	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
2	Sequential Application								
5	Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C				
5	----fomesafen	0.66	0.372						
5	----glyphosate	2.64	1.49						
5	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
3	1st Application						16.7 b	86.7 a	81.0 a
3	Sequential + Cobra								
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D				
3	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D				
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D				
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D				
3	Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D				
5	Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C				
5	----fomesafen	0.66	0.372						
5	----glyphosate	2.64	1.49						
5	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C				
LSD P=.05							4.51	10.63	14.75
Standard Deviation							2.69	6.36	8.89
CV							10.92	7.51	10.53

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -				
Description	PalmerAm	PalmerAm					
Rating Type	Count	TtlPlant					
Rating Unit	# plot	#					
Rating Date	09/27/19	09/27/19					
Trt No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
1 Single Application							
5 Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C		24.7 a	4.3 a
5 ----fomesafen	0.66	0.372					
5 ----glyphosate	2.64	1.49					
5 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2 1st Application							
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C		19.0 a	4.0 a
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer C			
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer C			
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
2 Sequential Application							
5 Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C			
5 ----fomesafen	0.66	0.372					
5 ----glyphosate	2.64	1.49					
5 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
3 1st Application						15.3 a	5.0 a
3 Sequential + Cobra							
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	D			
3 Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D			
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	D			
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	D			
3 Crop Oil Concentrate	100 L	4.7 qt/100 gal	+7 days	D			
5 Flexstar GT Premix	3.3 L	1.86 lb ai/a	16"	Palmer C			
5 ----fomesafen	0.66	0.372					
5 ----glyphosate	2.64	1.49					
5 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer C			
LSD P=.05						77.61	1.25
Standard Deviation						46.40	0.74
CV						132.40	17.17

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code			AMAPA C -	AMAPA C -				
Description			PalmerAm	PalmerAm				
Rating Type			Wt/plant	TtlSeedWt				
Rating Unit			grams	grams				
Rating Date			09/27/19	09/27/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
1 Single Application								
5 Flexstar GT Premix		3.3 L		1.86 lb ai/a	16"	Palmer C	4.663467133013330 a	1.9637 a
5 ----fomesafen		0.66		0.372				
5 ----glyphosate		2.64		1.49				
5 Dry Ammonium Sulfate		100 D		1.02 % w/v	16"	Palmer C		
2 1st Application								
2 Engenia.....dicamba		5 SL		0.5 lb ae/a	16"	Palmer C	4.652167131883330 a	1.7633 a
2 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	16"	Palmer C		
2 Nonionic Surfactant		100 L		0.25 % v/v	16"	Palmer C		
2 Dry Ammonium Sulfate		100 D		1.02 % w/v	16"	Palmer C		
2 Sequential Application								
5 Flexstar GT Premix		3.3 L		1.86 lb ai/a	16"	Palmer C		
5 ----fomesafen		0.66		0.372				
5 ----glyphosate		2.64		1.49				
5 Dry Ammonium Sulfate		100 D		1.02 % w/v	16"	Palmer C		
3 1st Application								
3 Sequential + Cobra								
3 Engenia.....dicamba		5 SL		0.5 lb ae/a	+7 days	D	5.361533869486670 a	2.7207 a
3 Cobra.....lactofen		2 EC		0.195 lb ai/a	+7 days	D		
3 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	+7 days	D		
3 Dry Ammonium Sulfate		100 D		1.02 % w/v	+7 days	D		
3 Crop Oil Concentrate		100 L		4.7 qt/100 gal	+7 days	D		
5 Flexstar GT Premix		3.3 L		1.86 lb ai/a	16"	Palmer C		
5 ----fomesafen		0.66		0.372				
5 ----glyphosate		2.64		1.49				
5 Dry Ammonium Sulfate		100 D		1.02 % w/v	16"	Palmer C		
LSD P=.05							11.9908147800307000	7.21037
Standard Deviation							7.1155090558641000	4.31109
CV							83.4874192294923000	117.03745

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -		
Description		PalmerAm seed/0.5g #	PalmerAm Seeds/plnt #		
Rating Type		09/27/19	09/27/19		
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc Rate	Form Type Unit	Appl Timing Appl Code		
1 Single Application 5 Flexstar GT Premix 5 ----fomesafen 5 ----glyphosate 5 Dry Ammonium Sulfate	3.3 L 0.66 2.64 100 D	1.86 lb ai/a 0.372 1.49 1.02 % w/v	16" Palmer C	1126.3 a	1827.30440495264000 a
2 1st Application 2 Engenia.....dicamba 2 Roundup PowerMax..glyphosate 2 Nonionic Surfactant 2 Dry Ammonium Sulfate	5 SL 4.5 AS 100 L 100 D	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	16" Palmer C 16" Palmer C 16" Palmer C 16" Palmer C	979.7 a	1679.93572354911000 a
2 Sequential Application 5 Flexstar GT Premix 5 ----fomesafen 5 ----glyphosate 5 Dry Ammonium Sulfate	3.3 L 0.66 2.64 100 D	1.86 lb ai/a 0.372 1.49 1.02 % w/v	16" Palmer C		
3 1st Application 3 Sequential + Cobra 3 Engenia.....dicamba 3 Cobra.....lactofen 3 Roundup PowerMax..glyphosate 3 Dry Ammonium Sulfate 3 Crop Oil Concentrate 5 Flexstar GT Premix 5 ----fomesafen 5 ----glyphosate 5 Dry Ammonium Sulfate	5 SL 2 EC 4.5 AS 100 D 100 L 3.3 L 0.66 2.64 100 D	0.5 lb ae/a 0.195 lb ai/a 1.13 lb ae/a 1.02 % w/v 4.7 qt/100 gal 1.86 lb ai/a	+7 days +7 days +7 days +7 days +7 days 16" Palmer C	992.0 a	1379.02644901374000 a
LSD P=.05 Standard Deviation CV				491.47 293.85 37.81	4735.057362706080000 2809.846049868240000 122.560613788716000

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code						C GLXMA
Description						Soybean Yield Bu/A
Rating Type						10/30/19
Rating Unit						
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1 Single Application						
5 Flexstar GT Premix	3.3 L		1.86 lb ai/a		16"	Palmer C
5 ----fomesafen	0.66		0.372			
5 ----glyphosate	2.64		1.49			
5 Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C
2 1st Application						23.7 a
2 Engenia.....dicamba	5 SL		0.5 lb ae/a		16"	Palmer C
2 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a		16"	Palmer C
2 Nonionic Surfactant	100 L		0.25 % v/v		16"	Palmer C
2 Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C
2 Sequential Application						
5 Flexstar GT Premix	3.3 L		1.86 lb ai/a		16"	Palmer C
5 ----fomesafen	0.66		0.372			
5 ----glyphosate	2.64		1.49			
5 Dry Ammonium Sulfate	100 D		1.02 % w/v		16"	Palmer C
3 1st Application						22.0 a
3 Sequential + Cobra						
3 Engenia.....dicamba	5 SL		0.5 lb ae/a	+7 days	D	
3 Cobra.....lactofen	2 EC		0.195 lb ai/a	+7 days	D	
3 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	+7 days	D	
3 Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days	D	
3 Crop Oil Concentrate	100 L		4.7 qt/100 gal	+7 days	D	
5 Flexstar GT Premix	3.3 L		1.86 lb ai/a	16"	Palmer C	
5 ----fomesafen	0.66		0.372			
5 ----glyphosate	2.64		1.49			
5 Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C	
LSD P=.05						13.88
Standard Deviation						8.19
CV						34.90

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Stunting % 08/03/18 Missing values in column 1 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	43	64369.662358				
R	2	0.833456	0.416728	0.058	0.9442	
A	2	1515.528193	757.764097	104.722	0.0001	2.0
B	4	62254.694983	15563.673746	2150.888	0.0001	2.6
AB	8	403.235580	50.404448	6.966	0.0001	4.5
ERROR	27	195.370145	7.235931			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Control % 08/03/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	3702.000000				
R	2	532.800000	266.400000	6.590	0.0045	
A	2	982.933333	491.466667	12.158	0.0002	4.8
B	4	522.444444	130.611111	3.231	0.0267	6.1
AB	8	531.955556	66.494444	1.645	0.1569	10.6
ERROR	28	1131.866667	40.423810			

Randomized Complete Block (RCB) AOV For AMAPA C PalmerAm Control % 08/26/18 Missing factor A1 B2 levels prevents analyzing column 3 as Factorial design; Missing values in column 3 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	54	31790.857745			
Replicate	2	335.874849	167.937425	2.126	0.1349
Treatment	18	28769.018932	1598.278830	20.232	0.0001
ERROR	34	2685.963964	78.998940		

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Count # plot 09/27/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	196149.911111				
R	2	14038.044444	7019.022222	3.260	0.0534	
A	2	19604.311111	9802.155556	4.553	0.0194	34.7
B	4	64414.355556	16103.588889	7.480	0.0003	44.8
AB	8	37809.244444	4726.155556	2.195	0.0593	77.6
ERROR	28	60283.955556	2152.998413			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm TtlPlant # 09/27/19 Missing values in column 7 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	40	63.644444				
R	2	0.177778	0.088889	0.162	0.8512	
A	2	2.177778	1.088889	1.986	0.1591	0.6
B	4	45.866667	11.466667	20.919	0.0001	0.7
AB	8	2.266667	0.283333	0.517	0.8319	1.2
ERROR	24	13.155556	0.548148			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Wt/plant grams 09/27/19 Missing values in column 10 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	40	3873.464950				
R	2	225.599771	112.799886	2.228	0.1296	
A	2	145.553971	72.776986	1.437	0.2573	5.362455390751580
B	4	2055.755397	513.938849	10.151	0.0001	6.922900141053690
AB	8	231.424794	28.928099	0.571	0.7908	11.990814780030700
ERROR	24	1215.131016	50.630459			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm TtlSeedWt grams 09/27/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	1110.365631				
R	2	47.191595	23.595798	1.270	0.2966	
A	2	2.252848	1.126424	0.061	0.9413	3.2246
B	4	419.266389	104.816597	5.640	0.0019	4.1629
AB	8	121.261614	15.157702	0.816	0.5952	7.2104
ERROR	28	520.393185	18.585471			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm seed/0.5g # 09/27/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	7815086.311111				
R	2	303591.644444	151795.822222	1.758	0.1909	
A	2	537995.244444	268997.622222	3.115	0.0600	219.8
B	4	3265219.866667	816304.966667	9.454	0.0001	283.8
AB	8	1290526.533333	161315.816667	1.868	0.1058	491.5
ERROR	28	2417753.022222	86348.322222			

## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Seeds/plnt # 09/27/19 Missing values in column 14 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	40	380443624.972446				
R	2	14827696.135248	7413848.067624	0.939	0.4049	
A	2	547104.038213	273552.019106	0.035	0.9660	2117.58202807434000
B	4	135055712.383487	33763928.095872	4.276	0.0094	2733.78664298668000
AB	8	40527514.537576	5065939.317197	0.642	0.7354	4735.05736270608000
ERROR	24	189485597.877923	7895233.244913			

## FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield Bu/A 10/30/19 Analysis will skip factor level B2 for column 17 - all B2 treatments are missing

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	2617.099588				
R	2	524.155975	262.077988	3.902	0.0354	
A	2	312.716932	156.358466	2.328	0.1210	6.2
B	3	123.475796	41.158599	0.613	0.6139	8.0
AB	6	179.306742	29.884457	0.445	0.8406	13.9
ERROR	22	1477.444143	67.156552			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Effect of Row Spacing on Control of Large Palmer amaranth plants

Trial ID: DSB1b-19

Location: REC Fld #3

Trial Year: 2019

Protocol ID: DSB1b-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 07/24/19

Initiation Date: 03/01/19

Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 12/16/19

Variety: S43XS27

Attributes: Xtend

Planting Date: 06/03/19

Planting Rate: 180000 S/A

Depth: 1 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Moisture: NORMAL normal, adequate

Soil Temperature: 75 F

Harvest Equipment: Plot combine

Emergence Date: 06/09/19

Harvest Date: 10/30/19

% Standard Moisture: 13.0

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth Entry Date: 12/16/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 9

Tillage Type: NOTILL no-till

Replications: 6

Study Design: FACTOR Factorial

**Field Prep./Maintenance:**

Early PrePlant applications of Roundup PowerMax (1.5 qt/A) + Liberty 280 (1 qt) + Outlok (12 fl.oz/A) on 05/23/19 and Roundup PowerMax (1.5 qt/A) + Liberty 280 (1 qt) on 06/06/19.

**Soil Description**

Description Name: Field 3

% Sand: 80

% OM: 0.8

Texture: LS

loamy sand

% Silt: 12

pH: 6.6

Soil Name: Rockawalkin loamy sand, 0-2% slopes

% Clay: 8

CEC: 4.0

Fert. Level: E

excellent

Soil Drainage: F

fair

**Application Description**

	A	B
Application Date	07/12/19	07/25/19
Appl. Stop Time	01:00 PM	12:45 PM
Application Method	SPRAY	SPRAY
Application Timing	16" palmer	+7 days
Application Placement	BROADC	BROADC
Applied By	VanGessel	VanGessel
Appl. Entry Date	12/16/19	12/16/19
Air Temperature Start, Stop	85 86 F	85 85 F
% Relative Humidity Start, Stop	68 65	46 48
Wind Velocity+Dir. Start	9 mph WNW	3 mph
Wind Velocity+Dir. Stop	5 mph W	3 mph
Wind Velocity+Dir. Max	9 mph WNW	3 mph
Wet Leaves (Y/N)	N no	N no
Soil Temperature	86 F	85 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	26	29
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	0.14 IN	0.31 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Days after Emergence	33	46
Stage Majority, Percent	veg 100	R1 100
Height Average	15 in	22 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent	veg 100	veg 100
Height Average	13 in	24 in
Height Minimum, Maximum	10 16	12 30
Density Average	10 plot	10 plot
Density Min, Max	2 75	2 75

**Application Equipment**

	A	B
Appl. Equipment	Bckpck4Nozl	Bckpck4Nozl
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIR MIX	AIR MIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	18 in
Boom Length	6 ft	6 ft
Boom Height	32 in	40 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	07/24/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	08/05/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

#### Trial Comments

07/12/19: Palmer amaranth plants are larger (14-16") and more dense in reps 1, 2, and 5 than reps 3, 4, and 6 (10-12"). AirMix tips were used for Liberty and Reflex treatments; TTI tips were used for Enlist and Engenia treatments.

07/25/19: TTI tips were used for Enlist and Engenia treatments; AirMix tips were used for other treatments.

08/01/19: Most of the Palmer treated with dicamba was severely curled but not dead; so canopeo readings were not just soybean canopy closure but also green Palmer tissue still present. Canopeo readings were the average of 10 shots over the length of the trial.

08/03/19: No crop injury.

08/26/19: Ratings based on visable Palmer amaranth biomass without moving soybean canopy.

## Effect of Row Spacing on Control of Large Palmer amaranth plants

Trial ID: DSB1b-19

Location: REC Fld #3

Trial Year: 2019

Protocol ID: DSB1b-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Crop Type, Code	AMAPA C -	AMAPA C -	C GLXMA				
Description	PalmerAm Control %	PalmerAm Control %	Soybean Canopeo				
Rating Type	08/03/19	08/26/19	08/01/19				
Rating Unit							
Rating Date							
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
1 Drilled Untreated Check						34.3 c	39.1 c
2 Drilled						88.6 a	98.1 a
Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer A		
Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer A		
3 Drilled						89.6 a	98.2 a
Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			87.607 a
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer A		
Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer A		
Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days		B		
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days		B		
Nonionic Surfactant	100 L	0.25 % v/v	+7 days		B		
Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days		B		
4 15-inch row spacing Untreated Check						16.7 d	8.3 d
5 15-inch row spacing						85.3 ab	92.3 ab
Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer A		
Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer A		
6 15-inch row spacing						89.3 a	97.5 a
Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			75.007 b
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer A		
Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer A		
Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days		B		
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days		B		
Nonionic Surfactant	100 L	0.25 % v/v	+7 days		B		
Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days		B		
7 30-inch row spacing Untreated Check						0.0 e	0.0 d
8 30-inch row spacing						80.0 b	86.2 b
Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
Nonionic Surfactant	100 L	0.25 % v/v		16"	Palmer A		
Dry Ammonium Sulfate	100 D	1.02 % w/v		16"	Palmer A		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=1,2,3,6,7,8,12

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm Weight gr/plant	AMAPA C - PalmerAm abovCanopy #/plot
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Drilled Untreated Check						47.7 c
2	Drilled Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5 SL 4.5 AS 100 L 100 D	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	16" Palmer A 16" Palmer A 16" Palmer A 16" Palmer A			7.5 d
3	Drilled Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5 SL 4.5 AS 100 L 100 D 5 SL 4.5 AS 100 L 100 D	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	16" Palmer A 16" Palmer A 16" Palmer A 16" Palmer A +7 days +7 days +7 days +7 days		0.3182522064075680 b	3.7 d
4	15-inch row spacing Untreated Check						80.8 b
5	15-inch row spacing Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5 SL 4.5 AS 100 L 100 D	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	16" Palmer A 16" Palmer A 16" Palmer A 16" Palmer A			4.2 d
6	15-inch row spacing Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5 SL 4.5 AS 100 L 100 D 5 SL 4.5 AS 100 L 100 D	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	16" Palmer A 16" Palmer A 16" Palmer A 16" Palmer A +7 days +7 days +7 days +7 days		0.9076041031060810 ab	1.5 d
7	30-inch row spacing Untreated Check						108.3 a
8	30-inch row spacing Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5 SL 4.5 AS 100 L 100 D	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	16" Palmer A 16" Palmer A 16" Palmer A 16" Palmer A			7.5 d

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=1,2,3,6,7,8,12

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm beloCanopy #/plot 10/01/19	C GLXMA Soybean Yield Bu/A 10/30/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Drilled Untreated Check						21.6 c
2	Drilled						29.2 b
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer A	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer A	
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer A	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer A	
3	Drilled						30.9 b
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer A	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer A	
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer A	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer A	
	Engenia.....dicamba	5 SL		0.5 lb ae/a	+7 days	B	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	+7 days	B	
	Nonionic Surfactant	100 L		0.25 % v/v	+7 days	B	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days	B	
4	15-inch row spacing						14.0 d
	Untreated Check						
5	15-inch row spacing						33.4 ab
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer A	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer A	
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer A	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer A	
6	15-inch row spacing						34.6 ab
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer A	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer A	
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer A	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer A	
	Engenia.....dicamba	5 SL		0.5 lb ae/a	+7 days	B	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	+7 days	B	
	Nonionic Surfactant	100 L		0.25 % v/v	+7 days	B	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	+7 days	B	
7	30-inch row spacing						20.3 cd
	Untreated Check						
8	30-inch row spacing						38.6 a
	Engenia.....dicamba	5 SL		0.5 lb ae/a	16"	Palmer A	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	16"	Palmer A	
	Nonionic Surfactant	100 L		0.25 % v/v	16"	Palmer A	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer A	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=1,2,3,6,7,8,12

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -	C GLXMA			
Description	PalmerAm	PalmerAm	Soybean				
Rating Type	Control	Control	Canopeo				
Rating Unit	%	%					
Rating Date	08/03/19	08/26/19	08/01/19				
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing	Appl Code			
9 30-inch row spacing Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5 SL 4.5 AS 100 L 100 D 5 SL 4.5 AS 100 L 100 D	0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	16" 16" 16" 16" +7 days +7 days +7 days +7 days	Palmer A Palmer A Palmer A Palmer A B B B B	84.2 ab        	87.7 b        	76.335 b        
LSD P=.05 Standard Deviation CV				7.77 6.62 10.49	8.76 7.47 11.07	9.6990 7.2850 9.15	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				3.379 0.0139 175.197 0.0001	1.994 0.1046 174.945 0.0001	7.837 0.0060 5.419 0.0325	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2,3,6,7,8,12

## University of Delaware

Pest Code		AMAPA	AMAPA						
Crop Type, Code		C -	C -						
Description		PalmerAm	PalmerAm						
Rating Type		Weight	above Canopy						
Rating Unit		gr/plant	#/plot						
Rating Date		08/06/19	10/01/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
9	30-inch row spacing								
	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A				
	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A				
	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B				
	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B				
LSD P=.05								0.65020130152420300	24.57
Standard Deviation								0.48836932778857400	20.94
CV								58.71	71.16
Replicate F								0.683	2.066
Replicate Prob(F)								0.6498	0.0941
Treatment F								5.800	22.076
Treatment Prob(F)								0.0278	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=1,2,3,6,7,8,12

## University of Delaware

Pest Code		AMAPA	C	GLXMA				
Crop Type, Code		C -		Soybean				
Description		PalmerAm		Yield				
Rating Type		beloCanopy	#/plot	Bu/A				
Rating Unit								
Rating Date		10/01/19		10/30/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
9	30-inch row spacing							
	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A		16.5 ab	37.4 a
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B			
	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B			
LSD P=.05							15.28	6.54
Standard Deviation							12.79	5.57
CV							109.02	19.3
Replicate F							4.991	28.309
Replicate Prob(F)							0.0031	0.0001
Treatment F							2.704	13.816
Treatment Prob(F)							0.0460	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns: Yates=1,2,3,6,7,8,12

## Effect of Row Spacing on Control of Large Palmer amaranth plants

Trial ID: DSB1b-19

Location: REC Fld #3

Trial Year: 2019

Protocol ID: DSB1b-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Crop Type, Code	AMAPA C -	AMAPA C -	C GLXMA
Description Rating Type	PalmerAm Control	PalmerAm Control	Soybean Canopeo
Rating Unit Rating Date	% 08/03/19	% 08/26/19	08/01/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate Appl Unit Timing	Appl Code	
TABLE OF R MEANS			
Replicate 1	60.2	67.2	
Replicate 2	62.9	68.9	
Replicate 3	58.8	64.6	
Replicate 4	60.9	62.8	
Replicate 5	66.7	72.8	
Replicate 6	69.2	68.7	
TABLE OF A (Row Spacing) MEANS			
1 Drilled	70.8 a	78.4 a	
2 15-inch row spacing	63.8 b	66.1 b	
3 30-inch row spacing	54.7 c	57.9 c	
LSD P=.05	4.48	5.06	
Standard Deviation	6.62	7.47	
CV	10.49	11.07	
TABLE OF B (Herbicide Program) MEANS			
1 Untreated Check	17.0 b	15.8 b	
2 Engenia.....dicamba	5 SL	0.5 lb ae/a 16" Palmer A	
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a 16" Palmer A	
2 Nonionic Surfactant	100 L	0.25 % v/v 16" Palmer A	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v 16" Palmer A	
3 Engenia.....dicamba	5 SL	0.5 lb ae/a 16" Palmer A	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a 16" Palmer A	
3 Nonionic Surfactant	100 L	0.25 % v/v 16" Palmer A	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v 16" Palmer A	
3 Engenia.....dicamba	5 SL	0.5 lb ae/a +7 days B	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a +7 days B	
3 Nonionic Surfactant	100 L	0.25 % v/v +7 days B	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v +7 days B	
LSD P=.05	4.48	5.06	
Standard Deviation	6.62	7.47	
CV	10.49	11.07	
TABLE OF A (Row Spacing) B (Herbicide Program) MEANS			
1 Drilled	34.3 c	39.1 c	.
1 Untreated Check			.
2 15-inch row spacing	16.7 d	8.3 d	.
1 Untreated Check			.
3 30-inch row spacing	0.0 e	0.0 d	.
1 Untreated Check			.
1 Drilled	88.6 a	98.1 a	.
2 Engenia.....dicamba	5 SL	0.5 lb ae/a 16" Palmer A	
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a 16" Palmer A	
2 Nonionic Surfactant	100 L	0.25 % v/v 16" Palmer A	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v 16" Palmer A	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		AMAPA C - PalmerAm Weight	AMAPA C - PalmerAm abovCanopy	
Description Rating Type				
Rating Unit Rating Date		gr/plant 08/06/19	#/plot 10/01/19	
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code	
TABLE OF R MEANS				
Replicate 1			26.0	
Replicate 2			29.9	
Replicate 3			38.0	
Replicate 4			43.8	
Replicate 5			16.9	
Replicate 6			22.0	
TABLE OF A (Row Spacing) MEANS				
1 Drilled			19.6 b	
2 15-inch row spacing			28.8 ab	
3 30-inch row spacing			39.8 a	
LSD P=.05			14.19	
Standard Deviation			20.94	
CV			71.16	
TABLE OF B (Herbicide Program) MEANS				
1 Untreated Check			79.0 a	
2 Engenia.....dicamba	5 SL	0.5 lb ae/a 16"	Palmer A	6.4 b
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a 16"	Palmer A	
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer A	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer A	
3 Engenia.....dicamba	5 SL	0.5 lb ae/a 16"	Palmer A	3.0 b
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a 16"	Palmer A	
3 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer A	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer A	
3 Engenia.....dicamba	5 SL	0.5 lb ae/a +7 days	B	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a +7 days	B	
3 Nonionic Surfactant	100 L	0.25 % v/v +7 days	B	
3 Dry Ammonium Sulfate	100 D	1.02 % w/v +7 days	B	
LSD P=.05			14.19	
Standard Deviation			20.94	
CV			71.16	
TABLE OF A (Row Spacing) B (Herbicide Program) MEANS				
1 Drilled			. 47.7 c	
1 Untreated Check				
2 15-inch row spacing			. 80.8 b	
1 Untreated Check				
3 30-inch row spacing			. 108.3 a	
1 Untreated Check				
1 Drilled			. 7.5 d	
2 Engenia.....dicamba	5 SL	0.5 lb ae/a 16"	Palmer A	
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a 16"	Palmer A	
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer A	
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer A	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code		AMAPA	C	GLXMA				
Crop Type, Code		C -						
Description		PalmerAm		Soybean				
Rating Type		beloCanopy		Yield				
Rating Unit		#/plot		Bu/A				
Rating Date		10/01/19		10/30/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
TABLE OF R MEANS								
Replicate 1						12.8	28.5	
Replicate 2						14.7	25.0	
Replicate 3						3.3	19.9	
Replicate 4						33.1	20.5	
Replicate 5						4.0	46.3	
Replicate 6						2.5	33.1	
TABLE OF A (Row Spacing) MEANS								
1 Drilled						4.4 b	27.2 b	
2 15-inch row spacing						9.5 b	27.4 b	
3 30-inch row spacing						21.3 a	32.1 a	
LSD P=.05						8.82	3.78	
Standard Deviation						12.79	5.57	
CV						109.02	19.30	
TABLE OF B (Herbicide Program) MEANS								
1 Untreated Check						.	18.6 b	
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A		12.9 a	33.7 a	
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A				
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A				
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A				
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A		10.5 a	34.3 a	
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A				
3 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A				
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A				
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B				
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B				
3 Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B				
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B				
LSD P=.05						8.82	3.78	
Standard Deviation						12.79	5.57	
CV						109.02	19.30	
TABLE OF A (Row Spacing) B (Herbicide Program) MEANS								
1 Drilled						.	21.6 a	
1 Untreated Check								
2 15-inch row spacing						.	14.0 a	
1 Untreated Check								
3 30-inch row spacing						.	20.3 a	
1 Untreated Check								
1 Drilled						1.7 a	29.2 a	
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A				
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A				
2 Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A				
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -	C GLXMA				
Description	PalmerAm Control	PalmerAm Control	Soybean Canopeo					
Rating Unit	%	%						
Rating Date	08/03/19	08/26/19	08/01/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
2	15-inch row spacing							
2	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A		85.3 ab	92.3 ab
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
2	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
2	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
3	30-inch row spacing						80.0 b	86.2 b
2	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
2	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
2	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
1	Drilled						89.6 a	98.2 a
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			87.607 a
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
3	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B			
3	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B			
2	15-inch row spacing						89.3 a	97.5 a
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			75.007 a
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
3	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B			
3	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B			
3	30-inch row spacing						84.2 ab	87.7 b
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			76.335 a
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
3	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B			
3	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B			
LSD P=.05							7.77	8.76
Standard Deviation							6.62	7.47
CV							10.49	11.07
								9.6990
								7.2850
								9.1463

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -		
Description	PalmerAm	PalmerAm			
Rating Type	Weight	above Canopy			
Rating Unit	gr/plant		#/plot		
Rating Date	08/06/19		10/01/19		
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit Unit	Appl Timing Appl Code		
2 15-inch row spacing				.	4.2 d
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer A		
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer A		
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer A		
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer A		
3 30-inch row spacing				.	7.5 d
2 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer A		
2 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer A		
2 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer A		
2 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer A		
1 Drilled				0.3182522064075680 a	3.7 d
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer A		
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer A		
3 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer A		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer A		
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days B		
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days B		
3 Nonionic Surfactant	100 L	0.25 % v/v	+7 days B		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days B		
2 15-inch row spacing				0.9076041031060810 a	1.5 d
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer A		
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer A		
3 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer A		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer A		
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days B		
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days B		
3 Nonionic Surfactant	100 L	0.25 % v/v	+7 days B		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days B		
3 30-inch row spacing				1.2695551178583200 a	3.7 d
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer A		
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16" Palmer A		
3 Nonionic Surfactant	100 L	0.25 % v/v	16" Palmer A		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer A		
3 Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days B		
3 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days B		
3 Nonionic Surfactant	100 L	0.25 % v/v	+7 days B		
3 Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days B		
LSD P=.05				0.65020130152420300	24.57
Standard Deviation				0.48836932778857400	20.94
CV				58.71208706531790000	71.16

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code			AMAPA					
Crop Type, Code			C -	GLXMA				
Description			PalmerAm	Soybean				
Rating Type			beloCanopy	Yield				
Rating Unit			#/plot	Bu/A				
Rating Date			10/01/19	10/30/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
2	15-inch row spacing							
2	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A		11.0 a	33.4 a
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
2	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
2	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
3	30-inch row spacing						26.2 a	38.6 a
2	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			
2	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
2	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
2	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
1	Drilled						7.1 a	30.9 a
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
3	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B			
3	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B			
2	15-inch row spacing						8.0 a	34.6 a
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
3	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B			
3	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B			
3	30-inch row spacing						16.5 a	37.4 a
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer A			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	16"	Palmer A			
3	Nonionic Surfactant	100 L	0.25 % v/v	16"	Palmer A			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	16"	Palmer A			
3	Engenia.....dicamba	5 SL	0.5 lb ae/a	+7 days	B			
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	+7 days	B			
3	Nonionic Surfactant	100 L	0.25 % v/v	+7 days	B			
3	Dry Ammonium Sulfate	100 D	1.02 % w/v	+7 days	B			
LSD P=.05							15.28	6.54
Standard Deviation							12.79	5.57
CV							109.02	19.30

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Control % 08/03/19 Missing values in column 1 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	63633.650446				
R	5	740.183405	148.036681	3.379	0.0139	
A	2	2347.380053	1173.690026	26.790	0.0001	4.5
B	2	57539.945360	28769.972680	656.689	0.0001	4.5
AB	4	1516.578244	379.144561	8.654	0.0001	7.8
ERROR	34	1489.563384	43.810688			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Control % 08/26/19 Missing values in column 2 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	80551.524398				
R	5	556.415546	111.283109	1.994	0.1046	
A	2	3838.352794	1919.176397	34.393	0.0001	5.1
B	2	72177.644241	36088.822121	646.732	0.0001	5.1
AB	4	2081.848346	520.462087	9.327	0.0001	8.8
ERROR	34	1897.263470	55.801867			

Randomized Complete Block (RCB) AOV For C GLXMA Soybean Canopeo 08/01/19 Missing factor B levels prevents analyzing column 3 as Factorial design; Missing values in column 3 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	15	3079.358086			
Replicate	5	2079.581016	415.916203	7.837	0.0060
Treatment	2	575.207631	287.603815	5.419	0.0325
ERROR	8	424.569440	53.071180		

Randomized Complete Block (RCB) AOV For AMAPA C PalmerAm Weight gr/plant 08/06/19 Missing factor B levels prevents analyzing column 6 as Factorial design; Missing values in column 6 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	15	5.488677			
Replicate	5	0.813998	0.162800	0.683	0.6498
Treatment	2	2.766642	1.383321	5.800	0.0278
ERROR	8	1.908036	0.238505		

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm abovCanopy #/plot 10/01/19 Missing values in column 7 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	96898.562277				
R	5	4529.995920	905.999184	2.066	0.0941	
A	2	3686.837093	1843.418547	4.203	0.0234	14.2
B	2	66333.070637	33166.535319	75.623	0.0001	14.2
AB	4	7437.115701	1859.278925	4.239	0.0069	24.6
ERROR	34	14911.542925	438.574792			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm beloCanopy #/plot 10/01/19 Analysis will skip factor level B1 for column 8 - all B1 treatments are missing; Missing values in column 8 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	33	10058.388748				
R	5	4083.215980	816.643196	4.991	0.0031	
A	2	1817.048901	908.524451	5.553	0.0108	8.8
B	1	52.814676	52.814676	0.323	0.5754	8.8
AB	2	341.975849	170.987924	1.045	0.3678	15.3
ERROR	23	3763.333342	163.623189			

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield Bu/A 10/30/19 Missing values in column 12 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	8886.387262				
R	5	4396.835881	879.367176	28.309	0.0001	
A	2	275.644877	137.822439	4.437	0.0194	3.8
B	2	2843.609960	1421.804980	45.771	0.0001	3.8
AB	4	314.149457	78.537364	2.528	0.0585	6.5
ERROR	34	1056.147086	31.063150			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Cereal Rye Termination Timing and Approach to Herbicide Use

Trial ID: DSB2-19

Location: Fld REC #9

Trial Year: 2019

Protocol ID: DSB2-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Delaware Soybean Board

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 04/23/19

Initiation Date: 03/01/19

Completion Date: 11/10/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 11/13/19

Variety: S43XS27

Attributes: Xtend

Planting Date: 05/22/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Planting Equipment: FE Field Equipment

Soil Temperature: 74 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 05/27/19

Soil Moisture: NORMAL normal, adequate

Harvest Date: 11/07/19

Harvest Equipment: Plot combine

% Standard Moisture: 13.0

Harvested Width: 7.5 FT

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth Entry Date: 11/13/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory Entry Date: 11/13/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 20 Tillage Type: NOTILL no-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 9

% Sand: 83 % OM: 1.1 Texture: LS loamy sand

% Silt: 9 pH: 6.0 Soil Name: Pepperbox loamy sand, 0-2% slopes

% Clay: 8 CEC: 5.7 Fert. Level: G good

Soil Drainage: F fair

<b>Application Description</b>		A	B	C	D	E
Application Date	04/25/19	05/09/19	05/22/19	06/11/19	06/20/19	
Appl. Stop Time	10:00 AM	11:40 AM	05:00 PM	11:10 AM	10:40 AM	
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	
Application Timing	4wksEPP	2wksEPP	PRE (2-3DAP)	2nd Trifol	4WAP	
Application Placement	BROADC	BROADC	BROADC	BROADC	BROADC	
Applied By	Johnson	Johnson	Johnson	Johnson	Johnson	
Appl. Entry Date	05/22/19	05/21/19	05/23/19	11/13/19	11/13/19	
Air Temperature Start, Stop	66 66 F	67 71 F	73 73 F	72 72 F	83 84 F	
% Relative Humidity Start, Stop	63 63	79 73	34 34	61 61	77 74	
Wind Velocity+Dir. Start	5 mph NNE	8 mph ENE	8 mph SE	8 mph NNW	7 mph SSW	
Wind Velocity+Dir. Stop	5 mph NNE	8 mph E	8 mph SE	8 mph NNW	10 mph SSW	
Wind Velocity+Dir. Max	5 mph NNE	8 mph ENE	8 mph SE	8 mph NNW	10 mph SSW	
Wet Leaves (Y/N)	N no	N no	N no	N no	N no	
Soil Temperature	66 F	67 F	78 F	76 F	80 F	
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	
% Cloud Cover	98	55	52	32	48	
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN	0 IN	
Moisture 1 Week after Appl.	1.03 IN	1.45 IN	1.68 IN	0.97 IN	1.02 IN	

<b>Crop Stage At Each Application</b>		A	B	C	D	E
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	
Days after Emergence	-32	-18	-5	15	24	
Stage Majority, Percent				2-3 trif 100	3-trifol 100	
Height Average				3.5 in	4.5 in	
Height Minimum, Maximum				3 4	4 5	

<b>Pest Stage At Each Application</b>		A	B	C	D	E
Pest 1 Code, Type, Scale	AMAPA W					
Stage Majority, Percent				veg 100	veg 100	
Height Average				7 in	8 in	
Height Minimum, Maximum				4 10	4 12	
Density Average				5 plot	5 plot	
Density Min, Max				0 10	0 10	
Pest 2 Code, Type, Scale	IPOSS W					
Stage Majority, Percent				veg 100	veg 80	
Stage Minimum, Percent					veg 80	
Stage Maximum, Percent					run 20	
Height Average				3 in	4 in	
Height Minimum, Maximum				2 5	2 6	
Density Average				4 m2	5 m2	
Density Min, Max				0 8	0 10	

**Application Equipment**

	A	B	C	D	E
Appl. Equipment	Tractr6Nozl	Tractr6Nozl	Tractr6Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi				
Nozzle Type	AIR MIX				
Nozzle Size	11002	11002	11002	11002	11002
Nozzle Spacing	20 in				
Boom Length	10 ft	10 ft	10 ft	6.7 ft	6.7 ft
Boom Height	18 in	18 in	18 in	26 in	28 in
Ground Speed	3 mph				
Carrier	WATER	WATER	WATER	WATER	WATER
Application Amount	20 gal/ac				
Propellant	COMAIR	COMAIR	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

**Trial Comments**

1st rye biomass taken on 04/24/19. Ranges sampled in alleys, 2 per alley.

Range	Sample	Dry weight (grams/0.5m2)
1	1	52
1	2	55
2	1	65
2	2	46
3	1	56
3	2	52
4	1	89
4	2	48
5	1	37
5	2	69
6	1	50
6	2	43

2nd Rye biomass taken on 05/08/19. Ranges sampled in alleys, 2 per alley.

Range	Sample	Dry weight (grams/0.5m2)
1	1	69
1	2	37
2	1	66
2	2	89
3	1	102
3	2	105
4	1	112
4	2	117
5	1	133
5	2	85
6	1	159
6	2	50

3rd Rye biomass taken on 05/22/19. Ranges sampled in alleys. 2 per alley.

Range	Sample	Dry weight (grams/0.5m2)
1	1	162
1	2	176

2	1	129
2	2	144
3	1	242
3	2	193
4	1	213
4	2	142
5	1	154
5	2	192
6	1	266
6	2	125

06/08/19: Treatment 1 is the untreated check for rating control of summer and winter annual weeds. Excellent control of horseweed with all treatments. Primrose control was excellent in all treated plots, but was present in treatment 20 (no 2,4-D treatment). Primrose beginning to flower in treatment 20 (about 18' tall and ~20/sq ft). Summer annual weeds density is low in treatment 2 due to presence/competition of winter annual weeds.

07/04/19: Primrose still present in trt 20. Grass pressure is variable and light- Goosegrass and Fall Panicum. Very poor soy stand at 301, 302, 311, 312, 313, 314; and (back half of 213, 316 and 317).

07/28/19: Soybeans with Enlist applied at 2 to 3 DAP are starting to catch up with the rest of the soybeans in terms of height and canopy, although they are still about 10 to 15% stunted compared to earlier applications of 2,4-D.

08/01/19: Canopeo video averaged ground cover for 8-10 samples. plots 213 and 304 had some deer damage? Several foot of row missing on left sides. Did not use those rows for canopeo.

09/11/19: 1= 97% or higher  
0= not acceptable control

## University of Delaware

## Cereal Rye Termination Timing and Approach to Herbicide Use

Trial ID: DSB2-19

Location: Fld REC #9

Trial Year: 2019

Protocol ID: DSB2-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Delaware Soybean Board

Pest Code	Crop Type, Code		C SECCE Rye	C SECCE Rye	AMAPA C - PalmerAm
Description			Control	Grnd Cover	Control
Rating Type					
Rating Unit			%	%	%
Rating Date			05/30/19	06/08/19	06/08/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
1	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	4wks EPP A	99.0 a
2	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	4wks EPP A	99.0 a
3	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	4wks EPP A	99.0 a
4	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	4wks EPP A	99.0 a
5	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	4wks EPP A 4wks EPP A 4wks EPP A PRE C PRE C PRE C 2nd Trifol D 2nd Trifol D 2nd Trifol D	99.0 a
6	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	4wks EPP A 4wks EPP A 2wks EPP B 2nd Trifol D 2nd Trifol D 2nd Trifol D	99.0 a
7	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2wks EPP B	98.3 ab
8	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2wks EPP B	99.0 a
9	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2wks EPP B 2wks EPP B 2wks EPP B 2wks EPP B 4 WAP E 4 WAP E	98.3 ab

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

Pest Code Crop Type, Code		IPOSS C - mornglry	AMAPA C - PalmerAm	IPOSS C - mornglry	AMAPA C - PalmerAm						
Description											
Rating Type		Control	Control	Control	Control						
Rating Unit	%		%	%	%						
Rating Date	06/08/19		06/21/19	06/21/19	07/04/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	4wks 4wks	EPP A EPP A		0.0 f	0.0 f	0.0 h	0.0 e	
2	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	4wks 4wks 4wks 4wks	EPP A EPP A EPP A EPP A		26.7 e	68.3 cd	40.0 fg	53.3 d	
3	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 4wks 4wks 4 WAP 4 WAP	E E		29.7 e	50.0 e	46.7 d-g	66.7 c	
4	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	4wks 4wks 4wks 4wks 4 WAP	EPP A EPP A EPP A EPP A E		30.0 e	56.7 de	33.3 g	60.0 cd	
5	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 4wks 4wks PRE PRE PRE 4 WAP 4 WAP	EPP A EPP A EPP A EPP A C C C E E		66.7 d	88.0 ab	55.0 c-f	90.3 ab	
6	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	4wks 4wks 2nd Trifol D 2nd Trifol D 2nd Trifol D	EPP A EPP A 2wks 2wks 2wks		36.7 e	86.7 ab	96.7 ab	90.7 ab	
7	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2wks 2wks	EPP B EPP B		73.3 cd	56.7 de	56.7 cde	50.0 d	
8	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2wks 2wks 2wks 2wks	EPP B EPP B EPP B EPP B		80.0 c	94.3 a	43.3 efg	86.0 b	
9	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2wks 2wks 2wks 2wks 4 WAP 4 WAP	EPP B EPP B EPP B EPP B E E		78.3 c	88.0 ab	65.0 c	92.0 ab	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

Pest Code Crop Type, Code		IPOSS C - morngly	GGGAN C - AnnGrass	AMAPA C - PalmerAm	IPOSS C - morngly						
Description		Control	Control	Control	Control						
Rating Type											
Rating Unit	%		%	%	%						
Rating Date	07/04/19	07/04/19	07/28/19	07/28/19	07/28/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	4wks 4wks	EPP A EPP A		0.0 i	0.0 c	0.0 h	0.0 k	
2	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	4wks 4wks 4wks 4wks	EPP A EPP A EPP A EPP A		23.3 h	60.0 b	50.0 fg	46.7 ij	
3	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 4wks 4wks 4 WAP 4 WAP	EPP A EPP A EPP A EPP A E E		66.7 f	99.0 a	70.7 de	68.3 efg	
4	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	4wks 4wks 4wks 4wks 4 WAP	EPP A EPP A EPP A EPP A E		43.3 g	99.0 a	60.0 ef	53.3 hi	
5	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 4wks 4wks PRE PRE PRE 4 WAP 4 WAP	EPP A EPP A EPP A EPP A C C C E E		81.0 cde	94.3 a	90.0 abc	71.7 def	
6	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	4wks 4wks 2nd Trifol D 2nd Trifol D 2nd Trifol D	EPP A EPP A 2wks 2wks 2wks		93.0 ab	99.0 a	81.7 bcd	77.7 cde	
7	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2wks 2wks	EPP B EPP B		26.7 h	95.3 a	43.3 g	46.7 ij	
8	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2wks 2wks 2wks 2wks	EPP B EPP B EPP B EPP B		46.7 g	99.0 a	84.0 bcd	40.0 j	
9	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2wks 2wks 2wks 2wks 4 WAP 4 WAP	EPP B EPP B EPP B EPP B E E		89.7 abc	99.0 a	89.7 abc	88.0 abc	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -	IPOSS C -						
Description	PalmerAm	PalmerAm	morngly							
Rating Type	1= excellen	Control	Control							
Rating Unit	0=not	%	%							
Rating Date	09/12/19	09/20/19	09/20/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	4wks 4wks	EPP A EPP A			0.0 c	0.0 c	0.0 i
2	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	4wks 4wks 4wks 4wks	EPP A EPP A EPP A EPP A			0.0 c	43.3 b	16.7 hi
3	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 4wks 4wks 4 WAP 4 WAP	EPP A EPP A EPP A EPP A E E			0.0 c	60.0 b	61.7 cde
4	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	4wks 4wks 4wks 4wks 4 WAP	EPP A EPP A EPP A EPP A E			0.0 c	60.0 b	50.0 efg
5	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 4wks 4wks PRE PRE PRE 4 WAP 4 WAP	EPP A EPP A EPP A EPP A C C C E E			0.3 bc	86.0 a	76.7 abc
6	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	4wks 4wks 2nd Trifol D 2nd Trifol D 2nd Trifol D	EPP A EPP A 2wks 2wks 2wks			0.0 c	82.7 a	70.0 a-e
7	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2wks 2wks	EPP B EPP B			0.0 c	51.7 b	30.0 gh
8	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumoxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2wks 2wks 2wks 2wks	EPP B EPP B EPP B EPP B			0.3 bc	84.0 a	40.0 fg
9	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2wks 2wks 2wks 2wks 4 WAP 4 WAP	EPP B EPP B EPP B EPP B E E			0.7 ab	93.3 a	73.3 a-d

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

Pest Code	Crop Type, Code		C GLXMA	C GLXMA			
Description	Rating Type	Soybean Stnd Cnts	avg grnd cvr	Canopeo vid			
Rating Unit	Rating Date	Num/10ft	%GC	07/09/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	4wks EPP A 4wks EPP A			
2	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	4wks EPP A 4wks EPP A 4wks EPP A 4wks EPP A			
3	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	4wks EPP A 4wks EPP A 4wks EPP A 4wks EPP A 4 WAP E 4 WAP E			
4	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	4wks EPP A 4wks EPP A 4wks EPP A 4wks EPP A 4 WAP E			
5	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	4wks EPP A 4wks EPP A PRE C PRE C PRE C PRE C PRE C 4 WAP E 4 WAP E	34.00000340000000 a	76.23 a	
6	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	4wks EPP A 4wks EPP A 2nd Trifol D 2nd Trifol D 2nd Trifol D	33.66667003333330 ab	75.47 a	
7	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2wks EPP B 2wks EPP B			
8	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2wks EPP B 2wks EPP B 2wks EPP B 2wks EPP B			
9	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2wks EPP B 2wks EPP B 2wks EPP B 2wks EPP B 4 WAP E 4 WAP E			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

Pest Code Crop Type, Code	Description Rating Type	Rating Unit Rating Date	C GLXMA avg grnd cvr Canopeo vid	C GLXMA Soybean Yield	
Trt No. Treatment Name	Form Conc Type	Rate Rate	Appl Unit Timing	Appl Code	
1 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 4wks 0.95 lb ae/a 4wks	EPP A EPP A	8.8 d	
2 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 4wks 0.95 lb ae/a 4wks 0.188 lb ai/a 4wks 0.064 lb ai/a 4wks	EPP A EPP A EPP A EPP A	16.0 bcd	
3 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 4wks 0.95 lb ae/a 4wks 0.188 lb ai/a 4wks 0.064 lb ai/a 4wks 0.585 lb ai/a 4 WAP 0.375 lb ai/a 4 WAP	EPP A EPP A EPP A EPP A E E	15.5 bcd	
4 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 4wks 0.95 lb ae/a 4wks 0.188 lb ai/a 4wks 0.064 lb ai/a 4wks 0.585 lb ai/a 4 WAP	EPP A EPP A EPP A EPP A E	13.8 cd	
5 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 4wks 0.95 lb ae/a 4wks 0.188 lb ai/a PRE 0.064 lb ai/a PRE 1.13 lb ae/a PRE 1.25 % v/v PRE 2.5 % v/v PRE 0.585 lb ai/a 4 WAP 0.375 lb ai/a 4 WAP	EPP A EPP A C C PRE C C E E	88.067 a	25.3 abc
6 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 4wks 0.95 lb ae/a 4wks 0.585 lb ai/a 2nd Trifol D 0.375 lb ai/a 2nd Trifol D 0.0263 lb ai/a 2nd Trifol D	EPP A EPP A D D D	76.050 a	22.8 abc
7 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 2wks 0.95 lb ae/a 2wks	EPP B EPP B		15.7 bcd
8 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 2wks 0.95 lb ae/a 2wks 0.188 lb ai/a 2wks 0.064 lb ai/a 2wks	EPP B EPP B EPP B EPP B		26.1 abc
9 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 2wks 0.95 lb ae/a 2wks 0.188 lb ai/a 2wks 0.064 lb ai/a 2wks 0.585 lb ai/a 4 WAP 0.375 lb ai/a 4 WAP	EPP B EPP B EPP B EPP B E E		26.3 abc

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

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Pest Code	C	SECCE	C	SECCE	AMAPA C -			
Crop Type, Code	Rye		Rye		PalmerAm			
Description	Control		Grnd Cover		Control			
Rating Type								
Rating Unit	%		%		%			
Rating Date	05/30/19		06/08/19		06/08/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code			
10	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	AS SL DF WG SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2wks EPP B 2wks EPP B 2wks EPP B 2wks EPP B 4 WAP E	99.0 a	81.1 abc	89.3 b
11	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	AS SL DF WG AS L L SL L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	2wks EPP B 2wks EPP B PRE C PRE C PRE C PRE C 4 WAP E 4 WAP E	94.7 cd	85.0 ab	99.0 a
12	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	AS SL SL L WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2wks EPP B 2wks EPP B 2nd Trifol D 2nd Trifol D 2nd Trifol D	89.0 e	76.7 bc	63.3 e
13	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	AS SL	1.13 lb ae/a 0.95 lb ae/a	2-3 DAP C	92.3 d	89.7 a	98.3 a
14	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	AS SL DF WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2-3 DAP C 2-3 DAP C 2-3 DAP C 2-3 DAP C	96.3 abc	86.7 ab	99.0 a
15	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	AS SL DF WG SL L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2-3 DAP C 2-3 DAP C 2-3 DAP C 2-3 DAP C 4 WAP E 4 WAP E	95.0 cd	88.3 a	98.7 a
16	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	AS SL DF WG SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2-3 DAP C 2-3 DAP C 2-3DAP C 2-3DAP C 4 WAP E	95.7 bc	90.0 a	99.0 a
17	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 2.34 SL 2 L	AS SL SL L	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a	4wks EPP A 4wks EPP A 2nd Trifol D 2nd Trifol D	99.0 a	21.7 e	33.3 h
18	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	AS SL SL L WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2-3 DAP C 2-3 DAP C 2nd Trifol D 2nd Trifol D 2nd Trifol D	92.3 d	88.3 a	98.0 a

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

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Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - mornglry	AMAPA C - PalmerAm	IPOSS C - mornglry	AMAPA C - PalmerAm	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
10	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2wks 2wks 2wks 2wks 4 WAP	EPP B EPP B EPP B EPP B E	82.3 bc	84.7 abc	60.0 cd	86.3 b
11	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	2wks 2wks PRE PRE PRE PRE PRE 4 WAP 4 WAP	EPP B EPP B C C C C C E E	92.7 ab	99.0 a	82.7 b	96.0 ab
12	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2wks 2wks 2nd Trifol 2nd Trifol 2nd Trifol	EPP B EPP B D D D	72.2 cd	99.0 a	99.0 a	95.3 ab
13	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2-3 DAP	C C	99.0 a	93.7 a	97.7 ab	87.0 b
14	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2-3 DAP	C C C C	99.0 a	99.0 a	93.7 ab	97.0 ab
15	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2-3 DAP 2-3 DAP 2-3 DAP 2-3 DAP 4 WAP 4 WAP	C C C C E E	96.0 a	99.0 a	88.7 ab	99.0 a
16	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2-3 DAP 2-3 DAP 2-3 DAP 2-3 DAP 4 WAP	C C C C E	98.3 a	99.0 a	88.0 ab	99.0 a
17	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 2nd Trifol 2nd Trifol	EPP A EPP A D D	33.3 e	75.7 bc	91.0 ab	94.7 ab
18	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2-3 DAP 2-3 DAP 2nd Trifol 2nd Trifol 2nd Trifol	C C D D D	96.7 a	99.0 a	99.0 a	99.0 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - morngly	GGGAN C - AnnGrass	AMAPA C - PalmerAm	IPOSS C - morngly	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
10	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2wks 2wks 2wks 2wks 4 WAP	EPP B EPP B EPP B EPP B E	68.3 f	99.0 a	83.7 bcd	63.3 fgh
11	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	2wks 2wks PRE PRE PRE PRE PRE 4 WAP 4 WAP	EPP B EPP B C C C C C E E	97.7 a	99.0 a	95.3 ab	93.0 ab
12	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2wks 2wks 2nd Trifol 2nd Trifol 2nd Trifol	EPP B EPP B D D D	99.0 a	99.0 a	94.0 ab	96.0 a
13	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2-3 DAP	C C	68.3 f	99.0 a	79.0 cd	56.7 ghi
14	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2-3 DAP	C C C C	75.7 def	99.0 a	90.3 abc	53.3 hi
15	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2-3 DAP 2-3 DAP 2-3 DAP 2-3 DAP 4 WAP 4 WAP	C C C C E E	98.3 a	99.0 a	99.0 a	81.3 bcd
16	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2-3 DAP	C C C C C	85.0 bcd	99.0 a	90.3 abc	71.7 def
17	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 2nd Trifol 2nd Trifol	EPP A EPP A D D	88.3 abc	97.7 a	88.0 abc	81.7 bcd
18	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2-3 DAP	C C C C 2nd Trifol	98.0 a	99.0 a	99.0 a	95.3 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C -	AMAPA C -	IPOSS C -
					PalmerAm 1= excellen	PalmerAm Control	mornglry Control
					0=not 09/12/19	% 09/20/19	% 09/20/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
10	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2wks 2wks 2wks 2wks 4 WAP	EPP B EPP B EPP B EPP B E		0.3 bc 85.0 a 56.7 c-f
11	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	2wks 2wks PRE PRE PRE PRE PRE 4 WAP 4 WAP	EPP B EPP B C C C C C E E	1.0 a	96.7 a 85.0 ab
12	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2wks 2wks 2nd Trifol 2nd Trifol 2nd Trifol	D D D D D	1.0 a	94.3 a 88.3 a
13	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2-3 DAP	C C	0.0 c	81.7 a 60.0 c-f
14	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2-3 DAP 2-3 DAP 2-3 DAP 2-3 DAP	C C C C	0.0 c	88.0 a 56.7 c-f
15	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2-3 DAP 2-3 DAP 2-3 DAP 2-3 DAP 4 WAP 4 WAP	C C C C E E	1.0 a	100.0 a 75.0 abc
16	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2-3 DAP 2-3 DAP 2-3DAP 2-3DAP 4 WAP	C C C C E	0.3 bc	92.7 a 53.3 def
17	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 2nd Trifol 2nd Trifol	EPP A EPP A D D	0.7 ab	86.0 a 85.0 ab
18	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2-3 DAP 2-3 DAP 2nd Trifol 2nd Trifol 2nd Trifol	C C D D D	1.0 a	100.0 a 88.3 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code	C GLXMA	C GLXMA							
Crop Type, Code	Soybean Stnd Cnts	avg grnd cvr Canopeo vid							
Description									
Rating Type									
Rating Unit									
Rating Date	Num/10ft 07/09/19	%GC 07/09/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
10	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2wks	EPP	B			
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2wks	EPP	B			
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	2wks	EPP	B			
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	2wks	EPP	B			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	4	WAP	E			
11	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2wks	EPP	B	30.33333636666670 abc	54.43 bc	
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2wks	EPP	B			
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE		C			
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE		C			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	PRE		C			
	Crop Oil Concentrate	100 L	1.25 % v/v	PRE		C			
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	PRE		C			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	4	WAP	E			
	Reflex.....fomesafen	2 L	0.375 lb ai/a	4	WAP	E			
12	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2wks	EPP	B	29.55555851111110 bc	65.58 ab	
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2wks	EPP	B			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	2nd Trifol	D				
	Reflex.....fomesafen	2 L	0.375 lb ai/a	2nd Trifol	D				
	Firstrate.....cloransulam	84 WG	0.0263 lb ai/a	2nd Trifol	D				
13	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-3 DAP		C			
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-3 DAP		C			
14	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-3 DAP		C			
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-3 DAP		C			
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	2-3 DAP		C			
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	2-3 DAP		C			
15	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-3 DAP		C	28.33333616666670 c	38.03 d	
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-3 DAP		C			
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	2-3 DAP		C			
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	2-3 DAP		C			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	4	WAP	E			
	Reflex.....fomesafen	2 L	0.375 lb ai/a	4	WAP	E			
16	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-3 DAP		C	28.11111392222220 c	37.33 d	
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-3 DAP		C			
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	2-3DAP		C			
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	2-3DAP		C			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	4	WAP	E			
17	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4wks	EPP	A			
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	4wks	EPP	A			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	2nd Trifol	D				
	Reflex.....fomesafen	2 L	0.375 lb ai/a	2nd Trifol	D				
18	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-3 DAP		C	27.44444718888890 c	43.83 cd	
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2-3 DAP		C			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	2nd Trifol	D				
	Reflex.....fomesafen	2 L	0.375 lb ai/a	2nd Trifol	D				
	Firstrate.....cloransulam	84 WG	0.0263 lb ai/a	2nd Trifol	D				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code	Crop Type, Code		C GLXMA	C GLXMA			
Description	Rating Type		avg grnd cvr	Soybean Yield			
Rating Unit	Rating Date		%GC 08/01/19	Bu/A 11/07/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
10	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2wks 2wks 2wks 2wks 4 WAP	EPP B EPP B EPP B EPP B E		26.1 abc
11	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Crop Oil Concentrate 30% Urea Ammonium Nitrate Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 4.5 AS 100 L 100 L 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 1.13 lb ae/a 1.25 % v/v 2.5 % v/v 0.585 lb ai/a 0.375 lb ai/a	2wks 2wks PRE PRE PRE PRE 4 WAP 4 WAP	EPP B EPP B C C C C E E	77.300 a	33.9 a
12	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2wks 2wks 2nd Trifol 2nd Trifol 2nd Trifol	EPP B EPP B D D D	80.761 a	30.2 a
13	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline	4.5 AS 3.8 SL	1.13 lb ae/a 0.95 lb ae/a	2-3 DAP	C C		26.9 abc
14	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin	4.5 AS 3.8 SL 75 DF 51 WG	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a	2-3 DAP 2-3 DAP 2-3 DAP 2-3 DAP	C C C C		28.7 ab
15	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a 0.375 lb ai/a	2-3 DAP 2-3 DAP 2-3 DAP 2-3 DAP 4 WAP 4 WAP	C C C C E E	67.767 a	29.8 a
16	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Metribuzin.....metribuzin Valor SX.....flumioxazin Liberty 280.....glufosinate	4.5 AS 3.8 SL 75 DF 51 WG 2.34 SL	1.13 lb ae/a 0.95 lb ae/a 0.188 lb ai/a 0.064 lb ai/a 0.585 lb ai/a	2-3 DAP 2-3 DAP 2-3DAP 2-3DAP 4 WAP	C C C C E	69.800 a	25.4 abc
17	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a	4wks 4wks 2nd Trifol 2nd Trifol	EPP A EPP A D D		23.4 abc
18	Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen Firstrate.....cloransulam	4.5 AS 3.8 SL 2.34 SL 2 L 84 WG	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a 0.0263 lb ai/a	2-3 DAP 2-3 DAP 2nd Trifol 2nd Trifol 2nd Trifol	C C D D D	72.212 a	32.4 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code Crop Type, Code	C SECCE Rye Control	C SECCE Rye Grnd Cover	AMAPA C - PalmerAm Control
Description			
Rating Type			
Rating Unit	%	%	%
Rating Date	05/30/19	06/08/19	06/08/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Unit Appl Timing	Appl Code
19 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a	2wks EPP B 2wks EPP B 2nd Trifol D 2nd Trifol D
20 Untreated Check		0.0 f	
LSD P=.05		2.69	10.29
Standard Deviation		1.63	6.21
CV		1.77	10.39
Replicate F		0.057	3.122
Replicate Prob(F)		0.9449	0.0566
Treatment F		540.797	176.971
Treatment Prob(F)		0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code Crop Type, Code		IPOSS C - mornglry	AMAPA C - PalmerAm	IPOSS C - mornglry	AMAPA C - PalmerAm
Description					
Rating Type		Control	Control	Control	Control
Rating Unit		%	%	%	%
Rating Date		06/08/19	06/21/19	06/21/19	07/04/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
19	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2wks	EPP B
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2wks	EPP B
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	2nd Trifol	D
	Reflex.....fomesafen	2 L	0.375 lb ai/a	2nd Trifol	D
20	Untreated Check				
LSD P=.05		11.01	17.52	15.81	11.95
Standard Deviation		6.63	10.60	9.55	7.23
CV		9.91	13.01	13.43	8.88
Replicate F		0.338	0.886	0.353	3.700
Replicate Prob(F)		0.7159	0.4205	0.7047	0.0340
Treatment F		64.907	16.602	25.922	34.803
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code Crop Type, Code	IPOSS C - mornglry	GGGAN C - AnnGrass	AMAPA C - PalmerAm	IPOSS C - mornglry	
Description					
Rating Type	Control	Control	Control	Control	
Rating Unit	%	%	%	%	
Rating Date	07/04/19	07/04/19	07/28/19	07/28/19	
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code	
19 Roundup PowerMax..glyphosate Enlist One.....2,4-D choline Liberty 280.....glufosinate Reflex.....fomesafen	4.5 AS 3.8 SL 2.34 SL 2 L	1.13 lb ae/a 0.95 lb ae/a 0.585 lb ai/a 0.375 lb ai/a	2wks EPP B 2wks EPP B 2nd Trifol D 2nd Trifol D	94.3 ab	99.0 a 94.0 ab 77.3 cde
20 Untreated Check		70.0 ef	99.0 a	85.0 abc 50.0 ij	
LSD P=.05		11.74	5.15	14.23 11.93	
Standard Deviation		7.10	3.12	8.61 7.22	
CV		10.05	3.4	10.98 11.0	
Replicate F		0.462	2.731	0.640 1.217	
Replicate Prob(F)		0.6335	0.0780	0.5329 0.3075	
Treatment F		48.907	166.986	23.355 31.039	
Treatment Prob(F)		0.0001	0.0001	0.0001 0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	AMAPA C -	IPOSS C -					
Description	PalmerAm	PalmerAm	mornglry						
Rating Type	1= excellen	Control	Control						
Rating Unit	0=not	%	%						
Rating Date	09/12/19	09/20/19	09/20/19						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
19 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2wks	EPP	B		1.0 a	97.3 a	66.7 b-e
Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2wks	EPP	B				
Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	2nd	Trifol	D				
Reflex.....fomesafen	2 L	0.375 lb ai/a	2nd	Trifol	D				
20 Untreated Check							0.0 c	87.3 a	50.0 efg
LSD P=.05							0.50	18.67	21.18
Standard Deviation							0.30	11.29	12.82
CV							78.47	14.39	21.66
Replicate F							4.605	0.363	2.058
Replicate Prob(F)							0.0168	0.6982	0.1418
Treatment F							5.924	14.194	10.300
Treatment Prob(F)							0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code		C GLXMA	C GLXMA						
Crop Type, Code		Soybean Stnd Cnts	avg grnd cvr Canopeo vid						
Description									
Rating Type									
Rating Unit		Num/10ft	%GC						
Rating Date	07/09/19	07/09/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
19	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2wks	EPP	B			
	Enlist One.....2,4-D choline	3.8 SL	0.95 lb ae/a	2wks	EPP	B			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	2nd	Trifol	D			
	Reflex.....fomesafen	2 L	0.375 lb ai/a	2nd	Trifol	D			
20 Untreated Check									
LSD P=.05							4.428775714185140	14.208	
Standard Deviation							2.489484304771740	7.809	
CV							8.24	13.98	
Replicate F							0.257	10.068	
Replicate Prob(F)							0.7775	0.0040	
Treatment F							3.415	13.952	
Treatment Prob(F)							0.0333	0.0002	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12

## University of Delaware

Pest Code		C GLXMA	C GLXMA						
Crop Type, Code		avg grnd cvr	Soybean Yield						
Description		Canopeo vid							
Rating Type		%GC	Bu/A						
Rating Unit		08/01/19	11/07/19						
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
19	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb	ae/a	2wks	EPP	B	
	Enlist One.....2,4-D choline	3.8	SL	0.95 lb	ae/a	2wks	EPP	B	
	Liberty 280.....glufosinate	2.34	SL	0.585 lb	ai/a	2nd	Trifol	D	
	Reflex.....fomesafen	2	L	0.375 lb	ai/a	2nd	Trifol	D	
20	Untreated Check								26.1 abc
LSD P=.05							15.7872	13.70	
Standard Deviation							8.6778	8.24	
CV							11.42	34.19	
Replicate F							5.970	1.678	
Replicate Prob(F)							0.0197	0.2027	
Treatment F							1.929	1.996	
Treatment Prob(F)							0.1711	0.0410	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2,3,4,6,17,18,24; Average=12



## ET Tankmixes for Burndown Weed Control

Trial ID: Soy2-19

Location: Field #6

Trial Year: 2019

Protocol ID: Soy2-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Nichino

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

ARM Trial Created On: 04/02/19

Initiation Date: 03/01/19

Completion Date: 06/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

C

**Pest Description**

Pest 1 Type: W Code: OEOLA Oenothera lacinata

Common Name: Cutleaf eveningprimrose Entry Date: 12/09/19

Pest 2 Type: W Code: ERICA Conyza canadensis

Common Name: Canada horseweed Entry Date: 12/09/19

Pest 3 Type: W Code: STEME Stellaria media

Common Name: Common chickweed Entry Date: 12/09/19

Pest 4 Type: W Code: LEPVI Lepidium virginicum

Common Name: Virginia pepperweed Entry Date: 12/09/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 20 Tillage Type: NOTILL no-till

Replications: 3 Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 6D

% Sand: 81 % OM: 0.8 Texture: LS loamy sand

% Silt: 10 pH: 6.6 Soil Name: Pepperbox loamy sand, 0-2% slopes

% Clay: 9 CEC: 4.2 Fert. Level: E excellent

Soil Drainage: G good

**Application Description**

	A	B
Application Date	04/18/19	05/02/19
Appl. Stop Time	10:00 AM	11:10 AM
Application Method	SPRAY	SPRAY
Application Timing	Early	Late
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/22/19	05/22/19
Air Temperature Start, Stop	66 72 F	76 79 F
% Relative Humidity Start, Stop	70 61	71 65
Wind Velocity+Dir. Start	7 mph S	9 mph SW
Wind Velocity+Dir. Stop	7 mph SSE	3 mph
Wind Velocity+Dir. Max	7 mph S	9 mph SW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	60 F	70 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	46	10
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.25 IN	1.83 IN

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	OEOLA W	OEOLA W
Stage Majority, Percent	Bolt 100	bolt 100
Height Average	2.5 in	4 in
Height Minimum, Maximum	2 3	3 5
Density Average	15 m2	15 m2
Density Min, Max	10 20	10 20
Pest 2 Code, Type, Scale	ERICA W	ERICA W
Stage Majority, Percent	bolt 100	bolt 100
Height Average	3.5 in	5 in
Height Minimum, Maximum	3 4	4 6
Density Average	2 plot	2 plot
Density Min, Max	1 3	1 3
Pest 3 Code, Type, Scale	STEME W	STEME W
Stage Majority, Percent	flower 100	flower 100
Height Average	6 in	7 in
Height Minimum, Maximum	5 8	5 8
Density Average	2 m2	2 m2
Density Min, Max	1 3	1 3
Pest 4 Code, Type, Scale	LEPVI W	LEPVI W
Stage Majority, Percent	flower 100	flower 100
Height Average	10 in	10 in
Height Minimum, Maximum	8 12	8 12
Density Average	4 m2	4 m2
Density Min, Max	2 6	2 6

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	34 in	34 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	04/02/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	04/02/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

05/09/19: Poor to no control:

Carolina geranium with treatments 1  
 Horseweed with treatments 3, 6, 18  
 Prickly lettuce with treatments 12 and 18

Sharpen was poor to fair for common chickweed and knawel

05/20/19: Poor to no control:

Prickly lettuce with treatments 1, 2, 18  
 Groundsel with treatment 1  
 Common vetch with treatment 3

05/29/19: Poor control of field pansy with treatments 5, 11, 12, 13, 14, and 16

ET Tankmixes for Burndown Weed Control									
Trial ID: Soy2-19		Location: Field #6		Trial Year: 2019					
Protocol ID: Soy2-19		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: Nichino				STEME C.chkwd	OEOLA CEprmrse	SCRAN Knawel	STEME C.chkwd		
Pest Code Description	Rating Type	Rating Unit	Rating Date	Control % 04/25/19	Control % 04/25/19	Control % 04/25/19	Control % 05/09/19		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.00406 lb ai/a 1 % v/v	lb ai/a Early	A	20.0 f	25.0 c 0.0 d 25.0 fg		
2	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0081 lb ai/a 1 % v/v	lb ai/a Early	A	33.3 ef	77.5 a 20.0 cd 28.3 fg		
3	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0122 lb ai/a 1 % v/v	lb ai/a Early	A	43.3 cde	90.0 a 30.0 cd 40.0 de		
4	Early (April 10) ET.....pyraflufen Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	0.208 EC 2.85 SC 100 L 100 L	0.0081 lb ai/a 0.0445 lb ai/a 1 % v/v 1 % v/v	lb ai/a Early	A	50.0 bcd	85.0 a 43.3 bc 53.3 c		
5	Early (April 10) ET.....pyraflufen Roundup PowerMax..glyphosate Crop Oil Concentrate	0.208 EC 4.5 AS 100 L	0.0081 lb ai/a 1.13 lb ae/a 1 % v/v	lb ai/a Early	A	60.0 b	84.0 a 60.0 abc 100.0 a		
6	Early (April 10) ET.....pyraflufen Gramoxone SL....paraquat Crop Oil Concentrate	0.208 EC 2 SL 100 L	0.0081 lb ai/a 0.625 lb ai/a 1 % v/v	lb ai/a Early	A	83.3 a	85.0 a 81.0 ab 100.0 a		
7	Early (April 10) Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 1 % v/v	lb ai/a Early	A	38.3 de	83.3 a 40.0 cd 38.3 de		
8	Early (April 10) Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	lb ae/a	Early	A	53.3 bc 46.7 bc 60.0 abc 99.7 a		
9	Early (April 10) Gramoxone SL....paraquat Crop Oil Concentrate	2 SL 100 L	0.625 lb ai/a 1 % v/v	lb ai/a Early	A	85.0 a	50.0 b 85.0 a 100.0 a		
10	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.00406 lb ai/a 1 % v/v	lb ai/a Late	B		20.0 g		
11	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0081 lb ai/a 1 % v/v	lb ai/a Late	B		25.0 fg		
12	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0122 lb ai/a 1 % v/v	lb ai/a Late	B		40.0 de		
13	Late (May 1) ET.....pyraflufen Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	0.208 EC 2.85 SC 100 L 100 L	0.0081 lb ai/a 0.0445 lb ai/a 1 % v/v 1 % v/v	lb ai/a Late	B		53.3 c		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,7,11,12; Average=2,3,8,9

Pest Code Description			OEOLA CEprmrse	STEME C.chkwd	OEOLA CEprmrse	ERICA Horsewd				
Rating Type			Control %	Control %	Control %	Control %				
Rating Unit			05/09/19	05/20/19	05/20/19	05/20/19				
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing				
1	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.00406 lb ai/a 1 % v/v	lb ai/a Early	A	46.7 hi	20.0 d	40.0 def	46.7 efg	
2	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0081 lb ai/a 1 % v/v	lb ai/a Early	A	63.3 c-g	36.7 bcd	43.3 def	55.0 b-e	
3	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0122 lb ai/a 1 % v/v	lb ai/a Early	A	63.3 c-g	33.3 cd	53.3 a-e	40.0 fg	
4	Early (April 10) ET.....pyraflufen Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	0.208 EC 2.85 SC 100 L 100 L	0.0081 lb ai/a 0.0445 lb ai/a 1 % v/v 1 % v/v	lb ai/a Early	A	96.0 a	40.0 bc	63.3 abc	99.0 a	
5	Early (April 10) ET.....pyraflufen Roundup PowerMax..glyphosate Crop Oil Concentrate	0.208 EC 4.5 AS 100 L	0.0081 lb ai/a 1.13 lb ae/a 1 % v/v	lb ai/a Early	A	79.3 b	99.0 a	68.3 a	63.3 bc	
6	Early (April 10) ET.....pyraflufen Gramoxone SL....paraquat Crop Oil Concentrate	0.208 EC 2 SL 100 L	0.0081 lb ai/a 0.625 lb ai/a 1 % v/v	lb ai/a Early	A	75.0 bcd	99.0 a	61.7 abc	61.7 bcd	
7	Early (April 10) Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 1 % v/v	lb ai/a Early	A	76.3 bc	26.7 cd	46.7 c-f	99.0 a	
8	Early (April 10) Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	lb ae/a	Early	A	70.0 b-e	99.0 a	70.0 a	56.7 b-e
9	Early (April 10) Gramoxone SL....paraquat Crop Oil Concentrate	2 SL 100 L	0.625 lb ai/a 1 % v/v	lb ai/a Early	A	56.7 e-i	99.0 a	33.3 f	36.7 g	
10	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.00406 lb ai/a 1 % v/v	lb ai/a Late	B	43.3 i	20.0 d	36.7 ef	40.0 fg	
11	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0081 lb ai/a 1 % v/v	lb ai/a Late	B	50.0 f-i	30.0 cd	43.3 def	56.7 b-e	
12	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0122 lb ai/a 1 % v/v	lb ai/a Late	B	63.3 c-g	30.0 cd	51.1 b-e	50.0 def	
13	Late (May 1) ET.....pyraflufen Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	0.208 EC 2.85 SC 100 L 100 L	0.0081 lb ai/a 0.0445 lb ai/a 1 % v/v 1 % v/v	lb ai/a Late	B	60.0 d-h	36.7 bcd	54.9 a-d	99.0 a	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,7,11,12; Average=2,3,8,9

Pest Code Description			VIORA FldPansy	STEME C.chkwd	OEOLA CEprmrse	ERICA Horsewd
Rating Type			Control % 05/20/19	Control % 05/29/19	Control % 05/29/19	Control % 05/29/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
1	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.00406 lb ai/a 1 % v/v	Early Early	A A	0.0 b 23.3 f
2	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0081 lb ai/a 1 % v/v	Early Early	A A	40.0 a 31.7 def
3	Early (April 10) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0122 lb ai/a 1 % v/v	Early Early	A A	20.0 ab 26.7 ef
4	Early (April 10) ET.....pyraflufen Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	0.208 EC 2.85 SC 100 L 100 L	0.0081 lb ai/a 0.0445 lb ai/a 1 % v/v 1 % v/v	Early Early Early Early	A A A A	40.0 a 46.7 cd
5	Early (April 10) ET.....pyraflufen Roundup PowerMax..glyphosate Crop Oil Concentrate	0.208 EC 4.5 AS 100 L	0.0081 lb ai/a 1.13 lb ae/a 1 % v/v	Early Early Early	A A A	25.0 ab 99.0 a
6	Early (April 10) ET.....pyraflufen Gramoxone SL....paraquat Crop Oil Concentrate	0.208 EC 2 SL 100 L	0.0081 lb ai/a 0.625 lb ai/a 1 % v/v	Early Early Early	A A A	99.0 a 43.3 c-f
7	Early (April 10) Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 1 % v/v	Early Early Early	A A A	40.0 a 26.7 ef
8	Early (April 10) Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A	99.0 a 66.7 a
9	Early (April 10) Gramoxone SL....paraquat Crop Oil Concentrate	2 SL 100 L	0.625 lb ai/a 1 % v/v	Early Early	A A	97.7 a 43.3 c-f
10	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.00406 lb ai/a 1 % v/v	Late Late	B B	10.0 b 43.3 cde
11	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0081 lb ai/a 1 % v/v	Late Late	B B	40.0 a 50.0 c
12	Late (May 1) ET.....pyraflufen Crop Oil Concentrate	0.208 EC 100 L	0.0122 lb ai/a 1 % v/v	Late Late	B B	40.0 a 43.3 cde
13	Late (May 1) ET.....pyraflufen Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	0.208 EC 2.85 SC 100 L 100 L	0.0081 lb ai/a 0.0445 lb ai/a 1 % v/v 1 % v/v	Late Late Late Late	B B B B	50.0 c 54.6 a-e

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,7,11,12; Average=2,3,8,9

## University of Delaware

Pest Code Description			STEME C.chkwd	OEOLA CEprmrse	SCRAN Knawel	STEME C.chkwd
Rating Type		Control %	Control %	Control %	Control %	Control %
Rating Unit		04/25/19	04/25/19	04/25/19	04/25/19	05/09/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
14	Late (May 1)					
	ET.....pyraflufen	0.208	EC	0.0081 lb ai/a	Late	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	Late	B
	Crop Oil Concentrate	100	L	1 % v/v	Late	B
15	Late (May 1)					
	ET.....pyraflufen	0.208	EC	0.0081 lb ai/a	Late	B
	Gramoxone SL....paraquat	2	SL	0.625 lb ai/a	Late	B
	Crop Oil Concentrate	100	L	1 % v/v	Late	B
16	Late (May 1)					
	Sharpen.....saflufenacil	2.85	SC	0.0445 lb ai/a	Late	B
	Methylated Seed Oil	100	L	1 % v/v	Late	B
	Liquid Ammonium Sulfate	100	L	1 % v/v	Late	B
17	Late (May 1)					
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	Late	B
18	Late (May 1)					
	Gramoxone SL....paraquat	2	SL	0.625 lb ai/a	Late	B
	Crop Oil Concentrate	100	L	1 % v/v	Late	B
19	Untreated Check				2.7 g	0.0 d
20	Liberty 280....glufosinate	2.34	SL	0.88 lb ai/a	Late	B
	Liquid Ammonium Sulfate	100	L	1 % v/v	Late	B
LSD P=.05				14.96	23.32	40.35
Standard Deviation				8.69	12.98	11.48
CV				18.51	20.71	5.57
Replicate F				2.941	1.117	0.018
Replicate Prob(F)				0.0800	0.3618	0.9819
Treatment F				26.286	17.046	0.4271
Treatment Prob(F)				0.0001	0.0001	89.231
					0.0470	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,7,11,12; Average=2,3,8,9

## University of Delaware

Pest Code Description			OEOLA CEprmrse	STEME C.chkwd	OEOLA CEprmrse	ERICA Horsewd				
Rating Type			Control %	Control %	Control %	Control %				
Rating Unit			05/09/19	05/20/19	05/20/19	05/20/19				
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code				
14	Late (May 1) ET.....pyraflufen Roundup PowerMax..glyphosate Crop Oil Concentrate	0.208 EC 4.5 AS 100 L	0.0081 lb ai/a 1.13 lb ae/a 1 % v/v	lb ai/a Late Late	B B B	53.3 f-i	97.0 a	63.3 abc	65.0 b	
15	Late (May 1) ET.....pyraflufen Gramoxone SL....paraquat Crop Oil Concentrate	0.208 EC 2 SL 100 L	0.0081 lb ai/a 0.625 lb ai/a 1 % v/v	lb ai/a Late Late	B B B	65.0 b-f	99.0 a	66.7 ab	51.7 c-f	
16	Late (May 1) Sharpen.....saflufenacil Methylated Seed Oil Liquid Ammonium Sulfate	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 1 % v/v	lb ai/a Late Late	B B B	50.0 f-i	23.3 cd	33.3 f	99.0 a	
17	Late (May 1) Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	lb ae/a	Late	B	21.7 j	89.0 a	40.0 def	36.7 g
18	Late (May 1) Gramoxone SL....paraquat Crop Oil Concentrate	2 SL 100 L	0.625 lb ai/a 1 % v/v	lb ai/a Late	B B	70.0 b-e	99.0 a	61.7 abc	36.7 g	
19	Untreated Check				0.0 k	0.0 e	0.0 g	0.0 h		
20	Liberty 280.....glufosinate Liquid Ammonium Sulfate	2.34 SL 100 L	0.88 lb ai/a 1 % v/v	lb ai/a Late	B B	48.3 ghi	53.3 b	63.3 abc	89.7 a	
LSD P=.05 Standard Deviation CV					15.65 9.47 16.44	18.43 11.15 19.74	16.94 10.23 20.57	12.49 7.51 12.7		
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					1.629 0.2094 14.483 0.0001	3.651 0.0355 30.967 0.0001	0.837 0.4413 8.132 0.0001	1.127 0.3366 37.581 0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,7,11,12; Average=2,3,8,9

## University of Delaware

Pest Code Description			VIORA FldPansy	STEME C.chkwrd	OEOLA CEprmrse	ERICA Horsewd
Rating Type			Control %	Control %	Control %	Control %
Rating Unit			05/20/19	05/29/19	05/29/19	05/29/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
14	Late (May 1)					
	ET.....pyraflufen	0.208	EC	0.0081 lb ai/a	Late	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	Late	B
	Crop Oil Concentrate	100	L	1 % v/v	Late	B
15	Late (May 1)					
	ET.....pyraflufen	0.208	EC	0.0081 lb ai/a	Late	B
	Gramoxone SL....paraquat	2	SL	0.625 lb ai/a	Late	B
	Crop Oil Concentrate	100	L	1 % v/v	Late	B
16	Late (May 1)					
	Sharpen.....saflufenacil	2.85	SC	0.0445 lb ai/a	Late	B
	Methylated Seed Oil	100	L	1 % v/v	Late	B
	Liquid Ammonium Sulfate	100	L	1 % v/v	Late	B
17	Late (May 1)					
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	Late	B
18	Late (May 1)					
	Gramoxone SL....paraquat	2	SL	0.625 lb ai/a	Late	B
	Crop Oil Concentrate	100	L	1 % v/v	Late	B
19	Untreated Check				0.0 b	0.0 g
20	Liberty 280....glufosinate	2.34	SL	0.88 lb ai/a	Late	B
	Liquid Ammonium Sulfate	100	L	1 % v/v	Late	B
LSD P=.05				27.19	17.26	18.54
Standard Deviation				14.08	10.44	11.21
CV				57.01	16.87	22.46
Replicate F				0.199	0.858	0.148
Replicate Prob(F)				0.8243	0.4320	0.8626
Treatment F				4.075	31.676	5.838
Treatment Prob(F)				0.0376	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,7,11,12; Average=2,3,8,9

ET Tankmixes for Burndown Weed Control							
Trial ID: Soy2-19		Location: Field #6		Trial Year: 2019			
Protocol ID: Soy2-19		Investigator: Mark VanGessel					
Study Director:							
Sponsor Contact: Nichino							
Pest Code	Description			STEME C.chkwd	OEOLA CEprmrse	SCRAN Knawel	STEME C.chkwd
Rating Type				Control % 04/25/19	Control % 04/25/19	Control % 04/25/19	Control % 05/09/19
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
TABLE OF R MEANS							
Replicate 1							56.1
Replicate 2							54.9
Replicate 3							53.1
TABLE OF A (Timings) MEANS							
1 Early (April 10)							65.0 a
2 Late (May 1)							44.4 b
LSD P=.05							2.48
Standard Deviation							4.48
CV							8.19
TABLE OF B (Herbicides) MEANS							
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A			22.5 f
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A			
2 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A			26.7 f
2 Crop Oil Concentrate	100 L	1 % v/v	Early	A			
3 ET.....pyraflufen	0.208 EC	0.0122 lb ai/a	Early	A			40.0 e
3 Crop Oil Concentrate	100 L	1 % v/v	Early	A			
4 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A			53.3 d
4 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A			
4 Methylated Seed Oil	100 L	1 % v/v	Early	A			
4 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A			
5 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A			76.7 b
5 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A			
5 Crop Oil Concentrate	100 L	1 % v/v	Early	A			
6 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A			87.5 a
6 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A			
6 Crop Oil Concentrate	100 L	1 % v/v	Early	A			
7 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A			35.0 e
7 Methylated Seed Oil	100 L	1 % v/v	Early	A			
7 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A			
8 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A			63.2 c
9 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A			87.5 a
9 Crop Oil Concentrate	100 L	1 % v/v	Early	A			
LSD P=.05							5.25
Standard Deviation							4.48
CV							8.19
TABLE OF A (Timings) B (Herbicides) MEANS							
1 Early (April 10)							
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A	20.0 a	25.0 a	0.0 a
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A			25.0 fg
2 Late (May 1)					.	.	.
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A			20.0 g
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Description		OEOLA CEprmrse	STEME C.chkwd	OEOLA CEprmrse	ERICA Horsewd
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		05/09/19	05/20/19	05/20/19	05/20/19
Rating Date					
Trt Treatment No. Name	Form Conc Form Type Rate	Rate Unit	Appl Timing	Appl Code	
TABLE OF R MEANS					
Replicate 1		63.3	63.6	53.2	62.8
Replicate 2		60.7	59.8	52.8	58.1
Replicate 3		59.9	56.1	49.2	61.2
TABLE OF A (Timings) MEANS					
1 Early (April 10)		69.6 a	61.4 a	53.3 a	62.0 a
2 Late (May 1)		53.0 b	58.2 a	50.1 a	59.4 a
LSD P=.05		4.71	5.24	5.27	4.21
Standard Deviation		8.52	9.48	9.51	7.54
CV		13.90	15.84	18.39	12.43
TABLE OF B (Herbicides) MEANS					
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A	
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A	45.0 d
2 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	56.7 c
2 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
3 ET.....pyraflufen	0.208 EC	0.0122 lb ai/a	Early	A	63.3 bc
3 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
4 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	78.0 a
4 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A	
4 Methylated Seed Oil	100 L	1 % v/v	Early	A	
4 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A	
5 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	66.3 bc
5 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A	
5 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
6 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	70.0 ab
6 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A	
6 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
7 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A	63.2 bc
7 Methylated Seed Oil	100 L	1 % v/v	Early	A	
7 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A	
8 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A	45.8 d
9 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A	63.3 bc
9 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
LSD P=.05		10.00	11.12	11.19	8.92
Standard Deviation		8.52	9.48	9.51	7.54
CV		13.90	15.84	18.39	12.43
TABLE OF A (Timings) B (Herbicides) MEANS					
1 Early (April 10)		46.7 gh	20.0 a	40.0 efg	46.7 a
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A	
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
2 Late (May 1)		43.3 h	20.0 a	36.7 fg	40.0 a
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A	
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Description		VIORA FldPansy	STEME C.chkwd	OEOLA CEprmrse	ERICA Horsewd
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		05/20/19	05/29/19	05/29/19	05/29/19
Rating Date					
Trt Treatment No. Name	Form Conc Form Type Rate	Rate Unit	Appl Timing	Appl Code	
TABLE OF R MEANS					
Replicate 1			65.5	52.8	65.7
Replicate 2			64.1	51.3	57.4
Replicate 3			63.4	50.8	63.0
TABLE OF A (Timings) MEANS					
1 Early (April 10)			61.1 b	53.1 a	61.8 a
2 Late (May 1)			67.6 a	50.1 a	62.2 a
LSD P=.05			5.13	6.49	4.03
Standard Deviation			9.28	11.72	7.27
CV			14.42	22.69	11.71
TABLE OF B (Herbicides) MEANS					
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A	
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A	33.3 cd
2 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	40.8 bc
2 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
3 ET.....pyraflufen	0.208 EC	0.0122 lb ai/a	Early	A	35.0 cd
3 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
4 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	48.3 b
4 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A	
4 Methylated Seed Oil	100 L	1 % v/v	Early	A	
4 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A	
5 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	99.0 a
5 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A	58.3 ab
5 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
6 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	99.0 a
6 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A	53.3 abc
6 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
7 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A	28.3 d
7 Methylated Seed Oil	100 L	1 % v/v	Early	A	
7 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A	
8 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A	96.8 a
9 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A	62.5 a
9 Crop Oil Concentrate	100 L	1 % v/v	Early	A	51.7 a-d
9 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A	56.7 bc
9 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
LSD P=.05			10.89	13.76	8.56
Standard Deviation			9.28	11.72	7.27
CV			14.42	22.69	11.71
TABLE OF A (Timings) B (Herbicides) MEANS					
1 Early (April 10)			0.0 a	23.3 a	40.0 a
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A	
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A	
2 Late (May 1)			10.0 a	43.3 a	36.7 a
1 ET.....pyraflufen	0.208 EC	0.00406 lb ai/a	Early	A	
1 Crop Oil Concentrate	100 L	1 % v/v	Early	A	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Description			STEME C.chkwd	OEOLA CEprmrse	SCRAN Knawel	STEME C.chkwd
Rating Type		Control %	Control %	Control %	Control %	Control %
Rating Unit		04/25/19	04/25/19	04/25/19	04/25/19	05/09/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Early (April 10)					
2 ET.....pyraflufen	0.208 EC	0.0081	lb ai/a	Early	A	
2 Crop Oil Concentrate	100 L	1 %	v/v	Early	A	
2 Late (May 1)						
2 ET.....pyraflufen	0.208 EC	0.0081	lb ai/a	Early	A	
2 Crop Oil Concentrate	100 L	1 %	v/v	Early	A	
1 Early (April 10)						
3 ET.....pyraflufen	0.208 EC	0.0122	lb ai/a	Early	A	
3 Crop Oil Concentrate	100 L	1 %	v/v	Early	A	
2 Late (May 1)						
3 ET.....pyraflufen	0.208 EC	0.0122	lb ai/a	Early	A	
3 Crop Oil Concentrate	100 L	1 %	v/v	Early	A	
1 Early (April 10)						
4 ET.....pyraflufen	0.208 EC	0.0081	lb ai/a	Early	A	
4 Sharpen.....saflufenacil	2.85 SC	0.0445	lb ai/a	Early	A	
4 Methylated Seed Oil	100 L	1 %	v/v	Early	A	
4 Liquid Ammonium Sulfate	100 L	1 %	v/v	Early	A	
2 Late (May 1)						
4 ET.....pyraflufen	0.208 EC	0.0081	lb ai/a	Early	A	
4 Sharpen.....saflufenacil	2.85 SC	0.0445	lb ai/a	Early	A	
4 Methylated Seed Oil	100 L	1 %	v/v	Early	A	
4 Liquid Ammonium Sulfate	100 L	1 %	v/v	Early	A	
1 Early (April 10)						
5 ET.....pyraflufen	0.208 EC	0.0081	lb ai/a	Early	A	
5 Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	Early	A	
5 Crop Oil Concentrate	100 L	1 %	v/v	Early	A	
2 Late (May 1)						
5 ET.....pyraflufen	0.208 EC	0.0081	lb ai/a	Early	A	
5 Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	Early	A	
5 Crop Oil Concentrate	100 L	1 %	v/v	Early	A	
1 Early (April 10)						
6 ET.....pyraflufen	0.208 EC	0.0081	lb ai/a	Early	A	
6 Gramoxone SL....paraquat	2 SL	0.625	lb ai/a	Early	A	
6 Crop Oil Concentrate	100 L	1 %	v/v	Early	A	
2 Late (May 1)						
6 ET.....pyraflufen	0.208 EC	0.0081	lb ai/a	Early	A	
6 Gramoxone SL....paraquat	2 SL	0.625	lb ai/a	Early	A	
6 Crop Oil Concentrate	100 L	1 %	v/v	Early	A	
1 Early (April 10)						
7 Sharpen.....saflufenacil	2.85 SC	0.0445	lb ai/a	Early	A	
7 Methylated Seed Oil	100 L	1 %	v/v	Early	A	
7 Liquid Ammonium Sulfate	100 L	1 %	v/v	Early	A	
2 Late (May 1)						
7 Sharpen.....saflufenacil	2.85 SC	0.0445	lb ai/a	Early	A	
7 Methylated Seed Oil	100 L	1 %	v/v	Early	A	
7 Liquid Ammonium Sulfate	100 L	1 %	v/v	Early	A	
1 Early (April 10)						
8 Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	Early	A	
2 Late (May 1)						
8 Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	Early	A	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Description			OEOLA CEprmrse	STEME C.chkwd	OEOLA CEprmrse	ERICA Horsewd
Rating Type			Control % 05/09/19	Control % 05/20/19	Control % 05/20/19	Control % 05/20/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1 Early (April 10)						
2 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	63.3 c-f	36.7 a
2 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
2 Late (May 1)						
2 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	50.0 fgh	30.0 a
2 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
3 ET.....pyraflufen	0.208 EC	0.0122 lb ai/a	Early	A	63.3 c-f	33.3 a
3 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
2 Late (May 1)						
3 ET.....pyraflufen	0.208 EC	0.0122 lb ai/a	Early	A	63.3 c-f	30.0 a
3 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
4 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	96.0 a	40.0 a
4 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A		
4 Methylated Seed Oil	100 L	1 % v/v	Early	A		
4 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A		
2 Late (May 1)						
4 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	60.0 d-g	36.7 a
4 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A		
4 Methylated Seed Oil	100 L	1 % v/v	Early	A		
4 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
5 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	79.3 b	99.0 a
5 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A		
5 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
2 Late (May 1)						
5 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	53.3 e-h	97.0 a
5 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A		
5 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
6 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	75.0 bc	99.0 a
6 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A		
6 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
2 Late (May 1)						
6 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	65.0 cde	99.0 a
6 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A		
6 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
7 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A	76.3 bc	26.7 a
7 Methylated Seed Oil	100 L	1 % v/v	Early	A		
7 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A		
2 Late (May 1)						
7 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A	50.0 fgh	23.3 a
7 Methylated Seed Oil	100 L	1 % v/v	Early	A		
7 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
8 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A	70.0 bcd	99.0 a
2 Late (May 1)						
8 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A	21.7 i	89.0 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Description			VIORA FldPansy	STEME C.chkwrd	OEOLA CEprmrse	ERICA Horsewd
Rating Type			Control %	Control %	Control %	Control %
Rating Unit			05/20/19	05/29/19	05/29/19	05/29/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1 Early (April 10)						
2 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	40.0 a	31.7 a
2 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
2 Late (May 1)						
2 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	40.0 a	50.0 a
2 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
3 ET.....pyraflufen	0.208 EC	0.0122 lb ai/a	Early	A	20.0 a	26.7 a
3 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
2 Late (May 1)						
3 ET.....pyraflufen	0.208 EC	0.0122 lb ai/a	Early	A	40.0 a	43.3 a
3 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
4 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	40.0 a	46.7 a
4 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A		
4 Methylated Seed Oil	100 L	1 % v/v	Early	A		
4 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A		
2 Late (May 1)					.	50.0 a
4 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A		54.6 a
4 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A		
4 Methylated Seed Oil	100 L	1 % v/v	Early	A		
4 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
5 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A	25.0 a	99.0 a
5 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A		
5 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
2 Late (May 1)					.	99.0 a
5 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A		53.3 a
5 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A		
5 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
1 Early (April 10)					.	99.0 a
6 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A		43.3 a
6 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A		
6 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
2 Late (May 1)					.	99.0 a
6 ET.....pyraflufen	0.208 EC	0.0081 lb ai/a	Early	A		63.3 a
6 Gramoxone SL....paraquat	2 SL	0.625 lb ai/a	Early	A		
6 Crop Oil Concentrate	100 L	1 % v/v	Early	A		
1 Early (April 10)						
7 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A	40.0 a	26.7 a
7 Methylated Seed Oil	100 L	1 % v/v	Early	A		
7 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A		
2 Late (May 1)					.	30.0 a
7 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	Early	A		31.7 a
7 Methylated Seed Oil	100 L	1 % v/v	Early	A		
7 Liquid Ammonium Sulfate	100 L	1 % v/v	Early	A		
1 Early (April 10)					.	99.0 a
8 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A		66.7 a
2 Late (May 1)					.	94.7 a
8 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Early	A		58.3 a
						50.0 def

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

University of Delaware

Pest Code Description	STEME C.chkwd	OEOLA CEprmrs	SCRAN Knawel	STEME C.chkwd				
Rating Type	Control %	Control %	Control %	Control %				
Rating Unit								
Rating Date	04/25/19	04/25/19	04/25/19	05/09/19				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate Unit	Appl Timing Appl Code				
1 Early (April 10) 9 Gramoxone SL....paraquat 9 Crop Oil Concentrate	2 SL 100 L	0.625 lb ai/a 1 % v/v	lb ai/a v/v	Early Early A A	85.0 a	50.0 a	85.0 a	100.0 a
2 Late (May 1) 9 Gramoxone SL....paraquat 9 Crop Oil Concentrate	2 SL 100 L	0.625 lb ai/a 1 % v/v	lb ai/a v/v	Early Early A A	.	.	.	75.0 b
LSD P=.05					14.96	23.32	40.35	7.43
Standard Deviation					8.69	12.98	11.48	4.48
CV					16.75	18.64	24.65	8.19

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Means followed by same letter or symbol do not significantly differ ( $P > 0.05$ , LSD). Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Description	OEOLA CEprmrse	STEME C.chkwd	OEOLA CEprmrse	ERICA Horsewd
Rating Type	Control %	Control %	Control %	Control %
Rating Unit	05/09/19	05/20/19	05/20/19	05/20/19
Rating Date				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1 Early (April 10) 9 Gramoxone SL....paraquat 9 Crop Oil Concentrate	2 SL 100 L	0.625 lb ai/a 1 % v/v	Early Early	A A
			56.7 d-h	99.0 a
2 Late (May 1) 9 Gramoxone SL....paraquat 9 Crop Oil Concentrate	2 SL 100 L	0.625 lb ai/a 1 % v/v	Early Early	A A
			70.0 bcd	99.0 a
LSD P=.05			14.14	15.73
Standard Deviation			8.52	9.48
CV			13.90	15.84
				15.82
				12.62
				9.51
				7.54
				18.39
				12.43

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Description		VIORA FldPansy	STEME C.chkwrd	OEOLA CEprmrse	ERICA Horsewd		
Rating Type	Control %		Control %		Control %		
Rating Unit	05/20/19		05/29/19		05/29/19		
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Early (April 10)						
9	Gramoxone SL....paraquat	2 SL		0.625 lb ai/a	Early	A	
9	Crop Oil Concentrate	100 L		1 % v/v	Early	A	
2	Late (May 1)						
9	Gramoxone SL....paraquat	2 SL		0.625 lb ai/a	Early	A	
9	Crop Oil Concentrate	100 L		1 % v/v	Early	A	
LSD P=.05				27.19	15.40	19.46	12.10
Standard Deviation				14.08	9.28	11.72	7.27
CV				49.70	14.42	22.69	11.71

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Randomized Complete Block (RCB) AOV For STEME C.chkwd Control % 04/25/19 Missing factor A levels prevents analyzing column 1 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	28	19577.543724			
Replicate	2	443.863169	221.931584	2.941	0.0800
Treatment	9	17850.949074	1983.438786	26.286	0.0001
ERROR	17	1282.731481	75.454793		

Randomized Complete Block (RCB) AOV For OEOLA CEprmrse Control % 04/25/19 Missing factor A levels prevents analyzing column 2 as Factorial design; Missing values in column 2 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	22	28055.575000			
Replicate	2	375.950000	187.975000	1.117	0.3618
Treatment	9	25827.741667	2869.749074	17.046	0.0001
ERROR	11	1851.883333	168.353030		

Randomized Complete Block (RCB) AOV For SCRAN Knawel Control % 04/25/19 Missing factor A levels prevents analyzing column 3 as Factorial design; Missing values in column 3 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	13	24807.866667			
Replicate	2	4.866667	2.433333	0.018	0.9819
Treatment	9	24539.200000	2726.577778	20.672	0.0470
ERROR	2	263.800000	131.900000		

#### FACTORIAL/POOLED ERROR AOV For STEME C.chkwd Control % 05/09/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	53	44831.259259				
R	2	85.592593	42.796296	2.134	0.1339	
A	1	5683.629630	5683.629630	283.456	0.0001	2.5
B	8	30807.925926	3850.990741	192.058	0.0001	5.3
AB	8	7572.370370	946.546296	47.206	0.0001	7.4
ERROR	34	681.740741	20.051198			

#### FACTORIAL/POOLED ERROR AOV For OEOLA CEprmrse Control % 05/09/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	53	16291.259259				
R	2	112.259259	56.129630	0.773	0.4695	
A	1	3750.000000	3750.000000	51.653	0.0001	4.7
B	8	5508.259259	688.532407	9.484	0.0001	10.0
AB	8	4452.333333	556.541667	7.666	0.0001	14.1
ERROR	34	2468.407407	72.600218			

#### FACTORIAL/POOLED ERROR AOV For STEME C.chkwd Control % 05/20/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	53	66540.148148				
R	2	513.814815	256.907407	2.861	0.0711	
A	1	136.962963	136.962963	1.525	0.2253	5.2
B	8	62700.148148	7837.518519	87.268	0.0001	11.1
AB	8	135.703704	16.962963	0.189	0.9908	15.7
ERROR	34	3053.518519	89.809368			

FACTORIAL/POOLED ERROR AOV For OEOLA CEprmrse Control % 05/20/19 Missing values in column 7 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	51	11047.514057				
R	2	178.280057	89.140029	0.985	0.3845	
A	1	140.331957	140.331957	1.551	0.2221	5.3
B	8	4946.423467	618.302933	6.833	0.0001	11.2
AB	8	2886.756107	360.844513	3.988	0.0023	15.8
ERROR	32	2895.722468	90.491327			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For ERICA Horsewd Control % 05/20/19 Missing values in column 8 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	28625.259259				
R	2	206.481481	103.240741	1.814	0.1816	
A	1	90.740741	90.740741	1.594	0.2171	4.2
B	8	25850.259259	3231.282407	56.777	0.0001	8.9
AB	8	884.259259	110.532407	1.942	0.0928	12.6
ERROR	28	1593.518519	56.911376			

Randomized Complete Block (RCB) AOV For VIORA FldPansy Control % 05/20/19 Analysis will skip factor level B6 for column 9 - all B6 treatments are missing; Missing factor A2 B4 levels prevents analyzing column 9 as Factorial design; Missing factor A2 B5 levels prevents analyzing column 9 as Factorial design; Missing factor A2 B7 levels prevents analyzing column 9 as Factorial design; Missing factor A1 B8 levels prevents analyzing column 9 as Factorial design; Missing factor A2 B8 levels prevents analyzing column 9 as Factorial design; Missing factor A1 B9 levels prevents analyzing column 9 as Factorial design; Missing factor A2 B9 levels prevents analyzing column 9 as Factorial design; Missing values in column 9 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	19	9546.969697			
Replicate	2	78.787879	39.393939	0.199	0.8243
Treatment	10	8080.303030	808.030303	4.075	0.0376
ERROR	7	1387.878788	198.268398		

FACTORIAL/POOLED ERROR AOV For STEME C.chkwd Control % 05/29/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	53	55802.000000				
R	2	40.111111	20.055556	0.233	0.7935	
A	1	573.629630	573.629630	6.661	0.0143	5.1
B	8	51249.000000	6406.125000	74.391	0.0001	10.9
AB	8	1011.370370	126.421296	1.468	0.2053	15.4
ERROR	34	2927.888889	86.114379			

FACTORIAL/POOLED ERROR AOV For OEOLA CEprmrse Control % 05/29/19 Missing values in column 11 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	52	9844.069970				
R	2	36.736945	18.368472	0.134	0.8752	
A	1	121.657946	121.657946	0.886	0.3534	6.5
B	8	3040.953627	380.119203	2.769	0.0185	13.8
AB	8	2114.053042	264.256630	1.925	0.0893	19.5
ERROR	33	4530.668411	137.292982			

FACTORIAL/POOLED ERROR AOV For ERICA Horsewd Control % 05/29/19 Missing values in column 12 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	50	26107.325579				
R	2	644.107155	322.053577	6.101	0.0058	
A	1	2.146017	2.146017	0.041	0.8415	4.0
B	8	22847.374256	2855.921782	54.102	0.0001	8.6
AB	8	977.283532	122.160441	2.314	0.0449	12.1
ERROR	31	1636.414620	52.787568			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Comparison of flumioxazin and sulfentrazone in soybeans

Trial ID: Soy3-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy3-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/09/19

Initiation Date: 03/01/19

Completion Date: 11/08/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max

Soybean

Entry Date: 11/14/19

Variety: CZ4539GTLL

Attributes: Liberty Link / glyphosate tolerant

Planting Date: 05/08/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 75 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 05/15/19

Harvest Equipment: Plot combine

Harvest Date: 11/04/19

Harvested Width: 6.25 FT

% Standard Moisture: 13.0

Harvested Length: 25 FT

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 12 Tillage Type: NOTILL no-till

Replications: 3 Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 16B

% Sand: 77 % OM: 1.4 Texture: SL sandy loam

% Silt: 12 pH: 6.6 Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11 CEC: 4.8 Fert. Level: F fair

Soil Drainage: F fair

**Application Description**

A	
Application Date	05/09/19
Appl. Stop Time	02:50 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	Johnson
Appl. Entry Date	05/21/19
Air Temperature Start, Stop	72 74 F
% Relative Humidity Start, Stop	71 69
Wind Velocity+Dir. Start	9 mph E
Wind Velocity+Dir. Stop	9 mph SE
Wind Velocity+Dir. Max	10 mph ESE
Wet Leaves (Y/N)	N no
Soil Temperature	72 F
Soil Moisture	NORMAL
% Cloud Cover	92
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.45 IN
Weather Source	ITERIS

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY

**Application Equipment**

A	
Appl. Equipment	Tractr4Nozl
Equipment Type	TRMOSP
Operation Pressure	40 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	20 in
Boom Length	6.7 ft
Boom Height	18 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

Context	Date	By	Notes
STATUS	05/09/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

## Trial Comments

06/21/19: Very low weed density. Not very uniform distribution of weeds.

## Comparison of flumioxazin and sulfentrazone in soybeans

Trial ID: Soy3-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy3-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Crop Type, Code	C	GLXMA	AMAPA C -	IPOSS C -	AMAPA C -
Description	Soybean Stunting %	PalmerAm Control %	Mornglry Control %	PalmerAm Control %	
Rating Type	05/31/19	06/21/19	06/21/19	07/04/19	
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code
1 Valor SX.....flumioxazin no metribuzin	51 WG	0.064 lb ai/a	PRE	A	0.0 b
2 Valor SX.....flumioxazin Metribuzin.....metribuzin	51 WG 75 DF	0.064 lb ai/a 0.188 lb ai/a	PRE	A	0.0 b
3 Valor SX.....flumioxazin Zidua.....pyroxasulfone	51 WG 4.17 SC	0.064 lb ai/a 0.106 lb ai/a	PRE	A	2.3 b
4 Spartan Charge Premix ----carfentrazone ----sulfentrazone no metribuzin	3.5 F 0.35 3.15	0.205 lb ai/a 0.0205 0.184	PRE	A	9.7 a
5 Spartan Charge Premix ----carfentrazone ----sulfentrazone Metribuzin.....metribuzin	3.5 F 0.35 3.15 75 DF	0.205 lb ai/a 0.0205 0.184 0.188 lb ai/a	PRE	A	2.3 b
6 Spartan Charge Premix ----carfentrazone ----sulfentrazone Zidua.....pyroxasulfone	3.5 F 0.35 3.15 4.17 SC	0.205 lb ai/a 0.0205 0.184 0.106 lb ai/a	PRE	A	0.2 b
7 Reflex.....fomesafen no metribuzin	2 L	0.375 lb ai/a	PRE	A	0.3 b
8 Reflex.....fomesafen Metribuzin.....metribuzin	2 L 75 DF	0.375 lb ai/a 0.188 lb ai/a	PRE	A	2.3 b
9 Reflex.....fomesafen Zidua.....pyroxasulfone	2 L 4.17 SC	0.375 lb ai/a 0.106 lb ai/a	PRE	A	0.0 b
10 Valor SX.....flumioxazin Metribuzin.....metribuzin	51 WG 75 DF	0.048 lb ai/a 0.188 lb ai/a	PRE	A	2.9 b
11 Spartan Charge Premix ----carfentrazone ----sulfentrazone Metribuzin.....metribuzin	3.5 F 0.35 3.15 75 DF	0.154 lb ai/a 0.0154 0.139 0.188 lb ai/a	PRE	A	
12 Reflex.....fomesafen Metribuzin.....metribuzin	2 L 75 DF	0.28 lb ai/a 0.188 lb ai/a	PRE	A	0.0 b
LSD P=.05		4.74	.	29.49	12.03
Standard Deviation		2.74	.	8.39	5.73
CV		149.52	.	14.1	7.2
Replicate F		1.190	.	0.419	0.273
Replicate Prob(F)		0.3298	.	0.7045	0.7719
Treatment F		3.256	.	3.929	12.567
Treatment Prob(F)		0.0174	.	0.2198	0.0060

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Due to missing data, larger LSD values (col. 2: &gt;= -99998.01 and &lt;= 0.00) are used for mean comparisons of treatment pairs with missing data.

Missing data estimates are included in columns: Yates=1; Average=3,4

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

Pest Code Crop Type, Code		C GLXMA	C GLXMA		
Description		Soybean Yield lb/plot	Soybean Yield Bu/A		
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc Type Rate	Rate Unit	Appl Timing Code		
1 Valor SX.....flumioxazin no metribuzin	51 WG	0.064 lb ai/a	PRE A	8.390 a	39.0 a
2 Valor SX.....flumioxazin Metribuzin.....metribuzin	51 WG 75 DF	0.064 lb ai/a 0.188 lb ai/a	PRE A	8.360 a	38.8 a
3 Valor SX.....flumioxazin Zidua.....pyroxasulfone	51 WG 4.17 SC	0.064 lb ai/a 0.106 lb ai/a	PRE A	9.903 a	46.0 a
4 Spartan Charge Premix ----carfentrazone ----sulfentrazone no metribuzin	3.5 F 0.35 3.15	0.205 lb ai/a 0.0205 0.184	PRE A	8.537 a	39.7 a
5 Spartan Charge Premix ----carfentrazone ----sulfentrazone Metribuzin.....metribuzin	3.5 F 0.35 3.15 75 DF	0.205 lb ai/a 0.0205 0.184 0.188 lb ai/a	PRE A	9.613 a	44.7 a
6 Spartan Charge Premix ----carfentrazone ----sulfentrazone Zidua.....pyroxasulfone	3.5 F 0.35 3.15 4.17 SC	0.205 lb ai/a 0.0205 0.184 0.106 lb ai/a	PRE A	5.980 a	27.8 a
7 Reflex.....fomesafen no metribuzin	2 L	0.375 lb ai/a	PRE A	8.447 a	39.2 a
8 Reflex.....fomesafen Metribuzin.....metribuzin	2 L 75 DF	0.375 lb ai/a 0.188 lb ai/a	PRE A	7.600 a	35.3 a
9 Reflex.....fomesafen Zidua.....pyroxasulfone	2 L 4.17 SC	0.375 lb ai/a 0.106 lb ai/a	PRE A	9.173 a	42.6 a
10 Valor SX.....flumioxazin Metribuzin.....metribuzin	51 WG 75 DF	0.048 lb ai/a 0.188 lb ai/a	PRE A	8.203 a	38.1 a
11 Spartan Charge Premix ----carfentrazone ----sulfentrazone Metribuzin.....metribuzin	3.5 F 0.35 3.15 75 DF	0.154 lb ai/a 0.0154 0.139 0.188 lb ai/a	PRE A	4.230 a	19.7 a
12 Reflex.....fomesafen Metribuzin.....metribuzin	2 L 75 DF	0.28 lb ai/a 0.188 lb ai/a	PRE A	8.557 a	39.8 a
LSD P=.05				3.3286	15.47
Standard Deviation				1.9657	9.13
CV				24.32	24.32
Replicate F				5.558	5.558
Replicate Prob(F)				0.0111	0.0111
Treatment F				1.912	1.912
Treatment Prob(F)				0.0942	0.0942

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Due to missing data, larger LSD values (col. 2: >= -99998.01 and <= 0.00) are used for mean comparisons of treatment pairs with missing data.

Missing data estimates are included in columns: Yates=1; Average=3,4

Could not calculate LSD (% mean diff) for columns 2 because error mean square = 0.

## Comparison of flumioxazin and sulfentrazone in soybeans

Trial ID: Soy3-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy3-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Crop Type, Code	C GLXMA	AMAPA C -	IPOSS C -	AMAPA C -
Description	Soybean Stunting %	PalmerAm Control %	Mornlry Control %	PalmerAm Control %
Rating Type		05/31/19	06/21/19	07/04/19
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code
TABLE OF R MEANS				
Replicate 1		0.8		
Replicate 2		2.0		
Replicate 3		3.0		
TABLE OF A (PPO) MEANS				
1 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a PRE	A	0.8 b
2 Spartan Charge Premix	3.5 F	0.205 lb ai/a PRE	A	4.1 a
2 ----carfentrazone	0.35	0.0205		
2 ----sulfentrazone	3.15	0.184		
3 Reflex.....fomesafen	2 L	0.375 lb ai/a PRE	A	0.9 b
LSD P=.05		2.67		
Standard Deviation		2.62		
CV		136.93		
TABLE OF B (metribuzin) MEANS				
1 no metribuzin		3.3 a		
2 Metribuzin.....metribuzin	75 DF	0.188 lb ai/a PRE	A	1.6 a
3 Zidua.....pyroxasulfone	4.17 SC	0.106 lb ai/a PRE	A	0.9 a
LSD P=.05		2.67		
Standard Deviation		2.62		
CV		136.93		
TABLE OF A (PPO) B (metribuzin) MEANS				
1 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a PRE	A	0.0 b
1 no metribuzin				60.0 a
2 Spartan Charge Premix	3.5 F	0.205 lb ai/a PRE	A	9.7 a
2 ----carfentrazone	0.35	0.0205		.
2 ----sulfentrazone	3.15	0.184		
1 no metribuzin				70.0 a
3 Reflex.....fomesafen	2 L	0.375 lb ai/a PRE	A	0.3 b
1 no metribuzin				60.0 a
1 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a PRE	A	0.0 b
2 Metribuzin.....metribuzin	75 DF	0.188 lb ai/a PRE	A	60.0 a
2 Spartan Charge Premix	3.5 F	0.205 lb ai/a PRE	A	2.3 b
2 ----carfentrazone	0.35	0.0205		70.0 a
2 ----sulfentrazone	3.15	0.184		
2 Metribuzin.....metribuzin	75 DF	0.188 lb ai/a PRE	A	99.0 a
3 Reflex.....fomesafen	2 L	0.375 lb ai/a PRE	A	2.3 b
2 Metribuzin.....metribuzin	75 DF	0.188 lb ai/a PRE	A	65.0 a
1 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a PRE	A	2.3 b
3 Zidua.....pyroxasulfone	4.17 SC	0.106 lb ai/a PRE	A	55.0 a
2 Spartan Charge Premix	3.5 F	0.205 lb ai/a PRE	A	0.2 b
2 ----carfentrazone	0.35	0.0205		50.0 a
2 ----sulfentrazone	3.15	0.184		.
3 Zidua.....pyroxasulfone	4.17 SC	0.106 lb ai/a PRE	A	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		C GLXMA	C GLXMA
Description		Soybean Yield lb/plot	Soybean Yield Bu/A
Rating Type			
Rating Unit			
Rating Date		11/04/19	11/04/19
Trt Treatment No. Name	Form Conc Type Rate	Rate Unit Appl Timing	Appl Code
TABLE OF R MEANS			
Replicate 1		10.424	48.4
Replicate 2		7.176	33.3
Replicate 3		7.734	35.9
TABLE OF A (PPO) MEANS			
1 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a PRE	A
2 Spartan Charge Premix	3.5 F	0.205 lb ai/a PRE	A
2 ----carfentrazone	0.35	0.0205	
2 ----sulfentrazone	3.15	0.184	
3 Reflex.....fomesafen	2 L	0.375 lb ai/a PRE	A
LSD P=.05		1.6697	7.76
Standard Deviation		1.6708	7.76
CV		19.7850	19.79
TABLE OF B (metribuzin) MEANS			
1 no metribuzin		8.458 a	39.3 a
2 Metribuzin.....metribuzin	75 DF	0.188 lb ai/a PRE	A
3 Zidua.....pyroxasulfone	4.17 SC	0.106 lb ai/a PRE	A
LSD P=.05		1.6697	7.76
Standard Deviation		1.6708	7.76
CV		19.7850	19.79
TABLE OF A (PPO) B (metribuzin) MEANS			
1 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a PRE	A
1 no metribuzin		8.390 a	39.0 a
2 Spartan Charge Premix	3.5 F	0.205 lb ai/a PRE	A
2 ----carfentrazone	0.35	0.0205	
2 ----sulfentrazone	3.15	0.184	
1 no metribuzin		8.537 a	39.7 a
3 Reflex.....fomesafen	2 L	0.375 lb ai/a PRE	A
1 no metribuzin		8.447 a	39.2 a
1 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a PRE	A
2 Metribuzin.....metribuzin	75 DF	0.188 lb ai/a PRE	A
2 Spartan Charge Premix	3.5 F	0.205 lb ai/a PRE	A
2 ----carfentrazone	0.35	0.0205	
2 ----sulfentrazone	3.15	0.184	
2 Metribuzin.....metribuzin	75 DF	0.188 lb ai/a PRE	A
3 Reflex.....fomesafen	2 L	0.375 lb ai/a PRE	A
2 Metribuzin.....metribuzin	75 DF	0.188 lb ai/a PRE	A
1 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a PRE	A
3 Zidua.....pyroxasulfone	4.17 SC	0.106 lb ai/a PRE	A
2 Spartan Charge Premix	3.5 F	0.205 lb ai/a PRE	A
2 ----carfentrazone	0.35	0.0205	
2 ----sulfentrazone	3.15	0.184	
3 Zidua.....pyroxasulfone	4.17 SC	0.106 lb ai/a PRE	A

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C GLXMA	AMAPA C -	IPOSS C -	AMAPA C -
Description	Soybean Stunting %	PalmerAm Control %	Mornglry Control %	PalmerAm Control %
Rating Type	05/31/19	06/21/19	06/21/19	07/04/19
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Form Type	Rate Rate lb ai/a	Appl Unit PRE	Appl Timing A
3 Reflex.....fomesafen	2 L	0.375	ai/a	PRE
3 Zidua.....pyroxasulfone	4.17 SC	0.106	lb ai/a	PRE
LSD P=.05		4.63		29.49
Standard Deviation		2.62		8.39
CV		136.93		5.73
				14.14
				7.24

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code		C GLXMA	C GLXMA					
Crop Type, Code		Soybean Yield lb/plot	Soybean Yield Bu/A					
Description								
Rating Type								
Rating Unit								
Rating Date		11/04/19	11/04/19					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
3 Reflex.....fomesafen	2 L	0.375	lb ai/a	PRE	A		9.173 a	42.6 a
3 Zidua.....pyroxasulfone	4.17 SC	0.106	lb ai/a	PRE	A			
LSD P=.05							2.8920	13.44
Standard Deviation							1.6708	7.76
CV							19.7850	19.79

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Stunting % 05/31/19 Missing values in column 1 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	23	342.486448				
R	2	22.281334	11.140667	1.620	0.2354	
A	2	63.170889	31.585445	4.594	0.0310	2.7
B	2	29.410477	14.705238	2.139	0.1574	2.7
AB	4	138.235236	34.558809	5.026	0.0114	4.6
ERROR	13	89.388512	6.876039			

Randomized Complete Block (RCB) AOV For IPOSS C Mornlry Control % 06/21/19 Missing factor A2 B1 levels prevents analyzing column 3 as Factorial design; Missing values in column 3 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	14	2968.181818			
Replicate	2	59.090909	29.545455	0.419	0.7045
Treatment	10	2768.181818	276.818182	3.929	0.2198
ERROR	2	140.909091	70.454545		

Randomized Complete Block (RCB) AOV For AMAPA C PalmerAm Control % 07/04/19 Missing factor A2 B3 levels prevents analyzing column 4 as Factorial design; Missing values in column 4 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	17	4310.378788			
Replicate	2	17.924242	8.962121	0.273	0.7719
Treatment	10	4128.212121	412.821212	12.567	0.0060
ERROR	5	164.242424	32.848485		

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield lb/plot 11/04/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	26	131.470074				
R	2	54.311207	27.155604	9.728	0.0017	
A	2	3.203252	1.601626	0.574	0.5746	1.670
B	2	0.135741	0.067870	0.024	0.9760	1.670
AB	4	29.154348	7.288587	2.611	0.0747	2.892
ERROR	16	44.665526	2.791595			

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield Bu/A 11/04/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	26	2838.311762				
R	2	1172.526447	586.263223	9.728	0.0017	
A	2	69.155110	34.577555	0.574	0.5746	7.8
B	2	2.930511	1.465256	0.024	0.9760	7.8
AB	4	629.414183	157.353546	2.611	0.0747	13.4
ERROR	16	964.285511	60.267844			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Weed Control with Tough 5EC in Soybeans**

Trial ID: Soy4-19      Location: Field #16      Trial Year: 2019  
Protocol ID: Soy4-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: Belchim

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/09/19

Initiation Date: 03/01/19

Completion Date: 11/09/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max

Soybean

Entry Date: 09/26/19

Variety: CZ4539GTLL

Attributes: Liberty Link / glyphosate tolerant

Planting Date: 05/08/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Field Equipment

Soil Temperature: 75 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 05/15/19

Soil Moisture: NORMAL normal, adequate

Harvest Date: 11/04/19

Harvest Equipment: Plot combine

% Standard Moisture: 13.0

Harvested Width: 6.25 FT

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory Entry Date: 09/26/19

Pest 2 Type: W Code: DIGSS Digitaria sp.

Common Name: Crabgrass Entry Date: 09/26/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup>

Treatments: 9 Tillage Type: NOTILL no-till

Replications: 3

Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 16B

% Sand: 77 % OM: 1.4 Texture: SL sandy loam

% Silt: 12 pH: 6.6 Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11 CEC: 4.8 Fert. Level: F fair

Soil Drainage: F fair

**Application Description**

	A	B
Application Date	05/09/19	06/06/19
Appl. Stop Time	12:30 PM	11:55 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	V2-4
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/23/19	09/26/19
Air Temperature Start, Stop	71 71 F	81 81 F
% Relative Humidity Start, Stop	73 73	63 63
Wind Velocity+Dir. Start	8 mph E	6 mph NNW
Wind Velocity+Dir. Stop	8 mph E	6 mph NNW
Wind Velocity+Dir. Max	8 mph E	6 mph NNW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	70 F	82 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	88	63
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.45 IN	1.9 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-6	22
Stage Majority, Percent		V2-3 100
Height Average		5 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		cotyl 100
Height Average		1 in
Density Average		1 m <sup>2</sup>
Density Min, Max		0 2
Pest 2 Code, Type, Scale	DIGSS W	DIGSS W
Stage Majority, Percent		3-tilr 65
Stage Minimum, Percent		2-tilr 15
Stage Maximum, Percent		4-tilr 20
Height Average		5 in
Height Minimum, Maximum		3 7
Density Average		6 m <sup>2</sup>
Density Min, Max		0 12

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	24 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/09/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

No injury prior to Tough application

05/24/19: No injury on any treatment

06/05/19: Deer damage present in all plots; damage is more severe towards the back of the study

06/18/19: Stunting primarily the result of deer feeding. Leaf burn primarily on lower leaves. Leaf drawstring trt. 3 (reps 1 & 2) and treatment 7 (rep 3).

Weed Control with Tough 5EC in Soybeans									
Trial ID: Soy4-19		Location: Field #16		Trial Year: 2019					
Protocol ID: Soy4-19		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: Belchim				AMAPA C -	IPOSS C -	SETFA C -	C GLXMA		
Pest Code				PalmerAm	morngrly	G.foxtl	Soybean		
Crop Type, Code				Control %	Control %	Control %	Stunting %		
Description				06/05/19	06/05/19	06/05/19	06/18/19		
Rating Type									
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	97.7 a	99.0 a		
	----metribuzin	64.3	0.161						
	----chlorimuron	10.7	0.0268						
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B				
2	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	98.0 a	100.0 a		
	----metribuzin	64.3	0.161						
	----chlorimuron	10.7	0.0268						
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B				
	Tough EC.....pyridate	5 EC	0.313 lb ai/a	V2-4	B				
	Crop Oil Concentrate	100 L	1 % v/v	V2-4	B				
3	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	98.3 a	99.0 a		
	----metribuzin	64.3	0.161						
	----chlorimuron	10.7	0.0268						
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B				
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	V2-4	B				
4	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	96.7 a	100.0 a		
	----metribuzin	64.3	0.161						
	----chlorimuron	10.7	0.0268						
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B				
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	V2-4	B				
	Tough EC.....pyridate	5 EC	0.313 lb ai/a	V2-4	B				
	Crop Oil Concentrate	100 L	1 % v/v	V2-4	B				
5	Trivence Premix	61.3 WG	0.23 lb ai/a	PRE	A	99.0 a	99.0 a		
	----chlorimuron	3.9	0.0146						
	----metribuzin	44.6	0.167						
	----flumioxazin	12.8	0.048						
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B				
6	Trivence Premix	61.3 WG	0.23 lb ai/a	PRE	A	97.7 a	95.0 a		
	----chlorimuron	3.9	0.0146						
	----metribuzin	44.6	0.167						
	----flumioxazin	12.8	0.048						
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B				
	Tough EC.....pyridate	5 EC	0.313 lb ai/a	V2-4	B				
	Crop Oil Concentrate	100 L	1 % v/v	V2-4	B				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code					C GLXMA	C GLXMA
Crop Type, Code				Soybean LeafBurn %	Soybean Yield Bu/A	
Description				06/18/19	11/04/19	
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	0.0 c
	----metribuzin	64.3	0.161			
	----chlorimuron	10.7	0.0268			
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B	
2	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	15.0 ab
	----metribuzin	64.3	0.161			
	----chlorimuron	10.7	0.0268			
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B	
	Tough EC.....pyridate	5 EC	0.313 lb ai/a	V2-4	B	
	Crop Oil Concentrate	100 L	1 % v/v	V2-4	B	
3	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	0.3 c
	----metribuzin	64.3	0.161			
	----chlorimuron	10.7	0.0268			
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B	
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	V2-4	B	
4	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	18.3 a
	----metribuzin	64.3	0.161			
	----chlorimuron	10.7	0.0268			
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B	
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	V2-4	B	
	Tough EC.....pyridate	5 EC	0.313 lb ai/a	V2-4	B	
	Crop Oil Concentrate	100 L	1 % v/v	V2-4	B	
5	Trivence Premix	61.3 WG	0.23 lb ai/a	PRE	A	0.0 c
	----chlorimuron	3.9	0.0146			
	----metribuzin	44.6	0.167			
	----flumioxazin	12.8	0.048			
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B	
6	Trivence Premix	61.3 WG	0.23 lb ai/a	PRE	A	10.0 b
	----chlorimuron	3.9	0.0146			
	----metribuzin	44.6	0.167			
	----flumioxazin	12.8	0.048			
	Crop Oil Concentrate	100 L	1 % v/v	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V2-4	B	
	Tough EC.....pyridate	5 EC	0.313 lb ai/a	V2-4	B	
	Crop Oil Concentrate	100 L	1 % v/v	V2-4	B	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm Control % 06/05/19	IPOSS C - mornglry Control % 06/05/19	SETFA C - G foxtl Control % 06/05/19	C GLXMA Soybean Stunting % 06/18/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing			
7 Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin Crop Oil Concentrate Roundup PowerMax..glyphosate Warrant.....acetochlor	61.3 WG 3.9 44.6 12.8 100 L 4.5 AS 3 CS	0.23 lb ai/a 0.0146 0.167 0.048 1 % v/v 1.13 lb ae/a 1.13 lb ai/a	PRE A V2-4 V2-4	95.0 a 95.7 a	98.3 ab 4.3 bcd
8 Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin Crop Oil Concentrate Roundup PowerMax..glyphosate Warrant.....acetochlor Tough EC.....pyridate Crop Oil Concentrate	61.3 WG 3.9 44.6 12.8 100 L 4.5 AS 3 CS 5 EC 100 L	0.23 lb ai/a 0.0146 0.167 0.048 1 % v/v 1.13 lb ae/a 1.13 lb ai/a 0.313 lb ai/a 1 % v/v	PRE A V2-4 V2-4 V2-4 V2-4	100.0 a 100.0 a	99.0 a 8.3 ab
9 Untreated Check			0.0 b	0.0 b	0.0 d 0.0 d
LSD P=.05 Standard Deviation CV		7.10 4.10 4.72	6.03 3.48 3.98	4.13 2.39 2.77	4.56 2.63 52.25
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		1.230 0.3184 189.774 0.0001	1.103 0.3558 267.464 0.0001	5.709 0.0135 552.685 0.0001	14.524 0.0003 4.890 0.0034

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	C GLXMA		
Description		Soybean LeafBurn %	Soybean Yield Bu/A		
Rating Type					
Rating Unit					
Rating Date		06/18/19	11/04/19		
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code		
7 Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin Crop Oil Concentrate Roundup PowerMax..glyphosate Warrant.....acetochlor	61.3 WG 3.9 44.6 12.8 100 L 4.5 AS 3 CS	0.23 lb ai/a 0.0146 0.167 0.048 1 % v/v 1.13 lb ae/a 1.13 lb ai/a	PRE A V2-4 V2-4	0.0 c	37.3 a
8 Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin Crop Oil Concentrate Roundup PowerMax..glyphosate Warrant.....acetochlor Tough EC.....pyridate Crop Oil Concentrate	61.3 WG 3.9 44.6 12.8 100 L 4.5 AS 3 CS 5 EC 100 L	0.23 lb ai/a 0.0146 0.167 0.048 1 % v/v 1.13 lb ae/a 1.13 lb ai/a 0.313 lb ai/a 1 % v/v	PRE A V2-4 B V2-4 B V2-4 B	11.7 b	42.2 a
9 Untreated Check				0.0 c	22.8 b
LSD P=.05 Standard Deviation CV				5.76 3.33 54.14	11.95 6.90 16.45
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				0.304 0.7419 15.473 0.0001	3.684 0.0483 3.964 0.0092

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation of Residual Herbicides for Soybeans - Medium Soils**

Trial ID: Soy5b-19      Location: Harrington      Trial Year: 2018  
 Protocol ID: Soy5b-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 04/29/19  
 Initiation Date: 03/01/19  
 Completion Date: 11/15/19

**Trial Location**

Country: USA United States

Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean BBCH Scale: BSOY  
 Entry Date: 04/30/19  
 Variety: NKS43V3X  
 Planting Date: 04/29/19  
 Row Spacing: 15 IN

**Site and Design**

Treated Plot Width: 10 FT Site Type: FIELD field  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 250 FT<sup>2</sup> Treatments: 14 Tillage Type: CONTIL conventional-till  
 Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Application Description**

	A
Application Date	04/30/19
Appl. Stop Time	12:00 PM
Application Method	SPRAY
Application Timing	PREPREG
Application Placement	BROSOI
Applied By	K. Vollmer
Appl. Entry Date	04/30/19
Air Temperature Start, Stop	70 73 F
% Relative Humidity Start, Stop	71 64
Wind Velocity+Dir. Start	6 mph WNW
Wind Velocity+Dir. Stop	5 mph WSW
Wind Velocity+Dir. Max	6 mph WNW
Wet Leaves (Y/N)	N no
Soil Temperature	67 F
Soil Moisture	SLIDRY
% Cloud Cover	9
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.83 IN

<b>Crop Stage At Each Application</b>	
	A
Crop 1 Code, BBCH Scale	GLXMA BSOY

<b>Application Equipment</b>	
	A
Appl. Equipment	Bckpck4Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	6 ft
Boom Height	18 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	04/29/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	04/30/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

#### Trial Comments

05/15/19: No observable injury to soybeans. No summer annual weed emergence. Horseweed and field pansy not controlled.

05/28/19: No observable injury to soybean. Patches of winter annual weed groundcover appear to be suppressing summer annual weed emergence.

06/17/19: Patches of dead winter annual ground cover may be suppressing some weeds. No stunting observed.

## Evaluation of Residual Herbicides for Soybeans - Medium Soils

Trial ID: Soy5b-19

Location: Harrington

Trial Year: 2018

Protocol ID: Soy5b-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Crop Type, Code		C GLXMA	C GLXMA	AMACH C -	IPOSS C -
Description		Soybean	Soybean	Sm.Pigwd	Morngly
Rating Type		Stunting %	Stunting %	Control %	Control %
Rating Unit					
Rating Date		05/23/19	05/28/19	05/28/19	05/28/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing
1	Untreated Check Roundup	4.5 AS	AS	0.77 lb ai/a	PREPREG A
2	Authority First Premix ----sulfentrazone ----cloransulam Roundup	70 DF 62.1 7.9 4.5 AS	DF 0.236 lb ai/a 0.21 0.0266 0.77 lb ai/a	PREPREG A	8.0 abc
3	Authority MTZ Premix ----sulfentrazone ----metribuzin Roundup	45 DF 18 27 4.5 AS	DF 0.338 lb ai/a 0.135 0.203 0.77 lb ai/a	PREPREG A	4.0 b-e
4	Authority Supreme _ Spartan Charge Premix _ Zidua.....pyroxasulfone Roundup	500 SC 3.5 F 4.17 SC 4.5 AS	SC 0.118 lb ai/a 0.106 lb ai/a 0.77 lb ai/a	PREPREG A	1.7 de
5	Canopy Premix ----metribuzin ----chlorimuron Roundup	75 DF 64.3 10.7 4.5 AS	DF 0.21 lb ai/a 0.18 0.03 0.77 lb ai/a	PREPREG A	9.0 ab
6	Fierce Premix ----flumioxazin ----pyroxasulfone Roundup	76 WG 33.5 42.5 4.5 AS	WG 0.0785 0.1 0.77 lb ai/a	PREPREG A	8.0 abc
7	BroadAxe Premix ----sulfentrazone ----s-metolachlor Roundup	7 SC 0.7 6.3 4.5 AS	SC 0.153 1.38 0.77 lb ai/a	PREPREG A	11.3 a
8	Valor SX.....flumioxazin Metribuzin.....metribuzin Roundup	51 WG 75 DF 4.5 AS	WG 0.064 lb ai/a 0.188 lb ai/a 0.77 lb ai/a	PREPREG A	0.0 e
9	Fierce MTZ Roundup	2.64 SC 4.5 AS	SC 0.33 lb ai/a 0.77 lb ai/a	PREPREG A	6.7 a-d
10	Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin _ Classic.....chlorimuron _ Metribuzin....metribuzin _ Valor SX.....flumioxazin Roundup	61.3 WG 3.9 44.6 12.8 25 WG 75 DF 51 WG 4.5 AS	WG 0.0164 0.187 0.0537 0.0164 lb ai/a 0.187 lb ai/a 0.0537 lb ai/a 0.77 lb ai/a	PREPREG A	0.0 e
11	Zidua.....pyroxasulfone Tricor DF.....metribuzin Roundup	85 WG 75 DF 4.5 AS	WG 0.106 lb ai/a 0.188 lb ai/a 0.77 lb ai/a	PREPREG A	4.7 b-e

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13

Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

Pest Code				MOLVE C - Carpetwd	DIGSA C - L.crbgrs	ERICA C - Horsewd	VIORA C - FldPansy
Crop Type, Code				Control % 05/28/19	Control % 05/28/19	Control % 05/28/19	Control % 05/28/19
Description							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Untreated Check						
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
2	Authority First Premix	70 DF		0.236 lb ai/a	PREP	RE A	
	----sulfentrazone	62.1		0.21			
	----cloransulam	7.9		0.0266			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
3	Authority MTZ Premix	45 DF		0.338 lb ai/a	PREP	RE A	
	----sulfentrazone	18		0.135			
	----metribuzin	27		0.203			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
4	Authority Supreme	500 SC		0.212 lb ai/a	PREP	RE A	
	Spartan Charge Premix	3.5 F		0.118 lb ai/a	PREP	RE A	
	Zidua.....pyroxasulfone	4.17 SC		0.106 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
5	Canopy Premix	75 DF		0.21 lb ai/a	PREP	RE A	
	----metribuzin	64.3		0.18			
	----chlorimuron	10.7		0.03			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
6	Fierce Premix	76 WG		0.178 lb ai/a	PREP	RE A	
	----flumioxazin	33.5		0.0785			
	----pyroxasulfone	42.5		0.1			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
7	BroadAxe Premix	7 SC		1.53 lb ai/a	PREP	RE A	
	----sulfentrazone	0.7		0.153			
	----s-metolachlor	6.3		1.38			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
8	Valor SX.....flumioxazin	51 WG		0.064 lb ai/a	PREP	RE A	
	Metribuzin.....metribuzin	75 DF		0.188 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
9	Fierce MTZ	2.64 SC		0.33 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
10	Trivent Premix	61.3 WG		0.257 lb ai/a	PRE		
	----chlorimuron	3.9		0.0164			
	----metribuzin	44.6		0.187			
	----flumioxazin	12.8		0.0537			
	Classic.....chlorimuron	25 WG		0.0164 lb ai/a	PREP	RE A	
	Metribuzin.....metribuzin	75 DF		0.187 lb ai/a	PREP	RE A	
	Valor SX.....flumioxazin	51 WG		0.0537 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
11	Zidua.....pyroxasulfone	85 WG		0.106 lb ai/a	PREP	RE A	
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13

Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

Pest Code				AMACH C - Sm.Pigwd	IPOSS C - Mornglry	SIDSP C - Pr.Sida	GGGAN C - AnnGrass
Crop Type, Code				Control %	Control %	Control %	Control %
Description				06/17/19	06/17/19	06/17/19	06/17/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Untreated Check						
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
2	Authority First Premix	70 DF		0.236 lb ai/a	PREP	RE A	
	----sulfentrazone	62.1		0.21			
	----cloransulam	7.9		0.0266			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
3	Authority MTZ Premix	45 DF		0.338 lb ai/a	PREP	RE A	
	----sulfentrazone	18		0.135			
	----metribuzin	27		0.203			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
4	Authority Supreme	500 SC		0.212 lb ai/a	PREP	RE A	
	_Spartan Charge Premix	3.5 F		0.118 lb ai/a	PREP	RE A	
	_Zidua.....pyroxasulfone	4.17 SC		0.106 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
5	Canopy Premix	75 DF		0.21 lb ai/a	PREP	RE A	
	----metribuzin	64.3		0.18			
	----chlorimuron	10.7		0.03			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
6	Fierce Premix	76 WG		0.178 lb ai/a	PREP	RE A	
	----flumioxazin	33.5		0.0785			
	----pyroxasulfone	42.5		0.1			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
7	BroadAxe Premix	7 SC		1.53 lb ai/a	PREP	RE A	
	----sulfentrazone	0.7		0.153			
	----s-metolachlor	6.3		1.38			
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
8	Valor SX.....flumioxazin	51 WG		0.064 lb ai/a	PREP	RE A	
	Metribuzin.....metribuzin	75 DF		0.188 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
9	Fierce MTZ	2.64 SC		0.33 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
10	Trivent Premix	61.3 WG		0.257 lb ai/a	PRE		
	----chlorimuron	3.9		0.0164			
	----metribuzin	44.6		0.187			
	----flumioxazin	12.8		0.0537			
	_Classic.....chlorimuron	25 WG		0.0164 lb ai/a	PREP	RE A	
	_Metribuzin.....metribuzin	75 DF		0.187 lb ai/a	PREP	RE A	
	_Vvalor SX.....flumioxazin	51 WG		0.0537 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	
11	Zidua.....pyroxasulfone	85 WG		0.106 lb ai/a	PREP	RE A	
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PREP	RE A	
	Roundup	4.5 AS		0.77 lb ai/a	PREP	RE A	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13

Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

Pest Code			ERICA	VIORA					
Crop Type, Code			C -	C -					
Description			Horsewd	FldPansy					
Rating Type			Control	Control					
Rating Unit			%	%					
Rating Date			06/17/19	06/17/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check							0.0 a	0.0 d
	Roundup	4.5 AS		0.77 lb ai/a					
2	Authority First Premix	70 DF		0.236 lb ai/a				0.0 a	23.3 a-d
	----sulfentrazone	62.1		0.21					
	----cloransulam	7.9		0.0266					
	Roundup	4.5 AS		0.77 lb ai/a					
3	Authority MTZ Premix	45 DF		0.338 lb ai/a				0.0 a	15.0 bcd
	----sulfentrazone	18		0.135					
	----metribuzin	27		0.203					
	Roundup	4.5 AS		0.77 lb ai/a					
4	Authority Supreme	500 SC		0.212 lb ai/a				0.0 a	0.0 d
	_Spartan Charge Premix	3.5 F		0.118 lb ai/a					
	_Zidua.....pyroxasulfone	4.17 SC		0.106 lb ai/a					
	Roundup	4.5 AS		0.77 lb ai/a					
5	Canopy Premix	75 DF		0.21 lb ai/a				0.0 a	55.0 ab
	----metribuzin	64.3		0.18					
	----chlorimuron	10.7		0.03					
	Roundup	4.5 AS		0.77 lb ai/a					
6	Fierce Premix	76 WG		0.178 lb ai/a				0.0 a	46.7 abc
	----flumioxazin	33.5		0.0785					
	----pyroxasulfone	42.5		0.1					
	Roundup	4.5 AS		0.77 lb ai/a					
7	BroadAxe Premix	7 SC		1.53 lb ai/a				0.0 a	16.7 bcd
	----sulfentrazone	0.7		0.153					
	----s-metolachlor	6.3		1.38					
	Roundup	4.5 AS		0.77 lb ai/a					
8	Valor SX.....flumioxazin	51 WG		0.064 lb ai/a				0.0 a	16.7 bcd
	Metribuzin.....metribuzin	75 DF		0.188 lb ai/a					
	Roundup	4.5 AS		0.77 lb ai/a					
9	Fierce MTZ	2.64 SC		0.33 lb ai/a				0.0 a	6.7 cd
	Roundup	4.5 AS		0.77 lb ai/a					
10	Trivent Premix	61.3 WG		0.257 lb ai/a				0.0 a	63.3 a
	----chlorimuron	3.9		0.0164					
	----metribuzin	44.6		0.187					
	----flumioxazin	12.8		0.0537					
	_Classic.....chlorimuron	25 WG		0.0164 lb ai/a					
	_Metribuzin.....metribuzin	75 DF		0.187 lb ai/a					
	_Vvalor SX.....flumioxazin	51 WG		0.0537 lb ai/a					
	Roundup	4.5 AS		0.77 lb ai/a					
11	Zidua.....pyroxasulfone	85 WG		0.106 lb ai/a				0.0 a	0.0 d
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a					
	Roundup	4.5 AS		0.77 lb ai/a					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13

Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	C GLXMA	AMACH C -	IPOSS C -
Description		Soybean	Soybean	Sm.Pigwd	Mornlgy
Rating Type		Stunting	Stunting	Control	Control
Rating Unit		%	%	%	%
Rating Date		05/23/19	05/28/19	05/28/19	05/28/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit
				Appl Timing	Appl Code
12 ---Gangster/Surveil Co-Pack					
_Valor SX.....flumioxazin		51 WG	0.08 lb ai/a	PREPREG A	
_Firstrate.....cloransulam		84 WG	0.0263 lb ai/a	PREPREG A	
Roundup		4.5 AS	0.77 lb ai/a	PREPREG A	
13 Boundary Premix		6.5 EC	1.02 lb ai/a	PREPREG A	
----s-metolachlor		5.25	0.82		
----metribuzin		1.25	0.196		
Roundup		4.5 AS	0.77 lb ai/a	PREPREG A	
14 Fierce XLT Premix		62.4 WG	0.146 lb ai/a	PREPREG A	
----flumioxazin		24.57	0.0575		
----pyroxasulfone		31.16	0.073		
----chlorimuron		6.67	0.0156		
_Cassic		25 WG	0.0156 lb ai/a	PREPREG A	
_Valor		51 WG	0.0574 lb ai/a	PREPREG A	
_Zidua		4.17 SC	0.073 lb ai/a	PREPREG A	
Roundup		4.5 AS	0.77 lb ai/a	PREPREG A	
LSD P=.05			5.08	.	2.27
Standard Deviation			3.03	0.00	1.35
CV			70.67	0.0	1.46
Replicate F			1.316	0.000	0.509
Replicate Prob(F)			0.2855	1.0000	0.6072
Treatment F			4.577	0.000	1167.194
Treatment Prob(F)			0.0005	1.0000	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13

Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description	MOLVE C - Carpetwd	DIGSA C - L.crbgrs	ERICA C - Horsewd	VIORA C - FldPansy			
Rating Type	Control %	Control %	Control %	Control %			
Rating Unit	05/28/19	05/28/19	05/28/19	05/28/19			
Rating Date							
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing	Appl Code			
12 ---Gangster/Surveil Co-Pack _Valor SX.....flumioxazin _Firstrate.....cloransulam Roundup	51 WG 84 WG 4.5 AS	0.08 lb ai/a 0.0263 lb ai/a 0.77 lb ai/a	PREPRE A PREPRE A PREPRE A	100.0 a	98.3 ab	16.7 a	26.7 cd
13 Boundary Premix ----s-metolachlor ----metribuzin Roundup	6.5 EC 5.25 1.25 4.5 AS	1.02 lb ai/a 0.82 0.196 0.77 lb ai/a	PREPRE A PREPRE A PREPRE A PREPRE A	100.0 a	100.0 a	16.7 a	16.7 cd
14 Fierce XLT Premix ----flumioxazin ----pyroxasulfone ----chlorimuron _Classic _Valor _Zidua Roundup	62.4 WG 24.57 31.16 6.67 25 WG 51 WG 4.17 SC 4.5 AS	0.146 lb ai/a 0.0575 0.073 0.0156 0.0156 lb ai/a 0.0574 lb ai/a 0.073 lb ai/a 0.77 lb ai/a	PREPRE A PREPRE A PREPRE A PREPRE A PREPRE A PREPRE A PREPRE A PREPRE A	100.0 a	100.0 a	13.3 a	26.7 cd
LSD P=.05 Standard Deviation CV		3.37 2.01 2.17	2.27 1.35 1.46	49.88 29.72 114.51	42.96 25.60 73.64		
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		1.000 0.3816 529.994 0.0001	0.509 0.6072 1167.194 0.0001	7.419 0.0028 0.570 0.8554	1.587 0.2237 2.263 0.0369		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13

Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description	AMACH C - Sm.Pigwd	IPOSS C - Morngly	SIDSP C - Pr.Sida	GGGAN C - AnnGrass
Rating Type	Control %	Control %	Control %	Control %
Rating Unit	06/17/19	06/17/19	06/17/19	06/17/19
Rating Date				
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing	Appl Code
12 ---Gangster/Surveil Co-Pack _Valor SX.....flumioxazin _Firstrate.....cloransulam Roundup	51 WG 84 WG 4.5 AS	0.08 lb ai/a 0.0263 lb ai/a 0.77 lb ai/a	PREPRA PREPRA PREPRA	96.7 a
13 Boundary Premix ----s-metolachlor ----metribuzin Roundup	6.5 EC 5.25 1.25 4.5 AS	1.02 lb ai/a 0.82 0.196 0.77 lb ai/a	PREPRA PREPRA PREPRA	84.0 b
14 Fierce XLT Premix ----flumioxazin ----pyroxasulfone ----chlorimuron _Classic _Valor _Zidua Roundup	62.4 WG 24.57 31.16 6.67 25 WG 51 WG 4.17 SC 4.5 AS	0.146 lb ai/a 0.0575 0.073 0.0156 0.0156 lb ai/a 0.0574 lb ai/a 0.073 lb ai/a 0.77 lb ai/a	PREPRA PREPRA PREPRA PREPRA PREPRA PREPRA PREPRA	100.0 a
LSD P=.05 Standard Deviation CV		7.75 4.62 5.06	57.10 34.02 277.45	81.28 48.43 88.05
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		0.808 0.4567 99.522 0.0001	1.235 0.3074 0.675 0.7683	0.045 0.3661 0.985 0.4910
				0.050 0.9514 39.592 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13

Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

## University of Delaware

Pest Code		ERICA	VIORA					
Crop Type, Code		C -	C -					
Description		Horsewd	FldPansy					
Rating Type		Control	Control					
Rating Unit		%	%					
Rating Date	06/17/19		06/17/19					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
12 ---Gangster/Surveil Co-Pack								
_Valor SX.....flumioxazin	51 WG	0.08 lb	ai/a	PREPRE A			0.0 a	25.0 a-d
_Firstrate.....cloransulam	84 WG	0.0263 lb	ai/a	PREPRE A				
Roundup	4.5 AS	0.77 lb	ai/a	PREPRE A				
13 Boundary Premix	6.5 EC	1.02 lb	ai/a	PREPRE A			0.0 a	8.3 cd
----s-metolachlor	5.25	0.82						
----metribuzin	1.25	0.196						
Roundup	4.5 AS	0.77 lb	ai/a	PREPRE A				
14 Fierce XLT Premix	62.4 WG	0.146 lb	ai/a	PREPRE A			0.0 a	33.3 a-d
----flumioxazin	24.57	0.0575						
----pyroxasulfone	31.16	0.073						
----chlorimuron	6.67	0.0156						
_Classic	25 WG	0.0156 lb	ai/a	PREPRE A				
_Valor	51 WG	0.0574 lb	ai/a	PREPRE A				
_Zidua	4.17 SC	0.073 lb	ai/a	PREPRE A				
Roundup	4.5 AS	0.77 lb	ai/a	PREPRE A				
LSD P=.05							.	40.72
Standard Deviation							0.00	24.26
CV							0.0	109.58
Replicate F							0.000	4.267
Replicate Prob(F)							1.0000	0.0250
Treatment F							0.000	2.165
Treatment Prob(F)							1.0000	0.0454

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=13

Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

Options for Residual Herbicides with Early Preplant Applications  
 Trial ID: Soy7-19 Location: Field #3 Trial Year: 2019  
 Protocol ID: Soy7-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 04/17/19  
 Initiation Date: 03/01/19  
 Completion Date: 11/09/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

C

**Pest Description**

Pest 1 Type: W Code: ERICA Conyza canadensis  
 Common Name: Canada horseweed Entry Date: 11/19/19

Pest 2 Type: W Code: OEOLA Oenothera lacinata  
 Common Name: Cutleaf eveningprimrose Entry Date: 12/03/19

Pest 3 Type: W Code: HLOUM Holosteum umbellatum  
 Common Name: Jagged chickweed Entry Date: 12/03/19

Pest 4 Type: W Code: LAMAM Lamium amplexicaule  
 Common Name: Henbit Entry Date: 12/03/19

Pest 5 Type: W Code: VIORA Viola bicolor  
 Common Name: Field Pansy Entry Date: 12/03/19

**Site and Design**

Treated Plot Width: 10 FT Site Type: FIELD field  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 250 FT<sup>2</sup> Treatments: 8 Tillage Type: NOTILL no-till  
 Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

All treatments received Roundup + Liberty + COC + AMS at application.

**Soil Description**

Description Name: Field 3  
 % Sand: 80 % OM: 0.8 Texture: LS loamy sand  
 % Silt: 12 pH: 6.6 Soil Name: Rockawalkin loamy sand, 0-2% slopes  
 % Clay: 8 CEC: 4.0 Fert. Level: G good  
 Soil Drainage: G good

**Application Description**

A	
Application Date	04/18/19
Appl. Stop Time	12:30 PM
Application Method	SPRAY
Application Timing	EPP
Application Placement	BROADC
Applied By	VanGessel
Appl. Entry Date	11/19/19
Air Temperature Start, Stop	79 79 F
% Relative Humidity Start, Stop	52 52
Wind Velocity+Dir. Start	7 mph SSW
Wind Velocity+Dir. Stop	7 mph SSW
Wind Velocity+Dir. Max	7 mph SSW
Wet Leaves (Y/N)	N no
Soil Temperature	71 F
Soil Moisture	NORMAL
% Cloud Cover	64
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.25 IN

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	ERICA W
Stage Majority, Percent	bolt 65
Stage Minimum, Percent	rosett 35
Stage Maximum, Percent	bolt 65
Diameter	3.5 in
Height Average	4 in
Height Minimum, Maximum	3 4
Density Average	2 m2
Pest 2 Code, Type, Scale	OEOLA W
Stage Majority, Percent	rosett 100
Diameter	5 in
Height Minimum, Maximum	4 6
Density Average	1 m2
Pest 3 Code, Type, Scale	HLOUM W
Stage Majority, Percent	seed 100
Height Average	6 in
Density Average	10 m2
Pest 4 Code, Type, Scale	LAMAM W
Stage Majority, Percent	seed 100
Height Average	5 in
Density Average	8 m2
Pest 5 Code, Type, Scale	VIORA W
Stage Majority, Percent	flower 100
Height Average	4.5 in
Height Minimum, Maximum	4 5
Density Average	1 m2

**Application Equipment**

	A
Appl. Equipment	Bckpck6Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	9 ft
Boom Height	24 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	04/17/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	06/18/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

04/18/19: Treatment 4 (Basis Blend) was applied at only 1/3 the intended rate (but with glyphosate and glufosinate). The remaining 2/3 was applied 2 hours later.

05/23/19: Poor to no ragweed control at trt 6. Poor ERICA from treatments 4 and 7, Fair-good ERICA with treatments 2 and 3, Excellent ERICA control with treatments 5, 6, and 8.

## University of Delaware

Options for Residual Herbicides with Early Preplant Applications  
 Trial ID: Soy7-19 Location: Field #3 Trial Year: 2019  
 Protocol ID: Soy7-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA PalmerAm Control %	DIGSA L.crbgrs Control %	AMAPA PalmerAm Control %	CHEAL C.lmsqtr Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Untreated Check							
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	EPP	A		
	Liberty 280.....glufosinate	2.34 SL		0.585 lb ai/a	EPP	A		
	Crop Oil Concentrate	100 L		1.25 % v/v	EPP	A		
	Dry Ammonium Sulfate	100 D		0.9 % w/v	EPP	A		
2	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	EPP	A	36.7 b	38.7 c
3	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	EPP	A	56.7 b	61.2 b
4	Basis Blend Premix	30 SG		0.0155 lb ai/a	EPP	A	56.7 b	91.7 a
	----rimsulfuron	20		0.0103				
	----thifensulfuron	10		0.00517				
5	Sharpen.....saflufenacil	2.85 SC		0.0334 lb ai/a	EPP	A	50.0 b	10.0 d
6	Valor SX.....flumioxazin	51 WG		0.064 lb ai/a	EPP	A	85.0 a	85.0 a
7	Prowl.....pendimethalin	3.3 EC		0.83 lb ai/a	EPP	A	40.0 b	81.7 a
8	Canopy Premix	75 DF		0.188 lb ai/a	EPP	A	91.7 a	71.7 ab
	----metribuzin	64.3		0.161				
	----chlorimuron	10.7		0.0268				
LSD P=.05					27.35	18.20	15.70	.
Standard Deviation					15.62	10.23	8.96	.
CV					29.99	17.79	28.88	.
Replicate F					1.234	2.269	1.919	
Replicate Prob(F)					0.3209	0.1460	0.1835	
Treatment F					10.179	39.313	47.494	
Treatment Prob(F)					0.0001	0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Due to missing data, larger LSD values (col. 4: >=-99998.01 and <=0.00) are used for mean comparisons of treatment pairs with missing data.

Missing data estimates are included in columns:Yates=2; Average=5

Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.

Pest Code		IPOSS	DIGSA	AMAPA						
Description		morngly	L.crbgrs	PalmerAm						
Rating Type		Control	Control	Dry weight						
Rating Unit		%	%	g/0.5m <sup>2</sup>						
Rating Date		05/23/19	05/23/19	05/28/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1	Untreated Check							0.0 c	0.0 c	0.1717 a
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	EPP	A				
	Liberty 280.....glufosinate	2.34 SL		0.585 lb ai/a	EPP	A				
	Crop Oil Concentrate	100 L		1.25 % v/v	EPP	A				
	Dry Ammonium Sulfate	100 D		0.9 % w/v	EPP	A				
2	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	EPP	A		0.0 c	6.7 c	0.3240 a
3	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	EPP	A		20.0 bc	6.7 c	
4	Basis Blend Premix	30 SG		0.0155 lb ai/a	EPP	A		35.0 b	81.7 a	
	----rimsulfuron	20		0.0103						
	----thifensulfuron	10		0.00517						
5	Sharpen.....saflufenacil	2.85 SC		0.0334 lb ai/a	EPP	A		10.0 bc	6.7 c	0.2890 a
6	Valor SX.....flumioxazin	51 WG		0.064 lb ai/a	EPP	A		85.0 a	87.3 a	
7	Prowl.....pendimethalin	3.3 EC		0.83 lb ai/a	EPP	A		0.0 c	63.3 b	
8	Canopy Premix	75 DF		0.188 lb ai/a	EPP	A		100.0 a	90.7 a	
	----metribuzin	64.3		0.161						
	----chlorimuron	10.7		0.0268						
LSD P=.05								28.03	15.42	0.41418
Standard Deviation								14.52	8.81	0.18270
CV								46.45	20.54	69.85
Replicate F								0.059	0.664	3.023
Replicate Prob(F)								0.9429	0.5302	0.1585
Treatment F								22.653	66.072	0.572
Treatment Prob(F)								0.0003	0.0001	0.6046

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Due to missing data, larger LSD values (col. 4: >=-99998.01 and <=0.00) are used for mean comparisons of treatment pairs with missing data.

Missing data estimates are included in columns:Yates=2; Average=5

Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.

## University of Delaware

Soybean Response to Various POST Herbicides and Effect On Yield  
 Trial ID: Soy8-19 Location: REC Fld #4 Trial Year: 2019  
 Protocol ID: Soy8-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 07/08/19  
 Initiation Date: 03/01/19  
 Completion Date: 09/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean  
 Entry Date: 12/11/19  
 Variety: S43XS27  
 Attributes: Extend  
 Planting Date: 07/08/19 Planting Rate: 180000 S/A  
 Depth: 1 IN  
 Rows per Plot: 7 Planting Method: PLANTD planted  
 Row Spacing: 15 IN Planting Equipment: FE Field Equipment  
 Seed Bed: MEDTRA medium/trashy  
 Soil Temperature: 78 F Soil Moisture: NORMAL normal, adequate  
 Emergence Date: 07/13/19

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morningglory Entry Date: 12/11/19

**Site and Design**

Treated Plot Width: 6.67 FT Site Type: FIELD field  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 10 Tillage Type: NOTILL no-till  
 Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

## Trial Initiation Comments:

Soybeans were doublecropped after wheat.

## Field Prep./Maintenance:

A total preemergence application of Roundup PowerMax (1 qt/A) + Broadaxe (25 fl.oz) + Dual Magnum (8 fl.oz/A) was applied on 07/09/19.

**Soil Description**

Description Name: Field 4  
 % Sand: 79 % OM: 1.4 Texture: LS loamy sand  
 % Silt: 13 pH: 6.3 Soil Name: Hammonton loamy sand, 0-2% slopes  
 % Clay: 8 CEC: 6.4 Fert. Level: G good  
 Soil Drainage: F fair

**Application Description**

	A	B
Application Date	07/09/19	07/31/19
Appl. Stop Time	01:30 PM	10:50 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	21DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	12/11/19	12/11/19
Air Temperature Start, Stop	84 84 F	86 86 F
% Relative Humidity Start, Stop	57 57	65 65
Wind Velocity+Dir. Start	1 mph	4 mph WSW
Wind Velocity+Dir. Stop	1 mph	4 mph WSW
Wind Velocity+Dir. Max	1 mph	4 mph WSW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	85 F	85 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	33	59
Moisture 6 Hours after Appl.	0 IN	0.12 IN
Moisture 1 Week after Appl.	0.33 IN	1.45 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-4	18
Stage Majority, Percent		3-trifol 100
Height Average		9 in
Height Minimum, Maximum		8 10

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	IPOSS W	IPOSS W

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	26 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	07/08/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	08/26/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

## University of Delaware

Soybean Response to Various POST Herbicides and Effect On Yield  
Trial ID: Soy8-19      Location: REC Fld #4      Trial Year: 2019  
Protocol ID: Soy8-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

## Trial Comments

07/31/19: Only scattered morningglory plants were present at application; not enough to rate.

08/22/19: Plot 106, 201, 206, and 209 missing beans in middle row.

Soybean Response to Various POST Herbicides and Effect On Yield  
 Trial ID: Soy8-19 Location: REC Fld #4 Trial Year: 2019  
 Protocol ID: Soy8-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Crop Type, Code		C GLXMA	C GLXMA	C GLXMA
Description		Stunting %	leaf burn %	Chlorosis %
Rating Type		08/03/19	Leaf Burn %	08/03/19
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Form Type Rate	Rate Unit	Appl Timing	Appl Code
1 Check Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B
2 Metribuzin.....metribuzin Roundup PowerMax..glyphosate	75 DF 4.5 AS	0.234 lb ai/a 1.13 lb ae/a	PRE 21DAP	A
3 Reflex.....fomesafen Roundup PowerMax..glyphosate	2 L 4.5 AS	0.375 lb ai/a 1.13 lb ae/a	21DAP	B
4 Reflex.....fomesafen Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2 L 4.5 AS 100 D	0.375 lb ai/a 1.13 lb ae/a 1.2 % w/v	21DAP	B
5 Flexstar GT Premix ----fomesafen ----glyphosate	3.3 L 0.66 2.64	1.86 lb ai/a 0.372 1.49	21DAP	B
6 Flexstar GT Premix ----fomesafen ----glyphosate Dry Ammonium Sulfate	3.3 L 0.66 2.64 100 D	1.86 lb ai/a 0.372 1.49 1.2 % w/v	21DAP	B
7 Ultra Blazer....acifluorfen Nonionic Surfactant	2 L 100 L	0.375 lb ai/a 0.25 % v/v	21DAP	B
8 Storm Premix ----bentazon ----acifluorfen Nonionic Surfactant	4 EC 2.67 1.33 100 L	0.375 lb ai/a 0.25 0.125 0.25 % v/v	21DAP	B
9 Raptor.....imazamox Crop Oil Concentrate 30% Urea Ammonium Nitrate	1 AS 100 L 100 L	0.0625 lb ai/a 1.25 % v/v 2.5 % v/v	21DAP	B
10 Cobra.....lactofen Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2 EC 4.5 AS 100 D	0.195 lb ai/a 1.13 lb ae/a 1.2 % w/v	21DAP	B
LSD P=.05		4.96	7.02	1.57
Standard Deviation		2.89	4.09	0.91
CV		60.6	66.01	39.12
Replicate F		2.305	2.083	1.000
Replicate Prob(F)		0.1285	0.1535	0.3874
Treatment F		12.126	19.152	196.000
Treatment Prob(F)		0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Crop Type, Code		C GLXMA					
Description							
Rating Type							
Rating Unit							
Rating Date		Stunting % 08/22/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Check Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	21DAP	B	0.0 b
2	Metribuzin.....metribuzin Roundup PowerMax..glyphosate	75 DF 4.5 AS		0.234 lb ai/a 1.13 lb ae/a	PRE 21DAP	A	0.0 b
3	Reflex.....fomesafen Roundup PowerMax..glyphosate	2 L 4.5 AS		0.375 lb ai/a 1.13 lb ae/a	21DAP	B	2.3 b
4	Reflex.....fomesafen Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2 L 4.5 AS 100 D		0.375 lb ai/a 1.13 lb ae/a 1.2 % w/v	21DAP	B	0.0 b
5	Flexstar GT Premix ----fomesafen ----glyphosate	3.3 L 0.66 2.64		1.86 lb ai/a 0.372 1.49	21DAP	B	0.0 b
6	Flexstar GT Premix ----fomesafen ----glyphosate Dry Ammonium Sulfate	3.3 L 0.66 2.64 100 D		1.86 lb ai/a 0.372 1.49 1.2 % w/v	21DAP	B	2.3 b
7	Ultra Blazer....acifluorfen Nonionic Surfactant	2 L 100 L		0.375 lb ai/a 0.25 % v/v	21DAP	B	0.0 b
8	Storm Premix ----bentazon ----acifluorfen Nonionic Surfactant	4 EC 2.67 1.33 100 L		0.375 lb ai/a 0.25 0.125 0.25 % v/v	21DAP	B	0.0 b
9	Raptor.....imazamox Crop Oil Concentrate 30% Urea Ammonium Nitrate	1 AS 100 L 100 L		0.0625 lb ai/a 1.25 % v/v 2.5 % v/v	21DAP	B	3.3 b
10	Cobra.....lactofen Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2 EC 4.5 AS 100 D		0.195 lb ai/a 1.13 lb ae/a 1.2 % w/v	21DAP	B	14.0 a
LSD P=.05							5.47
Standard Deviation							3.19
CV							144.93
Replicate F							1.721
Replicate Prob(F)							0.2070
Treatment F							5.561
Treatment Prob(F)							0.0010

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Valent and Corteva Products in Xtend Soybeans

Trial ID: Soy10-19 Location: Field #14 Trial Year: 2019  
Protocol ID: Soy10-19 Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: Valent, Corteva

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/20/19

Initiation Date: 03/01/19

Completion Date: 11/08/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 11/11/19

Variety: S43XS27

Attributes: Xtend

Planting Date: 05/22/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDIUM medium

Soil Temperature: 74 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 05/27/19

Harvest Date: 11/06/19

Harvest Equipment: Plot combine

Harvested Width: 5 FT

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth Entry Date: 11/11/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory Entry Date: 11/11/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 8 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14B

% Sand: 81 % OM: 1.6 Texture: LS loamy sand

% Silt: 12 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: G good

Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	05/22/19	06/12/19	06/20/19
Appl. Stop Time	01:50 PM	10:50 AM	11:55 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	14-21DAP	28-35DAP
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Jonnson	Johnson
Appl. Entry Date	05/23/19	11/11/19	11/11/19
Air Temperature Start, Stop	72 74 F	72 72 F	86 86 F
% Relative Humidity Start, Stop	29 29	57 57	70 70
Wind Velocity+Dir. Start	2 mph ENE	10 mph E	9 mph SW
Wind Velocity+Dir. Stop	5 mph ENE	10 mph E	9 mph SW
Wind Velocity+Dir. Max	5 mph ENE	10 mph E	9 mph SW
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	77 F	73 F	84 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	9	58	54
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.68 IN	1.64 IN	1.02 IN

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-5	16	24
Stage Majority, Percent		2-trifol 100	3-4 trif 100
Height Average		5 in	7 in
Height Minimum, Maximum		4 6	6 8

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100	veg 100
Height Average		4 in	2 in
Height Minimum, Maximum		2 6	2 3
Density Average		70 m2	3 m2
Density Min, Max		50 90	2 5
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		veg 100	veg 100
Height Average		2 in	2 in
Height Minimum, Maximum		1 3	1 3
Density Average		1 m2	2 m2
Density Min, Max		0 2	1 3

**Application Equipment**

	A	B	C
Appl. Equipment	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	18 in	22 in	24 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/20/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

07/22/19: No injury except for approximately 35% stunting in trt. 5; Morningglory density is noticeably higher in this treatment.

Valent and Corteva Products in Xtend Soybeans						
Trial ID: Soy10-19		Location: Field #14		Trial Year: 2019		
Protocol ID: Soy10-19		Investigator: Mark VanGessel				
Study Director:					Sponsor Contact: Valent, Corteva	
Pest Code	Crop Type, Code			AMAPA C -	PANDI C -	C GLXMA
Description				PalmerAm	F.panicm	Soybean
Rating Type				Control %	Control %	Stunting %
Rating Unit				07/22/19	07/22/19	07/03/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code
1	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	14-21DAP B		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	14-21DAP B		
	Intact Drift Retardant	43.18 L	0.5 % v/v	14-21DAP B		
	Nonionic Surfactant	100 L	0.25 % v/v	14-21DAP B		
2	Fierce EZ Premix	3.04 SC	0.143 lb ai/a	PRE	A	
	----flumioxazin	1.34	0.063			
	----pyroxasulfone	1.7	0.08			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28-35DAP C		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28-35DAP C		
	Intact Drift Retardant	43.18 L	0.5 % v/v	28-35DAP C		
	Nonionic Surfactant	100 L	0.25 % v/v	28-35DAP C		
3	Fierce MTZ Premix	2.64 SC	0.33 lb ai/a	PRE	A	
	----flumioxazin	0.5000001	0.0625			
	----metribuzin	1.5	0.188			
	----pyroxasulfone	0.64	0.08			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28-35DAP C		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28-35DAP C		
	Intact Drift Retardant	43.18 L	0.5 % v/v	28-35DAP C		
	Nonionic Surfactant	100 L	0.25 % v/v	28-35DAP C		
4	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A	
	Tricor 4F.....metribuzin	4 F	0.188 lb ai/a	PRE	A	
	Prowl H2O.....pendimethalin	3.8 CS	0.71 lb ai/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28-35DAP C		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28-35DAP C		
	Intact Drift Retardant	43.18 L	0.5 % v/v	28-35DAP C		
	Nonionic Surfactant	100 L	0.25 % v/v	28-35DAP C		
5	Fierce MTZ Premix	2.64 SC	0.33 lb ai/a	PRE	A	
	----flumioxazin	0.5000001	0.0625			
	----metribuzin	1.5	0.188			
	----pyroxasulfone	0.64	0.08			
	Scout.....glufosinate	2.34 SL	0.585 lb ai/a	28-35DAP C		
	Dry Ammonium Sulfate	100 D	1.5 % w/v	28-35DAP C		
6	Trivence Premix	61.3 WG	0.23 lb ai/a	PRE	A	
	----chlorimuron	3.9	0.0146			
	----metribuzin	44.6	0.167			
	----flumioxazin	12.8	0.048			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28-35DAP C		
7	Surveil Premix	48 WG	0.084 lb ai/a	PRE	A	
	----cloransulam	12	0.021			
	----flumioxazin	36	0.063			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28-35DAP C		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code			AMAPA C -	MOLVE C -	PANDI C -				
Description			PalmerAm	Carpetwd	F.panicm				
Rating Type			Control %	Control %	Control %				
Rating Unit									
Rating Date			07/03/19	07/03/19	07/03/19				
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
1	Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4.5 AS 2.9 SL 43.18 L 100 L	1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	14-21DAP B 14-21DAP B 14-21DAP B 14-21DAP B			86.0 b	80.0 b	85.3 b
2	Fierce EZ Premix ----flumioxazin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	3.04 SC 1.34 1.7 4.5 AS 2.9 SL 43.18 L 100 L	0.143 lb ai/a 0.063 0.08 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A 28-35DAP C 28-35DAP C 28-35DAP C 28-35DAP C			98.3 a	100.0 a	98.3 a
3	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	2.64 SC 0.5000001 1.5 0.64 4.5 AS 2.9 SL 43.18 L 100 L	0.33 lb ai/a 0.0625 0.188 0.08 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A 28-35DAP C 28-35DAP C 28-35DAP C 28-35DAP C			97.7 a	100.0 a	98.3 a
4	Valor SX.....flumioxazin Tricor 4F.....metribuzin Prowl H2O.....pendimethalin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	51 WG 4 F 3.8 CS 4.5 AS 2.9 SL 43.18 L 100 L	0.064 lb ai/a 0.188 lb ai/a 0.71 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A PRE A PRE A 28-35DAP C 28-35DAP C 28-35DAP C 28-35DAP C			97.7 a	99.0 a	99.0 a
5	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.34 SL 100 D	0.33 lb ai/a 0.0625 0.188 0.08 0.585 lb ai/a 1.5 % w/v	PRE A PRE A 28-35DAP C 28-35DAP C			93.3 ab	100.0 a	98.3 a
6	Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin Roundup PowerMax..glyphosate	61.3 WG 3.9 44.6 12.8 4.5 AS	0.23 lb ai/a 0.0146 0.167 0.048 1.13 lb ae/a	PRE A PRE A 28-35DAP C			95.3 a	98.3 a	96.0 a
7	Surveil Premix ----cloransulam ----flumioxazin Roundup PowerMax..glyphosate	48 WG 12 36 4.5 AS	0.084 lb ai/a 0.021 0.063 1.13 lb ae/a	PRE A PRE A 28-35DAP C			91.7 ab	100.0 a	98.3 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code			ELEIN C - Goosegrs Control % 07/03/19	IPOSS C - Morngly Control % 07/03/19	C GLXMA Soybean Yield Bu/A 11/06/19
Trt No. Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code
1 Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4.5 AS 2.9 SL 43.18 L 100 L	1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	14-21DAP B 14-21DAP B 14-21DAP B 14-21DAP B		96.7 a 77.7 b 7.7 cd
2 Fierce EZ Premix ----flumioxazin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	3.04 SC 1.34 1.7 4.5 AS 2.9 SL 43.18 L 100 L	0.143 lb ai/a 0.063 0.08 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A 28-35DAP C 28-35DAP C 28-35DAP C 28-35DAP C		100.0 a 84.3 ab 17.1 a
3 Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	2.64 SC 0.5000001 1.5 0.64 4.5 AS 2.9 SL 43.18 L 100 L	0.33 lb ai/a 0.0625 0.188 0.08 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A 28-35DAP C 28-35DAP C 28-35DAP C 28-35DAP C		100.0 a 95.7 a 15.9 ab
4 Valor SX.....flumioxazin Tricor 4F.....metribuzin Prowl H2O.....pendimethalin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	51 WG 4 F 3.8 CS 4.5 AS 2.9 SL 43.18 L 100 L	0.064 lb ai/a 0.188 lb ai/a 0.71 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A PRE A PRE A 28-35DAP C		100.0 a 93.3 ab 12.3 abc
5 Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.34 SL 100 D	0.33 lb ai/a 0.0625 0.188 0.08 0.585 lb ai/a 1.5 % w/v	PRE A 28-35DAP C 28-35DAP C		100.0 a 0.0 c 3.1 d
6 Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin Roundup PowerMax..glyphosate	61.3 WG 3.9 44.6 12.8 4.5 AS	0.23 lb ai/a 0.0146 0.167 0.048 1.13 lb ae/a	PRE A 28-35DAP C		100.0 a 3.3 c 8.8 bcd
7 Surveil Premix ----cloransulam ----flumioxazin Roundup PowerMax..glyphosate	48 WG 12 36 4.5 AS	0.084 lb ai/a 0.021 0.063 1.13 lb ae/a	PRE A 28-35DAP C		100.0 a 10.0 c 15.1 abc

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code		AMAPA	PANDI	C GLXMA					
Crop Type, Code		C -	C -						
Description		PalmerAm	F.panicm	Soybean					
Rating Type		Control	Control	Stunting					
Rating Unit	%	%	%	%					
Rating Date	07/22/19	07/22/19	07/03/19						
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
8	Canopy Premix ----metribuzin ----chlorimuron Warrant.....acetochlor Roundup PowerMax..glyphosate	75 DF 64.3 10.7	0.234 lb ai/a 0.2 0.0334	1.13 lb ai/a 1.13 lb ae/a	28-35DAP C 28-35DAP C	A	33.3 c	95.0 ab	7.3 bc
LSD P=.05							22.74	3.53	7.84
Standard Deviation							12.98	2.02	4.48
CV							19.12	2.48	42.98
Replicate F							1.179	0.379	1.599
Replicate Prob(F)							0.3362	0.6912	0.2369
Treatment F							20.330	818.880	33.011
Treatment Prob(F)							0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code		AMAPA	MOLVE	PANDI						
Crop Type, Code		C -	C -	C -						
Description		PalmerAm	Carpetwd	F.panicm						
Rating Type		Control	Control	Control						
Rating Unit	%	%	%	%						
Rating Date	07/03/19	07/03/19	07/03/19	07/03/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
8	Canopy Premix	75 DF	0.234	lb ai/a	PRE	A	70.0 c	100.0 a	100.0 a	
	----metribuzin	64.3	0.2							
	----chlorimuron	10.7	0.0334							
	Warrant.....acetochlor	3 CS	1.13	lb ai/a	28-35DAP	C				
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	28-35DAP	C				
LSD P=.05							7.93	1.95	5.28	
Standard Deviation							4.53	1.11	3.01	
CV							4.96	1.15	3.12	
Replicate F							0.896	2.154	0.225	
Replicate Prob(F)							0.4305	0.1529	0.8016	
Treatment F							13.218	117.538	7.381	
Treatment Prob(F)							0.0001	0.0001	0.0008	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code		ELEIN	IPOSS					
Crop Type, Code		C -	C -	C GLXMA				
Description		Goosegrs	Mornlry	Soybean				
Rating Type		Control	Control	Yield				
Rating Unit	%	%	%	Bu/A				
Rating Date	07/03/19	07/03/19		11/06/19				
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
8 Canopy Premix ----metribuzin ----chlorimuron Warrant.....acetochlor Roundup PowerMax..glyphosate	75 DF 64.3 10.7 3 CS 4.5 AS	0.234 lb ai/a 0.2 0.0334 1.13 lb ai/a 1.13 lb ae/a	PRE 28-35DAP C 28-35DAP C	A	100.0 a	0.0 c	10.2 a-d	
LSD P=.05					3.57	17.92	8.15	
Standard Deviation					2.04	10.23	4.65	
CV					2.05	22.47	41.34	
Replicate F					1.000	1.736	1.815	
Replicate Prob(F)					0.3927	0.2120	0.1991	
Treatment F					1.000	59.463	3.096	
Treatment Prob(F)					0.4706	0.0001	0.0342	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Valent PRE and POST Programs in Liberty Link Soybeans

Trial ID: Soy11-19 Location: Field #14

Trial Year: 2019

Protocol ID: Soy11-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Valent

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

Trial Status Date: 05/23/19 Last Export Date: 11/11/19 Last Changed By: Mark VanGessel

ARM Trial Created On: 05/20/19

Initiation Date: 03/01/19

Completion Date: 11/08/19

Protocol Revision Date: 05/20/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W USA 49.376656 - 24.53833

-124.715843 --66.968887

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max	Soybean	BBCH Scale: BSOY
Entry Date: 11/11/19		
Variety: CG4539GTLL		
Attributes: LL/GT		
Planting Date: 05/22/19	Planting Rate: 180000 S/A	
Depth: 1 IN		
Rows per Plot: 4	Planting Method: PLANTD planted	
Row Spacing: 30 IN	Planting Equipment: FE Field Equipment	
Soil Temperature: 74 F	Seed Bed: MEDIUM medium	
Emergence Date: 05/27/19	Soil Moisture: NORMAL normal, adequate	
Harvest Date: 11/06/19	Harvest Equipment: Plot combine	
% Standard Moisture: 13.0	Harvested Width: 5 FT	
	Harvested Length: 25 FT	

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth Entry Date: 11/11/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory Entry Date: 11/11/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 8 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14B

% Sand: 81

% OM: 1.6

Texture: LS

loamy sand

% Silt: 12

pH: 6.4

Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 7

CEC: 6.5

Fert. Level: G

good

Soil Drainage: G

good

**Application Description**

	A	B	C
Application Date	05/22/19	06/12/19	06/24/19
Appl. Stop Time	01:50 PM	10:50 AM	10:10 AM
Interval to Prev. Appl.		21 DAYS	12 DAYS
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	14-21DAP	28-35DAP
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Jonnson	Johnson
Appl. Entry Date	11/11/19	11/11/19	11/11/19
Air Temperature Start, Stop	72 74 F	72 72 F	80 80 F
% Relative Humidity Start, Stop	29 29	57 57	62 62
Wind Velocity+Dir. Start	2 mph ENE	10 mph E	7 mph SW
Wind Velocity+Dir. Stop	5 mph ENE	10 mph E	7 mph SW
Wind Velocity+Dir. Max	5 mph ENE	10 mph E	7 mph SW
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	77 F	73 F	77 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	9	58	11
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.68 IN	1.64 IN	0.08 IN
Weather Source	ITERIS	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-5	16	28
Stage Scale Used	BBCH	BBCH	
Stage Majority, Percent		2-trifol 100	3-4 trif 100
Height Average		5 in	8 in
Height Minimum, Maximum		4 6	7 9

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100	veg 100
Height Average		4 in	2 in
Height Minimum, Maximum		2 6	1 3
Density Average		40 m2	2 m2
Density Min, Max		0 80	0 4
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		veg 100	veg 100
Height Average		2 in	3 in
Height Minimum, Maximum		1 3	2 3
Density Average		4 m2	3 m2
Density Min, Max		0 8	1 8

**Application Equipment**

	A	B	C
Appl. Equipment	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	18 in	24 in	28 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Minimum Mix/Treatment	0.2297 GAL	0.2297 GAL	0.2297 GAL
Propellant	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/20/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

06/05/19: In addition to stunting, Zidua Pro treatments (Treatment 8) had 25-30% leaf burn on lower leaves. Draw-stringing/leaf puckering was also observed with Fierce EZ (treatments 3 and 5) and Fierce MTZ (treatments 4 and 6); injury was slightly more severe with Fierce MTZ compared to Fierce EZ treatments.

06/12/19: Only half plot is stunted in 304.

07/03/19: Dicamba drift from Soy10, the greater the stunting the greater the leaf cupping.

Valent PRE and POST Programs in Liberty Link Soybeans									
Trial ID: Soy11-19		Location: Field #14		Trial Year: 2019					
Protocol ID: Soy11-19		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: Valent									
Pest Code				C	GLXMA	C	AMAPA		
Crop Type, Code				Soybean		Soybean	C -		
Description				Stunting %	LfCupng prs1/ab0	PalmerAm	IPOSS C -		
Rating Type				07/03/19	07/03/19	Control %	Control %		
Rating Unit						07/03/19	07/03/19		
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1 Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	14-21DAP	B			
Dry Ammonium Sulfate		100 D		1.8 % w/v	14-21DAP	B			
Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	28-35DAP	C			
Dry Ammonium Sulfate		100 D		1.8 % w/v	28-35DAP	C			
2 V-10440		2.30 SC		0.108 lb ai/a	14-21DAP	B			
Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	14-21DAP	B			
Dry Ammonium Sulfate		100 D		1.8 % w/v	14-21DAP	B			
Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	28-35DAP	C			
Dry Ammonium Sulfate		100 D		1.8 % w/v	28-35DAP	C			
3 Fierce EZ Premix		3.04 SC		0.143 lb ai/a	PRE	A			
----flumioxazin		1.34		0.063					
----pyroxasulfone		1.7		0.08					
Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	14-21DAP	B			
Dry Ammonium Sulfate		100 D		1.8 % w/v	14-21DAP	B			
4 Fierce MTZ Premix		2.64 SC		0.33 lb ai/a	PRE	A			
----flumioxazin		0.5000001		0.0625					
----metribuzin		1.5		0.188					
----pyroxasulfone		0.64		0.08					
Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	14-21DAP	B			
Dry Ammonium Sulfate		100 D		1.8 % w/v	14-21DAP	B			
5 Fierce EZ Premix		3.04 SC		0.143 lb ai/a	PRE	A			
----flumioxazin		1.34		0.063					
----pyroxasulfone		1.7		0.08					
V-10440		2.30 SC		0.108 lb ai/a	14-21DAP	B			
Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	14-21DAP	B			
Dry Ammonium Sulfate		100 D		1.8 % w/v	14-21DAP	B			
6 Fierce MTZ Premix		2.64 SC		0.33 lb ai/a	PRE	A			
----flumioxazin		0.5000001		0.0625					
----metribuzin		1.5		0.188					
----pyroxasulfone		0.64		0.08					
V-10440		2.30 SC		0.108 lb ai/a	14-21DAP	B			
Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	14-21DAP	B			
Dry Ammonium Sulfate		100 D		1.8 % w/v	14-21DAP	B			
7 Authority MTZ Premix		45 DF		0.31 lb ai/a	PRE	A			
----sulfentrazone		18		0.124					
----metribuzin		27		0.186					
Anthem Maxx Premix		4.3 SC		0.084 lb ai/a	14-21DAP	B			
----pyroxasulfone		4.174		0.0815					
----fluthiacet		0.126		0.00246					
Scout.....	glufosinate	2.34 SL		0.585 lb ai/a	14-21DAP	B			
Dry Ammonium Sulfate		100 D		1.8 % w/v	14-21DAP	B			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Means followed by same letter or symbol do not significantly differ ( $P > 0.05$ ; LSD).

Pest Code Crop Type, Code			PANDI C -	DIGSA C -	C GLXMA	AMAPA C -
Description			F.panicm	L.crbgrs	Soybean	PalmerAm
Rating Type			Control %	Control %	Stunting %	Control %
Rating Unit			07/03/19	07/03/19	06/05/19	06/05/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing
1	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a	14-21DAP B 1.8 % w/v		
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a	28-35DAP C 1.8 % w/v		
2	V-10440 Scout.....glufosinate Dry Ammonium Sulfate	2.30 SC 2.34 SL 100 D	0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	14-21DAP B 14-21DAP B 28-35DAP C		
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 1.8 % w/v	28-35DAP C		
3	Fierce EZ Premix ----flumioxazin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	3.04 SC 1.34 1.7 2.34 SL 100 D	0.143 lb ai/a 0.063 0.08 0.585 lb ai/a 1.8 % w/v	PRE A		
4	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.34 SL 100 D	0.33 lb ai/a 0.0625 0.188 0.08 0.585 lb ai/a 1.8 % w/v	PRE A		
5	Fierce EZ Premix ----flumioxazin ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	3.04 SC 1.34 1.7 2.30 SC 2.34 SL 100 D	0.143 lb ai/a 0.063 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE A		
6	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.30 SC 2.34 SL 100 D	0.33 lb ai/a 0.0625 0.188 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE A		
7	Authority MTZ Premix ----sulfentrazone ----metribuzin Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Scout.....glufosinate Dry Ammonium Sulfate	45 DF 18 27 4.3 SC 4.174 0.126 2.34 SL 100 D	0.31 lb ai/a 0.124 0.186 0.084 lb ai/a 0.0815 0.00246 0.585 lb ai/a 1.8 % w/v	PRE A		
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 1.8 % w/v	14-21DAP B 14-21DAP B		

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C - Mornglry Control % 06/05/19	DIGSA C - L.crbgrs Control % 06/05/19	C GLXMA Soybean Stunting % 06/12/19	AMAPA C - PalmerAm Control % 06/12/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	SL	0.585 lb ai/a 1.8 % w/v	14-21DAP 14-21DAP	B	0.0 a	0.0 c
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	SL	0.585 lb ai/a 1.8 % w/v	28-35DAP 28-35DAP	C		
2	V-10440 Scout.....glufosinate Dry Ammonium Sulfate	2.30 SC 2.34 SL 100 D	SC	0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	14-21DAP 14-21DAP	B	0.0 a	0.0 c
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	SL	0.585 lb ai/a 1.8 % w/v	28-35DAP 28-35DAP	C		
3	Fierce EZ Premix ----flumioxazin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	3.04 SC 1.34 1.7 2.34 SL 100 D	SC	0.143 lb ai/a 0.063 0.08 0.585 lb ai/a 1.8 % w/v	PRE	A	33.3 a	100.0 a
4	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.34 SL 100 D	SC	0.33 lb ai/a 0.0625 0.188 0.08 0.585 lb ai/a 1.8 % w/v	PRE	A	50.0 a	100.0 a
5	Fierce EZ Premix ----flumioxazin ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	3.04 SC 1.34 1.7 2.30 SC 2.34 SL 100 D	SC	0.143 lb ai/a 0.063 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE	A	23.3 a	100.0 a
6	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.30 SC 2.34 SL 100 D	SC	0.33 lb ai/a 0.0625 0.188 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE	A	40.0 a	100.0 a
7	Authority MTZ Premix ----sulfentrazone ----metribuzin Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Scout.....glufosinate Dry Ammonium Sulfate	45 DF 18 27 4.3 SC 4.174 0.126 2.34 SL 100 D	DF	0.31 lb ai/a 0.124 0.186 0.084 lb ai/a 0.0815 0.00246 0.585 lb ai/a 1.8 % w/v	PRE	A	0.0 a	98.0 b

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code			IPOSS C -	DIGSA C -	DATST C -	AMAPA C -
Description			Mornglry Control %	L.crbgrs Control %	Jimsonwd Count #/plot	PalmerAm Control %
Rating Type			06/12/19	06/12/19	06/12/19	07/22/19
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 1.8 % w/v	14-21DAP B 14-21DAP B		
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 1.8 % w/v	28-35DAP C 28-35DAP C		
2	V-10440 Scout.....glufosinate Dry Ammonium Sulfate	2.30 SC 2.34 SL 100 D	0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	14-21DAP B 14-21DAP B 14-21DAP B		
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 1.8 % w/v	28-35DAP C 28-35DAP C		
3	Fierce EZ Premix ----flumioxazin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	3.04 SC 1.34 1.7 2.34 SL 100 D	0.143 lb ai/a 0.063 0.08 0.585 lb ai/a 1.8 % w/v	PRE A 14-21DAP B 14-21DAP B	68.3 ab	100.0 a
4	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.34 SL 100 D	0.33 lb ai/a 0.0625 0.188 0.08 0.585 lb ai/a 1.8 % w/v	PRE A 14-21DAP B 14-21DAP B	76.7 a	100.0 a
5	Fierce EZ Premix ----flumioxazin ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	3.04 SC 1.34 1.7 2.30 SC 2.34 SL 100 D	0.143 lb ai/a 0.063 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE A 14-21DAP B 14-21DAP B 14-21DAP B	60.0 bc	100.0 a
6	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.30 SC 2.34 SL 100 D	0.33 lb ai/a 0.0625 0.188 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE A 14-21DAP B 14-21DAP B 14-21DAP B	76.7 a	98.3 a
7	Authority MTZ Premix ----sulfentrazone ----metribuzin Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Scout.....glufosinate Dry Ammonium Sulfate	45 DF 18 27 4.3 SC 4.174 0.126 2.34 SL 100 D	0.31 lb ai/a 0.124 0.186 0.084 lb ai/a 0.0815 0.00246 0.585 lb ai/a 1.8 % w/v	PRE A 14-21DAP B 14-21DAP B 14-21DAP B 14-21DAP B	53.3 c	97.7 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		PANDI C - C	GLXMA						
Description		F.panicm	Soybean						
Rating Type		Control	Yield						
Rating Unit		%	Bu/A						
Rating Date		07/22/19	11/06/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code		
1	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 1.8 % w/v	14-21DAP B			66.7 c	20.6 a	
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 1.8 % w/v	28-35DAP C					
2	V-10440 Scout.....glufosinate Dry Ammonium Sulfate	2.30 SC 2.34 SL 100 D	0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	14-21DAP B			78.3 bc	10.6 a	
	Scout.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 1.8 % w/v	28-35DAP C					
3	Fierce EZ Premix ----flumioxazin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	3.04 SC 1.34 1.7 2.34 SL 100 D	0.143 lb ai/a 0.063 0.08 0.585 lb ai/a 1.8 % w/v	PRE	A		93.3 ab	17.0 a	
4	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.34 SL 100 D	0.33 lb ai/a 0.0625 0.188 0.08 0.585 lb ai/a 1.8 % w/v	PRE	A		91.3 ab	13.0 a	
5	Fierce EZ Premix ----flumioxazin ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	3.04 SC 1.34 1.7 2.30 SC 2.34 SL 100 D	0.143 lb ai/a 0.063 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE	A		100.0 a	16.7 a	
6	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	2.64 SC 0.5000001 1.5 0.64 2.30 SC 2.34 SL 100 D	0.33 lb ai/a 0.0625 0.188 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE	A		97.3 a	14.4 a	
7	Authority MTZ Premix ----sulfentrazone ----metribuzin Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Scout.....glufosinate Dry Ammonium Sulfate	45 DF 18 27 4.3 SC 4.174 0.126 2.34 SL 100 D	0.31 lb ai/a 0.124 0.186 0.084 lb ai/a 0.0815 0.00246 0.585 lb ai/a 1.8 % w/v	PRE	A		64.0 c	19.3 a	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code		C	GLXMA	C	GLXMA	AMAPA	IPOSS
Crop Type, Code		-	-	-	-	C -	C -
Description		Soybean	Soybean	PalmerAm	mornglry		
Rating Type		Stunting	LfCuppng	Control	Control		
Rating Unit		%	prs1/ab0	%	%		
Rating Date		07/03/19	07/03/19	07/03/19	07/03/19		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
8	Zidua PRO Premix	4.09	SC	0.144	lb ai/a	PRE	A
	----saflufenacil	0.48		0.0169			
	----imazethapyr	1.33		0.047			
	----pyroxasulfone	2.28		0.08			
	V-10440	2.30	SC	0.108	lb ai/a	14-21DAP B	
	Scout.....glufosinate	2.34	SL	0.585	lb ai/a	14-21DAP B	
	Dry Ammonium Sulfate	100	D	1.8	% w/v	14-21DAP B	
LSD P=.05				10.89	0.90	11.20	9.39
Standard Deviation				6.22	0.51	6.39	5.36
CV				56.12	76.76	6.85	6.16
Replicate F				4.667	0.636	0.151	10.086
Replicate Prob(F)				0.0280	0.5439	0.8614	0.0019
Treatment F				3.705	0.727	1.427	2.307
Treatment Prob(F)				0.0177	0.6524	0.2701	0.0868

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		PANDI C -	DIGSA C -	C GLXMA	AMAPA C -						
Description		F.panicm	L.crbgrs	Soybean	PalmerAm						
Rating Type		Control	Control	Stunting	Control						
Rating Unit		%	%	%	%						
Rating Date	07/03/19	07/03/19	06/05/19	06/05/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
8	Zidua PRO Premix	4.09	SC	0.144	lb ai/a	PRE	A	96.7 a	95.0 a	13.3 a	93.3 a
	----saflufenacil	0.48		0.0169							
	----imazethapyr	1.33		0.047							
	----pyroxasulfone	2.28		0.08							
	V-10440	2.30	SC	0.108	lb ai/a	14-21DAP B					
	Scout.....glufosinate	2.34	SL	0.585	lb ai/a	14-21DAP B					
	Dry Ammonium Sulfate	100	D	1.8 %	w/v	14-21DAP B					
LSD P=.05						5.49	6.35	11.64	12.66		
Standard Deviation						3.13	3.62	6.65	7.23		
CV						3.22	3.75	81.82	9.8		
Replicate F						0.777	1.906	0.919	1.137		
Replicate Prob(F)						0.4787	0.1853	0.4216	0.3488		
Treatment F						1.599	2.359	1.747	106.974		
Treatment Prob(F)						0.2153	0.0813	0.1771	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	IPOSS C -	DIGSA C -	C GLXMA	AMAPA C -				
Description	Mornlry Control %	L.crbgrs Control %	Soybean Stunting %	PalmerAm Control %				
Rating Type	06/05/19	06/05/19	06/12/19	06/12/19				
Rating Unit								
Rating Date								
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing Appl Code				
8 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	4.09 SC 0.48 1.33 2.28 2.30 SC 2.34 SL 100 D	0.144 lb ai/a 0.0169 0.047 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE 14-21DAP B 14-21DAP B 14-21DAP B	A	16.7 a	100.0 a	20.0 a	88.3 a
LSD P=.05 Standard Deviation CV					38.57 22.03 107.88	1.07 0.61 0.82	10.57 6.04 57.03	32.66 18.65 30.18
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					1.658 0.2259 2.384 0.0789	1.000 0.3927 17032.573 0.0001	0.293 0.7506 2.676 0.0554	1.329 0.2963 12.907 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	IPOSS C -	DIGSA C -	DATST C -	AMAPA C -			
Description	Mornlry	L.crbgrs	Jimsonwd	PalmerAm			
Rating Type	Control	Control	Count	Control			
Rating Unit	%	%	#/plot	%			
Rating Date	06/12/19	06/12/19	06/12/19	07/22/19			
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing			
8 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	4.09 SC 0.48 1.33 2.28 2.30 SC 2.34 SL 100 D	0.144 lb ai/a 0.0169 0.047 0.08 0.108 lb ai/a 0.585 lb ai/a 1.8 % w/v	PRE A 14-21DAP B 14-21DAP B 14-21DAP B	60.0 bc	97.7 a	3.3 a	91.0 a
LSD P=.05			11.56	3.48	4.63	28.63	
Standard Deviation			6.60	1.99	2.64	16.35	
CV			13.37	2.68	124.45	19.83	
Replicate F			0.645	0.832	0.340	1.606	
Replicate Prob(F)			0.5395	0.4558	0.7178	0.2356	
Treatment F			68.474	1590.711	1.184	3.672	
Treatment Prob(F)			0.0001	0.0001	0.3717	0.0183	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		PANDI C - C GLXMA					
Description	F.panicm	Soybean					
Rating Type	Control	Yield					
Rating Unit	%	Bu/A					
Rating Date	07/22/19	11/06/19					
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
8 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone V-10440 Scout.....glufosinate Dry Ammonium Sulfate	4.09 0.48 1.33 2.28 2.30 2.34 100	SC 0.0169 0.047 0.08 lb ai/a 14-21DAP B lb ai/a 14-21DAP B D		A 1.8 % w/v		88.3 ab	16.8 a
LSD P=.05						17.85	7.84
Standard Deviation						10.19	4.48
CV						12.0	27.9
Replicate F						1.031	3.167
Replicate Prob(F)						0.3823	0.0733
Treatment F						5.444	1.600
Treatment Prob(F)						0.0035	0.2150

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation of Burndown Options for Soybeans**

Trial ID: Soy12-19      Location: Field #3      Trial Year: 2019  
 Protocol ID: Soy12-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 04/18/19  
 Initiation Date: 03/01/19  
 Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947      E-mail: mjv@udel.edu  
 Country: USA      United States

**Crop Description**

C

**Pest Description**

Pest 1 Type: W Code: VIORA Viola bicolor  
 Common Name: Field Pansy      Entry Date: 12/09/19

Pest 2 Type: W Code: OEOLA Oenothera lacinata  
 Common Name: Cutleaf eveningprimrose      Entry Date: 12/09/19

Pest 3 Type: W Code: ERICA Conyza canadensis  
 Common Name: Canada horseweed      Entry Date: 12/09/19

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 250 FT<sup>2</sup> Treatments: 8      Tillage Type: NOTILL no-till  
 Replications: 3      Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 3  
 % Sand: 80      % OM: 0.8      Texture: LS      loamy sand  
 % Silt: 12      pH: 6.6      Soil Name: Rockawalkin loamy sand, 0-2% slopes  
 % Clay: 8      CEC: 4.0      Fert. Level: G      good  
 Soil Drainage: G      good

**Application Description**

A	
Application Date	05/03/19
Appl. Stop Time	12:30 PM
Application Method	SPRAY
Application Timing	EPP
Application Placement	BROADC
Applied By	VanGessel
Appl. Entry Date	12/09/19
Air Temperature Start, Stop	65 65 F
% Relative Humidity Start, Stop	87 87
Wind Velocity+Dir. Start	5 mph ENE
Wind Velocity+Dir. Stop	5 mph ENE
Wind Velocity+Dir. Max	5 mph ENE
Wet Leaves (Y/N)	N no
Soil Temperature	71 F
Soil Moisture	NORMAL
% Cloud Cover	56
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	0.9 IN

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	VIORA W
Stage Majority, Percent	flower 10
Height Average	5 in
Height Minimum, Maximum	4 6
Density Average	3 plot
Density Min, Max	2 5
Pest 2 Code, Type, Scale	OEOLA W
Stage Majority, Percent	flower 100
Height Average	8 in
Height Minimum, Maximum	6 10
Density Average	7 plot
Density Min, Max	5 10
Pest 3 Code, Type, Scale	ERICA W
Stage Majority, Percent	bolt 100
Height Average	6 in
Height Minimum, Maximum	4 8
Density Average	1 m2

**Application Equipment**

	A
Appl. Equipment	Bckpck6Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	9 ft
Boom Height	26 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	04/18/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

05/23/2019: Field pansy has senesced in treatments except Liberty + Roundup which is about 50% control.

Primrose control with glyphosate was very slow.

Better control of Palmer amaranth in treatments 5 and 6 than all other treatments, noticeably lower densities observed.

## Evaluation of Burndown Options for Soybeans

Trial ID: Soy12-19

Location: Field #3

Trial Year: 2019

Protocol ID: Soy12-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code	Description	Rating Type	Rating Unit	Rating Date	ERICAWHorsewd Control %	VIORAFldPansy Control %	OEOLACEPrmrse Control %	ERICAWHorsewd Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Untreated Check				0.0 f	0.0 d	0.0 f	0.0 d
2	Elevore.....halauxifen Methylated Seed Oil Roundup PowerMax..glyphosate Dry Ammonium Sulfate	0.57 SC 100 L 4.5 AS 100 D	0.00445 lb ae/a EPP 1 % v/v EPP 1 lb ae/a EPP 0.9 % w/v EPP	lb ae/a EPP 1 lb ae/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	A A A A	56.7 de	50.0 b	36.7 e
3	2,4-D LV6 ester Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.6 L 4.5 AS 100 D	0.47 lb ae/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	lb ae/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	A A A	65.0 cd	50.0 b	56.7 cd
4	2,4-D LV6 ester Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.6 L 4.5 AS 100 D	0.93 lb ae/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	lb ae/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	A A A	68.3 bc	50.0 b	50.0 d
5	Engenia Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5 SL 4.5 AS 100 D	0.5 lb ae/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	lb ae/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	A A A	75.0 b	45.3 bc	61.7 bc
6	Sharpen.....saflufenacil Methylated Seed Oil Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2.85 SC 100 L 4.5 AS 100 D	0.0334 lb ai/a EPP 1 % v/v EPP 1 lb ae/a EPP 0.9 % w/v EPP	lb ai/a EPP 1 % v/v EPP 1 lb ae/a EPP 0.9 % w/v EPP	A A A A	95.0 a	68.3 a	65.0 b
7	Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.5 AS 100 D	1 lb ae/a EPP 0.9 % w/v EPP	lb ae/a EPP 0.9 % w/v EPP	A A	50.0 e	40.3 c	31.7 e
8	Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2.34 SL 4.5 AS 100 D	0.585 lb ai/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	lb ai/a EPP 1 lb ae/a EPP 0.9 % w/v EPP	A A A	88.3 a	43.3 bc	85.0 a
LSD P=.05					8.65	9.25	7.79	8.29
Standard Deviation					4.94	5.20	4.45	4.73
CV					7.93	11.98	9.2	6.13
Replicate F					2.220	9.435	1.000	0.649
Replicate Prob(F)					0.1455	0.0035	0.3927	0.5375
Treatment F					105.652	42.011	100.090	142.248
Treatment Prob(F)					0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=2

Pest Code	Description	Rating Type	Rating Unit	OEOLA CEprmrse Control %	Rating Date		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Untreated Check						0.0 e
2	Elevore.....halauxifen Methylated Seed Oil Roundup PowerMax..glyphosate Dry Ammonium Sulfate	0.57 SC 100 L 4.5 AS 100 D	0.00445 lb ae/a 1 % v/v 1 lb ae/a 0.9 % w/v	EPP EPP EPP EPP	A A A A		77.3 d
3	2,4-D LV6 ester Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.6 L 4.5 AS 100 D	0.47 lb ae/a 1 lb ae/a 0.9 % w/v	EPP EPP EPP	A A A		86.7 b
4	2,4-D LV6 ester Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.6 L 4.5 AS 100 D	0.93 lb ae/a 1 lb ae/a 0.9 % w/v	EPP EPP EPP	A A A		88.0 b
5	Engenia Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5 SL 4.5 AS 100 D	0.5 lb ae/a 1 lb ae/a 0.9 % w/v	EPP EPP EPP	A A A		86.0 bc
6	Sharpen.....saflufenacil Methylated Seed Oil Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2.85 SC 100 L 4.5 AS 100 D	0.0334 lb ai/a 1 % v/v 1 lb ae/a 0.9 % w/v	EPP EPP EPP EPP	A A A A		89.0 ab
7	Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.5 AS 100 D	1 lb ae/a 0.9 % w/v	EPP EPP	A A		78.3 cd
8	Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2.34 SL 4.5 AS 100 D	0.585 lb ai/a 1 lb ae/a 0.9 % w/v	EPP EPP EPP	A A A		96.0 a
LSD P=.05							7.96
Standard Deviation							4.54
CV							6.04
Replicate F							0.850
Replicate Prob(F)							0.4483
Treatment F							139.233
Treatment Prob(F)							0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=2

**PRE and POST Weed Control in Xtend Soybeans**

Trial ID: Soy13-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy13-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Syngenta, BASF

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/17/19

Initiation Date: 03/01/19

Completion Date: 11/15/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 12/09/19

Variety: S43XS27

Attributes: Xtend

Planting Date: 05/16/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 74 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 05/23/19

Harvest Date: 11/05/19

Harvest Equipment: Plot combine

Harvested Width: 6.67 FT

Harvested Length: 25 FT

% Standard Moisture: 13.0

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 12 Tillage Type: NOTILL no-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 16B

% Sand: 77 % OM: 1.4 Texture: SL sandy loam

% Silt: 12 pH: 6.6 Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11 CEC: 4.8 Fert. Level: F fair

Soil Drainage: F fair

**Application Description**

	A	B	C
Application Date	05/17/19	05/25/19	
Appl. Stop Time	04:20 PM	10:45 AM	
Application Method	SPRAY	SPRAY	no applic
Application Timing	PRE	cot-unif	3-4"wds
Application Placement	BROADC	BROADC	
Applied By	Johnson	VanGessel	
Appl. Entry Date	05/22/19	12/09/19	
Air Temperature Start, Stop	80 80 F	69 69 F	
% Relative Humidity Start, Stop	52 52	59 59	
Wind Velocity+Dir. Start	8 mph SW	6 mph SE	
Wind Velocity+Dir. Stop	8 mph SW	6 mph SE	
Wind Velocity+Dir. Max	8 mph SW	6 mph SE	
Wet Leaves (Y/N)	N no	N no	
Soil Temperature	73 F	70 F	
Soil Moisture	NORMAL	NORMAL	
% Cloud Cover	57	99	
Moisture 6 Hours after Appl.	0 IN	0 IN	
Moisture 1 Week after Appl.	0.26 IN	1.87 IN	
Weather Source	ITERIS	ITERIS	

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-6	2	
Stage Majority, Percent		unifol 100	
Height Average		2 in	

**Application Equipment**

	A	B	C
Appl. Equipment	Tractr4Nozl	Bckpck4Nozl	
Equipment Type	TRMOSP	SPRBAC	
Operation Pressure	40 psi	31 psi	
Nozzle Type	AIRMIX	AIRMIX	
Nozzle Size	11002	11002	
Nozzle Spacing	20 in	18 in	
Boom Length	6.7 ft	6 ft	
Boom Height	18 in	18 in	
Ground Speed	3 mph	3 mph	
Carrier	WATER	WATER	
Application Amount	20 gal/ac	20 gal/ac	
Propellant	COMAIR	COMCO2	

Context	Date	By	Notes
STATUS	05/17/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/22/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

PRE and POST Weed Control in Xtend Soybeans

Trial ID: Soy13-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy13-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Syngenta, BASF

Trial Comments

06/11/19: Severe deer feeding.

## PRE and POST Weed Control in Xtend Soybeans

Trial ID: Soy13-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy13-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Syngenta, BASF

							C GLXMA	C GLXMA
							Soybean Stunting %	Soybean Yield Bu/A
							06/11/19	11/05/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
1	Untreated Check						0.0 c	37.2 e
2	BroadAxe Premix ----sulfentrazone ----s-metolachlor Metribuzin.....metribuzin Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 75 DF 3.38 CS 1.12 2.26 100 L 4.5 AS	SC 0.137 1.23 0.234 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	1.37 0.137 1.23 0.234 1.49 0.494 1 1 % v/v 1.13	lb ai/a ai/a lb ai/a lb ai/a lb ai/a v/v ae/a	PRE A A 3-4" wds C 3-4" wds C C 3-4" wds C		0.0 c 47.0 bc
3	Boundary Premix ----s-metolachlor ----metribuzin Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	6.5 EC 5.25 1.25 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	EC 1.32 0.313 CS 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	1.63 1.32 0.313 1.49 0.494 1 0.353 1 % v/v 1.13	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a v/v ae/a	PRE A 3-4" wds C 3-4" wds C C 3-4" wds C		0.0 c 39.2 de
4	BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 100 L 4.5 AS	SC 0.137 1.23 CS 0.494 1 1 % v/v 1.13 lb ae/a	1.37 0.137 1.23 1.49 0.494 1 1 % v/v 1.13	lb ai/a ai/a lb ai/a lb ai/a lb ai/a v/v ae/a	PRE A 3-4" wds C 3-4" wds C C 3-4" wds C		0.0 c 43.9 cde
5	BroadAxe Premix ----sulfentrazone ----s-metolachlor Linuron Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 50 DF 3.38 CS 1.12 2.26 100 L 4.5 AS	SC 0.137 1.23 DF CS 0.494 1 1 % v/v 1.13 lb ae/a	1.37 0.137 1.23 0.75 1.49 0.494 1 1 % v/v 1.13	lb ai/a ai/a lb ai/a lb ai/a lb ai/a v/v ae/a	PRE A 3-4" wds C 3-4" wds C C 3-4" wds C		0.0 c 50.1 abc
6	BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	SC 0.137 1.23 CS 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	1.37 0.137 1.23 1.49 0.494 1 0.353 1 % v/v 1.13	lb ai/a ai/a lb ai/a lb ai/a lb ai/a v/v ae/a	PRE A 3-4" wds C 3-4" wds C C 3-4" wds C		3.5 b 50.4 abc

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1

## University of Delaware

Crop Type, Code							C GLXMA	C GLXMA	
							Soybean Stunting %	Soybean Yield Bu/A	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
7	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 3.38 CS 1.12 2.26 100 L 4.5 AS	0.084 lb ai/a 0.0815 0.00246 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE 3-4"wds C C	A		0.0 c	49.4 abc	
8	BroadAxe Premix ----sulfentrazone ----s-metolachlor Sequence Premix ----glyphosate ----s-metolachlor Engenia.....dicamba	7 SC 0.7 6.3 5.25 EW 2.25 3 5 SL	1.37 lb ai/a 0.137 1.23 2.13 lb ai/a 0.91 1.22 0.5 lb ae/a	PRE 3-4"wds C C	A		0.0 c	44.8 cd	
9	BroadAxe Premix ----sulfentrazone ----s-metolachlor Prefix Premix ----s-metolachlor ----fomesafen Engenia.....dicamba Roundup PowerMax..glyphosate	7 SC 0.7 6.3 5.3 E 4.35 0.95 5 SL 4.5 AS	1.37 lb ai/a 0.137 1.23 0.99 lb ai/a 0.81 0.177 0.5 lb ae/a 0.98 lb ae/a	PRE 3-4"wds C C	A		0.0 c	46.7 bc	
10	Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant Engenia Pro Premix ----dicamba ----pyroxasulfone Outlook.....dimethenamid-p Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.5 AS 100 L 4.86 SL 4 0.86 6 L 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v 0.61 lb ae/a 0.5 0.108 0.6 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A PRE A 3-4"wds C C	A		0.0 c	49.5 abc	
11	BAS 872UAH Roundup PowerMax..glyphosate Nonionic Surfactant	5.24 SC 4.5 AS 100 L	0.655 lb ae/a 1.13 lb ae/a 0.25 % v/v	cot-unif cot-unif cot-unif	B		9.7 a	55.0 a	
12	BAS 872UAH Roundup PowerMax..glyphosate Nonionic Surfactant Engenia Pro Premix ----dicamba ----pyroxasulfone Outlook.....dimethenamid-p Roundup PowerMax..glyphosate Nonionic Surfactant	5.24 SC 4.5 AS 100 L 4.86 SL 4 0.86 6 L 4.5 AS 100 L	0.655 lb ae/a 1.13 lb ae/a 0.25 % v/v 0.61 lb ae/a 0.5 0.108 0.6 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A PRE A 3-4"wds C C	A		0.0 c	53.0 ab	
LSD P=.05 Standard Deviation CV							2.92 1.64 149.57	7.30 4.31 9.14	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)							0.900 0.4324 9.240 0.0003	26.732 0.0001 4.491 0.0013	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1

## PRE and POST Weed Control in Xtend Soybeans

Trial ID: Soy13a-19

Location: Field #14

Trial Year: 2019

Protocol ID: Soy13-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Syngenta, BASF

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 06/21/19

Initiation Date: 03/01/19

Completion Date: 11/09/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 09/13/19

Variety: S43XS27

Attributes: Xtend

Planting Date: 07/01/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDIUM medium

Soil Temperature: 89 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 07/06/19

Harvest Date: 11/06/19

Harvest Equipment: Plot combine

Harvested Width: 7.5 FT

% Standard Moisture: 13.0

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory Entry Date: 09/13/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup>

Tillage Type: CONTIL conventional-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14C

% Sand: 79 % OM: 1.6 Texture: LS loamy sand

% Silt: 14 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: E excellent

Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	07/03/19	07/09/19	07/25/19
Appl. Stop Time	11:00 AM	01:00 PM	12:10 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	cot-unif	3-4"wds
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Appl. Entry Date	09/13/19	09/13/19	09/13/19
Air Temperature Start, Stop	88 88 F	84 84 F	85 85 F
% Relative Humidity Start, Stop	57 57	57 57	46 46
Wind Velocity+Dir. Start	5 mph NNW	1 mph	3 mph
Wind Velocity+Dir. Stop	5 mph NNW	1 mph	3 mph
Wind Velocity+Dir. Max	5 mph NNW	1 mph	3 mph
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	87 F	85 F	85 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	0	33	29
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	0.53 IN	0.33 IN	0.31 IN

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-3	3	19
Stage Majority, Percent		unifol 100	3-trifol 100
Height Average		1.5 in	8 in

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent			Veg 65
Stage Minimum, Percent			Veg 65
Stage Maximum, Percent			run 35
Height Average			5 in
Height Minimum, Maximum			4 6
Density Average			2 m2
Density Min, Max			0 5

**Application Equipment**

	A	B	C
Appl. Equipment	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	18 in	20 in	24 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	06/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	08/26/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

#### Trial Comments

07/22/19: All treatments (except the untreated) provided 100% weed control of existing weeds. Ratings are for newly emerged weeds since unifoliate application.

## PRE and POST Weed Control in Xtend Soybeans

Trial ID: Soy13a-19

Location: Field #14

Trial Year: 2019

Protocol ID: Soy13-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Syngenta, BASF

Pest Code Crop Type, Code		C GLXMA Soybean	C GLXMA Soybean	AMAPA C -
Description		Injury	Stunting	NewlyEm
Rating Type		%	%	Cntrl %
Rating Unit		07/13/19	07/22/19	07/22/19
Rating Date				
Trt Treatment No. Name	Form Conc Form Type Rate	Rate Unit Appl Timing	Appl Code	
1 Untreated Check				0.0 c
2 BroadAxe Premix ----sulfentrazone ----s-metolachlor Metribuzin.....metribuzin Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 75 DF 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 0.234 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C 3-4"wds C	A
3 Boundary Premix ----s-metolachlor ----metribuzin Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	6.5 EC 5.25 1.25 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	1.63 lb ai/a 1.32 0.313 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C 3-4"wds C	A
4 BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C 3-4"wds C	A
5 BroadAxe Premix ----sulfentrazone ----s-metolachlor Linuron Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 50 DF 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 0.75 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C 3-4"wds C	A

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

Pest Code Crop Type, Code Description		IPOSS C - Mornglry	PANDI C - F.panicm	C GLXMA Soybean
Rating Type	NewlyEm	NewlyEm		Injury
Rating Unit Rating Date	Cntrl % 07/22/19	Cntrl % 07/22/19	% 08/03/19	
Trt Treatment No. Name	Form Conc Form Type Rate	Rate Unit Appl Timing	Appl Code	
1 Untreated Check				0.0 f
2 BroadAxe Premix ----sulfentrazone ----s-metolachlor Metribuzin.....metribuzin Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 75 DF 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 0.234 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C	A
		1.37 lb ai/a 0.137 1.23 0.234 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	90.0 abc	91.7 b-e
3 Boundary Premix ----s-metolachlor ----metribuzin Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	6.5 EC 5.25 1.25 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	1.63 lb ai/a 1.32 0.313 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C	A
		1.63 lb ai/a 1.32 0.313 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	36.7 e	95.7 abc
4 BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C	A
		1.37 lb ai/a 0.137 1.23 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	94.0 ab	86.0 de
5 BroadAxe Premix ----sulfentrazone ----s-metolachlor Linuron Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 50 DF 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 0.75 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A PRE A 3-4"wds C 3-4"wds C	A
		1.37 lb ai/a 0.137 1.23 0.75 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	86.0 bc	99.7 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - Mornglry	PANDI C - F.panicm	IPOSS C - Mornglry		
Rating Type Rating Unit Rating Date		Control % 08/03/19	Control % 08/03/19	Control % 08/03/19	Seedling Cntrl % 08/03/19		
Trt No. Treatment Name	Form Conc Form Type Rate Rate	Rate Unit Appl Timing	Appl Code				
1 Untreated Check				0.0 b	0.0 d		
2 BroadAxe Premix ----sulfentrazone ----s-metolachlor Metribuzin.....metribuzin Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 75 DF 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 0.234 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a	98.0 ab	100.0 a	0.7 a
3 Boundary Premix ----s-metolachlor ----metribuzin Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	6.5 EC 5.25 1.25 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	1.63 lb ai/a 1.32 0.313 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a	99.0 a	100.0 a	0.0 a
4 BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a	99.0 a	100.0 a	0.3 a
5 BroadAxe Premix ----sulfentrazone ----s-metolachlor Linuron Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 50 DF 3.38 CS 1.12 2.26 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 0.75 lb ai/a 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE A A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a	98.3 ab	100.0 a	0.7 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	IPOSS C - Mornlgy	PANDI C - F.panicm	C GLXMA Soybean	
Rating Type	Rating Unit	Rating Date	Control %	Control %	Control %	Yield Bu/A	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code	
	1 Untreated Check				0.0 b	0.0 c	33.3 b
2	BroadAxe Premix	7 SC	1.37 lb ai/a	PRE	A	100.0 a	100.0 a
	----sulfentrazone	0.7	0.137				
	----s-metolachlor	6.3	1.23				
	Metribuzin.....metribuzin	75 DF	0.234 lb ai/a	PRE	A		
	Tavium Premix	3.38 CS	1.49 lb ai/a	3-4" wds	C		
	----dicamba	1.12	0.494				
	----s-metolachlor	2.26	1				
	AG13063 conditioner	100 L	1 % v/v	3-4" wds	C		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3-4" wds	C		
3	Boundary Premix	6.5 EC	1.63 lb ai/a	PRE	A	100.0 a	100.0 a
	----s-metolachlor	5.25	1.32				
	----metribuzin	1.25	0.313				
	Tavium Premix	3.38 CS	1.49 lb ai/a	3-4" wds	C		
	----dicamba	1.12	0.494				
	----s-metolachlor	2.26	1				
	Flexstar.....fomesafen	1.88 ME	0.353 lb ai/a	3-4" wds	C		
	AG13063 conditioner	100 L	1 % v/v	3-4" wds	C		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3-4" wds	C		
4	BroadAxe Premix	7 SC	1.37 lb ai/a	PRE	A	100.0 a	100.0 a
	----sulfentrazone	0.7	0.137				
	----s-metolachlor	6.3	1.23				
	Tavium Premix	3.38 CS	1.49 lb ai/a	3-4" wds	C		
	----dicamba	1.12	0.494				
	----s-metolachlor	2.26	1				
	AG13063 conditioner	100 L	1 % v/v	3-4" wds	C		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3-4" wds	C		
5	BroadAxe Premix	7 SC	1.37 lb ai/a	PRE	A	100.0 a	99.7 a
	----sulfentrazone	0.7	0.137				
	----s-metolachlor	6.3	1.23				
	Linuron	50 DF	0.75 lb ai/a	PRE	A		
	Tavium Premix	3.38 CS	1.49 lb ai/a	3-4" wds	C		
	----dicamba	1.12	0.494				
	----s-metolachlor	2.26	1				
	AG13063 conditioner	100 L	1 % v/v	3-4" wds	C		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3-4" wds	C		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	C GLXMA	AMAPA C -
Description	Soybean	Soybean	PalmerAm	
Rating Type	Injury	Stunting	NewlyEm	
Rating Unit	%	%		
Rating Date	07/13/19	07/22/19	07/22/19	
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
6 BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	1.37 lb ai/a 0.137 1.23 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	PRE 3-4"wd C 3-4"wd C 3-4"wd C 3-4"wd C 3-4"wd C	A
7 Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 3.38 CS 1.12 2.26 100 L 4.5 AS	0.084 lb ai/a 0.0815 0.00246 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE 3-4"wd C 3-4"wd C 3-4"wd C 3-4"wd C	A
8 BroadAxe Premix ----sulfentrazone ----s-metolachlor Sequence Premix ----glyphosate ----s-metolachlor Engenia.....dicamba	7 SC 0.7 6.3 5.25 EW 2.25 3 5 SL	1.37 lb ai/a 0.137 1.23 2.13 lb ai/a 0.91 1.22 0.5 lb ae/a	PRE 3-4"wd C 3-4"wd C 3-4"wd C	A
9 BroadAxe Premix ----sulfentrazone ----s-metolachlor Prefix Premix ----s-metolachlor ----fomesafen Engenia.....dicamba Roundup PowerMax..glyphosate	7 SC 0.7 6.3 5.3 E 4.35 0.95 5 SL 4.5 AS	1.37 lb ai/a 0.137 1.23 0.99 lb ai/a 0.81 0.177 0.5 lb ae/a 0.98 lb ae/a	PRE 3-4"wd C 3-4"wd C 3-4"wd C 3-4"wd C	A
10 Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant Engenia Pro Premix ----dicamba ----pyroxasulfone Outlook.....dimethenamid-p Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.5 AS 100 L 4.86 SL 4 0.86 6 L 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v 0.61 lb ae/a 0.5 0.108 0.6 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A PRE A PRE A PRE A 3-4"wd C 3-4"wd C 3-4"wd C	A
11 BAS 872UAH Roundup PowerMax..glyphosate Nonionic Surfactant	5.24 SC 4.5 AS 100 L	0.655 lb ae/a 1.13 lb ae/a 0.25 % v/v	cot-unif cot-unif cot-unif	B

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description		IPOSS C - Morngly	PANDI C - F.panicm	C GLXMA Soybean							
Rating Type	NewlyEm	NewlyEm		Injury							
Rating Unit	Cntrl %	Cntrl %		%							
Rating Date	07/22/19	07/22/19		08/03/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
6	BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	SC 0.137 1.23 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	1.37 0.137 1.23 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a v/v lb ae/a	ai/a ai/a ai/a 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	PRE PRE PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A A A C A A C C A	93.0 ab	85.0 e	18.3 a
7	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 3.38 CS 1.12 2.26 100 L 4.5 AS	SC 0.0815 0.00246 SC 1.12 2.26 1 1 % v/v 1.13 lb ae/a	0.084 lb ai/a 0.0815 0.00246 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a v/v lb ae/a	ai/a ai/a ai/a 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	PRE PRE PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A A A C A A C C	46.7 d	89.3 cde	2.3 c
8	BroadAxe Premix ----sulfentrazone ----s-metolachlor Sequence Premix ----glyphosate ----s-metolachlor Engenia.....dicamba	7 SC 0.7 6.3 5.25 EW 2.25 3 5 SL	SC 0.137 1.23 EW 0.91 1.22 0.5 lb ae/a	1.37 lb ai/a 0.137 1.23 2.13 lb ai/a 0.91 1.22 0.5 lb ae/a	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ae/a	ai/a ai/a ai/a 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	PRE PRE PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A A A C A A C	96.3 a	86.7 de	3.3 c
9	BroadAxe Premix ----sulfentrazone ----s-metolachlor Prefix Premix ----s-metolachlor ----fomesafen Engenia.....dicamba Roundup PowerMax..glyphosate	7 SC 0.7 6.3 5.3 E 4.35 0.95 5 SL 4.5 AS	SC 0.137 1.23 E 0.81 0.177 0.5 lb ae/a 0.98 lb ae/a	1.37 lb ai/a 0.137 1.23 0.99 lb ai/a 0.81 0.177 0.5 lb ae/a 0.98 lb ae/a	lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ai/a lb ae/a lb ae/a	ai/a ai/a ai/a 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	PRE PRE PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A A A C A A C C	83.3 c	86.7 de	15.0 ab
10	Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant Engenia Pro Premix ----dicamba ----pyroxasulfone Outlook.....dimethenamid-p Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.5 AS 100 L 4.86 SL 4 0.86 6 L 4.5 AS 100 L	SL 0.5 0.108 AS 0.25 % v/v SL 0.5 0.108 L 0.6 lb ai/a AS 0.25 % v/v	0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v 0.61 lb ae/a 0.5 0.108 0.6 lb ai/a 1.13 lb ae/a 0.25 % v/v	lb ae/a lb lb lb v/v lb ae/a lb lb lb lb lb	ae/a ae/a ae/a ae/a v/v ae/a ae/a ae/a ai/a ae/a v/v	PRE PRE PRE PRE PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A A A A A C C C C C C	91.0 abc	93.7 a-d	10.7 b
11	BAS 872UAH Roundup PowerMax..glyphosate Nonionic Surfactant	5.24 SC 4.5 AS 100 L	SC AS L	0.655 lb ae/a 1.13 lb ae/a 0.25 % v/v	lb ae/a lb ae/a v/v	cot-unif cot-unif cot-unif	B B B	95.3 a	100.0 a	0.0 c	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description			AMAPA C - PalmerAm	IPOSS C - Mornlry	PANDI C - F.panicm	IPOSS C - Mornlry
Rating Type			Control %	Control %	Control %	Seedling Cntrl %
Rating Unit			08/03/19	08/03/19	08/03/19	08/03/19
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code
6	BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	SC lb ai/a 1.37 0.137 1.23 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	1.37 0.137 1.23 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A
7	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 3.38 CS 1.12 2.26 100 L 4.5 AS	0.084 lb ai/a 0.0815 0.00246 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	0.084 lb ai/a 0.0815 0.00246 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A
8	BroadAxe Premix ----sulfentrazone ----s-metolachlor Sequence Premix ----glyphosate ----s-metolachlor Engenia.....dicamba	7 SC 0.7 6.3 5.25 EW 2.25 3 5 SL	1.37 lb ai/a 0.137 1.23 2.13 lb ai/a 0.91 1.22 0.5 lb ae/a	1.37 lb ai/a 0.137 1.23 2.13 lb ai/a 0.91 1.22 0.5 lb ae/a	PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A
9	BroadAxe Premix ----sulfentrazone ----s-metolachlor Prefix Premix ----s-metolachlor ----fomesafen Engenia.....dicamba Roundup PowerMax..glyphosate	7 SC 0.7 6.3 5.3 E 4.35 0.95 5 SL 4.5 AS	1.37 lb ai/a 0.137 1.23 0.99 lb ai/a 0.81 0.177 0.5 lb ae/a 0.98 lb ae/a	1.37 lb ai/a 0.137 1.23 0.99 lb ai/a 0.81 0.177 0.5 lb ae/a 0.98 lb ae/a	PRE 3-4" wds C 3-4" wds C 3-4" wds C 3-4" wds C	A
10	Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant Engenia Pro Premix ----dicamba ----pyroxasulfone Outlook.....dimethenamid-p Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.5 AS 100 L 4.86 SL 4 0.86 6 L 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v 0.61 lb ae/a 0.5 0.108 0.6 lb ai/a 1.13 lb ae/a 0.25 % v/v	0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v 0.61 lb ae/a 0.5 0.108 0.6 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A PRE A PRE A PRE A PRE A	A
11	BAS 872UAH Roundup PowerMax..glyphosate Nonionic Surfactant	5.24 SC 4.5 AS 100 L	0.655 lb ae/a 1.13 lb ae/a 0.25 % v/v	0.655 lb ae/a 1.13 lb ae/a 0.25 % v/v	cot-unif cot-unif cot-unif	B B B

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

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Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description			AMAPA C - PalmerAm	IPOSS C - Mornlry	PANDI C - F.panicm	C GLXMA Soybean	
Rating Type			Control %	Control %	Control %	Yield Bu/A	
Rating Unit			08/26/19	08/26/19	08/26/19	11/06/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code	
6	BroadAxe Premix ----sulfentrazone ----s-metolachlor Tavium Premix ----dicamba ----s-metolachlor Flexstar.....fomesafen AG13063 conditioner Roundup PowerMax..glyphosate	7 SC 0.7 6.3 3.38 CS 1.12 2.26 1.88 ME 100 L 4.5 AS	SC 0.137 1.23 1.49 lb ai/a 0.494 1 0.353 lb ai/a 1 % v/v 1.13 lb ae/a	1.37 lb ai/a 0.137 1.23 1.49 lb ai/a 0.494 1 3-4"wds C 3-4"wds C 3-4"wds C	PRE A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a	16.8 bc
7	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Tavium Premix ----dicamba ----s-metolachlor AG13063 conditioner Roundup PowerMax..glyphosate	4.3 SC 4.174 0.126 3.38 CS 1.12 2.26 100 L 4.5 AS	SC 0.0815 0.00246 CS 0.0815 0.00246 SC 1.49 lb ai/a 0.494 1 1 % v/v 1.13 lb ae/a	0.084 lb ai/a 0.0815 0.00246 1.49 lb ai/a 0.494 1 3-4"wds C 3-4"wds C 3-4"wds C	PRE A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a 99.7 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a	27.7 ab
8	BroadAxe Premix ----sulfentrazone ----s-metolachlor Sequence Premix ----glyphosate ----s-metolachlor Engenia.....dicamba	7 SC 0.7 6.3 5.25 EW 2.25 3 5 SL	SC 0.137 1.23 EW 0.91 1.22 0.5 lb ae/a	1.37 lb ai/a 0.137 1.23 2.13 lb ai/a 0.91 1.22 3-4"wds C 3-4"wds C 3-4"wds C	PRE A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a 99.7 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a	28.1 ab
9	BroadAxe Premix ----sulfentrazone ----s-metolachlor Prefix Premix ----s-metolachlor ----fomesafen Engenia.....dicamba Roundup PowerMax..glyphosate	7 SC 0.7 6.3 5.3 E 4.35 0.95 5 SL 4.5 AS	SC 0.137 1.23 E 0.81 0.177 SL 0.5 lb ae/a	1.37 lb ai/a 0.137 1.23 0.99 lb ai/a 0.81 0.177 3-4"wds C 3-4"wds C 3-4"wds C	PRE A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a	24.6 ab
10	Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant Engenia Pro Premix ----dicamba ----pyroxasulfone Outlook.....dimethenamid-p Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.5 AS 100 L 4.86 SL 4 0.86 6 L 4.5 AS 100 L	SL 0.5 0.108 AS 0.25 % v/v SL 0.5 0.108 L 0.25 % v/v	0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v 0.61 lb ae/a 0.5 0.108 0.6 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A PRE A 3-4"wds C 3-4"wds C 3-4"wds C	100.0 a 90.0 ab 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a	23.7 ab
11	BAS 872UAH Roundup PowerMax..glyphosate Nonionic Surfactant	5.24 SC 4.5 AS 100 L	SC 1.13 lb ae/a 0.25 % v/v	0.655 lb ae/a 1.13 lb ae/a 0.25 % v/v	cot-unif B cot-unif B cot-unif B	100.0 a 81.7 b 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a 100.0 a	30.0 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	C GLXMA	AMAPA C -								
Description	Soybean	Soybean	PalmerAm									
Rating Type	Injury	Stunting	NewlyEm									
Rating Unit	%	%	Cntrl %									
Rating Date	07/13/19	07/22/19	07/22/19									
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code						
12 BAS 872UAH	5.24	SC	0.655	lb ae/a	PRE	A	0.0	c	0.0	a	100.0	a
Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	PRE	A						
Nonionic Surfactant	100	L	0.25	% v/v	PRE	A						
Engenia Pro Premix	4.86	SL	0.61	lb ae/a	3-4"wd	s C						
----dicamba	4		0.5									
----pyroxasulfone	0.86		0.108									
Outlook.....dimethenamid-p	6	L	0.6	lb ai/a	3-4"wd	s C						
Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	3-4"wd	s C						
Nonionic Surfactant	100	L	0.25	% v/v	3-4"wd	s C						
LSD P=.05							4.37		6.25		4.97	
Standard Deviation							2.58		3.69		2.93	
CV							134.64		114.53		3.23	
Replicate F							0.763		0.626		2.289	
Replicate Prob(F)							0.4780		0.5439		0.1250	
Treatment F							3.469		2.013		286.045	
Treatment Prob(F)							0.0063		0.0783		0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## University of Delaware

Pest Code	IPOSS	PANDI	C GLXMA							
Crop Type, Code	C - Mornglry	C - F.panicm	C Soybean							
Description	NewlyEm	NewlyEm	Injury							
Rating Type										
Rating Unit	Cntrl %	Cntrl %	%							
Rating Date	07/22/19	07/22/19	08/03/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
12	BAS 872UAH	5.24	SC	0.655	lb ae/a	PRE	A	93.0 ab	99.0 ab	4.7 c
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	PRE	A			
	Nonionic Surfactant	100	L	0.25	% v/v	PRE	A			
	Engenia Pro Premix	4.86	SL	0.61	lb ae/a	3-4" wds	C			
	----dicamba	4		0.5						
	----pyroxasulfone	0.86		0.108						
	Outlook.....dimethenamid-p	6	L	0.6	lb ai/a	3-4" wds	C			
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	3-4" wds	C			
	Nonionic Surfactant	100	L	0.25	% v/v	3-4" wds	C			
LSD P=.05				8.24		7.93	5.63			
Standard Deviation				4.87		4.68	3.33			
CV				6.45		5.54	52.51			
Replicate F				1.183		0.009	0.211			
Replicate Prob(F)				0.3251		0.9912	0.8114			
Treatment F				120.211		100.972	15.649			
Treatment Prob(F)				0.0001		0.0001	0.0001			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - Mornglry	PANDI C - F.panicm	IPOSS C - Mornglry											
Rating Type	Control %	Control %	Control %	Seedling Cntrl %												
Rating Unit	08/03/19	08/03/19	08/03/19	08/03/19	08/03/19											
Rating Date																
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code									
12	BAS 872UAH	5.24	SC	0.655	lb ae/a	PRE	A	100.0	a	99.0	a	100.0	a	0.7	a	
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	PRE	A									
	Nonionic Surfactant	100	L	0.25	% v/v	PRE	A									
	Engenia Pro Premix	4.86	SL	0.61	lb ae/a	3-4"wds	C									
	----dicamba	4		0.5												
	----pyroxasulfone	0.86		0.108												
	Outlook.....dimethenamid-p	6	L	0.6	lb ai/a	3-4"wds	C									
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	3-4"wds	C									
	Nonionic Surfactant	100	L	0.25	% v/v	3-4"wds	C									
LSD P=.05						.	.	3.75	.	.	.	0.82				
Standard Deviation						0.00		2.21		0.00		0.48				
CV						0.0		2.47		0.0		86.76				
Replicate F						0.000		0.721		0.000		0.478				
Replicate Prob(F)						1.0000		0.4973		1.0000		0.6262				
Treatment F						0.000		498.046		0.000		1.391				
Treatment Prob(F)						1.0000		0.0001		1.0000		0.2447				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - Mornglry	PANDI C - F.panicm	C GLXMA Soybean
Rating Type	Control %		Control %		Yield Bu/A
Rating Unit	08/26/19		08/26/19		11/06/19
Rating Date					
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing	Appl Code	
12 BAS 872UAH	5.24 SC	0.655 lb ae/a	PRE	A	100.0 a
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	PRE	A	
Nonionic Surfactant	100 L	0.25 % v/v	PRE	A	
Engenia Pro Premix	4.86 SL	0.61 lb ae/a	3-4" wds	C	
----dicamba	4	0.5			
----pyroxasulfone	0.86	0.108			
Outlook.....dimethenamid-p	6 L	0.6 lb ai/a	3-4" wds	C	
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3-4" wds	C	
Nonionic Surfactant	100 L	0.25 % v/v	3-4" wds	C	
LSD P=.05		.	12.07	28.22	12.50
Standard Deviation		0.00	7.13	16.67	7.36
CV		0.0	7.99	17.65	30.8
Replicate F		0.000	0.015	1.000	0.253
Replicate Prob(F)		1.0000	0.9848	0.3840	0.7791
Treatment F		0.000	48.567	4.000	2.863
Treatment Prob(F)		1.0000	0.0001	0.0027	0.0184

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=15

Could not calculate LSD (% mean diff) for columns 7,9,11 because error mean square = 0.

## PRE &amp; POST Weed Control in Credenz Soybeans

Trial ID: Soy14-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy14-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: BASF, Syngenta

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/09/19

Initiation Date: 03/01/19

Completion Date: 11/09/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max

Soybean

Entry Date: 09/13/19

Variety: CZ4539GTLL

Attributes: Liberty Link / glyphosate tolerant

Planting Date: 05/08/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Field Equipment

Soil Temperature: 75 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 05/18/19

Soil Moisture: NORMAL normal, adequate

Harvest Equipment: Plot combine

% Standard Moisture: 13.0

Harvested Width: 6.25 FT

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory

Entry Date: 09/13/19

Pest 2 Type: W Code: DIGSA Digitaria sanguinalis

Common Name: large crabgrass

Entry Date: 09/13/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 12 Tillage Type: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 16B

% Sand: 77 % OM: 1.4 Texture: SL sandy loam

% Silt: 12 pH: 6.6 Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11 CEC: 4.8 Fert. Level: F fair

Soil Drainage: F fair

**Application Description**

	A	B	C
Application Date	05/09/19	06/06/19	06/20/19
Appl. Stop Time	02:30 PM	11:30 AM	11:30 AM
Interval to Prev. Appl.		28 DAYS	14 DAYS
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	3"wds	B+14days
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Appl. Entry Date	05/21/19	09/13/19	09/13/19
Air Temperature Start, Stop	75 75 F	80 80 F	84 84 F
% Relative Humidity Start, Stop	66 66	68 68	74 74
Wind Velocity+Dir. Start	10 mph ESE	3 mph	10 mph SSW
Wind Velocity+Dir. Stop	10 mph ESE	3 mph	10 mph SSW
Wind Velocity+Dir. Max	10 mph ESE	3 mph	10 mph SSW
Wet Leaves (Y/N)	N no		
Soil Temperature	74 F	80 F	82 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	51	64	52
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.45 IN	1.9 IN	1.02 IN
Weather Source	ITERIS	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-9	19	33
Stage Scale Used		DESC	DESC
Stage Majority, Percent		V2-3 100	V4-5 100
Height Average		5 in	10 in

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		veg 100	run 100
Height Average		4 in	6 in
Height Minimum, Maximum		2 5	5 8
Density Average		3 m2	1 m2
Density Min, Max		0 6	0 2
Pest 2 Code, Type, Scale	DIGSA W	DIGSA W	DIGSA W
Stage Majority, Percent		3-tilr 70	
Stage Minimum, Percent		2-tilr 10	
Stage Maximum, Percent		4-tilr 20	
Height Average		3.5 in	
Height Minimum, Maximum		3 4	
Density Average		2 m2	
Density Min, Max		0 4	

**Application Equipment**

	A	B	C
Appl. Equipment	Tractr4Nozl	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	18 in	21 in	28 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/09/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

**Trial Comments**

06/12/19: Severe Deer Feeding.

07/04/19: CntrlNew is control of newly emerged morningglory (since application). Poor control of prickly sida.

## PRE &amp; POST Weed Control in Credenz Soybeans

Trial ID: Soy14-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy14-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: BASF, Syngenta

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm Control	IPOSS C - Mornlry Control	DIGSA C - L.crbgrs Control	AMAPA C - PalmerAm Control
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Zidua SC.....pyroxasulfone	4.17 SC	0.106 lb ai/a	PRE	A	96.0 ab	98.3 a	97.7 a
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	3"wds	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3"wds	B			
	Dry Ammonium Sulfate	100 D	1.8 % w/v	3"wds	B			
2	Zidua SC.....pyroxasulfone	4.17 SC	0.106 lb ai/a	PRE	A	90.3 ab	88.0 b	88.0 a
	Alite27	1 SC	0.0156 lb ai/a	PRE	A			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	B+14days	C			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	B+14days	C			
	Dry Ammonium Sulfate	100 D	1.8 % w/v	B+14days	C			
3	Zidua SC.....pyroxasulfone	4.17 SC	0.057 lb ai/a	PRE	A	99.0 a	99.0 a	99.0 a
	Outlook.....dimethenamid-p	6 L	0.47 lb ai/a	3"wds	B			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	3"wds	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3"wds	B			
	Dry Ammonium Sulfate	100 D	1.8 % w/v	3"wds	B			
4	Zidua SC.....pyroxasulfone	4.17 SC	0.106 lb ai/a	PRE	A	78.3 c	76.7 c	
	Alite27	1 SC	0.0156 lb ai/a	PRE	A			99.0 a
5	Alite27	1 SC	0.0156 lb ai/a	PRE	A	99.0 a	98.3 a	99.0 a
	Outlook.....dimethenamid-p	6 L	0.47 lb ai/a	3"wds	B			96.0 a
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	3"wds	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3"wds	B			
	Dry Ammonium Sulfate	100 D	1.8 % w/v	3"wds	B			
6	Authority First Premix	70 DF	0.219 lb ai/a	PRE	A	98.3 a	98.3 a	99.0 a
	----sulfentrazone	62.1	0.194					
	----cloransulam	7.9	0.0247					
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	3"wds	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3"wds	B			
	Dry Ammonium Sulfate	100 D	1.8 % w/v	3"wds	B			
7	Authority First Premix	70 DF	0.219 lb ai/a	PRE	A	91.3 ab	90.7 ab	87.0 a
	----sulfentrazone	62.1	0.194					
	----cloransulam	7.9	0.0247					
	Alite27	1 SC	0.0156 lb ai/a	PRE	A			
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	B+14days	C			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	B+14days	C			
	Dry Ammonium Sulfate	100 D	1.8 % w/v	B+14days	C			
8	Boundary Premix	6.5 EC	1.22 lb ai/a	PRE	A	97.7 a	97.7 ab	98.3 a
	----s-metolachlor	5.25	0.99					
	----metribuzin	1.25	0.235					
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	3"wds	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	3"wds	B			
	Dry Ammonium Sulfate	100 D	1.8 % w/v	3"wds	B			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,5,8,10,12,13,14; Average=6,7,9,11

Pest Code Crop Type, Code	Description Rating Type	Rating Unit Rating Date	IPOSS C - Mornglry Control	DIGSA C - L.crbgrs Control	AMAPA C - PalmerAm Control	IPOSS C - Mornglry Control		
Trt No. Treatment Name	Form Conc Type	Rate Rate	Appl Unit Timing	Appl Code				
1 Zidua SC.....pyroxasulfone Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 2.34 SL 4.5 AS 100 D	0.106 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wd 3"wd 3"wd	A B B B	89.4 ab 65.0 cd 90.9 a 58.3 d	99.0 a 89.7 b 99.0 a 80.0 c	87.0 ab 95.3 a 9.0 c 70.0 b	96.2 ab 91.3 abc 80.2 abc 50.0 e
2 Zidua SC.....pyroxasulfone Alite27 Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 1 SC 2.34 SL 4.5 AS 100 D	0.106 lb ai/a 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE PRE B+14days B+14days B+14days	A A C C C	88.5 ab 86.3 ab 82.0 ab	99.0 a 81.7 c 98.0 a	89.7 ab 92.0 a 90.0 a	56.7 de 99.3 a 82.1 abc
3 Zidua SC.....pyroxasulfone Outlook.....dimethenamid-p Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 6 L 2.34 SL 4.5 AS 100 D	0.057 lb ai/a 0.47 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wd 3"wd 3"wd 3"wd	A B B B B	90.9 a 99.0 a 99.0 a 99.0 a 99.0 a	99.0 a 99.0 a 99.0 a 99.0 a 99.0 a	9.0 c 9.0 c 9.0 c 9.0 c 9.0 c	80.2 abc 80.2 abc 80.2 abc 80.2 abc 80.2 abc
4 Zidua SC.....pyroxasulfone Alite27	4.17 SC 1 SC	0.106 lb ai/a 0.0156 lb ai/a	PRE PRE	A A	58.3 d	80.0 c	70.0 b	50.0 e
5 Alite27 Outlook.....dimethenamid-p Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	1 SC 6 L 2.34 SL 4.5 AS 100 D	0.0156 lb ai/a 0.47 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wd 3"wd 3"wd 3"wd	A B B B B	88.5 ab 86.3 ab 82.0 ab	99.0 a 99.0 a 98.0 a	89.7 ab 89.7 ab 82.1 abc	56.7 de 56.7 de 82.1 abc
6 Authority First Premix ----sulfentrazone ----cloransulam Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	70 DF 62.1 7.9 2.34 SL 4.5 AS 100 D	0.219 lb ai/a 0.194 0.0247 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wd 3"wd 3"wd 3"wd	A B B B B	97.0 a 99.0 a 99.0 a 99.0 a 99.0 a	99.0 a 99.0 a 99.0 a 99.0 a 99.0 a	95.3 a 95.3 a 95.3 a 95.3 a 95.3 a	88.7 abc 88.7 abc 88.7 abc 88.7 abc 88.7 abc
7 Authority First Premix ----sulfentrazone ----cloransulam Alite27 Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	70 DF 62.1 7.9 1 SC 2.34 SL 4.5 AS 100 D	0.219 lb ai/a 0.194 0.0247 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wd 3"wd PRE B+14days B+14days B+14days	A B A C C C C	86.3 ab 86.3 ab 86.3 ab 82.0 ab 98.0 a 98.0 a 98.0 a	81.7 c 81.7 c 81.7 c 82.0 ab 90.0 a 90.0 a 90.0 a	92.0 a 92.0 a 92.0 a 90.0 a 99.3 a 99.3 a 99.3 a	99.3 a 99.3 a 99.3 a 99.3 a 99.3 a 99.3 a 99.3 a
8 Boundary Premix ----s-metolachlor ----metribuzin Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 2.34 SL 4.5 AS 100 D	1.22 lb ai/a 0.99 0.235 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wd 3"wd 3"wd 3"wd 3"wd	A B B B B B	82.0 ab 82.0 ab 82.0 ab 82.0 ab 82.0 ab 82.0 ab	98.0 a 98.0 a 98.0 a 98.0 a 98.0 a 98.0 a	90.0 a 90.0 a 90.0 a 90.0 a 99.3 a 99.3 a	82.1 abc 82.1 abc 82.1 abc 82.1 abc 82.1 abc 82.1 abc

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,5,8,10,12,13,14; Average=6,7,9,11

Pest Code Crop Type, Code	Description Rating Type	Rating Unit Rating Date	GGGAN C - AnnGrass Control	C GLXMA Soybean Stunting	AMAPA C - PalmerAm Control					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Zidua SC.....pyroxasulfone Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 2.34 SL 4.5 AS 100 D	SC SL AS D	0.106 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	lb ai/a lb ai/a lb ae/a % w/v	PRE 3"wds 3"wds 3"wds	A B B B	89.5 ab	2.3 cd	89.5 b
2	Zidua SC.....pyroxasulfone Alite27 Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 1 SC 2.34 SL 4.5 AS 100 D	SC SC SL AS D	0.106 lb ai/a 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	lb ai/a lb ai/a lb ai/a lb ae/a % w/v	PRE PRE B+14days B+14days B+14days	A A C C C	99.0 a	4.7 cd	97.0 a
3	Zidua SC.....pyroxasulfone Outlook.....dimethenamid-p Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 6 L 2.34 SL 4.5 AS 100 D	SC L SL AS D	0.057 lb ai/a 0.47 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	lb ai/a lb ai/a lb ai/a lb ae/a % w/v	PRE 3"wds 3"wds 3"wds 3"wds	A B B B B	99.0 a	3.5 cd	99.0 a
4	Zidua SC.....pyroxasulfone Alite27	4.17 SC 1 SC	SC SC	0.106 lb ai/a 0.0156 lb ai/a	lb ai/a lb ai/a	PRE PRE	A A	76.7 c	0.0 d	75.0 c
5	Alite27 Outlook.....dimethenamid-p Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	1 SC 6 L 2.34 SL 4.5 AS 100 D	SC L SL AS D	0.0156 lb ai/a 0.47 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	lb ai/a lb ai/a lb ai/a lb ae/a % w/v	PRE 3"wds 3"wds 3"wds 3"wds	A B B B B	98.3 a	8.0 bc	93.0 ab
6	Authority First Premix ----sulfentrazone ----cloransulam Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	70 DF 62.1 7.9 2.34 SL 4.5 AS 100 D	DF 62.1 7.9 SL AS D	0.219 lb ai/a 0.194 0.0247 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	lb ai/a lb ai/a 0.0247 lb ai/a lb ae/a % w/v	PRE 3"wds 3"wds 3"wds 3"wds	A B B B B	94.3 ab	0.0 d	99.0 a
7	Authority First Premix ----sulfentrazone ----cloransulam Alite27 Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	70 DF 62.1 7.9 1 SC 2.34 SL 4.5 AS 100 D	DF 62.1 7.9 SC SL AS D	0.219 lb ai/a 0.194 0.0247 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	lb ai/a lb ai/a 0.0247 lb ai/a B+14days B+14days B+14days	PRE 3"wds 3"wds PRE C C C	A B A C C C C	96.7 a	4.0 cd	99.0 a
8	Boundary Premix ----s-metolachlor ----metribuzin Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 2.34 SL 4.5 AS 100 D	EC 5.25 1.25 SL AS D	1.22 lb ai/a 0.99 0.235 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	lb ai/a lb ai/a lb ai/a lb ai/a lb ae/a % w/v	PRE 3"wds 3"wds 3"wds 3"wds 3"wds	A B B B B B	98.3 a	0.0 d	97.7 a

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,5,8,10,12,13,14; Average=6,7,9,11

Pest Code Crop Type, Code	Description Rating Type	Rating Unit Rating Date	IPOSS C - 07/04/19	GGGAN C - 07/04/19	IPOSS C - 07/04/19	C GLXMA Soybean Yield Bu/A 11/04/19
Trt No. Treatment Name	Form Conc Type	Rate Rate	Appl Unit Timing	Appl Code		
1 Zidua SC.....pyroxasulfone Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 2.34 SL 4.5 AS 100 D	0.106 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wds 3"wds 3"wds	A B B B	84.7 a	95.4 a 0.0 c 46.0 a
2 Zidua SC.....pyroxasulfone Alite27 Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 1 SC 2.34 SL 4.5 AS 100 D	0.106 lb ai/a 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE PRE B+14days B+14days B+14days	A A C C C	99.0 a	99.0 a 43.3 abc 51.5 a
3 Zidua SC.....pyroxasulfone Outlook.....dimethenamid-p Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.17 SC 6 L 2.34 SL 4.5 AS 100 D	0.057 lb ai/a 0.47 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wds 3"wds 3"wds 3"wds	A B B B B	99.0 a	99.0 a 0.0 c 52.7 a
4 Zidua SC.....pyroxasulfone Alite27	4.17 SC 1 SC	0.106 lb ai/a 0.0156 lb ai/a	PRE PRE	A A	56.7 b	83.0 b 2.4 c 46.4 a
5 Alite27 Outlook.....dimethenamid-p Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	1 SC 6 L 2.34 SL 4.5 AS 100 D	0.0156 lb ai/a 0.47 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wds 3"wds 3"wds 3"wds	A B B B B	86.0 a	99.0 a 0.0 c 53.4 a
6 Authority First Premix ----sulfentrazone ----cloransulam Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	70 DF 62.1 7.9 2.34 SL 4.5 AS 100 D	0.219 lb ai/a 0.194 0.0247 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wds 3"wds 3"wds 3"wds	A B B B B	99.0 a	99.0 a 49.9 abc 53.2 a
7 Authority First Premix ----sulfentrazone ----cloransulam Alite27 Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	70 DF 62.1 7.9 1 SC 2.34 SL 4.5 AS 100 D	0.219 lb ai/a 0.194 0.0247 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wds 3"wds PRE B+14days B+14days B+14days	A B A C C C C	99.0 a	99.0 a 59.7 ab 53.4 a
8 Boundary Premix ----s-metolachlor ----metribuzin Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 2.34 SL 4.5 AS 100 D	1.22 lb ai/a 0.99 0.235 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE 3"wds 3"wds 3"wds 3"wds	A B B B B	99.0 a	99.0 a 0.0 c 55.8 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,5,8,10,12,13,14; Average=6,7,9,11

## University of Delaware

Pest Code Crop Type, Code			AMAPA C -	IPOSS C -	DIGSA C -	AMAPA C -
Description		PalmerAm Control	Mornlry Control	L.crbgrs Control	PalmerAm Control	
Rating Type		% 06/12/19	% 06/12/19	% 06/12/19	% 06/21/19	
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
9	Boundary Premix	6.5 EC	1.22 lb ai/a	PRE	A	88.0 b
	----s-metolachlor	5.25	0.99			
	----metribuzin	1.25	0.235			
	Alite27	1 SC	0.0156 lb ai/a	PRE	A	
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	B+14days	C	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	B+14days	C	
	Dry Ammonium Sulfate	100 D	1.8 % w/v	B+14days	C	
10	BroadAxe Premix	7 SC	1.37 lb ai/a	PRE	A	99.0 a
	----sulfentrazone	0.7	0.137			
	----s-metolachlor	6.3	1.23			
	Prefix Premix	5.3 E	1.33 lb ai/a	3"wds	B	
	----s-metolachlor	4.35	1.09			
	----fomesafen	0.95	0.238			
	Liberty 280....glufosinate	2.34 SL	0.53 lb ai/a	3"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	3"wds	B	
11	Boundary Premix	6.5 EC	1.63 lb ai/a	PRE	A	99.0 a
	----s-metolachlor	5.25	1.32			
	----metribuzin	1.25	0.313			
	Prefix Premix	5.3 E	1.33 lb ai/a	3"wds	B	
	----s-metolachlor	4.35	1.09			
	----fomesafen	0.95	0.238			
	Liberty 280....glufosinate	2.34 SL	0.53 lb ai/a	3"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	3"wds	B	
12	BroadAxe Premix	7 SC	1.37 lb ai/a	PRE	A	99.0 a
	----sulfentrazone	0.7	0.137			
	----s-metolachlor	6.3	1.23			
	Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	3"wds	B	
	Liberty 280....glufosinate	2.34 SL	0.53 lb ai/a	3"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	3"wds	B	
LSD P=.05				9.15	10.07	27.85
Standard Deviation				5.37	5.95	16.35
CV				5.68	6.29	5.87
						6.1
Replicate F				6.206	4.638	1.357
Replicate Prob(F)				0.0080	0.0209	0.2802
Treatment F				4.339	4.065	0.983
Treatment Prob(F)				0.0022	0.0025	0.4880
						0.0534

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Missing data estimates are included in columns:Yates=1,4,5,8,10,12,13,14; Average=6,7,9,11

## University of Delaware

Pest Code Crop Type, Code		IPOSS C -	DIGSA C -	AMAPA C -	IPOSS C -						
Description	Mornlry Control	L.crbgrs Control	PalmerAm Control	Mornlry Control							
Rating Unit	%	%	%	%							
Rating Date	06/21/19	06/21/19	07/22/19	07/22/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
9	Boundary Premix ----s-metolachlor ----metribuzin Alite27 Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 1 SC 2.34 SL 4.5 AS 100 D	1.22 lb ai/a 0.99 0.235 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE B+14days B+14days C	A	74.5 bc	99.0 a	84.5 ab	86.6 abc		
10	BroadAxe Premix ----sulfentrazone ----s-metolachlor Prefix Premix ----s-metolachlor ----fomesafen Liberty 280.....glufosinate Dry Ammonium Sulfate	7 SC 0.7 6.3 5.3 E 4.35 0.95 2.34 SL 100 D	1.37 lb ai/a 0.137 1.23 1.33 lb ai/a 1.09 0.238 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B	85.7 ab	99.0 a	99.0 a	72.3 cd		
11	Boundary Premix ----s-metolachlor ----metribuzin Prefix Premix ----s-metolachlor ----fomesafen Liberty 280.....glufosinate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 5.3 E 4.35 0.95 2.34 SL 100 D	1.63 lb ai/a 1.32 0.313 1.33 lb ai/a 1.09 0.238 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B	85.7 ab	99.0 a	99.0 a	76.3 bcd		
12	BroadAxe Premix ----sulfentrazone ----s-metolachlor Dual II Magnum..s-metolachlor Liberty 280.....glufosinate Dry Ammonium Sulfate	7 SC 0.7 6.3 7.64 E 2.34 SL 100 D	1.37 lb ai/a 0.137 1.23 0.955 lb ai/a 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B	89.0 ab	99.0 a	99.0 a	81.3 abc		
LSD P=.05						15.05	7.98	19.73	21.80		
Standard Deviation						8.74	4.49	10.48	12.65		
CV						10.57	4.72	12.45	15.8		
Replicate F						10.686	0.192	1.000	1.940		
Replicate Prob(F)						0.0010	0.8280	0.4095	0.1742		
Treatment F						4.986	7.695	17.117	4.098		
Treatment Prob(F)						0.0016	0.0007	0.0002	0.0047		

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,5,8,10,12,13,14; Average=6,7,9,11

## University of Delaware

Pest Code Crop Type, Code		GGGAN C - C	GLXMA	AMAPA C -				
Description	AnnGrass Control	Soybean Stunting	PalmerAm Control					
Rating Unit	%	%	%					
Rating Date	07/22/19	07/04/19	07/04/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
9	Boundary Premix ----s-metolachlor ----metribuzin Alite27 Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 1 SC 2.34 SL 4.5 AS 100 D	1.22 lb ai/a 0.99 0.235 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE B+14days B+14days C	A	99.0 a	3.3 cd	99.0 a
10	BroadAxe Premix ----sulfentrazone ----s-metolachlor Prefix Premix ----s-metolachlor ----fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	7 SC 0.7 6.3 5.3 E 4.35 0.95 2.34 SL 100 D	1.37 lb ai/a 0.137 1.23 1.33 lb ai/a 1.09 0.238 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B	92.3 ab	15.7 a	99.0 a
11	Boundary Premix ----s-metolachlor ----metribuzin Prefix Premix ----s-metolachlor ----fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 5.3 E 4.35 0.95 2.34 SL 100 D	1.63 lb ai/a 1.32 0.313 1.33 lb ai/a 1.09 0.238 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B	85.0 bc	14.5 ab	99.0 a
12	BroadAxe Premix ----sulfentrazone ----s-metolachlor Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7 SC 0.7 6.3 7.64 E 2.34 SL 100 D	1.37 lb ai/a 0.137 1.23 0.955 lb ai/a 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B	94.7 ab	5.7 cd	99.0 a
LSD P=.05 Standard Deviation CV						11.10 6.41 6.85	6.60 3.84 74.94	6.29 3.68 3.85
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						0.817 0.4594 3.465 0.0122	0.680 0.5191 5.553 0.0007	1.704 0.2087 11.190 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,5,8,10,12,13,14; Average=6,7,9,11

## University of Delaware

Pest Code Crop Type, Code		IPOSS C -	GGGAN C -	IPOSS C -	C GLXMA
Description	Mornlry Control	AnnGrass Control	Mornlry CntrlNew	Soybean Yield	
Rating Unit	%	%	%	Bu/A	
Rating Date	07/04/19	07/04/19	07/04/19	11/04/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing
9	Boundary Premix ----s-metolachlor ----metribuzin Alite27 Liberty 280....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 1 SC 2.34 SL 4.5 AS 100 D	1.22 lb ai/a 0.99 0.235 0.0156 lb ai/a 0.585 lb ai/a 1.13 lb ae/a 1.8 % w/v	PRE B+14days B+14days C	A
98.3 a	99.0 a	87.4 a	53.9 a		
10	BroadAxe Premix ----sulfentrazone ----s-metolachlor Prefix Premix ----s-metolachlor ----fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	7 SC 0.7 6.3 5.3 E 4.35 0.95 2.34 SL 100 D	1.37 lb ai/a 0.137 1.23 1.33 lb ai/a 1.09 0.238 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B
91.0 a	99.0 a	0.0 c	51.7 a		
11	Boundary Premix ----s-metolachlor ----metribuzin Prefix Premix ----s-metolachlor ----fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	6.5 EC 5.25 1.25 5.3 E 4.35 0.95 2.34 SL 100 D	1.63 lb ai/a 1.32 0.313 1.33 lb ai/a 1.09 0.238 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B
86.0 a	99.0 a	33.0 bc	45.4 a		
12	BroadAxe Premix ----sulfentrazone ----s-metolachlor Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7 SC 0.7 6.3 7.64 E 2.34 SL 100 D	1.37 lb ai/a 0.137 1.23 0.955 lb ai/a 0.53 lb ai/a 1.02 % w/v	PRE 3"wds 3"wds 3"wds	A B B
93.3 a	94.3 a	0.0 c	53.0 a		
LSD P=.05		20.55	8.59	51.56	8.71
Standard Deviation		12.10	5.06	30.17	5.14
CV		13.31	5.22	131.34	10.01
Replicate F		0.062	1.424	1.479	6.712
Replicate Prob(F)		0.9397	0.2630	0.2530	0.0053
Treatment F		3.067	2.573	3.094	1.353
Treatment Prob(F)		0.0131	0.0301	0.0149	0.2619

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,5,8,10,12,13,14; Average=6,7,9,11

**Control of PPO-R Ragweed with XtendiFlex**

Trial ID: Soy15-19      Location: Bridgeville      Trial Year: 2019  
Protocol ID: Soy15-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: Monsanto

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Trial Status: E established

ARM Trial Created On: 05/15/19

Initiation Date: 05/15/19

Completion Date: 07/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.726785 N

Longitude of LL Corner °: 75.589009 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 08/09/19

Variety: AG40XF0

Attributes: XtendiFlex

Planting Date: 05/16/19 Planting Rate: 180000 S/A

Depth: 1 IN

Planting Method: PLANTD planted

Row Spacing: 15 IN Planting Equipment: FE Field Equipment

Seed Bed: MEDIUM medium

Soil Temperature: 73 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 05/23/19

**Pest Description**

Pest 1 Type: W Code: AMBEL Ambrosia artemisiifolia

Common Name: Common ragweed Entry Date: 08/09/19

Attributes: PPO-resistant

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 12 Tillage Type: NOTILL no-till

Replications: 4

Study Design: RACOBL Randomized Complete Block (RCB)

**Application Description**

	A	B	C
Application Date	05/17/19	06/12/19	
Appl. Stop Time	12:00 PM	10:30 AM	
Application Method	SPRAY	SPRAY	not appl.
Application Timing	PRE	21DAP	35DAP
Application Placement	BROADC	BROADC	
Applied By	VanGesl	VanGesl	
Appl. Entry Date	08/09/19	08/09/19	
Air Temperature Start, Stop	74 74 F	71 71 F	
% Relative Humidity Start, Stop	58 58	54 54	
Wind Velocity+Dir. Start	6 mph SSW	6 mph ENE	
Wind Velocity+Dir. Stop	6 mph WSW	6 mph ENE	
Wind Velocity+Dir. Max	6 mph SSW	6 mph ENE	
Soil Temperature	67 F	70 F	
% Cloud Cover	58	44	
Moisture 6 Hours after Appl.	0 IN	0 IN	
Moisture 1 Week after Appl.	0.44 IN	2.35 IN	

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-6	20	
Stage Majority, Percent		V3 100	
Height Average		8 in	

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMBEL W	AMBEL W	AMBEL W
Stage Majority, Percent		veg 80	
Stage Minimum, Percent		cotyl 20	
Stage Maximum, Percent		veg 80	
Height Average		1 in	
Height Minimum, Maximum		0.75 2	
Density Average		1.5 m2	
Density Min, Max		1 2	

**Application Equipment**

	A	B	C
Appl. Equipment	Bckpck6Nozl	Bckpck6Nozl	
Equipment Type	SPRBAC	SPRBAC	
Operation Pressure	31 psi	31 psi	
Nozzle Type	AITEEJET	AITEEJET	
Nozzle Size	11002	11002	
Nozzle Spacing	18 in	18 in	
Boom Length	9 ft	9 ft	
Boom Height	18 in	24 in	
Ground Speed	3 mph	3 mph	
Carrier	WATER	WATER	
Application Amount	20 gal/ac	20 gal/ac	
Propellant	COMCO2	COMCO2	

Context	Date	By	Notes
STATUS	05/15/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/18/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

## Trial Comments

05/30/19: No significant stunting, however height is quite variable due to deer feeding.

06/21/19: Morningglory seedlings beginning to emerge, not rated.

07/03/19: Entire study was sprayed with glyphosate plus dicamba the week before by mistake.

Control of PPO-R Ragweed with XtendiFlex									
Trial ID: Soy15-19		Location: Bridgeville		Trial Year: 2019					
Protocol ID: Soy15-19		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: Monsanto									
Pest Code									
Crop Type, Code									
Description									
Rating Type									
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing			
						Code			
1	Valor SX.....flumioxazin	51 WG	0.064	lb ai/a	PRE	A			
	Reflex.....fomesafen	2 L	0.25	lb ai/a	21DAP	B			
	Nonionic Surfactant	100 L	0.25	% v/v	21DAP	B			
	Cobra.....lactofen	2 EC	0.156	lb ai/a	35DAP	C			
	Crop Oil Concentrate	100 L	1	% v/v	35DAP	C			
2	Warrant.....acetochlor	3 CS	1.13	lb ai/a	PRE	A			
	Mauler.....metribuzin	4 L	0.25	lb ai/a	PRE	A			
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	21DAP	B			
	Xtendimax.....dicamba	2.9 SL	0.5	lb ae/a	21DAP	B			
	Intact Drift Retardant	43.18 L	0.5	% v/v	21DAP	B			
	Class Act Ridion	100 L	1	% v/v	21DAP	B			
	Warrant Ultra Premix	3.45 SC	1.35	lb ai/a	35DAP	C			
	----acetochlor	2.82	1.1						
	----fomesafen	0.6300001	0.247						
	Nonionic Surfactant	100 L	0.25	% v/v	35DAP	C			
3	Valor SX.....flumioxazin	51 WG	0.064	lb ai/a	PRE	A			
	Xtendimax.....dicamba	2.9 SL	0.5	lb ae/a	PRE	A			
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	21DAP	B			
	Xtendimax.....dicamba	2.9 SL	0.5	lb ae/a	21DAP	B			
	Intact Drift Retardant	43.18 L	0.5	% v/v	21DAP	B			
	Class Act Ridion	100 L	1	% v/v	21DAP	B			
	Liberty 280....glufosinate	2.34 SL	0.585	lb ai/a	35DAP	C			
	Dry Ammonium Sulfate	100 D	1.02	% w/v	35DAP	C			
4	Valor SX.....flumioxazin	51 WG	0.064	lb ai/a	PRE	A			
	Mauler.....metribuzin	4 L	0.25	lb ai/a	PRE	A			
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	21DAP	B			
	Xtendimax.....dicamba	2.9 SL	0.5	lb ae/a	21DAP	B			
	Intact Drift Retardant	43.18 L	0.5	% v/v	21DAP	B			
	Class Act Ridion	100 L	1	% v/v	21DAP	B			
	Liberty 280....glufosinate	2.34 SL	0.585	lb ai/a	35DAP	C			
	Dry Ammonium Sulfate	100 D	1.02	% w/v	35DAP	C			
5	Xtendimax.....dicamba	2.9 SL	0.5	lb ae/a	PRE	A			
	Warrant.....acetochlor	3 CS	1.13	lb ai/a	PRE	A			
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	21DAP	B			
	Xtendimax.....dicamba	2.9 SL	0.5	lb ae/a	21DAP	B			
	Warrant.....acetochlor	3 CS	1.13	lb ai/a	21DAP	B			
	Intact Drift Retardant	43.18 L	0.5	% v/v	21DAP	B			
	Class Act Ridion	100 L	1	% v/v	21DAP	B			
	Liberty 280....glufosinate	2.34 SL	0.585	lb ai/a	35DAP	C			
	Dry Ammonium Sulfate	100 D	1.02	% w/v	35DAP	C			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2

Pest Code Crop Type, Code Description Rating Type Rating Unit Rating Date		AMBEL C - C.ragwd Control % 06/21/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
1	Valor SX.....flumioxazin Reflex.....fomesafen Nonionic Surfactant Cobra.....lactofen Crop Oil Concentrate		51 WG 2 L 100 L 2 EC 100 L	0.064 lb ai/a 0.25 lb ai/a 0.25 % v/v 0.156 lb ai/a 1 % v/v	PRE 21DAP B 21DAP B 35DAP C 35DAP C	A	47.5 e
2	Warrant.....acetochlor Mauler.....metribuzin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion Warrant Ultra Premix ----acetochlor ----fomesafen Nonionic Surfactant		3 CS 4 L 4.5 AS 2.9 SL 43.18 L 100 L 3.45 SC 2.82 0.6300001 100 L	1.13 lb ai/a 0.25 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v 1.35 lb ai/a 1.1 0.247 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C	A	94.5 ab
3	Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Dry Ammonium Sulfate		51 WG 2.9 SL 4.5 AS 2.9 SL 43.18 L 100 L 2.34 SL 100 D	0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.02 % w/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C	A	96.8 ab
4	Valor SX.....flumioxazin Mauler.....metribuzin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Dry Ammonium Sulfate		51 WG 4 L 4.5 AS 2.9 SL 43.18 L 100 L 2.34 SL 100 D	0.064 lb ai/a 0.25 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.02 % w/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C	A	88.3 bc
5	Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Xtendimax.....dicamba Warrant.....acetochlor Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Dry Ammonium Sulfate		2.9 SL 3 CS 4.5 AS 2.9 SL 3 CS 43.18 L 100 L 2.34 SL 100 D	0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.02 % w/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C	A	89.8 bc

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2

## University of Delaware

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C GLXMA	AMBEL C - C.ragwd	C GLXMA	
						05/30/19	06/12/19	06/21/19	
Trt	Treatment No.	Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
6	Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate		2.9 SL 3 CS 4.5 AS 2.9 SL 43.18 L 100 L 2.34 SL 4.5 AS 100 D	0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C 35DAP C	A A B B B B C C C	0.0 a	68.5 b	9.3 a
7	Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Select Max.....clethodim Nonionic Surfactant Dry Ammonium Sulfate		2.9 SL 3 CS 4.5 AS 2.9 SL 43.18 L 100 L 2.34 SL 1 EC 100 L 100 D	0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 0.07 lb ai/a 0.25 % v/v 1.02 % w/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C 35DAP C 35DAP C	A A B B B B C C C C	0.0 a	77.5 b	5.3 abc
8	Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Xtendimax.....dicamba Liberty 280.....glufosinate Intact Drift Retardant Class Act Ridion		2.9 SL 3 CS 4.5 AS 2.9 SL 2.34 SL 43.18 L 100 L	0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.585 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 21DAP B	A A B B B B B	1.8 a	76.3 b	1.8 cd
9	Roundup PowerMax..glyphosate Xtendimax.....dicamba Warrant Ultra Premix ----acetochlor ----fomesafen Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate		4.5 AS 2.9 SL 3.45 SC 2.82 0.6300001 43.18 L 100 L 2.34 SL 4.5 AS 100 D	1.13 lb ae/a 0.5 lb ae/a 1.35 lb ai/a 1.1 0.247 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.13 lb ae/a 1.02 % w/v	21DAP B 21DAP B 21DAP B 21DAP B 21DAP B B B 35DAP C 35DAP C 35DAP C	B B B B B B B B B	0.0 a	0.0 c	1.8 cd
10	Roundup PowerMax..glyphosate Xtendimax.....dicamba Warrant.....acetochlor Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate		4.5 AS 2.9 SL 3 CS 43.18 L 100 L 2.34 SL 4.5 AS 100 D	1.13 lb ae/a 0.5 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.13 lb ae/a 1.02 % w/v	21DAP B 21DAP B 21DAP B 21DAP B 21DAP B 21DAP B 21DAP C 21DAP C	B B B B B B B B	0.0 a	0.0 c	3.5 bcd
11	Roundup PowerMax..glyphosate Xtendimax.....dicamba Warrant.....acetochlor Intact Drift Retardant Class Act Ridion Cobra.....lactofen Crop Oil Concentrate		4.5 AS 2.9 SL 3 CS 43.18 L 100 L 2 EC 100 L	1.13 lb ae/a 0.5 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v 0.156 lb ai/a 1 % v/v	21DAP B 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C	B B B B B B B	0.0 a	0.0 c	0.0 d

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=1,2

## University of Delaware

Pest Code Crop Type, Code Description Rating Type Rating Unit Rating Date		AMBEL C - C.ragwd Control % 06/21/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
6	Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	2.9 SL 3 CS 4.5 AS 2.9 SL 43.18 L 100 L 2.34 SL 4.5 AS 100 D	SL CS AS SL L L SL AS D	0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C 35DAP C	A A B B B B C C C	96.8 ab	
7	Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Select Max.....clethodim Nonionic Surfactant Dry Ammonium Sulfate	2.9 SL 3 CS 4.5 AS 2.9 SL 43.18 L 100 L 2.34 SL 1 EC 100 L 100 D	SL CS AS SL L L SL EC L D	0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 0.07 lb ai/a 0.25 % v/v 1.02 % w/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 35DAP C 35DAP C 35DAP C 35DAP C	A A B B B B C C C C	96.8 ab	
8	Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Xtendimax.....dicamba Liberty 280.....glufosinate Intact Drift Retardant Class Act Ridion	2.9 SL 3 CS 4.5 AS 2.9 SL 2.34 SL 43.18 L 100 L	SL CS AS SL SL L L	0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.585 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B 21DAP B	A A B B B B B	99.0 a	
9	Roundup PowerMax..glyphosate Xtendimax.....dicamba Warrant Ultra Premix ----acetochlor ----fomesafen Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.5 AS 2.9 SL 3.45 SC 2.82 0.6300001 43.18 L 100 L 2.34 SL 4.5 AS 100 D	AS SL SC 2.82 0.6300001 L L SL AS D	1.13 lb ae/a 0.5 lb ae/a 1.35 lb ai/a 1.1 0.247 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.13 lb ae/a 1.02 % w/v	21DAP B 21DAP B 21DAP B B B 21DAP B 21DAP B 35DAP C 35DAP C 35DAP C	B B B B B B B C C C	91.0 ab	
10	Roundup PowerMax..glyphosate Xtendimax.....dicamba Warrant.....acetochlor Intact Drift Retardant Class Act Ridion Liberty 280.....glufosinate Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.5 AS 2.9 SL 3 CS 43.18 L 100 L 2.34 SL 4.5 AS 100 D	AS SL CS L L SL AS D	1.13 lb ae/a 0.5 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v 0.585 lb ai/a 1.13 lb ae/a 1.02 % w/v	21DAP B 21DAP B 21DAP B B B 35DAP C 35DAP C 35DAP C	B B B B B B B B	77.5 d	
11	Roundup PowerMax..glyphosate Xtendimax.....dicamba Warrant.....acetochlor Intact Drift Retardant Class Act Ridion Cobra.....lactofen Crop Oil Concentrate	4.5 AS 2.9 SL 3 CS 43.18 L 100 L 2 EC 100 L	AS SL CS L L EC L	1.13 lb ae/a 0.5 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v 0.156 lb ai/a 1 % v/v	21DAP B 21DAP B 21DAP B B B 35DAP C 35DAP C	B B B B B B B	81.3 cd	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2

## University of Delaware

Pest Code		C	GLXMA	AMBEL	C	GLXMA				
Crop Type, Code				C -						
Description			Soybean	C.ragwd		Soybean				
Rating Type			Stunting	Control		Stunting				
Rating Unit			%	%		%				
Rating Date		05/30/19		06/12/19		06/21/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
12	Zidua.....pyroxasulfone	85 WG	0.106 lb	ai/a	PRE	A		0.0 a	92.5 a	8.5 a
	Engenia.....dicamba	5 SL	0.5 lb	ae/a	PRE	A				
	Engenia.....dicamba	5 SL	0.5 lb	ae/a	21DAP	B				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	21DAP	B				
	Outlook.....dimethenamid-p	6 L	0.75 lb	ai/a	21DAP	B				
	Class Act Ridion	100 L	1 %	v/v	21DAP	B				
	Liberty 280....glufosinate	2.34 SL	0.585 lb	ai/a	35DAP	C				
	Dry Ammonium Sulfate	100 D	1.02 %	w/v	35DAP	C				
LSD P=.05					2.12	10.06	4.08			
Standard Deviation					1.47	6.97	2.84			
CV					504.98	11.94	71.29			
Replicate F					0.627	1.742	1.252			
Replicate Prob(F)					0.6026	0.1789	0.3067			
Treatment F					0.856	106.684	6.567			
Treatment Prob(F)					0.5895	0.0001	0.0001			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2

## University of Delaware

Pest Code		AMBEL						
Crop Type, Code		C -						
Description		C.ragwd						
Rating Type		Control						
Rating Unit		%						
Rating Date		06/21/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
12	Zidua.....pyroxasulfone	85 WG	0.106 lb	ai/a	PRE	A	99.0 a	
	Engenia.....dicamba	5 SL	0.5 lb	ae/a	PRE	A		
	Engenia.....dicamba	5 SL	0.5 lb	ae/a	21DAP	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	21DAP	B		
	Outlook.....dimethenamid-p	6 L	0.75 lb	ai/a	21DAP	B		
	Class Act Ridion	100 L	1 %	v/v	21DAP	B		
	Liberty 280....glufosinate	2.34 SL	0.585 lb	ai/a	35DAP	C		
	Dry Ammonium Sulfate	100 D	1.02 %	w/v	35DAP	C		
LSD P=.05							8.98	
Standard Deviation							6.24	
CV							7.08	
Replicate F							3.016	
Replicate Prob(F)							0.0437	
Treatment F							21.654	
Treatment Prob(F)							0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,2

Weed Control in Soybeans with Xtendimax System

Trial ID: Soy16-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy16-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Monsanto

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/17/19

Initiation Date: 03/01/19 Planned Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

C

**Site and Design**

Treated Plot Width: 6.67 FT

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 12

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Application Description**

	A	B
Application Date	05/17/19	
Appl. Stop Time	04:40 PM	
Application Method	SPRAY	
Application Timing	PRE	20-30DAP
Application Placement	BROADC	
Applied By	Johnson	
Appl. Entry Date	05/23/19	
Air Temperature Start, Stop	80 80 F	
% Relative Humidity Start, Stop	52 54	
Wind Velocity+Dir. Start	8 mph SW	
Wind Velocity+Dir. Stop	6 mph WSW	
Wind Velocity+Dir. Max	8 mph SW	
Wet Leaves (Y/N)	N no	
Soil Temperature	73 F	
Soil Moisture	NORMAL	
% Cloud Cover	57	
Moisture 6 Hours after Appl.	0 IN	
Weather Source	ITERIS	

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	
Equipment Type	TRMOSP	
Operation Pressure	40 psi	
Nozzle Type	AIRMIX	
Nozzle Size	11002	
Nozzle Spacing	20 in	
Boom Length	6.7 ft	
Boom Height	18 in	
Ground Speed	3 mph	
Carrier	WATER	
Application Amount	20 gal/ac	
Propellant	COMAIR	

Context	Date	By	Notes
STATUS	05/17/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

6/7: Deer damage present in all plots. Warrant treatments had slight drawstringing. All weeds present except horsetail, at extremely low densities, even in running checks.

Weed Control in Soybeans with Xtendimax System									
Trial ID: Soy16-19		Location: Field #16		Trial Year: 2019					
Protocol ID: Soy16-19		Investigator: Mark VanGessel							
Study Director:			Sponsor Contact: Monsanto						
Pest Code Description				AMAPA PalmerAm	IPOSS Mornglry	SOLCA Horsenetl			
Rating Type				CONTRO %	CONTRO %	CONTRO %			
Rating Unit				06/07/19	06/07/19	06/07/19			
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant Ultra Premix ----acetochlor ----fomesafen Intact Drift Retardant Class Act Ridion		3 CS 4 L 2.9 SL 4.5 AS 3.45 SC 2.82 0.6300001 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.35 lb ai/a 1.1 0.247 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	99.0 a	97.3 a	96.7 a
2	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		3 CS 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a	89.3 a	97.3 a
3	Fierce Premix ----flumioxazin ----pyroxasulfone Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		76 WG 33.5 42.5 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.143 lb ai/a 0.063 0.08 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a	97.3 a	98.3 a
4	Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a	95.3 a	70.0 a
5	Xtendimax.....dicamba Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		2.9 SL 51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.5 lb ae/a 0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a	96.0 a	96.7 a
6	Warrant Ultra Premix ----acetochlor ----fomesafen Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		3.45 SC 2.82 0.6300001 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.35 lb ai/a 1.1 0.247 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a	94.7 a	93.3 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Means followed by same letter(s) symbol is not significantly differ ( $P > 0.05$ , LSD).

Pest Code	Description	Rating Type	Rating Unit	Rating Date	DIGSA L.crbgrs CONTRO % 06/07/19		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
1	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant Ultra Premix ----acetochlor ----fomesafen Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3.45 SC 2.82 0.6300001 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.35 lb ai/a 1.1 0.247 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A A A A A A	20-30DAP B 20-30DAP B	98.0 a
2	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A A A A A A	20-30DAP B 20-30DAP B	98.0 a
3	Fierce Premix ----flumioxazin ----pyroxasulfone Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	76 WG 33.5 42.5 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.143 lb ai/a 0.063 0.08 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A A A A A A	20-30DAP B 20-30DAP B	100.0 a
4	Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A A A A A	20-30DAP B 20-30DAP B	96.7 a
5	Xtendimax.....dicamba Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	2.9 SL 51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.5 lb ae/a 0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A A A A A A	20-30DAP B 20-30DAP B	98.3 a
6	Warrant Ultra Premix ----acetochlor ----fomesafen Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3.45 SC 2.82 0.6300001 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.35 lb ai/a 1.1 0.247 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A A A A A A	20-30DAP B 20-30DAP B	99.0 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Description			AMAPA PalmerAm	IPOSS Mornlgy	SOLCA Horsenell			
Rating Type			CONTRO	CONTRO	CONTRO			
Rating Unit			%	%	%			
Rating Date			06/07/19	06/07/19	06/07/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit Timing			
7	Warrant.....acetochlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3 CS 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A B B B B B	100.0 a      	87.3 a      	87.0 a      
8	Warrant.....acetochlor Xtendimax.....dicamba Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3 CS 2.9 SL 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.5 lb ae/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B	100.0 a       	94.3 a       	97.3 a       
9	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Select Max.....clethodim Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3 CS 1 EC 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.0625 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B	100.0 a       	93.3 a       	63.3 a       
10	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Cobra.....lactofen Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3 CS 2 EC 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.156 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B	100.0 a       	91.7 a       	96.0 a       
11	Verdict Premix ----saflufenacil ----dimethenamid Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	5.57 EC 0.57 5 4.5 AS 5 SL 6 L 100 L	0.218 lb ai/a 0.0223 0.196 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A      	100.0 a      	90.0 a      	89.7 a      
12	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	4.09 SC 0.48 1.33 2.28 4.5 AS 5 SL 6 L 100 L	0.192 lb ai/a 0.0225 0.0624 0.107 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A        	100.0 a        	95.7 a        	92.7 a        
LSD P=.05						0.85	6.63	32.57
Standard Deviation						0.50	3.92	19.23
CV						0.5	4.19	21.41
Replicate F						1.000	4.742	2.368
Replicate Prob(F)						0.3840	0.0194	0.1171
Treatment F						1.000	2.077	1.062
Treatment Prob(F)						0.4767	0.0696	0.4319

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code	Description	Rating Type	Rating Unit	Rating Date	DIGSA L.crbgrs CONTRO % 06/07/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
7	Warrant.....acetochlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3 CS 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	98.3 a		
8	Warrant.....acetochlor Xtendimax.....dicamba Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3 CS 2.9 SL 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.5 lb ae/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	99.0 a		
9	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Select Max.....clethodim Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3 CS 1 EC 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.0625 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a		
10	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Cobra.....lactofen Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3 CS 2 EC 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.156 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a		
11	Verdict Premix ----saflufenacil ----dimethenamid Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	5.57 EC 0.57 5 4.5 AS 5 SL 6 L 100 L	0.218 lb ai/a 0.0223 0.196 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a		
12	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	4.09 SC 0.48 1.33 2.28 4.5 AS 5 SL 6 L 100 L	0.192 lb ai/a 0.0225 0.0624 0.107 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a		
LSD P=.05 Standard Deviation CV							3.22 1.90 1.92	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)							11.061 0.0005 1.000 0.4767	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Weed Control in Soybeans with Xtendimax System**

Trial ID: Soy16a-19

Location: Field #14

Trial Year: 2019

Protocol ID: Soy16-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Monsanto

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 06/21/19

Initiation Date: 03/01/19

Completion Date: 11/09/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 08/29/19

Variety: S43XS27

Attributes: Xtend

Planting Date: 07/01/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Planting Equipment: FE Field Equipment

Soil Temperature: 89 F

Seed Bed: MEDIUM medium

Emergence Date: 07/06/19

Soil Moisture: NORMAL normal, adequate

Harvest Date: 11/06/19

Harvest Equipment: Plot combine

% Standard Moisture: 13.0

Harvested Width: 7.5 FT

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory Entry Date: 08/29/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup>

Tillage Type: CONTIL conventional-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14C

% Sand: 79 % OM: 1.6 Texture: LS loamy sand

% Silt: 14 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: E excellent

Soil Drainage: G good

**Application Description**

	A	B
Application Date	07/03/19	07/25/19
Appl. Stop Time	10:05 AM	12:25 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	20-30DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	08/29/19	08/29/19
Air Temperature Start, Stop	85 85 F	85 85 F
% Relative Humidity Start, Stop	63 63	46 46
Wind Velocity+Dir. Start	2 mph	3 mph
Wind Velocity+Dir. Stop	2 mph	3 mph
Wind Velocity+Dir. Max	2 mph	3 mph
Wet Leaves (Y/N)	N no	N no
Soil Temperature	84 F	85 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	0	29
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	0.53 IN	0.31 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-3	19
Stage Majority, Percent		V3 100
Height Average		8 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		veg 85
Stage Minimum, Percent		veg 85
Stage Maximum, Percent		run 15
Height Average		5 in
Height Minimum, Maximum		4 6
Density Average		2 m2
Density Min, Max		0 5

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	26 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	06/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	08/01/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

## Trial Comments

08/01/19: No weeds present in plots.

## Weed Control in Soybeans with Xtendimax System

Trial ID: Soy16a-19

Location: Field #14

Trial Year: 2019

Protocol ID: Soy16-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Monsanto

Pest Code Crop Type, Code		AMAPA C -	IPOHE C -	DIGSA C -					
Description		PalmerAm	IvylfMgy	L.crbgrs					
Rating Type		Control %	Control %	Control %					
Rating Unit		07/22/19	07/22/19	07/22/19					
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
1	Warrant.....acetochlor		3 CS	1.13 lb ai/a	PRE	A			
	Mauler.....metribuzin		4 L	0.25 lb ai/a	PRE	A			
	Xtendimax.....dicamba		2.9 SL	0.5 lb ae/a	20-30DAP	B			
	Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	20-30DAP	B			
	Warrant Ultra Premix		3.45 SC	1.35 lb ai/a	20-30DAP	B			
	----acetochlor		2.82	1.1					
	----fomesafen	0.6300001		0.247					
	Intact Drift Retardant		43.18 L	0.5 % v/v	20-30DAP	B			
	Class Act Ridion		100 L	1 % v/v	20-30DAP	B			
2	Warrant.....acetochlor		3 CS	1.13 lb ai/a	PRE	A			
	Mauler.....metribuzin		4 L	0.25 lb ai/a	PRE	A			
	Xtendimax.....dicamba		2.9 SL	0.5 lb ae/a	20-30DAP	B			
	Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	20-30DAP	B			
	Warrant.....acetochlor		3 CS	1.13 lb ai/a	20-30DAP	B			
	Intact Drift Retardant		43.18 L	0.5 % v/v	20-30DAP	B			
	Class Act Ridion		100 L	1 % v/v	20-30DAP	B			
3	Fierce Premix		76 WG	0.143 lb ai/a	PRE	A			
	----flumioxazin		33.5	0.063					
	----pyroxasulfone		42.5	0.08					
	Mauler.....metribuzin		4 L	0.25 lb ai/a	PRE	A			
	Xtendimax.....dicamba		2.9 SL	0.5 lb ae/a	20-30DAP	B			
	Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	20-30DAP	B			
	Warrant.....acetochlor		3 CS	1.13 lb ai/a	20-30DAP	B			
	Intact Drift Retardant		43.18 L	0.5 % v/v	20-30DAP	B			
	Class Act Ridion		100 L	1 % v/v	20-30DAP	B			
4	Valor SX.....flumioxazin		51 WG	0.064 lb ai/a	PRE	A			
	Xtendimax.....dicamba		2.9 SL	0.5 lb ae/a	20-30DAP	B			
	Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	20-30DAP	B			
	Warrant.....acetochlor		3 CS	1.13 lb ai/a	20-30DAP	B			
	Intact Drift Retardant		43.18 L	0.5 % v/v	20-30DAP	B			
	Class Act Ridion		100 L	1 % v/v	20-30DAP	B			
5	Xtendimax.....dicamba		2.9 SL	0.5 lb ae/a	PRE	A			
	Valor SX.....flumioxazin		51 WG	0.064 lb ai/a	PRE	A			
	Xtendimax.....dicamba		2.9 SL	0.5 lb ae/a	20-30DAP	B			
	Roundup PowerMax..glyphosate		4.5 AS	1.13 lb ae/a	20-30DAP	B			
	Warrant.....acetochlor		3 CS	1.13 lb ai/a	20-30DAP	B			
	Intact Drift Retardant		43.18 L	0.5 % v/v	20-30DAP	B			
	Class Act Ridion		100 L	1 % v/v	20-30DAP	B			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

Pest Code Crop Type, Code			PANDI C - C	GLXMA	C GLXMA				
Description		F.panicm	Soybean	Soybean					
Rating Type		Control %	DrawStrng %	LeafBurn %					
Rating Unit		07/22/19	08/01/19	08/01/19					
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
1	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant Ultra Premix ----acetochlor ----fomesafen Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3.45 SC 2.82 0.6300001 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.35 lb ai/a 1.1 0.247 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 1 20-30DAP B 20-30DAP B	A A B B B B B B B	98.3 a	20.0 a	15.0 b	
2	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B	97.3 a	0.0 c	0.0 d	
3	Fierce Premix ----flumioxazin ----pyroxasulfone Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	76 WG 33.5 42.5 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.143 lb ai/a 0.063 0.08 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B B B	98.3 a	0.0 c	0.0 d	
4	Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A B B B B B	66.3 a	0.0 c	0.0 d	
5	Xtendimax.....dicamba Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	2.9 SL 51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.5 lb ae/a 0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B	96.0 a	0.0 c	0.0 d	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

Pest Code Crop Type, Code		C GLXMA	C GLXMA	AMAPA C -				
Description	Soybean	Soybean	PalmerAm					
Rating Type	Stunting %	Stunting %	Control %					
Rating Unit	08/01/19	08/08/19	08/08/19					
Rating Date								
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1 Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant Ultra Premix ----acetochlor ----fomesafen	3 CS 4 L 2.9 SL 4.5 AS 3.45 SC 2.82 0.6300001	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.35 lb ai/a 1.1 0.247	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B	10.0 a	3.3 a	100.0 a	
Intact Drift Retardant Class Act Ridion	43.18 L 100 L	0.5 % v/v 1 % v/v	20-30DAP B 20-30DAP B					
2 Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B	0.0 a	0.0 a	100.0 a	
3 Fierce Premix ----flumioxazin ----pyroxasulfone Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	76 WG 33.5 42.5 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.143 lb ai/a 0.063 0.08 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B B B	1.0 a	0.0 a	100.0 a	
4 Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A B B B B B	0.0 a	0.0 a	100.0 a	
5 Xtendimax.....dicamba Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	2.9 SL 51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.5 lb ae/a 0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A B B B B B	0.0 a	0.0 a	100.0 a	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS C -	DIGSA C -	PANDI C -	
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code		
1	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant Ultra Premix ----acetochlor ----fomesafen Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3.45 SC 2.82 0.6300001 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.35 lb ai/a 1.1 0.247 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A	100.0 a	100.0 a	100.0 a
2	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	3 CS 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A	100.0 a	100.0 a	100.0 a
3	Fierce Premix ----flumioxazin ----pyroxasulfone Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	76 WG 33.5 42.5 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.143 lb ai/a 0.063 0.08 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a	100.0 a	100.0 a
4	Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	98.3 a	100.0 a	100.0 a
5	Xtendimax.....dicamba Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion	2.9 SL 51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.5 lb ae/a 0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a	100.0 a	100.0 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

Pest Code Crop Type, Code		C GLXMA						
Description		Soybean						
Rating Type		Yield						
Rating Unit		Bu/A						
Rating Date		11/06/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
1	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant Ultra Premix ----acetochlor ----fomesafen Intact Drift Retardant Class Act Ridion		3 CS 4 L 2.9 SL 4.5 AS 3.45 SC 2.82 0.6300001 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.35 lb ai/a 1.1 0.247 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A	20.7 a	
2	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		3 CS 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A A	26.8 a	
3	Fierce Premix ----flumioxazin ----pyroxasulfone Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		76 WG 33.5 42.5 4 L 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.143 lb ai/a 0.063 0.08 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	21.7 a	
4	Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	24.8 a	
5	Xtendimax.....dicamba Valor SX.....flumioxazin Xtendimax.....dicamba Roundup PowerMax..glyphosate Warrant.....acetochlor Intact Drift Retardant Class Act Ridion		2.9 SL 51 WG 2.9 SL 4.5 AS 3 CS 43.18 L 100 L	0.5 lb ae/a 0.064 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 1.13 lb ai/a 0.5 % v/v 1 % v/v	PRE PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	22.1 a	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

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Pest Code				AMAPA C -	IPOHE C -	DIGSA C -				
Crop Type, Code				PalmerAm	IvylfMgy	L.crbgrs				
Description				Control %	Control %	Control %				
Rating Type				07/22/19	07/22/19	07/22/19				
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
6	Warrant Ultra Premix ----acetochlor ----fomesafen	3.45 SC 2.82 0.6300001	SC	1.35 lb ai/a 1.1 0.247	PRE	A	100.0 a	0.0 c	100.0 a	
	Xtendimax.....dicamba	2.9 SL	SL	0.5 lb ae/a	20-30DAP	B				
	Roundup PowerMax..glyphosate	4.5 AS	AS	1.13 lb ae/a	20-30DAP	B				
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
7	Warrant.....acetochlor Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 2.9 SL 4.5 AS	CS	1.13 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE	A	100.0 a	0.0 c	98.3 a	
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
8	Warrant.....acetochlor Xtendimax.....dicamba Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 2.9 SL 2.9 SL 4.5 AS	CS	1.13 lb ai/a 0.5 lb ae/a 0.5 lb ae/a 1.13 lb ae/a	PRE	A	100.0 a	83.3 a	98.3 a	
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
9	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 4 L 2.9 SL 4.5 AS	CS	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE	A	100.0 a	0.0 c	99.0 a	
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Select Max.....clethodim	1 EC	EC	0.0625 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
10	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 4 L 2.9 SL 4.5 AS	CS	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE	A	100.0 a	0.0 c	100.0 a	
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Cobra.....lactofen	2 EC	EC	0.156 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
11	Verdict Premix ----saflufenacil ----dimethenamid	5.57 EC 0.57 5	EC	0.218 lb ai/a 0.0223 0.196	PRE	A	100.0 a	36.7 b	98.3 a	
	Roundup PowerMax..glyphosate	4.5 AS	AS	1.13 lb ae/a	20-30DAP	B				
	Engenia.....dicamba	5 SL	SL	0.5 lb ae/a	20-30DAP	B				
	Outlook.....dimethenamid-p	6 L	L	0.75 lb ai/a	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code			PANDI C - C	GLXMA	C GLXMA				
Description		F.panicm	Soybean	Soybean					
Rating Type		Control %	DrawStrng %	LeafBurn %					
Rating Unit		07/22/19	08/01/19	08/01/19					
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
6	Warrant Ultra Premix ----acetochlor ----fomesafen	3.45 SC 2.82 0.6300001	1.35 lb ai/a 1.1 0.247	PRE	A	96.3 a	0.0 c	0.0 d	
	Xtendimax.....dicamba Roundup PowerMax..glyphosate	2.9 SL 4.5 AS	0.5 lb ae/a 1.13 lb ae/a	20-30DAP B					
	Warrant.....acetochlor Intact Drift Retardant	3 CS 43.18 L	1.13 lb ai/a 0.5 % v/v	20-30DAP B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP B					
7	Warrant.....acetochlor Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 2.9 SL 4.5 AS	1.13 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	20-30DAP B		97.3 a	0.0 c	0.0 d	
	Warrant.....acetochlor Intact Drift Retardant	3 CS 43.18 L	1.13 lb ai/a 0.5 % v/v	20-30DAP B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP B					
8	Warrant.....acetochlor Xtendimax.....dicamba Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 2.9 SL 2.9 SL 4.5 AS	1.13 lb ai/a 0.5 lb ae/a 0.5 lb ae/a 1.13 lb ae/a	PRE	A	94.0 a	0.0 c	0.0 d	
	Warrant.....acetochlor Intact Drift Retardant	3 CS 43.18 L	1.13 lb ai/a 0.5 % v/v	20-30DAP B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP B					
9	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 4 L 2.9 SL 4.5 AS	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE	A	97.3 a	0.0 c	1.0 c	
	Warrant.....acetochlor Select Max.....clethodim	3 CS 1 EC	1.13 lb ai/a 0.0625 lb ai/a	20-30DAP B					
	Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP B					
10	Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 4 L 2.9 SL 4.5 AS	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE	A	97.0 a	11.7 b	35.0 a	
	Warrant.....acetochlor Cobra.....lactofen	3 CS 2 EC	1.13 lb ai/a 0.156 lb ai/a	20-30DAP B					
	Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP B					
11	Verdict Premix ----saflufenacil ----dimethenamid	5.57 EC 0.57 5	0.218 lb ai/a 0.0223 0.196	PRE	A	95.0 a	4.7 c	0.0 d	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	20-30DAP B					
	Engenia.....dicamba	5 SL	0.5 lb ae/a	20-30DAP B					
	Outlook.....dimethenamid-p	6 L	0.75 lb ai/a	20-30DAP B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP B					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	C GLXMA	AMAPA C -						
Description		Soybean	Soybean	PalmerAm						
Rating Type		Stunting %	Stunting %	Control %						
Rating Unit										
Rating Date		08/01/19	08/08/19	08/08/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
6	Warrant Ultra Premix ----acetochlor ----fomesafen	3.45 SC 2.82 0.6300001	SC	1.35 lb ai/a 1.1 0.247	PRE	A		3.3 a	0.0 a	100.0 a
	Xtendimax.....dicamba	2.9 SL	SL	0.5 lb ae/a	20-30DAP	B				
	Roundup PowerMax..glyphosate	4.5 AS	AS	1.13 lb ae/a	20-30DAP	B				
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
7	Warrant.....acetochlor Xtendimax.....dicamba	3 CS 2.9 SL	CS	1.13 lb ai/a 0.5 lb ae/a	PRE	A	3.3 a	1.0 a	100.0 a	
	Roundup PowerMax..glyphosate	4.5 AS	AS	1.13 lb ae/a	20-30DAP	B				
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
8	Warrant.....acetochlor Xtendimax.....dicamba	3 CS 2.9 SL	CS	1.13 lb ai/a 0.5 lb ae/a	PRE	A	0.0 a	0.0 a	100.0 a	
	Xtendimax.....dicamba	2.9 SL	SL	0.5 lb ae/a	20-30DAP	B				
	Roundup PowerMax..glyphosate	4.5 AS	AS	1.13 lb ae/a	20-30DAP	B				
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
9	Warrant.....acetochlor Mauler.....metribuzin	3 CS 4 L	CS	1.13 lb ai/a 0.25 lb ai/a	PRE	A	1.7 a	1.0 a	100.0 a	
	Xtendimax.....dicamba	2.9 SL	SL	0.5 lb ae/a	20-30DAP	B				
	Roundup PowerMax..glyphosate	4.5 AS	AS	1.13 lb ae/a	20-30DAP	B				
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Select Max.....clethodim	1 EC	EC	0.0625 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
10	Warrant.....acetochlor Mauler.....metribuzin	3 CS 4 L	CS	1.13 lb ai/a 0.25 lb ai/a	PRE	A	0.0 a	2.7 a	100.0 a	
	Xtendimax.....dicamba	2.9 SL	SL	0.5 lb ae/a	20-30DAP	B				
	Roundup PowerMax..glyphosate	4.5 AS	AS	1.13 lb ae/a	20-30DAP	B				
	Warrant.....acetochlor	3 CS	CS	1.13 lb ai/a	20-30DAP	B				
	Cobra.....lactofen	2 EC	EC	0.156 lb ai/a	20-30DAP	B				
	Intact Drift Retardant	43.18 L	L	0.5 % v/v	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				
11	Verdict Premix ----saflufenacil ----dimethenamid	5.57 EC 0.57 5	EC	0.218 lb ai/a 0.0223 0.196	PRE	A	1.7 a	2.0 a	100.0 a	
	Roundup PowerMax..glyphosate	4.5 AS	AS	1.13 lb ae/a	20-30DAP	B				
	Engenia.....dicamba	5 SL	SL	0.5 lb ae/a	20-30DAP	B				
	Outlook.....dimethenamid-p	6 L	L	0.75 lb ai/a	20-30DAP	B				
	Class Act Ridion	100 L	L	1 % v/v	20-30DAP	B				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		IPOSS C -	DIGSA C -	PANDI C -						
Description	Mornglry Control %	L.crbgrs Control %	F.panicm Control %							
Rating Type	08/08/19	08/08/19	08/08/19							
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
6	Warrant Ultra Premix ----acetochlor ----fomesafen	3.45 SC 2.82 0.6300001	1.35 lb ai/a 1.1 0.247	PRE	A	100.0 a	100.0 a	100.0 a		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	20-30DAP	B					
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	20-30DAP	B					
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	20-30DAP	B					
	Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP	B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP	B					
7	Warrant.....acetochlor Xtendimax.....dicamba	3 CS 2.9 SL	1.13 lb ai/a 0.5 lb ae/a	PRE	A	100.0 a	100.0 a	100.0 a		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	20-30DAP	B					
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	20-30DAP	B					
	Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP	B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP	B					
8	Warrant.....acetochlor Xtendimax.....dicamba Xtendimax.....dicamba	3 CS 2.9 SL 2.9 SL	1.13 lb ai/a 0.5 lb ae/a 0.5 lb ae/a	PRE	A	97.3 a	100.0 a	100.0 a		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	20-30DAP	B					
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	20-30DAP	B					
	Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP	B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP	B					
9	Warrant.....acetochlor Mauler.....metribuzin	3 CS 4 L	1.13 lb ai/a 0.25 lb ai/a	PRE	A	100.0 a	100.0 a	100.0 a		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	20-30DAP	B					
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	20-30DAP	B					
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	20-30DAP	B					
	Select Max.....clethodim	1 EC	0.0625 lb ai/a	20-30DAP	B					
	Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP	B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP	B					
10	Warrant.....acetochlor Mauler.....metribuzin	3 CS 4 L	1.13 lb ai/a 0.25 lb ai/a	PRE	A	100.0 a	100.0 a	100.0 a		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	20-30DAP	B					
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	20-30DAP	B					
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	20-30DAP	B					
	Cobra.....lactofen	2 EC	0.156 lb ai/a	20-30DAP	B					
	Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP	B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP	B					
11	Verdict Premix ----saflufenacil	5.57 EC 0.57	0.218 lb ai/a 0.0223	PRE	A	100.0 a	100.0 a	100.0 a		
	----dimethenamid	5	0.196							
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	20-30DAP	B					
	Engenia.....dicamba	5 SL	0.5 lb ae/a	20-30DAP	B					
	Outlook.....dimethenamid-p	6 L	0.75 lb ai/a	20-30DAP	B					
	Class Act Ridion	100 L	1 % v/v	20-30DAP	B					

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA				
Description		Soybean Yield Bu/A				
Rating Type						
Rating Unit						
Rating Date		11/06/19				
Trt Treatment No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code	
6 Warrant Ultra Premix ----acetochlor ----fomesafen	3.45 SC 2.82 0.6300001	1.35 lb ai/a 1.1 0.247	PRE	A	30.2 a	
Xtendimax.....dicamba Roundup PowerMax..glyphosate	2.9 SL 4.5 AS	0.5 lb ae/a 1.13 lb ae/a	20-30DAP B			
Warrant.....acetochlor Intact Drift Retardant	3 CS 43.18 L	1.13 lb ai/a 0.5 % v/v	20-30DAP B			
Class Act Ridion	100 L	1 % v/v	20-30DAP B			
7 Warrant.....acetochlor Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 2.9 SL 4.5 AS	1.13 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE 20-30DAP B	A	21.3 a	
Warrant.....acetochlor Intact Drift Retardant	3 CS 43.18 L	1.13 lb ai/a 0.5 % v/v	20-30DAP B			
Class Act Ridion	100 L	1 % v/v	20-30DAP B			
8 Warrant.....acetochlor Xtendimax.....dicamba Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 2.9 SL 2.9 SL 4.5 AS	1.13 lb ai/a 0.5 lb ae/a 0.5 lb ae/a 1.13 lb ae/a	PRE 20-30DAP B	A	23.8 a	
Warrant.....acetochlor Intact Drift Retardant	3 CS 43.18 L	1.13 lb ai/a 0.5 % v/v	20-30DAP B			
Class Act Ridion	100 L	1 % v/v	20-30DAP B			
9 Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 4 L 2.9 SL 4.5 AS	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE 20-30DAP B	A	24.2 a	
Warrant.....acetochlor Select Max.....clethodim	3 CS 1 EC	1.13 lb ai/a 0.0625 lb ai/a	20-30DAP B			
Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP B			
Class Act Ridion	100 L	1 % v/v	20-30DAP B			
10 Warrant.....acetochlor Mauler.....metribuzin Xtendimax.....dicamba Roundup PowerMax..glyphosate	3 CS 4 L 2.9 SL 4.5 AS	1.13 lb ai/a 0.25 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE 20-30DAP B	A	26.0 a	
Warrant.....acetochlor Cobra.....lactofen	3 CS 2 EC	1.13 lb ai/a 0.156 lb ai/a	20-30DAP B			
Intact Drift Retardant	43.18 L	0.5 % v/v	20-30DAP B			
Class Act Ridion	100 L	1 % v/v	20-30DAP B			
11 Verdict Premix ----saflufenacil ----dimethenamid	5.57 EC 0.57 5	0.218 lb ai/a 0.0223 0.196	PRE	A	29.1 a	
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	20-30DAP B			
Engenia.....dicamba	5 SL	0.5 lb ae/a	20-30DAP B			
Outlook.....dimethenamid-p	6 L	0.75 lb ai/a	20-30DAP B			
Class Act Ridion	100 L	1 % v/v	20-30DAP B			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA	IPOHE	DIGSA						
Crop Type, Code		C -	C -	C -						
Description		PalmerAm	IvylfMgy	L.crbgrs						
Rating Type		Control	Control	Control						
Rating Unit	%	%	%	%						
Rating Date	07/22/19	07/22/19	07/22/19	07/22/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
12	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	4.09 0.48 1.33 2.28 4.5 AS 5 SL 6 L 100 L	SC 0.0225 0.0624 0.107 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	0.192 lb ai/a 0.0225 0.0624 0.107 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	100.0 a	16.7 bc	100.0 a	
LSD P=.05							.	26.06	2.92	
Standard Deviation							0.00	15.39	1.72	
CV							0.0	68.41	1.75	
Replicate F							0.000	3.596	19.444	
Replicate Prob(F)							1.0000	0.0445	0.0001	
Treatment F							0.000	14.737	1.283	
Treatment Prob(F)							1.0000	0.0001	0.2964	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

## University of Delaware

Pest Code		PANDI								
Crop Type, Code		C -	GLXMA	C GLXMA						
Description		F.panicm	Soybean	Soybean						
Rating Type		Control	DrawStrng	LeafBurn						
Rating Unit	%	07/22/19	%	%						
Rating Date			08/01/19	08/01/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
12	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	4.09 0.48 1.33 2.28 4.5 AS 5 SL 6 L 100 L	SC 0.0225 0.0624 0.107 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	0.192 lb ai/a 0.192 lb ai/a 0.192 lb ai/a 0.192 lb ai/a 0.192 lb ai/a	PRE 0.192 0.192 0.192 0.192 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	95.7 a	5.0 c	0.0 d	
LSD P=.05							25.03	5.43	0.85	
Standard Deviation							14.78	3.21	0.50	
CV							15.71	93.18	11.76	
Replicate F							1.300	1.588	1.000	
Replicate Prob(F)							0.2926	0.2268	0.3840	
Treatment F							1.071	11.664	1346.455	
Treatment Prob(F)							0.4252	0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	C GLXMA	AMAPA C -				
Description		Soybean	Soybean	PalmerAm				
Rating Type		Stunting %	Stunting %	Control %				
Rating Unit								
Rating Date		08/01/19	08/08/19	08/08/19				
Trt No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
12 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	4.09 SC 0.48 1.33 2.28 4.5 AS 5 SL 6 L 100 L	0.192 lb ai/a 0.0225 0.0624 0.107 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A	0.0 a	0.0 a	100.0 a	
LSD P=.05 Standard Deviation CV					9.87 5.83 333.2	3.54 2.09 250.89	. 0.00 0.0	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					0.363 0.6998 0.738 0.6926	0.133 0.8758 0.991 0.4832	0.000 1.0000 0.000 1.0000	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		IPOSS C -	DIGSA C -	PANDI C -
Description	Mornglry			
Rating Type	Control			
Rating Unit	%			
Rating Date	08/08/19	08/08/19	08/08/19	08/08/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing
12 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	4.09 SC 0.48 1.33 2.28 4.5 AS 5 SL 6 L 100 L	0.192 lb ai/a 0.0225 0.0624 0.107 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v	PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B	A
LSD P=.05		2.72		
Standard Deviation		1.60	0.00	0.00
CV		1.61	0.0	0.0
Replicate F		0.529	0.000	0.000
Replicate Prob(F)		0.5965	1.0000	1.0000
Treatment F		0.882	0.000	0.000
Treatment Prob(F)		0.5698	1.0000	1.0000

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

Pest Code	C	GLXMA				
Crop Type, Code						
Description						
Rating Type						
Rating Unit						
Rating Date		11/06/19				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
12 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Engenia.....dicamba Outlook.....dimethenamid-p Class Act Ridion	4.09 0.48 1.33 2.28 4.5 AS 5 SL 6 L 100 L	SC 0.0225 0.0624 0.107 1.13 lb ae/a 0.5 lb ae/a 0.75 lb ai/a 1 % v/v		PRE 20-30DAP B 20-30DAP B 20-30DAP B 20-30DAP B		A
LSD P=.05						31.2 a
Standard Deviation						8.08
CV						4.77
Replicate F						18.96
Replicate Prob(F)						34.322
Treatment F						0.0001
Treatment Prob(F)						1.670
						0.1474

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,9,11,12 because error mean square = 0.

Authority Brands and Anthem Max in Xtend Soybeans

Trial ID: Soy17-19

Location: Field #16

Trial Year: 2019

Protocol ID: Soy17-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: FMC

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/20/19

Initiation Date: 03/01/19

Completion Date: 11/09/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max	Soybean	BBCH Scale: BSOY
Entry Date: 11/15/19		
Variety: S43XS27		
Attributes: Xtend		
Planting Date: 05/16/19	Planting Rate: 180000	S/A
Depth: 1 IN		
Rows per Plot: 7	Planting Method: PLANTD	planted
Row Spacing: 15 IN	Planting Equipment: FE	Field Equipment
Soil Temperature: 74 F	Seed Bed: MEDTRA	medium/trashy
Emergence Date: 05/23/19	Soil Moisture: NORMAL	normal, adequate
Harvest Date: 11/05/19	Harvest Equipment: Plot combine	
% Standard Moisture: 13.0	Harvested Width: 6.25 FT	
	Harvested Length: 25 FT	

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory Entry Date: 12/12/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup>

Treatments: 9 Tillage Type: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 16B

% Sand: 77 % OM: 1.4 Texture: SL sandy loam

% Silt: 12 pH: 6.6 Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11 CEC: 4.8 Fert. Level: F fair

Soil Drainage: F fair

**Application Description**

	A	B
Application Date	05/21/19	06/06/19
Appl. Stop Time	10:20 AM	12:20 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	21DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/22/19	12/12/19
Air Temperature Start, Stop	66 66 F	81 81 F
% Relative Humidity Start, Stop	50 50	63 63
Wind Velocity+Dir. Start	12 mph NNW	6 mph NNW
Wind Velocity+Dir. Stop	12 mph NNW	6 mph NNW
Wind Velocity+Dir. Max	12 mph NNW	6 mph NNW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	73 F	82 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	4	63
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.68 IN	1.9 IN
Weather Source	ITERIS	ITERIS

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-2	14
Stage Majority, Percent		V2 100
Height Average		5 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		cot 60
Stage Minimum, Percent		cot 60
Stage Maximum, Percent		1-leaf 40
Height Average		1.25 in
Height Minimum, Maximum		1 1.5
Density Average		1 plot
Density Min, Max		0 8

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	20 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/20/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/22/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Initiation Date entered.

**Trial Comments**

05/28/19: No weeds present at time of rating.

06/04/19: No stunting, but poor emergence in plot 201, 204, 205, 206, and 309. Insect damage in every plot. Deer damage in every plot but more severe in plot 106, 209, 303. Weed densities not high enough for control ratings.

06/11/19: No SETFA present in any plots.

Authority Brands and Anthem Max in Xtend Soybeans						
Trial ID: Soy17-19		Location: Field #16		Trial Year: 2019		
Protocol ID: Soy17-19		Investigator: Mark VanGessel				
Study Director:						
Sponsor Contact: FMC						
Pest Code						IPOSS
Crop Type, Code						C -
Description						Soybean
Rating Type						Morngly
Rating Unit						Plants/plot
Rating Date						%
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
						Code
1	VHP58-R002	4.25 SC	0.232 lb	ai/a	PRE	A
	Dual II Magnum..s-metolachlor	7.64 E	0.955 lb	ai/a	21DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb	ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	21DAP	B
	Intact Drift Retardant	43.18 L	0.5 %	v/v	21DAP	B
2	VHP58-R002	4.25 SC	0.3 lb	ai/a	PRE	A
	Dual II Magnum..s-metolachlor	7.64 E	0.955 lb	ai/a	21DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb	ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	21DAP	B
	Intact Drift Retardant	43.18 L	0.5 %	v/v	21DAP	B
3	Authority Elite Premix	7 EC	1.42 lb	ai/a	PRE	A
	----sulfentrazone	0.7	0.142			
	----s-metolachlor	6.3	1.28			
	Anthem Maxx Premix	4.3 SC	0.109 lb	ai/a	21DAP	B
	----pyroxasulfone	4.174	0.106			
	----fluthiacet	0.126	0.0032			
	Xtendimax.....dicamba	2.9 SL	0.5 lb	ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	21DAP	B
	Intact Drift Retardant	43.18 L	0.5 %	v/v	21DAP	B
4	Authority Supreme Premix	4.16 SC	0.208 lb	ai/a	PRE	A
	----sulfentrazone	2.08	0.104			
	----pyroxasulfone	2.08	0.104			
	Dual II Magnum..s-metolachlor	7.64 E	0.955 lb	ai/a	21DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb	ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	21DAP	B
	Intact Drift Retardant	43.18 L	0.5 %	v/v	21DAP	B
5	Anthem Maxx Premix	4.3 SC	0.109 lb	ai/a	PRE	A
	----pyroxasulfone	4.174	0.106			
	----fluthiacet	0.126	0.0032			
	Metribuzin.....metribuzin	75 DF	0.188 lb	ai/a	PRE	A
	Dual II Magnum..s-metolachlor	7.64 E	0.955 lb	ai/a	21DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb	ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	21DAP	B
	Intact Drift Retardant	43.18 L	0.5 %	v/v	21DAP	B
6	Valor SX.....flumioxazin	51 WG	0.064 lb	ai/a	PRE	A
	Warrant.....acetochlor	3 CS	1.13 lb	ai/a	21DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb	ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	21DAP	B
	Intact Drift Retardant	43.18 L	0.5 %	v/v	21DAP	B

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code Crop Type, Code		C GLXMA	IPOSS C - Soybean Stunting Plants/plot	SETFA C - morngly Plants/plot
Description Rating Type		% 06/11/19	% 06/11/19	06/04/19
Rating Unit Rating Date				
Trt No. Treatment Name	Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code
1 VHP58-R002	4.25 SC	0.232 lb ai/a	PRE	A
Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	21DAP	B
Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B
Intact Drift Retardant	43.18 L	0.5 % v/v	21DAP	B
2 VHP58-R002	4.25 SC	0.3 lb ai/a	PRE	A
Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	21DAP	B
Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B
Intact Drift Retardant	43.18 L	0.5 % v/v	21DAP	B
3 Authority Elite Premix	7 EC	1.42 lb ai/a	PRE	A
----sulfentrazone	0.7	0.142		
----s-metolachlor	6.3	1.28		
Anthem Maxx Premix	4.3 SC	0.109 lb ai/a	21DAP	B
----pyroxasulfone	4.174	0.106		
----fluthiacet	0.126	0.0032		
Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B
Intact Drift Retardant	43.18 L	0.5 % v/v	21DAP	B
4 Authority Supreme Premix	4.16 SC	0.208 lb ai/a	PRE	A
----sulfentrazone	2.08	0.104		
----pyroxasulfone	2.08	0.104		
Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	21DAP	B
Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B
Intact Drift Retardant	43.18 L	0.5 % v/v	21DAP	B
5 Anthem Maxx Premix	4.3 SC	0.109 lb ai/a	PRE	A
----pyroxasulfone	4.174	0.106		
----fluthiacet	0.126	0.0032		
Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A
Dual II Magnum..s-metolachlor	7.64 E	0.955 lb ai/a	21DAP	B
Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B
Intact Drift Retardant	43.18 L	0.5 % v/v	21DAP	B
6 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A
Warrant.....acetochlor	3 CS	1.13 lb ai/a	21DAP	B
Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B
Intact Drift Retardant	43.18 L	0.5 % v/v	21DAP	B

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code Crop Type, Code		C GLXMA					
Description		Soybean					
Rating Type		Yield					
Rating Unit		Bu/A					
Rating Date		11/05/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	VHP58-R002	4.25	SC	0.232	lb ai/a	PRE	A
	Dual II Magnum..s-metolachlor	7.64	E	0.955	lb ai/a	21DAP	B
	Xtendimax.....dicamba	2.9	SL	0.5	lb ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	21DAP	B
	Intact Drift Retardant	43.18	L	0.5	% v/v	21DAP	B
2	VHP58-R002	4.25	SC	0.3	lb ai/a	PRE	A
	Dual II Magnum..s-metolachlor	7.64	E	0.955	lb ai/a	21DAP	B
	Xtendimax.....dicamba	2.9	SL	0.5	lb ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	21DAP	B
	Intact Drift Retardant	43.18	L	0.5	% v/v	21DAP	B
3	Authority Elite Premix	7	EC	1.42	lb ai/a	PRE	A
	----sulfentrazone	0.7		0.142			
	----s-metolachlor	6.3		1.28			
	Anthem Maxx Premix	4.3	SC	0.109	lb ai/a	21DAP	B
	----pyroxasulfone	4.174		0.106			
	----fluthiacet	0.126		0.0032			
	Xtendimax.....dicamba	2.9	SL	0.5	lb ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	21DAP	B
	Intact Drift Retardant	43.18	L	0.5	% v/v	21DAP	B
4	Authority Supreme Premix	4.16	SC	0.208	lb ai/a	PRE	A
	----sulfentrazone	2.08		0.104			
	----pyroxasulfone	2.08		0.104			
	Dual II Magnum..s-metolachlor	7.64	E	0.955	lb ai/a	21DAP	B
	Xtendimax.....dicamba	2.9	SL	0.5	lb ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	21DAP	B
	Intact Drift Retardant	43.18	L	0.5	% v/v	21DAP	B
5	Anthem Maxx Premix	4.3	SC	0.109	lb ai/a	PRE	A
	----pyroxasulfone	4.174		0.106			
	----fluthiacet	0.126		0.0032			
	Metribuzin.....metribuzin	75	DF	0.188	lb ai/a	PRE	A
	Dual II Magnum..s-metolachlor	7.64	E	0.955	lb ai/a	21DAP	B
	Xtendimax.....dicamba	2.9	SL	0.5	lb ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	21DAP	B
	Intact Drift Retardant	43.18	L	0.5	% v/v	21DAP	B
6	Valor SX.....flumioxazin	51	WG	0.064	lb ai/a	PRE	A
	Warrant.....acetochlor	3	CS	1.13	lb ai/a	21DAP	B
	Xtendimax.....dicamba	2.9	SL	0.5	lb ae/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	21DAP	B
	Intact Drift Retardant	43.18	L	0.5	% v/v	21DAP	B

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	IPOSS C -	SETFA C -				
Description	Soybean Stunting	Mornlry Plants/plot	G.foxtl Plants/plot					
Rating Type	%	%	%					
Rating Unit								
Rating Date	06/04/19	06/04/19	06/04/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
7	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Outlook.....dimethenamid-p Engenia.....dicamba Roundup PowerMax..glyphosate Intact Drift Retardant	4.09 0.48 1.33 2.28 6 L 5 SL 4.5 AS 43.18 L	SC 0.192 lb ai/a 0.0225 0.0624 0.107 0.56 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.5 % v/v	lb ai/a 0.0225 0.0624 0.107 21DAP B 21DAP B 21DAP B 21DAP B	PRE A	2.0 b	0.0 a	0.0 a
8	Fierce Premix ----flumioxazin ----pyroxasulfone Dual II Magnum..s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Intact Drift Retardant	76 WG 33.5 42.5 7.64 E 2.9 SL 4.5 AS 43.18 L	0.143 lb ai/a 0.063 0.08 0.955 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.5 % v/v	lb ai/a 0.063 0.08 21DAP B 21DAP B 21DAP B 21DAP B	PRE A	13.3 a	0.0 a	0.0 a
9	Boundary Premix ----s-metolachlor ----metribuzin Tavium Premix ----dicamba ----s-metolachlor Roundup PowerMax..glyphosate Intact Drift Retardant	6.5 EC 5.25 1.25 3.38 CS 1.12 2.26 4.5 AS 43.18 L	1.22 lb ai/a 0.99 0.235 1.49 lb ai/a 0.494 1 1.13 lb ae/a 0.5 % v/v	lb ai/a 0.99 0.235 21Dap B 0.494 1 21DAP B 21DAP B	PRE A	0.0 b	0.0 a	0.0 a
LSD P=.05					3.70	1.11	0.44	
Standard Deviation					2.14	0.64	0.25	
CV					82.53	157.56	343.69	
Replicate F					0.154	2.517	2.286	
Replicate Prob(F)					0.8588	0.1121	0.1339	
Treatment F					11.298	1.775	1.000	
Treatment Prob(F)					0.0001	0.1563	0.4726	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	IPOSS C -	SETFA C -						
Description	Soybean Stunting	mornlry Plants/plot	G.foxtl Plants/plot							
Rating Type										
Rating Unit	%	%								
Rating Date	06/11/19	06/11/19	06/04/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
7	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Outlook.....dimethenamid-p Engenia.....dicamba Roundup PowerMax..glyphosate Intact Drift Retardant	4.09 0.48 1.33 2.28 6 L 5 SL 4.5 AS 43.18 L	SC 0.192 0.0225 0.0624 0.107 lb ai/a lb ai/a lb ae/a lb ae/a % v/v	0.192 0.0225 0.0624 0.107 lb ai/a lb ai/a lb ae/a lb ae/a % v/v	lb ai/a lb ai/a lb ae/a lb ae/a % v/v	PRE 21DAP B 21DAP B 21DAP B 21DAP B	A	3.7 bc	0.0 a	0.0 a
8	Fierce Premix ----flumioxazin ----pyroxasulfone Dual II Magnum..s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Intact Drift Retardant	76 WG 33.5 42.5 7.64 E 2.9 SL 4.5 AS 43.18 L	0.143 0.063 0.08 0.955 0.5 1.13 0.5 %	0.143 0.063 0.08 0.955 0.5 1.13 0.5 %	lb ai/a lb ai/a lb ae/a lb ai/a lb ae/a lb ae/a % v/v	PRE 21DAP B 21DAP B 21DAP B 21DAP B 21DAP B	A	5.0 b	0.0 a	0.0 a
9	Boundary Premix ----s-metolachlor ----metribuzin Tavium Premix ----dicamba ----s-metolachlor Roundup PowerMax..glyphosate Intact Drift Retardant	6.5 EC 5.25 1.25 3.38 CS 1.12 2.26 4.5 AS 43.18 L	1.22 0.99 0.235 1.49 0.494 1 1.13 0.5 %	1.22 0.99 0.235 1.49 0.494 1 1.13 0.5 %	lb ai/a lb ai/a lb ae/a lb ai/a lb ae/a lb ae/a lb ae/a % v/v	PRE 21Dap B 21Dap B 21Dap B 21Dap B 21Dap B	A	3.0 cd	0.3 a	0.0 a
LSD P=.05								1.61	1.01	.
Standard Deviation								0.93	0.59	0.00
CV								15.94	316.07	0.0
Replicate F								1.191	2.703	0.000
Replicate Prob(F)								0.3293	0.0974	1.0000
Treatment F								101.596	1.000	0.000
Treatment Prob(F)								0.0001	0.4726	1.0000

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code Crop Type, Code		C GLXMA		
Description		Soybean		
Rating Type		Yield		
Rating Unit		Bu/A		
Rating Date		11/05/19		
Trt Treatment No. Name	Form Conc Type	Rate Rate Unit	Appl Appl Timing Code	
7 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Outlook.....dimethenamid-p Engenia.....dicamba Roundup PowerMax..glyphosate Intact Drift Retardant	4.09 SC 0.48 1.33 2.28 6 L 5 SL 4.5 AS 43.18 L	0.192 lb ai/a 0.0225 0.0624 0.107 0.56 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.5 % v/v	PRE A 21DAP B 21DAP B 21DAP B 21DAP B	62.5 a
8 Fierce Premix ----flumioxazin ----pyroxasulfone Dual II Magnum..s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Intact Drift Retardant	76 WG 33.5 42.5 7.64 E 2.9 SL 4.5 AS 43.18 L	0.143 lb ai/a 0.063 0.08 0.955 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.5 % v/v	PRE A 21DAP B 21DAP B 21DAP B 21DAP B	58.1 a
9 Boundary Premix ----s-metolachlor ----metribuzin Tavium Premix ----dicamba ----s-metolachlor Roundup PowerMax..glyphosate Intact Drift Retardant	6.5 EC 5.25 1.25 3.38 CS 1.12 2.26 4.5 AS 43.18 L	1.22 lb ai/a 0.99 0.235 1.49 lb ai/a 0.494 1 1.13 lb ae/a 0.5 % v/v	PRE A 21Dap B 21DAP B 21DAP B 21DAP B	64.8 a
LSD P=.05 Standard Deviation CV				8.76 5.06 8.32
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				9.727 0.0017 1.611 0.1983

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.



## University of Delaware

## Comparison of Residual Herbicides for Early-POST Applications

Trial ID: Soy18-19      Location: Field #9      Trial Year: 2019  
Protocol ID: Soy18-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
ARM Trial Created On: 05/15/19  
Initiation Date: 03/01/19  
Completion Date: 11/09/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
Longitude of LL Corner °: 75.455834 W  
Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
Address: 16483 County Seat Hwy  
City+State/Prov: Georgetown, Delaware  
Postal Code: 19947 E-mail: mjv@udel.edu  
Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean  
Entry Date: 12/12/19  
Variety: CZ4539GTLL  
Attributes: LL/GT  
Planting Date: 06/03/19 Planting Rate: 180000 S/A  
Depth: 1 IN  
Rows per Plot: 7 Planting Method: PLANTD planted  
Row Spacing: 15 IN Planting Equipment: FE Field Equipment  
Soil Temperature: 74 F Seed Bed: MEDTRA medium/trashy  
Emergence Date: 06/09/19 Soil Moisture: NORMAL normal, adequate

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
Common Name: Palmer amaranth Entry Date: 12/12/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
Common Name: Morning glory Entry Date: 12/12/19

**Site and Design**

Treated Plot Width: 6.67 FT Site Type: FIELD field  
Treated Plot Length: 25 FT  
Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 8 Tillage Type: NOTILL no-till  
Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

## Field Prep./Maintenance:

Total early preplant application Liberty 280 (1 qt/A) + Roundup PowerMax (1 qt/A) + Valor SX (2 oz/A) + Metribuzin (4 oz/A) on 05/16/19. Total preemergence application of Liberty 280 (1 qt/A) + Roundup PowerMax (1 qt/A) on 06/04/19.

**Soil Description**

Description Name: Field 9  
% Sand: 83 % OM: 1.1 Texture: LS loamy sand  
% Silt: 9 pH: 6.0 Soil Name: Pepperbox loamy sand, 0-2% slopes  
% Clay: 8 CEC: 5.7 Fert. Level: G good  
Soil Drainage: F fair

**Application Description**

A	
Application Date	06/24/19
Appl. Stop Time	12:50 PM
Application Method	SPRAY
Application Timing	2nd Trifol
Application Placement	BROADC
Applied By	Johnson
Appl. Entry Date	12/12/19
Air Temperature Start, Stop	84 86 F
% Relative Humidity Start, Stop	55 51
Wind Velocity+Dir. Start	9 mph SSW
Wind Velocity+Dir. Stop	10 mph SSW
Wind Velocity+Dir. Max	10 mph SSW
Wet Leaves (Y/N)	N no
Soil Temperature	82 F
Soil Moisture	NORMAL
% Cloud Cover	45
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	0.08 IN

**Crop Stage At Each Application**

A	
Crop 1 Code, BBCH Scale	GLXMA BSOY
Days after Emergence	15
Stage Majority, Percent	2 trifol 100
Height Average	5 in

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	AMAPA W
Stage Majority, Percent	veg 100
Height Average	3 in
Height Minimum, Maximum	2 4
Density Average	3 m2
Density Min, Max	1 5
Pest 2 Code, Type, Scale	IPOSS W
Stage Majority, Percent	veg 100
Height Average	2 in
Height Minimum, Maximum	1 3
Density Average	2 m2
Density Min, Max	1 3

**Application Equipment**

	A
Appl. Equipment	Tractr4Nozl
Equipment Type	TRMOSP
Operation Pressure	40 psi
Nozzle Type	AIR MIX
Nozzle Size	11002
Nozzle Spacing	20 in
Boom Length	6.7 ft
Boom Height	22 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

Context	Date	By	Notes
STATUS	05/15/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	10/09/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

Severe deer feeding in back half of the study

07/04/19; Excellent control of all Palmer amaranth and morningglory seedlings present at time of applicaiton. Seedling emergence was noted as 1=present and 0=absent. Leaf injury was rated as either leaf crinkling or leaf spotting.

Comparison of Residual Herbicides for Early-POST Applications												
Trial ID: Soy18-19		Location: Field #9		Trial Year: 2019								
Protocol ID: Soy18-19		Investigator: Mark VanGessel										
Study Director:						Sponsor Contact:						
Pest Code		C	GLXMA	C	GLXMA	AMAPA	IPOSS					
Crop Type, Code				C	-	C	-					
Description		Soybean	Soybean	PalmerAm	Mornlry							
Rating Type		Stunting	LfDamage	CntrlPOS	CntrlPOS							
Rating Unit	%		%	%	%							
Rating Date	07/04/19		07/04/19	07/04/19	07/04/19		07/04/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code					
1	Untreated				0.0	c	0.0	d	0.0	b	0.0	b
2	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A	3.5	bc	0.0	d	100.0	a	100.0	a
3	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.106 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A	7.0	abc	13.5	ab	100.0	a	100.0	a
4	Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	2 L 2.34 SL 100 D	0.375 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A	12.5	ab	12.5	ab	100.0	a	100.0	a
5	Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1.19 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A	5.0	bc	10.0	bc	100.0	a	100.0	a
6	Warrant.....acetochlor Liberty 280....glufosinate Dry Ammonium Sulfate	3 CS 2.34 SL 100 D	0.56 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A	10.0	ab	6.0	c	100.0	a	100.0	a
7	Dual II Magnum..s-metolachlor Firstrate.....cloransulam Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 84 WG 2.34 SL 100 D	1.19 lb ai/a 0.0263 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A 2nd Trifol A	16.0	a	8.5	bc	100.0	a	100.0	a
8	Dual II Magnum..s-metolachlor Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2 L 2.34 SL 100 D	1.19 lb ai/a 0.375 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A 2nd Trifol A	15.0	a	17.5	a	100.0	a	100.0	a
LSD P=.05					9.39	5.34	.	.	.	.	.	.
Standard Deviation					3.65	2.26	0.00	0.00	0.00	0.00	0.00	0.00
CV					42.36	26.59	0.0	0.0	0.0	0.0	0.0	0.0
Replicate F					5.412	0.049	0.000	0.000	0.000	0.000	0.000	0.000
Replicate Prob(F)					0.0675	0.8312	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Treatment F					4.888	15.385	0.000	0.000	0.000	0.000	0.000	0.000
Treatment Prob(F)					0.0498	0.0009	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,7,13

Could not calculate LSD (% mean diff) for columns 3,4,5,13 because error mean square = 0.

Pest Code Crop Type, Code			AMAPA C - PalmerAm	IPOSS C - Mornglry	C GLXMA Soybean	AMAPA C - PalmerAm						
Description			SdlngrPrs	SdlngrPrs	Stunting	Control						
Rating Type												
Rating Unit			1=yes 07/04/19	1=yes 07/04/19	% 07/13/19	% 07/13/19						
Rating Date												
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code					
1	Untreated							1.0 a	1.0 a	0.0 a	0.0 d	
2	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A				0.0 b	0.3 a	0.0 a	91.3 bc	
3	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.106 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A				0.0 b	0.3 a	7.0 a	99.0 a	
4	Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	2 L 2.34 SL 100 D	0.375 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A				0.0 b	0.3 a	11.0 a	99.0 a	
5	Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1.19 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A				0.0 b	0.0 a	3.5 a	99.0 a	
6	Warrant.....acetochlor Liberty 280....glufosinate Dry Ammonium Sulfate	3 CS 2.34 SL 100 D	0.56 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A				0.0 b	0.0 a	7.0 a	98.7 ab	
7	Dual II Magnum..s-metolachlor Firstrate.....cloransulam Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 84 WG 2.34 SL 100 D	1.19 lb ai/a 0.0263 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A 2nd Trifol A				0.0 b	0.3 a	5.0 a	89.7 c	
8	Dual II Magnum..s-metolachlor Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2 L 2.34 SL 100 D	1.19 lb ai/a 0.375 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A 2nd Trifol A				0.0 b	0.0 a	11.0 a	99.0 a	
LSD P=.05					.			0.68		11.01	7.60	
Standard Deviation					0.00			0.39		3.97	4.34	
CV					0.0			132.26		71.31	5.14	
Replicate F					0.000			1.960		2.896	1.823	
Replicate Prob(F)					1.0000			0.1776		0.1640	0.1979	
Treatment F					0.000			2.200		2.356	188.036	
Treatment Prob(F)					1.0000			0.0991		0.2129	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,7,13

Could not calculate LSD (% mean diff) for columns 3,4,5,13 because error mean square = 0.

Pest Code	Crop Type, Code	Description	IPOSS C - Mornglry Control %	AMAPA C - PalmerAm Control %	IPOSS C - Mornglry Control %	AMAPA C - PalmerAm Control %	
Rating Date			07/13/19	07/28/19	07/28/19	09/01/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Untreated				0.0 c	0.0 b	0.0 b
2	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A	92.3 b	86.3 a	88.0 a 74.0 a
3	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.106 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A	92.7 b	92.7 a	86.3 a 92.0 a
4	Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	2 L 2.34 SL 100 D	0.375 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A	94.7 ab	90.0 a	86.0 a 84.0 a
5	Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1.19 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A	94.0 ab	98.3 a	96.0 a 91.3 a
6	Warrant.....acetochlor Liberty 280....glufosinate Dry Ammonium Sulfate	3 CS 2.34 SL 100 D	0.56 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A	94.0 ab	95.3 a	94.7 a 87.3 a
7	Dual II Magnum..s-metolachlor Firstrate.....cloransulam Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 84 WG 2.34 SL 100 D	1.19 lb ai/a 0.0263 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A 2nd Trifol A	90.7 b	85.7 a	85.3 a 73.3 a
8	Dual II Magnum..s-metolachlor Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2 L 2.34 SL 100 D	1.19 lb ai/a 0.375 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A 2nd Trifol A 2nd Trifol A 2nd Trifol A	97.7 a	98.3 a	98.3 a 97.7 a
LSD P=.05				4.94	15.34	19.50	25.38
Standard Deviation				2.82	8.76	11.14	14.49
CV				3.44	10.83	14.04	19.34
Replicate F				10.814	1.776	4.220	3.217
Replicate Prob(F)				0.0014	0.2055	0.0368	0.0709
Treatment F				415.701	42.664	25.479	14.141
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,7,13

Could not calculate LSD (% mean diff) for columns 3,4,5,13 because error mean square = 0.

Pest Code		IPOSS					
Crop Type, Code		C -					
Description		Mornlry					
Rating Type		Control					
Rating Unit		%					
Rating Date		09/01/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
1	Untreated						0.0 c
2	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A			97.0 a
3	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.106 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A			97.0 a
4	Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	2 L 2.34 SL 100 D	0.375 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A			97.0 a
5	Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1.19 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A			60.0 b
6	Warrant.....acetochlor Liberty 280....glufosinate Dry Ammonium Sulfate	3 CS 2.34 SL 100 D	0.56 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A			97.0 a
7	Dual II Magnum..s-metolachlor Firstrate.....cloransulam Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 84 WG 2.34 SL 100 D	1.19 lb ai/a 0.0263 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A			
8	Dual II Magnum..s-metolachlor Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2 L 2.34 SL 100 D	1.19 lb ai/a 0.375 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A			
LSD P=.05							
Standard Deviation							0.00
CV							0.0
Replicate F							0.000
Replicate Prob(F)							1.0000
Treatment F							0.000
Treatment Prob(F)							1.0000

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=1,7,13

Could not calculate LSD (% mean diff) for columns 3,4,5,13 because error mean square = 0.

**Soybean Safety with Metribuzin Use in Early Spring**

Trial ID: Soy19ayld-19      Location: Georgetown      Trial Year: 2019  
 Protocol ID: Soy19-19      Investigator: Mark VanGessel  
                             Study Director:  
                             Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 12/20/19

Initiation Date: 03/01/19

Completion Date: 11/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 01/23/20

Variety: S43XS27

Attributes: Xtend

Planting Date: 06/03/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Planting Equipment: FE Field Equipment

Soil Temperature: 74 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 06/09/19

Soil Moisture: NORMAL normal, adequate

Harvest Date: 11/07/19

Harvest Equipment: Plot combine

% Standard Moisture: 13.0

Harvested Width: 7.5 FT

Harvested Length: 25 FT

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 15 Tillage Type: NOTILL no-till

Replications: 3

Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 36

% Sand: 77 % OM: 1.3 Texture: SL sandy loam

% Silt: 12

pH: 6.5 Soil Name: Hurlokk loamy sand, 0-2% slopes

% Clay: 11

CEC: 5.1 Fert. Level: G good

Soil Drainage: G good

**Application Description**

	A	B
Application Date	05/16/19	06/04/19
Appl. Start Time	02:55 PM	11:15 AM
Appl. Stop Time	03:15 PM	11:45 AM
Application Method	SPRAY	SPRAY
Application Timing	EPP	PRE
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/22/19	01/23/20
Air Temperature Start, Stop	73 73 F	69 69 F
% Relative Humidity Start, Stop	50 50	40 36
Wind Velocity+Dir. Start	8 mph W	2 mph
Wind Velocity+Dir. Stop	8 mph W	5 mph WNW
Wind Velocity+Dir. Max	8 mph W	5 mph WNW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	73 F	72 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	25	14
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	0.02 IN	1.71 IN
Weather Source	ITERIS	ITERIS

**Application Equipment**

	A	B
Appl. Equipment	Tractr6Nozl	Tractr6Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	10 ft	10 ft
Boom Height	18 in	18 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

## Trial Comments

06/14/19: no visible injury present at this rating date

06/24/19: no visible injury present at this rating date

Plots continued to be observed weekly through July of 2019; however no injury was present as a result of PRE herbicide applications.

## Soybean Safety with Metribuzin Use in Early Spring

Trial ID: Soy19ayld-19

Location: Georgetown

Trial Year: 2019

Protocol ID: Soy19-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code						C GLXMA	
Crop Name						Soybean	
Rating Type						Yield	
Rating Unit						Bu/A	
Rating Date						11/07/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code	
1	No metribuzin EPP					31.9 a	
	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
2	No metribuzin EPP					31.1 a	
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
3	No metribuzin EPP					34.9 a	
	Tricor DF.....metribuzin	75 DF		0.234 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
4	Tricor DF.....metribuzin	75 DF		0.094 lb ai/a	EPP	A	36.3 a
	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
5	Tricor DF.....metribuzin	75 DF		0.094 lb ai/a	EPP	A	34.1 a
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
6	Tricor DF.....metribuzin	75 DF		0.094 lb ai/a	EPP	A	33.5 a
	Tricor DF.....metribuzin	75 DF		0.234 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
7	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	EPP	A	34.8 a
	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
8	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	EPP	A	35.4 a
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
9	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	EPP	A	35.2 a
	Tricor DF.....metribuzin	75 DF		0.234 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
10	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	EPP	A	29.5 a
	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
11	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	EPP	A	33.7 a
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
12	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	EPP	A	31.9 a
	Tricor DF.....metribuzin	75 DF		0.234 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
13	Weed-free					33.5 a	
	BroadAxe Premix	7 SC		1.53 lb ai/a	PRE	B	
	----sulfentrazone	0.7		0.153			
	----s-metolachlor	6.3		1.38			
14	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	EPP	A	29.3 a
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=3

## University of Delaware

Crop Type, Code	C GLXMA
Crop Name	Soybean
Rating Type	Yield
Rating Unit	Bu/A
Rating Date	11/07/19
Trt Treatment No. Name	Form Form Conc Type Rate Rate Unit Timing Code
15 Weed-free BroadAxe Premix ----sulfentrazone ----s-metolachlor	7 SC      1.53 lb ai/a PRE    B 0.7      0.153 6.3      1.38
LSD P=.05	36.8 a
Standard Deviation	6.05
CV	3.58
Replicate F	10.71
Replicate Prob(F)	111.416
Treatment F	0.0001
Treatment Prob(F)	1.252
	0.3065

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=3

Soybean Safety with Metribuzin Use in Early Spring					
Trial ID: Soy19ayld-19	Location: Georgetown	Trial Year: 2019			
Protocol ID: Soy19-19	Investigator: Mark VanGessel				
	Study Director:				
	Sponsor Contact:				

Crop Type, Code	C GLXMA				
Crop Name	Soybean				
Rating Type	Yield				
Rating Unit	Bu/A				
Rating Date	11/07/19				
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
TABLE OF R MEANS					
Replicate 1					25.2
Replicate 2					30.7
Replicate 3					44.6
TABLE OF A (Early Preplant) MEANS					
1 No metribuzin EPP					32.6 a
2 Tricor DF.....metribuzin	75 DF	0.094 lb ai/a	EPP	A	34.6 a
3 Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	EPP	A	35.2 a
4 Tricor DF.....metribuzin	75 DF	0.188 lb ai/a	EPP	A	31.7 a
LSD P=.05					3.02
Standard Deviation					3.05
CV					9.10
TABLE OF B (Preemergence) MEANS					
1 Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	PRE	B	33.1 a
1 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
2 Tricor DF.....metribuzin	75 DF	0.188 lb ai/a	PRE	B	33.6 a
2 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
3 Tricor DF.....metribuzin	75 DF	0.234 lb ai/a	PRE	B	33.9 a
3 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
LSD P=.05					2.62
Standard Deviation					3.05
CV					9.10
TABLE OF A (Early Preplant) B (Preemergence) MEANS					
1 No metribuzin EPP					31.9 a
1 Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	PRE	B	
1 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
2 Tricor DF.....metribuzin	75 DF	0.094 lb ai/a	EPP	A	36.3 a
1 Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	PRE	B	
1 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
3 Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	EPP	A	34.8 a
1 Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	PRE	B	
1 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
4 Tricor DF.....metribuzin	75 DF	0.188 lb ai/a	EPP	A	29.5 a
1 Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	PRE	B	
1 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
1 No metribuzin EPP					31.1 a
2 Tricor DF.....metribuzin	75 DF	0.188 lb ai/a	PRE	B	
2 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
2 Tricor DF.....metribuzin	75 DF	0.094 lb ai/a	EPP	A	34.1 a
2 Tricor DF.....metribuzin	75 DF	0.188 lb ai/a	PRE	B	
2 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	
3 Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	EPP	A	35.4 a
2 Tricor DF.....metribuzin	75 DF	0.188 lb ai/a	PRE	B	
2 Dual Magnum....s-metolachlor	7.62 E	1.33 lb ai/a	PRE	B	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Type, Code	C GLXMA
Crop Name	Soybean
Rating Type	Yield
Rating Unit	Bu/A
Rating Date	11/07/19
Trt Treatment No. Name	Form Form Conc Type Rate Appl Unit Timing Appl Code
4 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a EPP A
2 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a PRE B
2 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
1 No metribuzin EPP	
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
2 Tricor DF.....metribuzin	75 DF 0.094 lb ai/a EPP A
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
3 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a EPP A
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
4 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a EPP A
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
LSD P=.05	5.23
Standard Deviation	3.05
CV	9.10

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield Bu/A 11/07/19 Missing values in column 3 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	31	2697.602426				
R	2	2391.645098	1195.822549	128.467	0.0001	
A	3	72.769464	24.256488	2.606	0.0834	3.0
B	2	3.365470	1.682735	0.181	0.8361	2.6
AB	6	62.271125	10.378521	1.115	0.3923	5.2
ERROR	18	167.551269	9.308404			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Soybean Safety with Metribuzin Use in Early Spring**

Trial ID: Soy19byld-19

Location: Dukes

Trial Year: 2019

Protocol ID: Soy19-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 12/20/19

Initiation Date: 03/01/19

Completion Date: 11/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 01/23/20

Variety: S43XS27

Attributes: Xtend

Planting Date: 06/03/19

Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 74 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 06/09/19

Harvest Date: 10/07/19

Harvest Equipment: Plot combine

Harvested Width: 7.5 FT

Harvested Length: 25 FT

% Standard Moisture: 13.0

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 16

Tillage Type: NOTILL no-till

Replications: 4

Study Design: FACTOR Factorial

**Application Description**

	A	B
Application Date	05/16/19	06/04/19
Appl. Start Time	01:30 PM	12:00 PM
Appl. Stop Time	01:50 PM	12:30 PM
Application Method	SPRAY	SPRAY
Application Timing	EPP	PRE
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	05/21/19	01/23/20
Air Temperature Start, Stop	69 71 F	69 69 F
% Relative Humidity Start, Stop	54 51	36 36
Wind Velocity+Dir. Start	8 mph NW	5 mph WNW
Wind Velocity+Dir. Stop	7 mph W	5 mph WNW
Wind Velocity+Dir. Max	8 mph NW	5 mph WNW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	69 F	75 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	29	11
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	0.02 IN	1.71 IN
Weather Source	ITERIS	ITERIS

**Application Equipment**

	A	B
Appl. Equipment	Tractr6Nozl	
Equipment Type	TRMOSP	
Operation Pressure	40 psi	
Nozzle Type	AIR MIX	
Nozzle Size	11002	
Nozzle Spacing	20 in	
Boom Length	10 ft	
Boom Height	18 in	
Ground Speed	3 mph	
Carrier	WATER	
Application Amount	20 gal/ac	
Propellant	COMAIR	

## Trial Comments

06/14/19: No visible injury present at this rating date.

06/24/19: Slight draw stringing from Dual applications, but not present on all plants (<5%).

Soybean Safety with Metribuzin Use in Early Spring  
 Trial ID: Soy19byld-19 Location: Dukes Trial Year: 2019  
 Protocol ID: Soy19-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Crop Type, Code						C GLXMA	
Crop Name						Soybean	
Rating Type						Yield	
Rating Unit						Bu/A	
Rating Date						10/07/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code	
1	No metribuzin EPP					41.5 a	
	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
2	No metribuzin EPP					40.8 a	
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
3	No metribuzin EPP					42.3 a	
	Tricor DF.....metribuzin	75 DF		0.234 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
4	Tricor DF.....metribuzin	75 DF		0.094 lb ai/a	EPP	A	41.9 a
	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
5	Tricor DF.....metribuzin	75 DF		0.094 lb ai/a	EPP	A	42.7 a
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
6	Tricor DF.....metribuzin	75 DF		0.094 lb ai/a	EPP	A	41.7 a
	Tricor DF.....metribuzin	75 DF		0.234 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
7	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	EPP	A	42.5 a
	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
8	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	EPP	A	40.1 a
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
9	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	EPP	A	44.3 a
	Tricor DF.....metribuzin	75 DF		0.234 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
10	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	EPP	A	43.8 a
	Tricor DF.....metribuzin	75 DF		0.14 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
11	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	EPP	A	41.9 a
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
12	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	EPP	A	42.8 a
	Tricor DF.....metribuzin	75 DF		0.234 lb ai/a	PRE	B	
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
13	Weed-free					41.8 a	
	BroadAxe Premix	7 SC		1.53 lb ai/a	PRE	B	
	----sulfentrazone	0.7		0.153			
	----s-metolachlor	6.3		1.38			
14	Sharpen.....saflufenacil	2.85 SC		0.0334 lb ai/a	EPP	A	42.0 a
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	
15	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	EPP	A	42.2 a
	Dual Magnum.....s-metolachlor	7.62 E		1.33 lb ai/a	PRE	B	

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Type, Code		C GLXMA					
Crop Name		Soybean					
Rating Type		Yield					
Rating Unit		Bu/A					
Rating Date		10/07/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
16	Weed-free						42.6 a
	BroadAxe Premix	7	SC	1.53	lb ai/a	PRE	B
	----sulfentrazone	0.7		0.153			
	----s-metolachlor	6.3		1.38			
LSD P=.05							4.07
Standard Deviation							2.86
CV							6.78
Replicate F							4.188
Replicate Prob(F)							0.0107
Treatment F							0.496
Treatment Prob(F)							0.9299

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Soybean Safety with Metribuzin Use in Early Spring  
 Trial ID: Soy19byld-19 Location: Dukes Trial Year: 2019  
 Protocol ID: Soy19-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Crop Type, Code	C GLXMA
Crop Name	Soybean
Rating Type	Yield
Rating Unit	Bu/A
Rating Date	10/07/19
Trt Treatment No. Name	Form Form Rate Appl Appl Conc Type Rate Unit Timing Code
<b>TABLE OF R MEANS</b>	
Replicate 1	43.9
Replicate 2	42.2
Replicate 3	40.9
Replicate 4	41.8
<b>TABLE OF A (Early Preplant) MEANS</b>	
1 No metribuzin EPP	41.6 a
2 Tricor DF.....metribuzin	75 DF 0.094 lb ai/a EPP A
3 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a EPP A
4 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a EPP A
LSD P=.05	2.19
Standard Deviation	2.63
CV	6.23
<b>TABLE OF B (Preemergence) MEANS</b>	
1 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a PRE B
1 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
2 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a PRE B
2 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
LSD P=.05	1.89
Standard Deviation	2.63
CV	6.23
<b>TABLE OF A (Early Preplant) B (Preemergence) MEANS</b>	
1 No metribuzin EPP	41.5 a
1 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a PRE B
1 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
2 Tricor DF.....metribuzin	75 DF 0.094 lb ai/a EPP A
1 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a PRE B
1 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
3 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a EPP A
1 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a PRE B
1 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
4 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a EPP A
1 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a PRE B
1 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
1 No metribuzin EPP	40.8 a
2 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a PRE B
2 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
2 Tricor DF.....metribuzin	75 DF 0.094 lb ai/a EPP A
2 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a PRE B
2 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Crop Type, Code	C GLXMA
Crop Name	Soybean
Rating Type	Yield
Rating Unit	Bu/A
Rating Date	10/07/19
Trt Treatment No. Name	Form Conc Form Type Rate Unit Appl Timing Appl Code
3 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a EPP A
2 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a PRE B
2 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
4 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a EPP A
2 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a PRE B
2 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
1 No metribuzin EPP	
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
2 Tricor DF.....metribuzin	75 DF 0.094 lb ai/a EPP A
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
3 Tricor DF.....metribuzin	75 DF 0.14 lb ai/a EPP A
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
4 Tricor DF.....metribuzin	75 DF 0.188 lb ai/a EPP A
3 Tricor DF.....metribuzin	75 DF 0.234 lb ai/a PRE B
3 Dual Magnum.....s-metolachlor	7.62 E 1.33 lb ai/a PRE B
LSD P=.05	3.79
Standard Deviation	2.63
CV	6.23

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield Bu/A 10/07/19						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	345.888644				
R	3	58.191593	19.397198	2.802	0.0551	
A	3	10.422685	3.474228	0.502	0.6836	2.2
B	2	16.928938	8.464469	1.223	0.3074	1.9
AB	6	31.886412	5.314402	0.768	0.6007	3.8
ERROR	33	228.459016	6.923000			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Weed Control for Double-Cropped Soybeans**

Trial ID: Soy20-19      Location: REC Fld #4      Trial Year: 2019  
 Protocol ID: Soy20-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: UPL

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 07/02/19

Initiation Date: 03/01/19

Completion Date: 09/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C GLXMA Glycine max Soybean

Entry Date: 10/31/19

Variety: Kennedy 1936E

Attributes: Enlist

Planting Date: 07/08/19 Planting Rate: 180000 S/A

Depth: 1 IN

Rows per Plot: 7 Planting Method: PLANTD planted

Row Spacing: 15 IN Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 78 F Soil Moisture: NORMAL normal, adequate

Emergence Date: 07/13/19

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth Entry Date: 10/31/19

**Site and Design**

Treated Plot Width: 6.67 FT

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 10

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 4

% Sand: 79 % OM: 1.4 Texture: LS loamy sand

% Silt: 13 pH: 6.3 Soil Name: Hammonton loamy sand, 0-2% slopes

% Clay: 8 CEC: 6.4 Fert. Level: G good

Soil Drainage: F fair

**Application Description**

	A	B
Application Date	07/03/19	07/31/19
Appl. Stop Time	02:00 PM	11:00 AM
Application Method	SPRAY	SPRAY
Application Timing	Preplant	3" weeds
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Appl. Entry Date	10/31/19	10/31/19
Air Temperature Start, Stop	91 91 F	86 86 F
% Relative Humidity Start, Stop	54 52	65 65
Wind Velocity+Dir. Start	3 mph	4 mph WSW
Wind Velocity+Dir. Stop	3 mph	4 mph WSW
Wind Velocity+Dir. Max	3 mph	4 mph WSW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	92 F	85 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	1	59
Moisture 6 Hours after Appl.	0 IN	0.12 IN
Moisture 1 Week after Appl.	0.53 IN	1.45 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Days after Emergence	-10	18
Stage Majority, Percent		3-trifol 100
Height Average		9 in
Height Minimum, Maximum		8 10

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		veg 65
Stage Minimum, Percent		veg 65
Stage Maximum, Percent		flower 35
Height Average		18 in
Height Minimum, Maximum		12 24
Density Average		2 m2
Density Min, Max		0 6

**Application Equipment**

	A	B
Appl. Equipment	Tractr4Nozl	Tractr4Nozl
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	20 in	20 in
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	40 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	07/02/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	10/10/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

08/26/19: Control ratings based on weed biomass above soybean canopy.

Weed Control for Double-Cropped Soybeans							
Trial ID: Soy20-19		Location: REC Fld #4		Trial Year: 2019			
Protocol ID: Soy20-19		Investigator: Mark VanGessel					
Study Director:						Sponsor Contact: UPL	
Pest Code	Crop Type, Code	Description		AMAPA C - PalmerAm	IPOSS C - Mornlry	AMAPA C - PalmerAm	IPOSS C - Mornlry
Rating Type	Rating Unit	Rating Date		Control % 07/13/19	Control % 07/13/19	Control % 07/27/19	Control % 07/27/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	Preplant A		98.7 a	98.0 b
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			60.0 cd
2	Interline.....glufosinate Tricor DF.....metribuzin Dry Ammonium Sulfate	2.34 SL 75 DF 100 D	0.585 lb ai/a 0.188 lb ai/a 2.04 % w/v	Preplant A		98.3 a	99.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			78.3 ab
3	Interline.....glufosinate Tripzin Premix Dry Ammonium Sulfate	2.34 SL 4 SC 100 D	0.585 lb ai/a 0.69 lb ai/a 2.04 % w/v	Preplant A		98.7 a	99.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			81.7 a
4	Interline.....glufosinate Moccasin MTZ Premix Dry Ammonium Sulfate	2.34 SL 4.47 SL 100 D	0.585 lb ai/a 0.77 lb ai/a 2.04 % w/v	Preplant A		99.0 a	98.7 ab
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			85.0 a
5	Interline.....glufosinate Preview Premix Dry Ammonium Sulfate	2.34 SL 3.28 SC 100 D	0.585 lb ai/a 0.23 lb ai/a 2.04 % w/v	Preplant A		97.7 a	98.3 ab
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			83.3 a
6	Interline.....glufosinate 2,4-DB Dry Ammonium Sulfate	2.34 SL 2 L 100 D	0.585 lb ai/a 0.188 lb ae/a 2.04 % w/v	Preplant A		98.3 a	99.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			56.1 d
7	Interline.....glufosinate 2,4-DB Crop Oil Concentrate Dry Ammonium Sulfate	2.34 SL 2 L 100 L 100 D	0.585 lb ai/a 0.188 lb ae/a 1 % v/v 2.04 % w/v	Preplant A		99.0 a	99.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			65.0 bcd
8	Ultra Blazer....acifluorfen 2,4-DB Crop Oil Concentrate Dry Ammonium Sulfate	2 L 2 L 100 L 100 D	0.375 lb ai/a 0.188 lb ae/a 1 % v/v 2.04 % w/v	Preplant A		99.0 a	99.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			75.0 abc
9	Enlist Duo Premix ----2,4-D choline ----glyphosate	3.34 SL 1.63 1.71	1.88 lb ae/a 0.92 0.96	Preplant A		99.0 a	99.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B			81.7 a
							83.3 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3; Average=9

Pest Code	Crop Type, Code	Description	C	GLXMA Soybean	AMAPA C - PalmerAm	IPOSS C - Mornlry	AMAPA C - PalmerAm	
Rating Type	Rating Unit	Rating Date		Stunting %	Control %	Control %	Control %	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	Preplant A	0.0 b	79.3 a	80.0 a	68.3 c
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				
2	Interline.....glufosinate Tricor DF.....metribuzin Dry Ammonium Sulfate	2.34 SL 75 DF 100 D	0.585 lb ai/a 0.188 lb ai/a 2.04 % w/v	Preplant A	2.3 ab	84.3 a	83.3 a	71.7 abc
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				
3	Interline.....glufosinate Tripzin Premix Dry Ammonium Sulfate	2.34 SL 4 SC 100 D	0.585 lb ai/a 0.69 lb ai/a 2.04 % w/v	Preplant A	5.7 a	86.7 a	81.3 a	81.7 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				
4	Interline.....glufosinate Moccasin MTZ Premix Dry Ammonium Sulfate	2.34 SL 4.47 SL 100 D	0.585 lb ai/a 0.77 lb ai/a 2.04 % w/v	Preplant A	5.7 a	87.7 a	80.7 a	81.7 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				
5	Interline.....glufosinate Preview Premix Dry Ammonium Sulfate	2.34 SL 3.28 SC 100 D	0.585 lb ai/a 0.23 lb ai/a 2.04 % w/v	Preplant A	4.7 a	84.3 a	79.0 a	70.0 bc
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				
6	Interline.....glufosinate 2,4-DB Dry Ammonium Sulfate	2.34 SL 2 L 100 D	0.585 lb ai/a 0.188 lb ae/a 2.04 % w/v	Preplant A	0.0 b	81.7 a	75.7 a	71.7 abc
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				
7	Interline.....glufosinate 2,4-DB Crop Oil Concentrate Dry Ammonium Sulfate	2.34 SL 2 L 100 L 100 D	0.585 lb ai/a 0.188 lb ae/a 1 % v/v 2.04 % w/v	Preplant A	0.0 b	84.3 a	79.7 a	68.3 c
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				
8	Ultra Blazer....acifluorfen 2,4-DB Crop Oil Concentrate Dry Ammonium Sulfate	2 L 2 L 100 L 100 D	0.375 lb ai/a 0.188 lb ae/a 1 % v/v 2.04 % w/v	Preplant A	0.0 b	83.3 a	80.7 a	71.7 abc
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				
9	Enlist Duo Premix ----2,4-D choline ----glyphosate	3.34 SL 1.63 1.71	1.88 lb ae/a 0.92 0.96	Preplant A	0.0 b	88.3 a	87.3 a	79.3 ab
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B 3" weeds B				

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3; Average=9

Pest Code		IPOSS						
Crop Type, Code		C -						
Description		Mornglry						
Rating Type		Control	%					
Rating Unit								
Rating Date			08/26/19					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
1	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	Preplant Preplant A	A			60.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			
2	Interline.....glufosinate Tricor DF.....metribuzin Dry Ammonium Sulfate	2.34 SL 75 DF 100 D	0.585 lb ai/a 0.188 lb ai/a 2.04 % w/v	Preplant Preplant A	A			70.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			
3	Interline.....glufosinate Tripzin Premix Dry Ammonium Sulfate	2.34 SL 4 SC 100 D	0.585 lb ai/a 0.69 lb ai/a 2.04 % w/v	Preplant Preplant A	A			60.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			
4	Interline.....glufosinate Moccasin MTZ Premix Dry Ammonium Sulfate	2.34 SL 4.47 SL 100 D	0.585 lb ai/a 0.77 lb ai/a 2.04 % w/v	Preplant Preplant A	A			68.3 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			
5	Interline.....glufosinate Preview Premix Dry Ammonium Sulfate	2.34 SL 3.28 SC 100 D	0.585 lb ai/a 0.23 lb ai/a 2.04 % w/v	Preplant Preplant A	A			60.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			
6	Interline.....glufosinate 2,4-DB Dry Ammonium Sulfate	2.34 SL 2 L 100 D	0.585 lb ai/a 0.188 lb ae/a 2.04 % w/v	Preplant Preplant A	A			60.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			
7	Interline.....glufosinate 2,4-DB Crop Oil Concentrate Dry Ammonium Sulfate	2.34 SL 2 L 100 L 100 D	0.585 lb ai/a 0.188 lb ae/a 1 % v/v 2.04 % w/v	Preplant Preplant A	A			60.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			
8	Ultra Blazer....acifluorfen 2,4-DB Crop Oil Concentrate Dry Ammonium Sulfate	2 L 2 L 100 L 100 D	0.375 lb ai/a 0.188 lb ae/a 1 % v/v 2.04 % w/v	Preplant Preplant A	A			61.7 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			
9	Enlist Duo Premix ----2,4-D choline ----glyphosate Interline.....glufosinate Dry Ammonium Sulfate	3.34 SL 1.63 1.71 2.34 SL 100 D	1.88 lb ae/a 0.92 0.96 0.585 lb ai/a 2.04 % w/v	Preplant A				70.0 a
	Interline.....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.585 lb ai/a 2.04 % w/v	3" weeds B	B			

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=3; Average=9

## University of Delaware

Pest Code Crop Type, Code Description	AMAPA C - PalmerAm	IPOSS C - Mornlry	AMAPA C - PalmerAm	IPOSS C - Mornlry		
Rating Type	Control	Control	Control	Control		
Rating Unit	%	%	%	%		
Rating Date	07/13/19	07/13/19	07/27/19	07/27/19		
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit		
				Appl Timing		
				Appl Code		
10 Untreated Check			0.0 b	0.0 c	0.0 e	0.0 d
LSD P=.05			1.43	0.86	16.61	8.93
Standard Deviation			0.83	0.50	9.64	5.21
CV			0.94	0.56	14.47	8.01
Replicate F			3.513	1.588	0.506	4.515
Replicate Prob(F)			0.0515	0.2316	0.6116	0.0257
Treatment F			4214.444	11623.839	21.062	60.683
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3; Average=9

## University of Delaware

Pest Code	C	GLXMA	AMAPA	IPOSS	AMAPA
Crop Type, Code		C -	C -	C -	C -
Description	Soybean	PalmerAm	Mornglry	PalmerAm	
Rating Type	Stunting	Control	Control	Control	Control
Rating Unit	%	%	%	%	%
Rating Date	08/06/19	08/06/19	08/06/19	08/06/19	08/26/19
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
10 Untreated Check					
LSD P=.05		4.63	9.44	15.10	10.10
Standard Deviation		2.70	5.50	8.80	5.89
CV		147.37	7.24	12.09	8.86
Replicate F		2.689	2.233	0.274	0.765
Replicate Prob(F)		0.0951	0.1360	0.7633	0.4799
Treatment F		2.641	71.402	25.667	49.460
Treatment Prob(F)		0.0380	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3; Average=9

## University of Delaware

Pest Code	IPOSS
Crop Type, Code	C -
Description	Mornglry
Rating Type	Control
Rating Unit	%
Rating Date	08/26/19
Trt Treatment No. Name	Form Form Conc Type Rate Unit Appl Timing Appl Code
10 Untreated Check	0.0 b
LSD P=.05	10.40
Standard Deviation	5.79
CV	10.15
Replicate F	0.971
Replicate Prob(F)	0.4091
Treatment F	37.651
Treatment Prob(F)	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Yates=3; Average=9

**POST Control of Fall Panicum in Soybeans**

Trial ID: Soy21-19      Location: REC Fld #14      Trial Year: 2019  
Protocol ID: Soy21-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 07/22/19

Initiation Date: 03/01/19

Completion Date: 10/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

**Contacts**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Cooperator/Landowner****Other Contacts****Pest Description**

Pest 1 Type: W Code: PANDI Panicum dichotomiflorum

Common Name: Fall panicum

Entry Date: 12/03/19

**Site and Design**

Treated Plot Width: 6.67 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 7 Tillage Type: CONTIL conventional-till

Replications: 4 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14A

% Sand: 77 % OM: 1.6 Texture: SL sandy loam

% Silt: 16 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: E excellent

Soil Drainage: F fair

**Application Description**

A	
Application Date	07/19/19
Appl. Stop Time	09:00 AM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROADC
Applied By	VanGessel
Appl. Entry Date	12/03/19
Air Temperature Start, Stop	83 85 F
% Relative Humidity Start, Stop	85 77
Wind Velocity+Dir. Start	2 mph
Wind Velocity+Dir. Stop	2 mph
Wind Velocity+Dir. Max	2 mph
Wet Leaves (Y/N)	N no
Soil Temperature	82 F
Soil Moisture	NORMAL
% Cloud Cover	4
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	0.8 IN

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	PANDI W
Stage Majority, Percent	tiller 100
Height Average	18 in
Height Minimum, Maximum	6 20
Density Average	5 m2
Density Min, Max	3 8

**Application Equipment**

A	
Appl. Equipment	Bckpck4Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	6 ft
Boom Height	34 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

**Trial Comments**

07/19/19: Fall panicum was mowed approximately 10 days prior to application, and had many tillers. Height is shorter near dirt lane.

POST Control of Fall Panicum in Soybeans									
Trial ID: Soy21-19		Location: REC Fld #14		Trial Year: 2019					
Protocol ID: Soy21-19		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact:									
Pest Code				PANDI F.panicm Control %	PANDI F.panicm Control %	PANDI F.panicm Control %	ELEIN Goosegrs Control %		
Description				07/27/19	08/03/19	08/26/19	08/26/19		
Rating Type									
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	POST	A	85.3 ab	88.8 b		
	Dry Ammonium Sulfate	100 D	1.2 % w/v	POST	A				
2	Roundup PowerMax..glyphosate	4.5 AS	1.4 lb ae/a	POST	A	88.5 a	96.8 a		
	Dry Ammonium Sulfate	100 D	1.2 % w/v	POST	A				
3	Reflex.....fomesafen	2 L	0.375 lb ai/a	POST	A	80.5 bc	86.3 bc		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	POST	A				
	Dry Ammonium Sulfate	100 D	1.2 % w/v	POST	A				
4	Select Max.....clethodim	1 EC	0.125 lb ai/a	POST	A	83.0 b	89.5 b		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	POST	A				
	Nonionic Surfactant	100 L	0.25 % v/v	POST	A				
	Dry Ammonium Sulfate	100 D	1.2 % w/v	POST	A				
5	Select Max.....clethodim	1 EC	0.125 lb ai/a	POST	A	61.3 d	86.5 bc		
	Crop Oil Concentrate	100 L	1.25 % v/v	POST	A				
	Dry Ammonium Sulfate	100 D	1.2 % w/v	POST	A				
6	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	POST	A	76.3 c	86.8 bc		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	POST	A				
	Dry Ammonium Sulfate	100 D	1.2 % w/v	POST	A				
7	Select Max.....clethodim	1 EC	0.125 lb ai/a	POST	A	75.8 c	83.0 c		
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	POST	A				
	Crop Oil Concentrate	100 L	1.25 % v/v	POST	A				
	Dry Ammonium Sulfate	100 D	1.2 % w/v	POST	A				
LSD P=.05				5.00	4.42	5.55	11.33		
Standard Deviation				3.36	2.98	3.74	5.40		
CV				4.28	3.37	4.5	7.09		
Replicate F				0.215	4.952	1.302	0.870		
Replicate Prob(F)				0.8850	0.0111	0.3043	0.4741		
Treatment F				28.266	8.349	146.874	66.619		
Treatment Prob(F)				0.0001	0.0002	0.0001	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=4

PRE Herbicide Programs for HR Common Ragweed  
 Trial ID: Soy25a-19 Location: Bridgeville, DE Trial Year: 2019  
 Protocol ID: Soy25-19 Investigator: Mark VanGessel  
 Study Director: Sarah Hirsh  
 Sponsor Contact:

**General Trial Information**

Study Director: Sarah Hirsch  
 Investigator: Mark VanGessel

Trial Status: E established  
 ARM Trial Created On: 05/14/19

Conducted Under GLP: No  
 Conducted Under GEP: No

**Contacts**

Study Director: Sarah Hirsch

Investigator: Mark VanGessel

**Crop Description**

C

**Site and Design**

Treated Plot Width: 6.67 FT

Treated Plot Length: 25 FT

Treated Plot Area: 166.75 FT<sup>2</sup> Treatments: 8

Replications: 4

Study Design: RACOBL Randomized Complete Block (RCB)

Context	Date	By	Notes
STATUS	05/14/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/25/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

05/30/2019: Soybeans are at the unifoliate stage; no injury observed.

## PRE Herbicide Programs for HR Common Ragweed

Trial ID: Soy25a-19

Location: Bridgeville, DE

Trial Year: 2019

Protocol ID: Soy25-19

Investigator: Mark VanGessel

Study Director: Sarah Hirsh

Sponsor Contact:

Pest Code	Description	Rating Type	Rating Unit	Rating Date	AMBEL C.ragwd Control %	AMBEL C.ragwd Control %	AMBEL C.ragwd Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check						
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	PRE	A	
	Liberty 280.....glufosinate	2.34 SL		0.585 lb ai/a	PRE	A	
	Dry Ammonium Sulfate	100 D		1.02 % w/v	PRE	A	
2	Command.....clomazone	3 ME		0.5 lb ai/a	PRE	A	55.0 d
3	Lorox.....linuron	50 DF		0.625 lb ai/a	PRE	A	66.7 bc
4	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	A	60.0 cd
5	Lorox.....linuron	50 DF		0.625 lb ai/a	PRE	A	81.7 a
	Command.....clomazone	3 ME		0.5 lb ai/a	PRE	A	72.5 a
6	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	A	72.5 ab
	Command.....clomazone	3 ME		0.5 lb ai/a	PRE	A	55.0 b
7	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	A	77.5 ab
	Lorox.....linuron	50 DF		0.625 lb ai/a	PRE	A	63.3 ab
8	Valor SX.....flumioxazin	51 WG		0.064 lb ai/a	PRE	A	68.3 bc
	Tricor DF.....metribuzin	75 DF		0.188 lb ai/a	PRE	A	60.0 b
LSD P=.05					11.06	10.36	16.97
Standard Deviation					7.29	6.88	11.43
CV					12.11	14.08	20.26
Replicate F					0.269	0.110	0.547
Replicate Prob(F)					0.8468	0.9528	0.6566
Treatment F					50.179	42.139	19.243
Treatment Prob(F)					0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=3; Average=1,2

**Potential Herbicides to Control Problem Weeds in Snap Beans**

Trial ID: Bean1-19      Location: Field 14      Trial Year: 2019  
Protocol ID: Bean1-19      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: PVGA

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
ARM Trial Created On: 05/30/19  
Initiation Date: 03/01/19  
Completion Date: 08/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
Longitude of LL Corner °: 75.455834 W  
Time Zone: America/New\_York

Conducted Under GLP: No  
Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
Address: 16483 County Seat Hwy  
City+State/Prov: Georgetown, Delaware  
Postal Code: 19947      E-mail: mjv@udel.edu  
Country: USA      United States

**Crop Description**

Crop 1: C PHSVX Phaseolus vulgaris Garden bean  
Entry Date: 07/08/19  
Variety: Caprice  
Planting Date: 06/20/19      Planting Rate: 6      S/ROWFT  
Depth: 0.75 IN  
Rows per Plot: 4      Planting Method: PLANTD planted  
Row Spacing: 30 IN      Planting Equipment: FE      Field Equipment  
                          Seed Bed: MEDIUM medium  
                          Soil Moisture: NORMAL normal, adequate  
Emergence Date: 06/27/19  
Harvest Date: 08/15/19      Harvest Equipment: Hand harvested  
                          Harvested Width: 5 FT  
                          Harvested Length: 10 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
Common Name: Palmer amaranth      Entry Date: 08/14/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
Common Name: Morning glory      Entry Date: 08/14/19

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
Treated Plot Length: 25 FT  
Treated Plot Area: 250 FT<sup>2</sup> Treatments: 14      Tillage Type: CONTIL conventional-till  
Replications: 3      Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Basagran was added to all treatments to control common cocklebur.

**Soil Description**

Description Name: Field 14C  
% Sand: 79      % OM: 1.6      Texture: LS      loamy sand  
% Silt: 14      pH: 6.4      Soil Name: Klej loamy sand, 0-2% slopes  
% Clay: 7      CEC: 6.5      Fert. Level: E      excellent  
Soil Drainage: G      good

**Application Description**

	A	B
Application Date	06/21/19	07/09/19
Appl. Start Time	10:10 AM	12:55 PM
Appl. Stop Time	10:30 AM	01:15 PM
Application Method	Spray	Spray
Application Timing	PRE	2 Trifol
Application Placement	Brdcst	Brdcst
Applied By	Quintin	Quintin
Appl. Entry Date	11/06/19	11/06/19
Air Temperature Start, Stop	74 76 F	83 84 F
% Relative Humidity Start, Stop	68 67	61 57
Wind Velocity+Dir. Start	10 MPH WNW	3 MPH SSW
Wind Velocity+Dir. Stop	9 MPH W	1 MPH
Wind Velocity+Dir. Max	9 MPH W	1 MPH
Wet Leaves (Y/N)	N no	N no
Soil Temperature	77 F	85 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	100	33
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	0 IN	0.33 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	PHSVX BVBE	PHSVX BVBE
Days after Emergence	-6	12
Stage Majority, Percent		2 trifol
Stage Minimum, Percent		1 trifol
Stage Maximum, Percent		3 trifol
Height Average		7 in
Height Minimum, Maximum		5 9

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		7 lvs
Stage Minimum, Percent		5 lvs
Stage Maximum, Percent		9 lvs
Height Average		4.5 in
Height Minimum, Maximum		2 5
Density Average		5 m <sup>2</sup>
Density Min, Max		0 12
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		3 lvs
Stage Minimum, Percent		2 lvs
Stage Maximum, Percent		6 lvs
Height Average		3 in
Height Minimum, Maximum		2 4
Density Average		5 m <sup>2</sup>
Density Min, Max		0 8

**Application Equipment**

	A	B
Appl. Equipment	TRACTOR	TRACTOR
Equipment Type	TRMOSP	TRMOSP
Operation Pressure	40 PSI	40 PSI
Nozzle Type	AIR MIX	AIR MIX
Nozzle Size	11002	11002
Nozzle Spacing	20 IN	20 IN
Nozzles/Row	6	4
Boom Length	9.5 FT	6.7 FT
Boom Height	18 IN	26 IN
Ground Speed	3 MPH	3 MPH
Carrier	WATER	WATER
Application Amount	20 GAL/AC	20 GAL/AC
Propellant	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	05/30/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	06/28/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

7/09/19: Sprayed with Basagran (and Reflex/Raptor trts) after rating and stand counts. Untreated check is injured. Ratings based on outside rows of best looking plots. Stage of snapbean uninjured: 2nd trifoliolate with 3rd just emerging. Grasses heavy in 201. 5th range has a swail 3/4 way into the plots. Plots 104 and 306 have injury ratings of 18/68 and 80/30 (Front /Back) respectively.

7/18/19: Snapbean stage at rating - uninjured 5th trifoliolate fully formed (some working on 6th), 10-14 inches tall.

8/15/19: plot 314 had a moderate stand of horsetettle that competed with crop. Could not rate crop injury due to blanket of morningglory and competition from other weeds.

## Potential Herbicides to Control Problem Weeds in Snap Beans

Trial ID: Bean1-19

Location: Field 14

Trial Year: 2019

Protocol ID: Bean1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: PVGA

Pest Code Crop Type, Code	C PHSU	C PHSU	C PHSU	C PHSU						
Crop Name Description	Lima bean	Lima bean	Lima bean 1stTrif+	Lima bean						
Rating Type	Emergence total#	recount emergttl	Stunting %	Stand ct TT 50ft-row						
Rating Unit	06/27/19	06/28/19	07/02/19	07/08/19						
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1 Untreated Check							83 b	83 cd	0.0 g	143 e
2 Valor SX Dual Magnum	51 WG 7.62 E	0.032 lb ai/a 1.19 lb ai/a	0.032 lb ai/a PRE 1.19 lb ai/a PRE	A A			45 c	63 de	63.3 b	74 f
3 Valor SX Dual Magnum	51 WG 7.62 E	0.064 lb ai/a 1.19 lb ai/a	0.064 lb ai/a PRE 1.19 lb ai/a PRE	A A			154 a	186 a	4.0 fg	250 a
4 Spartan Charge Dual Magnum	3.5 F 7.62 E	0.105 lb ai/a 1.19 lb ai/a	0.105 lb ai/a PRE 1.19 lb ai/a PRE	A A			100 b	100 c	29.0 d	170 de
5 Spartan Charge Dual Magnum	3.5 F 7.62 E	0.21 lb ai/a 1.19 lb ai/a	0.21 lb ai/a PRE 1.19 lb ai/a PRE	A A			101 b	101 c	40.0 c	191 bcd
6 Cobra Dual Magnum	2 EC 7.62 E	0.188 lb ai/a 1.19 lb ai/a	0.188 lb ai/a PRE 1.19 lb ai/a PRE	A A			141 a	141 b	13.0 e	238 a
7 Collide Dual Magnum	2 EC 7.62 E	0.25 lb ai/a 1.19 lb ai/a	0.25 lb ai/a PRE 1.19 lb ai/a PRE	A A			80 b	80 cd	58.3 b	182 cde
8 Reflex Dual Magnum	2 L 7.62 E	0.313 lb ai/a 1.19 lb ai/a	0.313 lb ai/a PRE 1.19 lb ai/a PRE	A A			159 a	159 b	0.0 g	242 a
9 Sandea Dual Magnum	75 DF 7.62 E	0.0234 lb ai/a 1.19 lb ai/a	0.0234 lb ai/a PRE 1.19 lb ai/a PRE	A A			152 a	152 b	10.7 ef	243 a
10 Valor SX Dual Magnum Basagran Reflex NIS	51 WG 7.62 E 4 L 2 EC 100 SL	0.064 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	0.064 lb ai/a PRE 1.19 lb ai/a PRE 0.75 lb ai/a 2nd Trifol B 0.188 lb ai/a 2nd Trifol B 2nd Trifol B	A A B B B			36 c	45 e	81.7 a	58 f
11 Spartan Charge Dual Magnum Basagran Reflex NIS	3.5 F 7.62 E 4 L 2 EC 100 SL	0.21 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	0.21 lb ai/a PRE 1.19 lb ai/a PRE 0.75 lb ai/a 2nd Trifol B 0.188 lb ai/a 2nd Trifol B 2nd Trifol B	A A B B B			93 b	93 c	45.0 c	177 de
12 Cobra Dual Magnum Basagran Reflex NIS	2 EC 7.62 E 4 L 2 EC 100 SL	0.188 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	0.188 lb ai/a PRE 1.19 lb ai/a PRE 0.75 lb ai/a 2nd Trifol B 0.188 lb ai/a 2nd Trifol B 2nd Trifol B	A A B B B			138 a	138 b	16.0 e	226 ab
13 Sandea Dual Magnum Basagran Reflex Nonionic Surfactant	75 DF 7.62 E 4 L 2 L 100 L	0.0234 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	0.0234 lb ai/a PRE 1.19 lb ai/a PRE 0.75 lb ai/a 2nd Trifol B 0.188 lb ai/a 2nd Trifol B 2nd Trifol B	A A B B B			160 a	160 b	9.7 ef	239 a

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	C	PHSLU	AMAPA C -	IPOSS C -	C	PHSLU	AMAPA C -
Crop Name Description	Lima bean 2-3 trifol	PalmerAm	Mornlry	Lima bean 5 trifol	PalmerAm		
Rating Type	Stunting %	Control %	Control %	Stunting %	Control %		
Rating Unit	07/09/19	07/09/19	07/09/19	07/18/19	07/18/19		
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Untreated Check						
2	Valor SX Dual Magnum	51 WG 7.62 E	0.032 lb ai/a 1.19 lb ai/a	PRE PRE	A A	73.3 a	100.0 a
3	Valor SX Dual Magnum	51 WG 7.62 E	0.064 lb ai/a 1.19 lb ai/a	PRE PRE	A A	21.3 d	88.3 bcd
4	Spartan Charge Dual Magnum	3.5 F 7.62 E	0.105 lb ai/a 1.19 lb ai/a	PRE PRE	A A	42.0 c	100.0 a
5	Spartan Charge Dual Magnum	3.5 F 7.62 E	0.21 lb ai/a 1.19 lb ai/a	PRE PRE	A A	33.7 c	100.0 a
6	Cobra Dual Magnum	2 EC 7.62 E	0.188 lb ai/a 1.19 lb ai/a	PRE PRE	A A	16.3 d	94.3 abc
7	Collide Dual Magnum	2 EC 7.62 E	0.25 lb ai/a 1.19 lb ai/a	PRE PRE	A A	58.3 b	98.3 ab
8	Reflex Dual Magnum	2 L 7.62 E	0.313 lb ai/a 1.19 lb ai/a	PRE PRE	A A	17.7 d	100.0 a
9	Sandea Dual Magnum	75 DF 7.62 E	0.0234 lb ai/a 1.19 lb ai/a	PRE PRE	A A	16.7 d	80.0 d
10	Valor SX Dual Magnum Basagran Reflex NIS	51 WG 7.62 E 4 L 2 EC 100 SL	0.064 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol 2nd Trifol 2nd Trifol	A A B B B	81.7 a	100.0 a
11	Spartan Charge Dual Magnum Basagran Reflex NIS	3.5 F 7.62 E 4 L 2 EC 100 SL	0.21 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol 2nd Trifol 2nd Trifol	A A B B B	41.7 c	96.3 ab
12	Cobra Dual Magnum Basagran Reflex NIS	2 EC 7.62 E 4 L 2 EC 100 SL	0.188 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol 2nd Trifol 2nd Trifol	A A B B B	17.0 d	97.3 ab
13	Sandea Dual Magnum Basagran Reflex Nonionic Surfactant	75 DF 7.62 E 4 L 2 L 100 L	0.0234 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol 2nd Trifol 2nd Trifol	A A B B B	17.3 d	83.3 cd
							30.0 cde
							16.0 e
							93.3 ab

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		IPOSS C - Mornglry	PANDI C - F.panicm	C PHSLU Lima bean EaFlower	AMAPA C - PalmerAm	IPOSS C - Mornglry
Crop Name Description		Control % 07/18/19	Control % 07/18/19	Stunting % 07/26/19	Control % 07/26/19	Control % 07/26/19
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated Check			0.0 h	0.0 e	0.0 g
2	Valor SX Dual Magnum	51 WG 7.62 E	0.032 lb ai/a 1.19 lb ai/a	PRE PRE	A A	63.3 abc 86.7 a
3	Valor SX Dual Magnum	51 WG 7.62 E	0.064 lb ai/a 1.19 lb ai/a	PRE PRE	A A	40.3 def 48.3 cd
4	Spartan Charge Dual Magnum	3.5 F 7.62 E	0.105 lb ai/a 1.19 lb ai/a	PRE PRE	A A	65.3 abc 82.7 a
5	Spartan Charge Dual Magnum	3.5 F 7.62 E	0.21 lb ai/a 1.19 lb ai/a	PRE PRE	A A	57.0 bcd 85.7 a
6	Cobra Dual Magnum	2 EC 7.62 E	0.188 lb ai/a 1.19 lb ai/a	PRE PRE	A A	16.7 gh 64.0 abc
7	Collide Dual Magnum	2 EC 7.62 E	0.25 lb ai/a 1.19 lb ai/a	PRE PRE	A A	44.3 def 81.0 a
8	Reflex Dual Magnum	2 L 7.62 E	0.313 lb ai/a 1.19 lb ai/a	PRE PRE	A A	30.3 efg 76.7 ab
9	Sandea Dual Magnum	75 DF 7.62 E	0.0234 lb ai/a 1.19 lb ai/a	PRE PRE	A A	30.3 efg 53.3 bcd
10	Valor SX Dual Magnum Basagran Reflex NIS	51 WG 7.62 E 4 L 2 EC 100 SL	0.064 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol B 2nd Trifol B 2nd Trifol B	A A B B B	53.3 cd 87.3 a 80.3 a
11	Spartan Charge Dual Magnum Basagran Reflex NIS	3.5 F 7.62 E 4 L 2 EC 100 SL	0.21 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol B 2nd Trifol B 2nd Trifol B	A A B B B	77.3 a 88.0 a 47.7 c
12	Cobra Dual Magnum Basagran Reflex NIS	2 EC 7.62 E 4 L 2 EC 100 SL	0.188 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol B 2nd Trifol B 2nd Trifol B	A A B B B	26.7 fg 35.0 d 18.3 e
13	Sandea Dual Magnum Basagran Reflex Nonionic Surfactant	75 DF 7.62 E 4 L 2 L 100 L	0.0234 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol B 2nd Trifol B 2nd Trifol B	A A B B B	48.7 cde 54.0 bcd 11.0 ef
						99.0 a 99.3 a 96.0 ab 70.3 abc

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		AMAPA C - PalmerAm Control % 08/15/19	IPOSS C - Mornglry Control % 08/15/19	C PHSLU Lima bean Yield beans lb/A 08/15/19	C PHSLU Lima bean injury % 06/27/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code		
1 Untreated Check			0.0 g	0.0 g	240.76485608 gh 0.0 d
2 Valor SX Dual Magnum	51 WG 7.62 E	0.032 lb ai/a PRE 1.19 lb ai/a PRE	A A	95.3 ab	13.3 fg 346.41964664 fgh 1.0 cd
3 Valor SX Dual Magnum	51 WG 7.62 E	0.064 lb ai/a PRE 1.19 lb ai/a PRE	A A	50.0 f	0.0 g 1035.41694754 efg 5.0 bcd
4 Spartan Charge Dual Magnum	3.5 F 7.62 E	0.105 lb ai/a PRE 1.19 lb ai/a PRE	A A	98.7 a	66.7 ab 2301.99377020 abc 0.0 d
5 Spartan Charge Dual Magnum	3.5 F 7.62 E	0.21 lb ai/a PRE 1.19 lb ai/a PRE	A A	97.3 a	41.7 b-e 1663.58270236 cde 0.0 d
6 Cobra Dual Magnum	2 EC 7.62 E	0.188 lb ai/a PRE 1.19 lb ai/a PRE	A A	79.3 d	0.0 g 2013.20400932 bcd 0.0 d
7 Collide Dual Magnum	2 EC 7.62 E	0.25 lb ai/a PRE 1.19 lb ai/a PRE	A A	80.7 cd	16.7 efg 284.69163567 gh 56.7 a
8 Reflex Dual Magnum	2 L 7.62 E	0.313 lb ai/a PRE 1.19 lb ai/a PRE	A A	98.3 a	23.3 d-g 1796.77177168 cde 0.0 d
9 Sandea Dual Magnum	75 DF 7.62 E	0.0234 lb ai/a PRE 1.19 lb ai/a PRE	A A	65.3 e	31.0 c-f 1547.68259877 cde 10.0 bc
10 Valor SX Dual Magnum Basagran Reflex NIS	51 WG 7.62 E 4 L 2 EC 100 SL	0.064 lb ai/a PRE 1.19 lb ai/a PRE 0.75 lb ai/a 2nd Trifol B 0.188 lb ai/a 2nd Trifol B 0.25 % v/v 2nd Trifol B	A A	100.0 a	53.3 abc 0.00000000 h 14.0 b
11 Spartan Charge Dual Magnum Basagran Reflex NIS	3.5 F 7.62 E 4 L 2 EC 100 SL	0.21 lb ai/a PRE 1.19 lb ai/a PRE 0.75 lb ai/a 2nd Trifol B 0.188 lb ai/a 2nd Trifol B 0.25 % v/v 2nd Trifol B	A A	98.3 a	71.7 a 1203.18394832 def 0.0 d
12 Cobra Dual Magnum Basagran Reflex NIS	2 EC 7.62 E 4 L 2 EC 100 SL	0.188 lb ai/a PRE 1.19 lb ai/a PRE 0.75 lb ai/a 2nd Trifol B 0.188 lb ai/a 2nd Trifol B 0.25 % v/v 2nd Trifol B	A A	93.3 abc	33.3 c-f 957.93676779 efg 0.0 d
13 Sandea Dual Magnum Basagran Reflex Nonionic Surfactant	75 DF 7.62 E 4 L 2 L 100 L	0.0234 lb ai/a PRE 1.19 lb ai/a PRE 0.75 lb ai/a 2nd Trifol B 0.188 lb ai/a 2nd Trifol B 0.25 % v/v 2nd Trifol B	A A	89.3 a-d	46.7 a-d 2834.10971541 ab 0.0 d

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C PHSLU	C PHSLU	C PHSLU	C PHSLU											
Crop Name Description	Lima bean	Lima bean	Lima bean 1stTrif+	Lima bean											
Rating Type	Emergence total#	recount emergttl	Stunting %	Stand ct TT 50ft-row											
Rating Unit	06/27/19	06/28/19	07/02/19	07/08/19											
Rating Date															
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code								
14	Sandeal	75	DF	0.0234	lb ai/a	PRE	A	159	a	159	b	3.3	fg	222	abc
	Dual Magnum	7.62	E	1.19	lb ai/a	PRE	A								
	Basagran	4	L	0.75	lb ai/a	2nd Trifol	B								
	Raptor	1	AS	0.0313	lb ai/a	2nd Trifol	B								
	Nonionic Surfactant	100	L	0.25	% v/v	2nd Trifol	B								
LSD P=.05					22.8	22.2	8.92	42.1							
Standard Deviation					13.6	13.2	5.32	25.1							
CV					11.89	11.16	19.9	13.24							
Replicate F					5.263	5.887	3.873	2.179							
Replicate Prob(F)					0.0120	0.0078	0.0337	0.1334							
Treatment F					30.221	31.517	75.245	18.217							
Treatment Prob(F)					0.0001	0.0001	0.0001	0.0001							

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C	PHSLU	AMAPA C -	IPOSS C -	C	PHSLU	AMAPA C -
Crop Name Description	Lima bean 2-3 trifol	PalmerAm	Mornglry	Lima bean 5 trifol	PalmerAm		
Rating Type	Stunting	Control	Control	Stunting	Control		
Rating Unit	%	%	%	%	%		
Rating Date	07/09/19	07/09/19	07/09/19	07/18/19	07/18/19		
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
14 Sandea	75 DF	0.0234	lb ai/a	PRE	A	14.3 d	81.7 d
Dual Magnum	7.62 E	1.19	lb ai/a	PRE	A		
Basagran	4 L	0.75	lb ai/a	2nd Trifol	B		
Raptor	1 AS	0.0313	lb ai/a	2nd Trifol	B		
Nonionic Surfactant	100 L	0.25	% v/v	2nd Trifol	B		
LSD P=.05			9.12		11.55	23.46	8.49
Standard Deviation			5.44		6.88	13.98	5.06
CV			16.86		7.9	44.68	14.14
Replicate F			2.356		6.574	2.438	0.756
Replicate Prob(F)			0.1148		0.0049	0.1071	0.4794
Treatment F			59.677		43.268	6.766	80.955
Treatment Prob(F)			0.0001		0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	IPOSS C - Morngly	PANDI C - F.panicm	C PHSLU Lima bean EaFlower	AMAPA C - PalmerAm	IPOSS C - Morngly							
Rating Type	Control %	Control %	Stunting %	Control %	Control %							
Rating Unit												
Rating Date	07/18/19	07/18/19	07/26/19	07/26/19	07/26/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code					
14	Sandeas	75 DF	0.0234	lb ai/a	PRE	A	72.3 ab	79.0 a	10.0 efg	90.7 bc	84.7 a	
	Dual Magnum	7.62 E	1.19	lb ai/a	PRE	A						
	Basagran	4 L	0.75	lb ai/a	2nd Trifol	B						
	Raptor	1 AS	0.0313	lb ai/a	2nd Trifol	B						
	Nonionic Surfactant	100 L	0.25	% v/v	2nd Trifol	B						
LSD P=.05				18.63	24.07	10.72	7.79	29.53				
Standard Deviation				11.10	14.34	6.39	4.64	17.60				
CV				24.83	21.79	21.51	5.35	28.03				
Replicate F				4.991	0.341	3.056	4.892	3.646				
Replicate Prob(F)				0.0146	0.7141	0.0643	0.0157	0.0402				
Treatment F				11.956	9.508	49.132	97.086	6.172				
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001	0.0001				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	AMAPA C - PalmerAm Control % 08/15/19	IPOSS C - Mornlry Control % 08/15/19	C PHSLU Lima bean Yield beans lb/A 08/15/19	C PHSLU Lima bean injury % 06/27/19
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code	
14 Sandea Dual Magnum Basagran Raptor Nonionic Surfactant	75 DF 7.62 E 4 L 1 AS 100 L	0.0234 lb ai/a 1.19 lb ai/a 0.75 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRE PRE 2nd Trifol B 2nd Trifol B 2nd Trifol B	A A B B B
LSD P=.05 Standard Deviation CV		82.0 bcd	33.3 c-f	3097.92652579 a 864.748342883 515.242485989 37.33 9.31 5.55 89.62
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		13.57 8.09 10.04	27.83 16.58 53.86	5.496 3.499 3.608 0.0102 0.0451 0.0414 34.365 6.088 10.777 0.0001 0.0001 0.948 0.4007 22.465 0.0001 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Lima Bean Response to Different POST Timings of Dual**

Trial ID: Bean 4-19      Location: Field 14      Trial Year: 2018  
 Protocol ID: Bean 4-19      Investigator: Kurt Vollmer  
                                     Study Director: Kurt Vollmer  
                                     Sponsor Contact:

**General Trial Information**

Study Director: Kurt Vollmer  
 Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 06/10/19

Initiation Date: 03/01/19

Completion Date: 08/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

**Contacts**

Study Director: Kurt Vollmer

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C PHSU Phaseolus lunatus Lima bean

Entry Date: 01/23/20

Variety: Cypress

Planting Date: 06/20/19

Planting Rate: 8 S/ROWFT

Depth: 0.75 IN

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDIUM medium

Soil Moisture: NORMAL normal, adequate

Emergence Date: 06/27/19

Harvest Equipment: Hand harvested

Harvested Width: 5 FT

Harvested Length: 10 FT

**Site and Design**

Treated Plot Width: 4 m

Site Type: FIELD field

Treated Plot Length: 6 m

Treated Plot Area: 24 m<sup>2</sup> Treatments: 18 Tillage Type: CONTIL conventional-till

Replications: 4 Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 14C

% Sand: 79 % OM: 1.6 Texture: LS loamy sand

% Silt: 14 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: E excellent

Soil Drainage: G good

<b>Application Description</b>		A	B	C	D
Application Date	06/20/19	07/03/19	07/10/19	07/17/19	
Appl. Stop Time	04:10 PM	02:50 PM	01:30 PM	10:40 AM	
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	
Application Timing	PRE	2WAP	3WAP	4WAP	
Application Placement	BROADC	BROADC	BROADC	BROADC	
Applied By	Johnson	Johnson	Johnson	Johnson	
Appl. Entry Date	11/20/19	11/20/19	11/20/19	11/20/19	
Air Temperature Start, Stop	88 89 F	90 92 F	86 88 F	88 92 F	
% Relative Humidity Start, Stop	61 61	54 51	54 50	72 62	
Wind Velocity+Dir. Start	7 MPH SW	4 MPH WNW	3 MPH S	4 MPH SSW	
Wind Velocity+Dir. Stop	14 MPH SW	3 MPH	8 MPH S	6 MPH SSW	
Wind Velocity+Dir. Max	14 MPH SSW	3 MPH	8 MPH S	6 MPH SSW	
Wet Leaves (Y/N)	N no	N no	N no	N no	
Soil Temperature	87 F	94 F	87 F	86 F	
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL	
% Cloud Cover	47	10	25	3	
Moisture 6 Hours after Appl.	0.55 IN	0 IN	0 IN	0 IN	
Moisture 1 Week after Appl.	1.02 IN	0.53 IN	0.33 IN	0.94 IN	

<b>Crop Stage At Each Application</b>		A	B	C	D
Crop 1 Code, BBCH Scale	PHSLU BVBE				

<b>Application Equipment</b>		A	B	C	D
Appl. Equipment	TRACTOR	TRACTOR	TRACTOR	TRACTOR	
Equipment Type	TRMOSP	TRMOSP	TRMOSP	TRMOSP	
Operation Pressure	40 PSI	40 PSI	40 PSI	40 PSI	
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX	
Nozzle Size	11002	11002	11002	11002	
Nozzle Spacing	20 IN	20 IN	20 IN	20 IN	
Nozzles/Row	6	6	6	6	
Boom Length	9.5 FT	9.5 FT	9.5 FT	9.5 FT	
Boom Height	18 IN	26 IN	30 IN	38 IN	
Ground Speed	3 MPH	3 MPH	3 MPH	3 MPH	
Carrier	WATER	WATER	WATER	WATER	
Application Amount	20 GAL/AC	20 GAL/AC	20 GAL/AC	20 GAL/AC	
Propellant	COMAIR	COMAIR	COMAIR	COMAIR	

Context	Date	By	Notes
STATUS	06/10/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/08/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

Trial Comments	
07/03/19: No injury reported as a result of initial herbicide application.	
07/18/19: Disease in trt 206?, smaller stunted rows stunted in 301, stunting 312, 418, 417	

## Lima Bean Response to Different POST Timings of Dual

Trial ID: Bean 4-19

Location: Field 14

Trial Year: 2018

Protocol ID: Bean 4-19

Investigator: Kurt Vollmer

Study Director: Kurt Vollmer

Sponsor Contact:

Pest Code Crop Type, Code	AMAPA C - PalmerAm	IPOSS C - Mornlry	XANOR C - C.cklbur	GGGAN C - AnnGrass	C PHSLU LimaBean
Description	density #/25ft2 07/03/19	density #/25ft2 07/03/19	density #/25ft2 07/03/19	density #/25ft2 07/03/19	stunting % 07/05/19
Trt No. Treatment Name	Form Conc Rate	Form Type Rate	Rate Unit	Appl Timing	Appl Code
1 Dual Magnum Dual Magnum 2 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.714 lb ai/a	PRE POST 2 WAP B	A	4.3 b 47.5 a 1.0 a 48.3 a 0.0 a
2 Dual Magnum Dual Magnum 3 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.714 lb ai/a	PRE POST 3 WAP B	A	2.8 b 32.3 a 1.3 a 38.5 a
3 Dual Magnum Dual Magnum 4 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.714 lb ai/a	PRE POST 4 WAP B	A	1.0 b 24.3 a 0.3 a 29.5 a
4 Dual Magnum Dual Magnum 2 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.95 lb ai/a	PRE POST 2 WAP B	A	2.3 b 34.3 a 2.5 a 17.5 a 0.0 a
5 Dual Magnum Dual Magnum 3 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.95 lb ai/a	PRE POST 3 WAP B	A	2.3 b 30.5 a 0.0 a 96.5 a
6 Dual Magnum Dual Magnum 4 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.95 lb ai/a	PRE POST 4 WAP B	A	3.8 b 26.5 a 5.5 a 25.3 a
7 Dual Magnum Dual Magnum 2 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.714 lb ai/a	PRE POST 2 WAP B	A	2.3 b 35.0 a 0.3 a 33.3 a 0.0 a
8 Dual Magnum Dual Magnum 3 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.714 lb ai/a	PRE POST 3 WAP B	A	1.3 b 23.0 a 0.0 a 26.3 a
9 Dual Magnum Dual Magnum 4 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.714 lb ai/a	PRE POST 4 WAP B	A	1.3 b 23.0 a 0.0 a 15.5 a
10 Dual Magnum Dual Magnum 2 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.95 lb ai/a	PRE POST 2 WAP B	A	0.8 b 22.3 a 1.0 a 31.0 a 0.0 a
11 Dual Magnum Dual Magnum 3 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.95 lb ai/a	PRE POST 3 WAP B	A	1.0 b 25.0 a 0.3 a 32.5 a
12 Dual Magnum Dual Magnum 4 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.95 lb ai/a	PRE POST 4 WAP B	A	3.5 b 37.5 a 0.3 a 26.0 a
13 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	7.8 b 52.8 a 1.5 a 31.5 a
14 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	0.8 b 32.8 a 0.8 a 17.8 a
15 Dual Magnum Dual Magnum	7.62 EC 7.62 EC	0.95 lb ai/a 2.38 lb ai/a	PRE 3 WAP B	A	2.0 b 27.3 a 0.5 a 32.5 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18.33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

Pest Code Crop Type, Code	C PHSLU	C PHSLU	AMAPA C -	GGGAN C -	C PHSLU		
Description	LimaBean	LimaBean	PalmerAm	AnnGrass	LimaBean		
Rating Type	If burn %	drwstrng %	control %	control %	drwstrng %		
Rating Unit	07/05/19	07/05/19	07/05/19	07/05/19	07/10/19		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	2 wk			2 WAP	B		
2	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	3 wk			3 WAP	B		
3	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	4 wk			4 WAP	B		
4	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	2 wk			2 WAP	B		
5	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	3 wk			3 WAP	B		
6	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	4 wk			4 WAP	B		
7	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	2 wk			2 WAP	B		
8	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	3 wk			3 WAP	B		
9	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	4 wk			4 WAP	B		
10	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	2 wk			2 WAP	B		
11	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	3 wk			3 WAP	B		
12	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	4 wk			4 WAP	B		
13	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
14	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
15	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	2.38 lb ai/a	3 WAP	B		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18.33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

Pest Code Crop Type, Code	C	PHSLU	AMAPA C -	MOLVE C -	GGGAN C -	AMAPA C -	
Description	LimaBean	PalmerAm	Carpetwd	AnnGrass	PalmerAm		
Rating Type	Lf burn	density	density	density	density	density	
Rating Unit	%	#/25ft <sup>2</sup>					
Rating Date	07/10/19	07/10/19	07/10/19	07/10/19	07/10/19	07/16/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	2 wk			2 WAP	B		
2	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	3 wk			3 WAP	B		
3	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	4 wk			4 WAP	B		
4	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	2 wk			2 WAP	B		
5	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	3 wk			3 WAP	B		
6	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	4 wk			4 WAP	B		
7	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	2 wk			2 WAP	B		
8	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	3 wk			3 WAP	B		
9	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
	4 wk			4 WAP	B		
10	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	2 wk			2 WAP	B		
11	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	3 wk			3 WAP	B		
12	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
	4 wk			4 WAP	B		
13	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
				0.0 c	28.5 b	8.0 b	156.3 a
14	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
				2.5 b	27.5 b	4.8 b	84.3 a
15	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
	Dual Magnum	7.62 EC	2.38 lb ai/a	3 WAP	B		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18.33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

Pest Code Crop Type, Code	MOLVE C - Carpetwd	C PHSLU	C PHSLU	C PHSLU	AMAPA C - PalmerAm				
Description	density #/25ft <sup>2</sup>	drwstrng %	Lf burn %	drwstrng %	density #/25ft <sup>2</sup>				
Rating Type	07/16/19	07/18/19	07/18/19	07/25/19	07/25/19				
Trt No. Treatment Name	Form Conc Rate	Form Type Rate	Rate Unit	Appl Timing	Appl Code				
1 Dual Magnum Dual Magnum 2 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.714 lb ai/a	PRE POST 2 WAP	A B B	14.8 b	12.5 d-h	0.0 d	1.0 b	9.0 b
2 Dual Magnum Dual Magnum 3 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.714 lb ai/a	PRE POST 3 WAP	A B B	3.0 cd	16.3 c-f	1.7 d	2.8 b	7.0 b
3 Dual Magnum Dual Magnum 4 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.714 lb ai/a	PRE POST 4 WAP	A B B	8.8 bc	8.0 f-i	5.0 bcd	0.5 b	4.3 b
4 Dual Magnum Dual Magnum 2 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.95 lb ai/a	PRE POST 2 WAP	A B B	4.5 cd	11.3 d-h	3.3 cd	1.3 b	6.5 b
5 Dual Magnum Dual Magnum 3 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.95 lb ai/a	PRE POST 3 WAP	A B B	6.8 bcd	22.5 bc	3.3 cd	5.0 b	5.5 b
6 Dual Magnum Dual Magnum 4 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.95 lb ai/a	PRE POST 4 WAP	A B B	5.0 cd	18.8 b-e	5.0 bcd	7.0 b	5.3 b
7 Dual Magnum Dual Magnum 2 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.714 lb ai/a	PRE POST 2 WAP	A B B	1.8 cd	11.3 d-h	5.0 bcd	1.3 b	4.3 b
8 Dual Magnum Dual Magnum 3 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.714 lb ai/a	PRE POST 3 WAP	A B B	2.3 cd	19.3 bcd	6.7 bcd	4.5 b	3.3 b
9 Dual Magnum Dual Magnum 4 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.714 lb ai/a	PRE POST 4 WAP	A B B	2.8 cd	7.5 f-i	5.0 bcd	0.8 b	5.0 b
10 Dual Magnum Dual Magnum 2 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.95 lb ai/a	PRE POST 2 WAP	A B B	0.5 d	10.0 e-h	6.3 bcd	2.3 b	3.0 b
11 Dual Magnum Dual Magnum 3 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.95 lb ai/a	PRE POST 3 WAP	A B B	2.8 cd	26.3 b	5.0 bcd	5.8 b	1.5 b
12 Dual Magnum Dual Magnum 4 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.95 lb ai/a	PRE POST 4 WAP	A B B	2.3 cd	6.3 ghi	11.7 b	0.8 b	4.3 b
13 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	2.5 cd	15.0 c-g	0.0 d	1.0 b	16.5 b
14 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	4.8 cd	13.8 c-g	10.0 bc	2.5 b	5.0 b
15 Dual Magnum Dual Magnum	7.62 EC 7.62 EC	0.95 lb ai/a 2.38 lb ai/a	PRE 3 WAP	A B	5.3 cd	45.0 a	23.3 a	31.3 a	6.3 b

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18.33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

Pest Code		MOLVE							
Crop Type, Code		C -	PHSLU						
Description		Carpetwd	LimaBean						
Rating Type		density	Yield						
Rating Unit		#/25ft <sup>2</sup>	kg/20 ft						
Rating Date		07/25/19	09/11/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		15.8 a	0.3910 a
	Dual Magnum	7.62 EC	0.714	lb ai/a	POST	B			
	2 wk				2 WAP	B			
2	Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		6.5 b	0.4795 a
	Dual Magnum	7.62 EC	0.714	lb ai/a	POST	B			
	3 wk				3 WAP	B			
3	Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		13.8 a	0.7663 a
	Dual Magnum	7.62 EC	0.714	lb ai/a	POST	B			
	4 wk				4 WAP	B			
4	Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		4.3 bc	0.4588 a
	Dual Magnum	7.62 EC	0.95	lb ai/a	POST	B			
	2 wk				2 WAP	B			
5	Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		4.3 bc	0.6205 a
	Dual Magnum	7.62 EC	0.95	lb ai/a	POST	B			
	3 wk				3 WAP	B			
6	Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		7.0 b	0.5810 a
	Dual Magnum	7.62 EC	0.95	lb ai/a	POST	B			
	4 wk				4 WAP	B			
7	Dual Magnum	7.62 EC	1.19	lb ai/a	PRE	A		3.3 bc	0.5820 a
	Dual Magnum	7.62 EC	0.714	lb ai/a	POST	B			
	2 wk				2 WAP	B			
8	Dual Magnum	7.62 EC	1.19	lb ai/a	PRE	A		4.0 bc	0.8438 a
	Dual Magnum	7.62 EC	0.714	lb ai/a	POST	B			
	3 wk				3 WAP	B			
9	Dual Magnum	7.62 EC	1.19	lb ai/a	PRE	A		4.3 bc	0.5475 a
	Dual Magnum	7.62 EC	0.714	lb ai/a	POST	B			
	4 wk				4 WAP	B			
10	Dual Magnum	7.62 EC	1.19	lb ai/a	PRE	A		2.5 bc	0.9425 a
	Dual Magnum	7.62 EC	0.95	lb ai/a	POST	B			
	2 wk				2 WAP	B			
11	Dual Magnum	7.62 EC	1.19	lb ai/a	PRE	A		2.5 bc	0.8025 a
	Dual Magnum	7.62 EC	0.95	lb ai/a	POST	B			
	3 wk				3 WAP	B			
12	Dual Magnum	7.62 EC	1.19	lb ai/a	PRE	A		2.5 bc	1.2177 a
	Dual Magnum	7.62 EC	0.95	lb ai/a	POST	B			
	4 wk				4 WAP	B			
13	Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		5.5 bc	0.3275 a
14	Dual Magnum	7.62 EC	1.19	lb ai/a	PRE	A		6.5 b	0.7033 a
15	Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		5.8 bc	0.8310 a
	Dual Magnum	7.62 EC	2.38	lb ai/a	3 WAP	B			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18.33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	AMAPA C -	IPOSS C -	XANOR C -	GGGAN C -	C PHSLU
Description	PalmerAm	Mornglry	C.cklbur	AnnGrass	LimaBean
Rating Type	density	density	density	density	stunting
Rating Unit	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	%
Rating Date	07/03/19	07/03/19	07/03/19	07/03/19	07/05/19
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
16 Local Standard					
Dual Magnum	7.62 EC	1.43 lb ai/a	PRE	A	
Sandea nonionic surfactant	75 DF 100 L	0.031 lb ai/a 0.25 % v/v	4 WAP B	A	
17 Weed Free					
Dual Magnum	7.62 EC	1.27 lb ai/a	PRE	A	
Pursuit	2 EC	0.0313 lb ai/a	PRE	A	
Spartan Charge	3.5 EC	0.082 lb ai/a	PRE	A	
18 untreated					
LSD P=.05		16.05	24.03	4.22	56.24
Standard Deviation		11.31	16.93	2.97	39.62
CV		69.12	57.25	334.57	125.83
Replicate F		1.054	3.157	1.185	2.004
Replicate Prob(F)		0.3770	0.0325	0.3247	0.1251
Treatment F		112.431	1.708	0.789	0.944
Treatment Prob(F)		0.0001	0.0720	0.6969	0.5306
					0.000
					1.0000
					0.000

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18,33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	C PHSLU	C PHSLU	AMAPA C -	GGGAN C -	C PHSLU		
Description	LimaBean	LimaBean	PalmerAm	AnnGrass	LimaBean		
Rating Type	If burn	drwstrng	control	control	drwstrng		
Rating Unit	%	%	%	%	%		
Rating Date	07/05/19	07/05/19	07/05/19	07/05/19	07/10/19		
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
16	Local Standard						
	Dual Magnum	7.62 EC	1.43 lb ai/a	PRE	A		
	Sandeal	75 DF	0.031 lb ai/a	4 WAP	B		
	nonionic surfactant	100 L	0.25 % v/v	4 WAP	B		
17	Weed Free						
	Dual Magnum	7.62 EC	1.27 lb ai/a	PRE	A	0.0 a	0.0 a
	Pursuit	2 EC	0.0313 lb ai/a	PRE	A		
	Spartan Charge	3.5 EC	0.082 lb ai/a	PRE	A		
18	untreated					0.0 a	0.0 a
LSD P=.05				.62	28.76	6.96	3.35
Standard Deviation			0.00	0.41	19.08	4.62	2.36
CV			0.0	244.95	25.09	6.12	214.98
Replicate F			0.000	0.000	0.820	1.048	3.444
Replicate Prob(F)			1.0000	1.0000	0.5028	0.3999	0.0234
Treatment F			0.000	1.000	16.778	261.186	1.513
Treatment Prob(F)			1.0000	0.4509	0.0001	0.0001	0.1279

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18.33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	C PHSLU	AMAPA C -	MOLVE C -	GGGAN C -	AMAPA C -							
Description	LimaBean	PalmerAm	Carpetwd	AnnGrass	PalmerAm							
Rating Type	Lf burn %	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>							
Rating Unit	07/10/19	07/10/19	07/10/19	07/10/19	07/16/19							
Rating Date												
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code					
16	Local Standard											
	Dual Magnum	7.62 EC	1.43 lb ai/a	PRE	A			0.0 c	6.0 b	5.3 b	99.8 a	2.5 cd
	Sandeal	75 DF	0.031 lb ai/a	4 WAP	B							
	nonionic surfactant	100 L	0.25 % v/v	4 WAP	B							
17	Weed Free							0.8 bc	50.3 b	25.0 b	4.0 a	0.5 d
	Dual Magnum	7.62 EC	1.27 lb ai/a	PRE	A							
	Pursuit	2 EC	0.0313 lb ai/a	PRE	A							
	Spartan Charge	3.5 EC	0.082 lb ai/a	PRE	A							
18	untreated							0.0 c	226.3 a	61.5 a	0.8 a	131.3 a
LSD P=.05				1.76	52.19	28.86	179.72					7.37
Standard Deviation				1.24	36.76	20.33	126.60					5.19
CV				168.05	143.24	245.56	113.7					42.4
Replicate F				0.808	0.604	1.783	2.938					1.611
Replicate Prob(F)				0.4954	0.6153	0.1621	0.0419					0.1982
Treatment F				14.924	7.790	1.967	1.417					132.311
Treatment Prob(F)				0.0001	0.0001	0.0324	0.1678					0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18,33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	MOLVE C - Carpetwd density #/25ft2 07/16/19	C PHSLU	C PHSLU	C PHSLU	AMAPA C - PalmerAm
Description	LimaBean	LimaBean	LimaBean		
Rating Type	drwstrng	Lf burn	drwstrng	density	
Rating Unit	%	%	%	%	#/25ft2
Rating Date	07/18/19	07/18/19	07/25/19	07/25/19	07/25/19
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
16 Local Standard					
Dual Magnum	7.62 EC	1.43 lb ai/a	PRE	A	
Sandeal	75 DF	0.031 lb ai/a	4 WAP	B	
nonionic surfactant	100 L	0.25 % v/v	4 WAP	B	
17 Weed Free					
Dual Magnum	7.62 EC	1.27 lb ai/a	PRE	A	
Pursuit	2 EC	0.0313 lb ai/a	PRE	A	
Spartan Charge	3.5 EC	0.082 lb ai/a	PRE	A	
18 untreated		105.0 a		0.0 i	0.0 d
LSD P=.05		8.12	9.21	7.35	7.12
Standard Deviation		5.72	6.49	5.09	5.02
CV		58.69	44.64	96.17	130.84
Replicate F		1.675	0.428	0.120	0.411
Replicate Prob(F)		0.1841	0.7335	0.9479	0.7460
Treatment F		70.432	9.451	4.711	8.109
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001
					226.3 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=18,33

Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

## University of Delaware

Pest Code Crop Type, Code	MOLVE C - C	PHSLU					
Description	Carpetwd	LimaBean					
Rating Type	density	Yield					
Rating Unit	#/25ft <sup>2</sup>	kg/20 ft					
Rating Date	07/25/19	09/11/19					
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
16 Local Standard Dual Magnum Sandeal nonionic surfactant	7.62 EC 75 DF 100 L	1.43 lb ai/a 0.031 lb ai/a 0.25 % v/v	PRE 4 WAP B 4 WAP B	A	4.8 bc	0.8523 a	
17 Weed Free Dual Magnum Pursuit Spartan Charge	7.62 EC 2 EC 3.5 EC	1.27 lb ai/a 0.0313 lb ai/a 0.082 lb ai/a	PRE PRE PRE	A A A	0.0 c	1.5618 a	
18 untreated							
LSD P=.05 Standard Deviation CV					5.87 4.13 75.43	0.80068 0.56069 76.2	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					3.029 0.0383 3.630 0.0003	2.040 0.1233 1.211 0.3011	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
 Missing data estimates are included in columns:Average=18.33  
 Could not calculate LSD (% mean diff) for columns 5,6 because error mean square = 0.

## Lima Bean Response to Different POST Timings of Dual

Trial ID: Bean 4-19

Location: Field 14

Trial Year: 2018

Protocol ID: Bean 4-19

Investigator: Kurt Vollmer

Study Director: Kurt Vollmer

Sponsor Contact:

Pest Code Crop Type, Code	AMAPA C -	IPOSS C -	XANOR C -	GGGAN C -						
Description	PalmerAm	Mornglry	C.cklbur	AnnGrass						
Rating Type	density	density	density	density						
Rating Unit	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>						
Rating Date	07/03/19	07/03/19	07/03/19	07/03/19						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
TABLE OF R MEANS										
Replicate 1							1.0	34.9	0.5	36.5
Replicate 2							1.3	36.3	1.2	59.8
Replicate 3							2.8	23.0	0.1	23.9
Replicate 4							3.7	26.1	2.3	19.8
TABLE OF A (PRE treatment) MEANS										
1 Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	2.7 a	32.5 a	1.8 a	42.6 a
2 Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	1.7 a	27.6 a	0.3 a	27.4 a
LSD P=.05							1.89	10.22	2.11	28.23
Standard Deviation							3.21	17.40	3.59	48.06
CV							146.74	57.84	351.56	137.32
TABLE OF B (POST treatment) MEANS										
1 Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B	2.1 a	30.8 a	0.5 a	31.9 a
2 Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B	2.3 a	29.3 a	1.6 a	38.1 a
LSD P=.05							1.89	10.22	2.11	28.23
Standard Deviation							3.21	17.40	3.59	48.06
CV							146.74	57.84	351.56	137.32
TABLE OF C (POST Timing) MEANS										
1 2 wk			2	WAP	B		2.4 a	34.8 a	1.2 a	32.5 a
2 3 wk			3	WAP	B		1.8 a	27.7 a	0.4 a	48.4 a
3 4 wk			4	WAP	B		2.4 a	27.8 a	1.5 a	24.1 a
LSD P=.05							2.31	12.52	2.58	34.57
Standard Deviation							3.21	17.40	3.59	48.06
CV							146.74	57.84	351.56	137.32
TABLE OF A (PRE treatment) B (POST treatment) MEANS										
1 Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	2.7 a	34.7 a	0.8 a	38.8 a
1 Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B				
2 Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	1.6 a	27.0 a	0.1 a	25.0 a
1 Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B				
1 Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	2.8 a	30.4 a	2.7 a	46.4 a
2 Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B				
2 Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	1.8 a	28.3 a	0.5 a	29.8 a
2 Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B				
LSD P=.05							2.67	14.45	2.98	39.92
Standard Deviation							3.21	17.40	3.59	48.06
CV							146.74	57.84	351.56	137.32
TABLE OF A (PRE treatment) C (POST Timing) MEANS										
1 Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	3.3 a	40.9 a	1.8 a	32.9 a
1 2 wk				2	WAP	B				
2 Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	1.5 a	28.6 a	0.6 a	32.1 a
2 Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code	C	PHSLU	C	PHSLU	C	PHSLU
Crop Type, Code	LimaBean	LimaBean	LimaBean	LimaBean	LimaBean	LimaBean
Description	stunting %	If burn %	drwstrng %			
Rating Type	07/05/19	07/05/19	07/05/19			
Rating Unit						
Rating Date						
Trt Treatment No.	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
Replicate 1						
Replicate 2						
Replicate 3						
Replicate 4						
TABLE OF R MEANS						
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
LSD P=.05						
Standard Deviation						
CV						
TABLE OF B (POST treatment) MEANS						
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
LSD P=.05						
Standard Deviation						
CV						
TABLE OF C (POST Timing) MEANS						
1 2 wk		2 WAP	B			
2 3 wk		3 WAP	B			
3 4 wk		4 WAP	B			
LSD P=.05						
Standard Deviation						
CV						
TABLE OF A (PRE treatment) B (POST treatment) MEANS						
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		
LSD P=.05						
Standard Deviation						
CV						
TABLE OF A (PRE treatment) C (POST Timing) MEANS						
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		
1 2 wk		2 WAP	B			
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		
1 2 wk		2 WAP	B			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	AMAPA C - PalmerAm	GGGAN C - AnnGrass	C PHSLU LimaBean
Description	control %	control %	drwstrng %
Rating Type			
Rating Unit			
Rating Date	07/05/19	07/05/19	07/10/19
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code
TABLE OF R MEANS			
Replicate 1			1.3
Replicate 2			3.1
Replicate 3			0.5
Replicate 4			0.6
TABLE OF A (PRE treatment) MEANS			
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A
LSD P=.05			1.53
Standard Deviation			2.60
CV			188.95
TABLE OF B (POST treatment) MEANS			
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST B
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST B
LSD P=.05			1.53
Standard Deviation			2.60
CV			188.95
TABLE OF C (POST Timing) MEANS			
1 2 wk		2 WAP B	2.4 a
2 3 wk		3 WAP B	1.6 a
3 4 wk		4 WAP B	0.2 a
LSD P=.05			1.87
Standard Deviation			2.60
CV			188.95
TABLE OF A (PRE treatment) B (POST treatment) MEANS			
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST B
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST B
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST B
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST B
LSD P=.05			2.16
Standard Deviation			2.60
CV			188.95
TABLE OF A (PRE treatment) C (POST Timing) MEANS			
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A
1 2 wk		2 WAP B	2.0 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A
1 2 wk		2 WAP B	2.8 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	C	PHSLU	AMAPA C -	MOLVE C -	GGGAN C -
Description	LimaBean	PalmerAm	Carpetwd	AnnGrass	
Rating Type	Lf burn %	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>	
Rating Unit	07/10/19	07/10/19	07/10/19	07/10/19	07/10/19
Rating Date					
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code					
TABLE OF R MEANS					
Replicate 1	0.0	2.6	3.8	103.8	
Replicate 2	0.0	5.0	1.6	232.6	
Replicate 3	0.0	18.6	5.7	91.6	
Replicate 4	0.0	11.5	2.4	85.9	
TABLE OF A (PRE treatment) MEANS					
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.0 a	11.2 a	3.8 a	159.9 a	
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	0.0 a	7.7 a	3.0 a	97.0 a	
LSD P=.05	.	4.51	1.91	89.27	
Standard Deviation	0.00	7.68	3.24	151.99	
CV	0.00	81.55	96.14	118.30	
TABLE OF B (POST treatment) MEANS					
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	0.0 a	8.9 a	3.5 a	157.3 a	
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	0.0 a	9.9 a	3.3 a	99.7 a	
LSD P=.05	.	4.51	1.91	89.27	
Standard Deviation	0.00	7.68	3.24	151.99	
CV	0.00	81.55	96.14	118.30	
TABLE OF C (POST Timing) MEANS					
1 2 wk 2 WAP B	0.0 a	8.9 a	2.8 a	123.2 a	
2 3 wk 3 WAP B	0.0 a	8.3 a	3.2 a	112.3 a	
3 4 wk 4 WAP B	0.0 a	11.1 a	4.1 a	149.9 a	
LSD P=.05	.	5.52	2.33	109.33	
Standard Deviation	0.00	7.68	3.24	151.99	
CV	0.00	81.55	96.14	118.30	
TABLE OF A (PRE treatment) B (POST treatment) MEANS					
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.0 a	10.3 a	3.6 a	223.5 a	
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B					
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	0.0 a	7.6 a	3.4 a	91.1 a	
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B					
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.0 a	12.1 a	3.9 a	96.3 a	
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B					
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	0.0 a	7.8 a	2.6 a	103.0 a	
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B					
LSD P=.05	.	6.38	2.69	126.24	
Standard Deviation	0.00	7.68	3.24	151.99	
CV	0.00	81.55	96.14	118.30	
TABLE OF A (PRE treatment) C (POST Timing) MEANS					
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.0 a	11.0 a	3.0 a	130.9 a	
1 2 wk 2 WAP B					
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	0.0 a	6.9 a	2.6 a	115.5 a	
1 2 wk 2 WAP B					

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code		AMAPA C -	MOLVE C -	C PHSLU						
Crop Type, Code		PalmerAm	Carpetwd	LimaBean						
Description										
Rating Type		density	density	drwstrng						
Rating Unit		#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	%						
Rating Date		07/16/19	07/16/19	07/18/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
TABLE OF R MEANS										
Replicate 1						2.9	9.0	15.8		
Replicate 2						3.9	2.0	13.1		
Replicate 3						8.4	4.6	13.1		
Replicate 4						5.8	2.8	14.6		
TABLE OF A (PRE treatment) MEANS										
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		6.6 a	7.1 a	14.9 a		
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		3.9 b	2.0 b	13.4 a		
LSD P=.05						2.20	2.85	2.50		
Standard Deviation						3.74	4.85	4.26		
CV						71.00	105.90	30.11		
TABLE OF B (POST treatment) MEANS										
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		5.7 a	5.5 a	12.5 b		
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		4.8 a	3.6 a	15.8 a		
LSD P=.05						2.20	2.85	2.50		
Standard Deviation						3.74	4.85	4.26		
CV						71.00	105.90	30.11		
TABLE OF C (POST Timing) MEANS										
1 2 wk		2 WAP	B			6.0 a	5.4 a	11.3 b		
2 3 wk		3 WAP	B			4.7 a	3.7 a	21.1 a		
3 4 wk		4 WAP	B			5.1 a	4.7 a	10.1 b		
LSD P=.05						2.69	3.49	3.06		
Standard Deviation						3.74	4.85	4.26		
CV						71.00	105.90	30.11		
TABLE OF A (PRE treatment) B (POST treatment) MEANS										
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		7.1 a	8.8 a	12.3 a		
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B						
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		4.3 a	2.3 a	12.7 a		
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B						
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		6.2 a	5.4 a	17.5 a		
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B						
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		3.5 a	1.8 a	14.2 a		
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B						
LSD P=.05						3.11	4.03	3.54		
Standard Deviation						3.74	4.85	4.26		
CV						71.00	105.90	30.11		
TABLE OF A (PRE treatment) C (POST Timing) MEANS										
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		8.0 a	9.6 a	11.9 b		
1 2 wk		2 WAP	B							
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		4.0 a	1.1 a	10.6 bc		
1 2 wk		2 WAP	B							

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code		C	PHSLU	C	PHSLU	AMAPA
Crop Type, Code			LimaBean	LimaBean	PalmerAm	C -
Description			Lf burn %	drwstrng %	density #/25ft <sup>2</sup>	
Rating Type			07/18/19	07/25/19	07/25/19	
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
TABLE OF R MEANS						
Replicate 1				5.0	2.5	2.8
Replicate 2				3.5	2.8	4.1
Replicate 3				5.3	3.4	7.8
Replicate 4				5.6	2.3	4.8
TABLE OF A (PRE treatment) MEANS						
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	3.1 b	2.9 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	6.6 a	2.5 a
LSD P=.05					3.07	1.33
Standard Deviation					5.06	2.27
CV					104.75	83.21
TABLE OF B (POST treatment) MEANS						
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B	3.9 a	1.8 b
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B	5.8 a	3.7 a
LSD P=.05					3.07	1.33
Standard Deviation					5.06	2.27
CV					104.75	83.21
TABLE OF C (POST Timing) MEANS						
1 2 wk		2 WAP	B		3.6 a	1.4 b
2 3 wk		3 WAP	B		4.2 a	4.5 a
3 4 wk		4 WAP	B		6.7 a	2.3 b
LSD P=.05					3.76	1.63
Standard Deviation					5.06	2.27
CV					104.75	83.21
TABLE OF A (PRE treatment) B (POST treatment) MEANS						
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	2.2 a	1.4 a
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		6.8 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	5.6 a	2.2 a
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		4.2 a
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	3.9 a	4.4 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		5.8 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	7.6 a	2.9 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		2.9 a
LSD P=.05					4.34	1.89
Standard Deviation					5.06	2.27
CV					104.75	83.21
TABLE OF A (PRE treatment) C (POST Timing) MEANS						
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	1.7 a	1.1 c
1 2 wk		2 WAP	B			7.8 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	5.6 a	1.8 bc
1 2 wk		2 WAP	B			3.6 a

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	MOLVE C - C PHSLU
Description	Carpetwd density
Rating Type	#/25ft <sup>2</sup>
Rating Unit	07/25/19
Rating Date	09/11/19
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code	
TABLE OF R MEANS	
Replicate 1	7.3 0.8251
Replicate 2	4.3 0.7757
Replicate 3	7.5 0.3970
Replicate 4	4.3 0.7466
TABLE OF A (PRE treatment) MEANS	
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	8.6 a 0.5495 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	3.2 b 0.8227 a
LSD P=.05	2.52 0.32211
Standard Deviation	4.29 0.54557
CV	73.08 79.52051
TABLE OF B (POST treatment) MEANS	
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	7.9 a 0.6017 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	3.8 b 0.7705 a
LSD P=.05	2.52 0.32211
Standard Deviation	4.29 0.54557
CV	73.08 79.52051
TABLE OF C (POST Timing) MEANS	
1 2 wk 2 WAP B	6.4 a 0.5936 a
2 3 wk 3 WAP B	4.3 a 0.6866 a
3 4 wk 4 WAP B	6.9 a 0.7781 a
LSD P=.05	3.09 0.39450
Standard Deviation	4.29 0.54557
CV	73.08 79.52051
TABLE OF A (PRE treatment) B (POST treatment) MEANS	
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	12.0 a 0.5456 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	3.8 b 0.6578 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	5.2 b 0.5534 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	2.5 b 0.9876 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	
LSD P=.05	3.57 0.45553
Standard Deviation	4.29 0.54557
CV	73.08 79.52051
TABLE OF A (PRE treatment) C (POST Timing) MEANS	
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	10.0 a 0.4249 a
1 2 wk 2 WAP B	
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	2.9 a 0.7623 a
1 2 wk 2 WAP B	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm	IPOSS C - Mornglry	XANOR C - C.cklbur	GGGAN C - AnnGrass					
Description										
Rating Type		density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>					
Rating Unit		07/03/19	07/03/19	07/03/19	07/03/19					
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 3	A WAP	2 wk	2.5 a	31.4 a	0.6 a	67.5 a
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 3	A WAP	3 wk	1.1 a	24.0 a	0.1 a	29.4 a
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 4	A WAP	4 wk	2.4 a	25.4 a	2.9 a	27.4 a
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 4	A WAP	3 wk	2.4 a	30.3 a	0.1 a	20.8 a
LSD P=.05				3.27	17.70	3.65	48.89			
Standard Deviation				3.21	17.40	3.59	48.06			
CV				146.74	57.84	351.56	137.32			
TABLE OF B (POST treatment) C (POST Timing) MEANS										
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 2	B WAP	1 wk	3.3 a	41.3 a	0.6 a	40.8 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 2	B WAP	2 wk	1.5 a	28.3 a	1.8 a	24.3 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 3	B WAP	3 wk	2.0 a	27.6 a	0.6 a	32.4 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 3	B WAP	2 wk	1.6 a	27.8 a	0.1 a	64.5 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 4	B WAP	3 wk	1.1 a	23.6 a	0.1 a	22.5 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 4	B WAP	2 wk	3.6 a	32.0 a	2.9 a	25.6 a
LSD P=.05				3.27	17.70	3.65	48.89			
Standard Deviation				3.21	17.40	3.59	48.06			
CV				146.74	57.84	351.56	137.32			
TABLE OF A (PRE treatment) B (POST treatment) C (POST Timing) MEANS										
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 1	A	2 wk	4.3 a	47.5 a	1.0 a	48.3 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 2	B WAP	1 wk				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 1	A	2 wk	2.3 a	35.0 a	0.3 a	33.3 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 2	B WAP	1 wk				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 2	A	2 wk	2.3 a	34.3 a	2.5 a	17.5 a
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 1	A	2 wk	0.8 a	22.3 a	1.0 a	31.0 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 2	B WAP	1 wk				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 3	A	2 wk	2.8 a	32.3 a	1.3 a	38.5 a
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 3	A WAP	2 wk	1.3 a	23.0 a	0.0 a	26.3 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 3	B WAP	3 wk				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C PHSU	C PHSU	C PHSU
Description	LimaBean stunting %	LimaBean If burn %	LimaBean drwstrng %
Rating Type	07/05/19	07/05/19	07/05/19
Rating Unit			
Rating Date			
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code			
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 2 3 wk 3 WAP B			
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 2 3 wk 3 WAP B			
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 3 4 wk 4 WAP B			
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 3 4 wk 4 WAP B			
LSD P=.05			
Standard Deviation			
CV			
TABLE OF B (POST treatment) C (POST Timing) MEANS 1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 1 2 wk 2 WAP B			
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 1 2 wk 2 WAP B			
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 2 3 wk 3 WAP B			
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 2 3 wk 3 WAP B			
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 3 4 wk 4 WAP B			
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 3 4 wk 4 WAP B			
LSD P=.05			
Standard Deviation			
CV			
TABLE OF A (PRE treatment) B (POST treatment) C (POST Timing) MEANS 1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 1 2 wk 2 WAP B	0.0 a	0.0 a	0.3 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 1 2 wk 2 WAP B	0.0 a	0.0 a	0.0 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 1 2 wk 2 WAP B	0.0 a	0.0 a	0.3 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 1 2 wk 2 WAP B	0.0 a	0.0 a	0.5 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 2 3 wk 3 WAP B	.	.	.
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 2 3 wk 3 WAP B	.	.	.

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm control % 07/05/19	GGGAN C - AnnGrass control % 07/05/19	C PHSLU LimaBean drwstrng % 07/10/19
Description				
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code	
1 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a	PRE 3 WAP B	A	0.3 a
2 Dual Magnum 2 3 wk	7.62 EC 1.19 lb ai/a	PRE 3 WAP B	A	2.9 a
1 Dual Magnum 3 4 wk	7.62 EC 0.95 lb ai/a	PRE 4 WAP B	A	0.4 a
2 Dual Magnum 3 4 wk	7.62 EC 1.19 lb ai/a	PRE 4 WAP B	A	0.0 a
LSD P=.05				2.64
Standard Deviation				2.60
CV				188.95
TABLE OF B (POST treatment) C (POST Timing) MEANS				
1 Dual Magnum 1 2 wk	7.62 EC 0.714 lb ai/a	POST 2 WAP B	B	1.9 a
2 Dual Magnum 1 2 wk	7.62 EC 0.95 lb ai/a	POST 2 WAP B	B	2.9 a
1 Dual Magnum 2 3 wk	7.62 EC 0.714 lb ai/a	POST 3 WAP B	B	1.1 a
2 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a	POST 3 WAP B	B	2.0 a
1 Dual Magnum 3 4 wk	7.62 EC 0.714 lb ai/a	POST 4 WAP B	B	0.0 a
2 Dual Magnum 3 4 wk	7.62 EC 0.95 lb ai/a	POST 4 WAP B	B	0.4 a
LSD P=.05				2.64
Standard Deviation				2.60
CV				188.95
TABLE OF A (PRE treatment) B (POST treatment) C (POST Timing) MEANS				
1 Dual Magnum 1 2 wk	7.62 EC 0.95 lb ai/a	PRE 2 WAP B	A	95.0 a
1 Dual Magnum 1 2 wk	7.62 EC 0.714 lb ai/a	POST 2 WAP B	B	88.8 a
2 Dual Magnum 1 2 wk	7.62 EC 1.19 lb ai/a	PRE 2 WAP B	A	94.5 a
1 Dual Magnum 1 2 wk	7.62 EC 0.714 lb ai/a	POST 2 WAP B	B	88.3 a
1 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a	PRE 2 WAP B	A	68.0 a
2 Dual Magnum 1 2 wk	7.62 EC 0.95 lb ai/a	POST 2 WAP B	B	91.3 a
2 Dual Magnum 2 3 wk	7.62 EC 1.19 lb ai/a	PRE 2 WAP B	A	98.8 a
1 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a	POST 3 WAP B	B	84.5 a
1 Dual Magnum 2 3 wk	7.62 EC 0.714 lb ai/a	PRE 3 WAP B	A	0.3 a
2 Dual Magnum 2 3 wk	7.62 EC 1.19 lb ai/a	PRE 3 WAP B	A	2.0 a
1 Dual Magnum 2 3 wk	7.62 EC 0.714 lb ai/a	POST 3 WAP B	B	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	C PHSLU	AMAPA C -	MOLVE C -	GGGAN C -
Description	LimaBean	PalmerAm	Carpetwd	AnnGrass
Rating Type	Lf burn %	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>
Rating Unit	07/10/19	07/10/19	07/10/19	07/10/19
Rating Date				
Trt Treatment No. Name	Form Conc Rate	Form Type Rate	Appl Unit Timing	Appl Code
1 Dual Magnum 2 3 wk	7.62 EC	0.95 lb ai/a	PRE A 3 WAP B	0.0 a
2 Dual Magnum 2 3 wk	7.62 EC	1.19 lb ai/a	PRE A 3 WAP B	0.0 a
1 Dual Magnum 3 4 wk	7.62 EC	0.95 lb ai/a	PRE A 4 WAP B	0.0 a
2 Dual Magnum 3 4 wk	7.62 EC	1.19 lb ai/a	PRE A 4 WAP B	0.0 a
LSD P=.05			.	7.81
Standard Deviation		0.00	7.68	3.30
CV		0.00	81.55	154.61
151.99			3.24	118.30
TABLE OF B (POST treatment) C (POST Timing) MEANS				
1 Dual Magnum 1 2 wk	7.62 EC	0.714 lb ai/a	POST B 2 WAP B	0.0 a
2 Dual Magnum 1 2 wk	7.62 EC	0.95 lb ai/a	POST B 2 WAP B	0.0 a
1 Dual Magnum 2 3 wk	7.62 EC	0.714 lb ai/a	POST B 3 WAP B	0.0 a
2 Dual Magnum 2 3 wk	7.62 EC	0.95 lb ai/a	POST B 3 WAP B	0.0 a
1 Dual Magnum 3 4 wk	7.62 EC	0.714 lb ai/a	POST B 4 WAP B	0.0 a
2 Dual Magnum 3 4 wk	7.62 EC	0.95 lb ai/a	POST B 4 WAP B	0.0 a
LSD P=.05		.	7.81	3.30
Standard Deviation		0.00	7.68	154.61
CV		0.00	81.55	151.99
119.0 a			3.24	118.30
105.6 a			4.0 a	
204.3 a			5.0 a	
95.6 a			3.3 a	
148.6 a			3.1 a	
97.8 a			2.5 a	
119.0 a			2.4 a	
188.0 a			3.0 a	
109.3 a			3.3 a	
73.8 a			3.0 a	
121.8 a			2.0 a	
134.0 a			2.0 a	
104.0 a			2.8 a	
Means followed by same letter or symbol do not significantly differ (P=.05, LSD).				
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.				

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm	MOLVE C - Carpetwd	C PHSLU LimaBean			
Description							
Rating Type		density	density	drwstrng			
Rating Unit		#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	%			
Rating Date		07/16/19	07/16/19	07/18/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate			
			Appl Unit	Appl Timing Code			
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	6.6 a	4.9 a	19.4 a
2		2 3 wk		3 WAP B			
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	2.8 a	2.5 a	22.8 a
2		3 wk		3 WAP B			
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	5.3 a	6.9 a	13.4 b
3		4 wk		4 WAP B			
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	5.0 a	2.5 a	6.9 c
3		4 wk		4 WAP B			
LSD P=.05					3.81	4.94	4.33
Standard Deviation					3.74	4.85	4.26
CV					71.00	105.90	30.11
TABLE OF B (POST treatment) C (POST Timing) MEANS							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B	7.4 a	8.3 a	11.9 cd
2		1 2 wk		2 WAP B			
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B	4.6 a	2.5 a	10.6 cd
1		2 wk		2 WAP B			
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B	4.8 a	2.6 a	17.8 b
2		3 wk		3 WAP B			
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B	4.6 a	4.8 a	24.4 a
2		3 wk		3 WAP B			
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B	5.0 a	5.8 a	7.8 d
3		4 wk		4 WAP B			
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B	5.3 a	3.6 a	12.5 c
3		4 wk		4 WAP B			
LSD P=.05					3.81	4.94	4.33
Standard Deviation					3.74	4.85	4.26
CV					71.00	105.90	30.11
TABLE OF A (PRE treatment) B (POST treatment) C (POST Timing) MEANS							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	9.3 a	14.8 a	12.5 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B			
2		1 2 wk		2 WAP B			
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	5.5 a	1.8 a	11.3 a
1		2 wk		2 WAP B			
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	6.8 a	4.5 a	11.3 a
2		2 wk		2 WAP B			
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	2.5 a	0.5 a	10.0 a
2		2 wk		2 WAP B			
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	6.5 a	3.0 a	16.3 a
1		2 3 wk		2 WAP B			
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B			
2		3 wk		3 WAP B			
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	3.0 a	2.3 a	19.3 a
2		3 wk		3 WAP B			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C PHSLU	C PHSLU	AMAPA C -				
Description	LimaBean	LimaBean	PalmerAm				
Rating Type	Lf burn %	drwstrng %	density #/25ft <sup>2</sup>				
Rating Unit	07/18/19	07/25/19	07/25/19				
Rating Date							
Trt Treatment No. Name	Form Conc Rate	Form Type Rate	Appl Unit Timing	Appl Code			
1 Dual Magnum 2 3 wk	7.62 EC	0.95 lb ai/a	PRE	A	2.5 a	3.9 ab	6.3 a
			3 WAP	B			
2 Dual Magnum 2 3 wk	7.62 EC	1.19 lb ai/a	PRE	A	5.8 a	5.1 a	2.4 a
			3 WAP	B			
1 Dual Magnum 3 4 wk	7.62 EC	0.95 lb ai/a	PRE	A	5.0 a	3.8 ab	4.8 a
			4 WAP	B			
2 Dual Magnum 3 4 wk	7.62 EC	1.19 lb ai/a	PRE	A	8.3 a	0.8 c	4.6 a
			4 WAP	B			
LSD P=.05					5.31	2.31	3.75
Standard Deviation					5.06	2.27	3.69
CV					104.75	83.21	75.27
TABLE OF B (POST treatment) C (POST Timing) MEANS							
1 Dual Magnum 1 2 wk	7.62 EC	0.714 lb ai/a	POST	B	2.5 a	1.1 a	6.6 a
			2 WAP	B			
2 Dual Magnum 1 2 wk	7.62 EC	0.95 lb ai/a	POST	B	4.8 a	1.8 a	4.8 a
			2 WAP	B			
1 Dual Magnum 2 3 wk	7.62 EC	0.714 lb ai/a	POST	B	4.2 a	3.6 a	5.1 a
			3 WAP	B			
2 Dual Magnum 2 3 wk	7.62 EC	0.95 lb ai/a	POST	B	4.2 a	5.4 a	3.5 a
			3 WAP	B			
1 Dual Magnum 3 4 wk	7.62 EC	0.714 lb ai/a	POST	B	5.0 a	0.6 a	4.6 a
			4 WAP	B			
2 Dual Magnum 3 4 wk	7.62 EC	0.95 lb ai/a	POST	B	8.3 a	3.9 a	4.8 a
			4 WAP	B			
LSD P=.05					5.31	2.31	3.75
Standard Deviation					5.06	2.27	3.69
CV					104.75	83.21	75.27
TABLE OF A (PRE treatment) B (POST treatment) C (POST Timing) MEANS							
1 Dual Magnum 1 2 wk	7.62 EC	0.95 lb ai/a	PRE	A	0.0 a	1.0 a	9.0 a
			2 WAP	B			
2 Dual Magnum 1 2 wk	7.62 EC	1.19 lb ai/a	PRE	A	5.0 a	1.3 a	4.3 a
			2 WAP	B			
1 Dual Magnum 2 3 wk	7.62 EC	0.95 lb ai/a	POST	B	3.3 a	1.3 a	6.5 a
			2 WAP	B			
2 Dual Magnum 2 3 wk	7.62 EC	0.95 lb ai/a	POST	B	6.3 a	2.3 a	3.0 a
			2 WAP	B			
1 Dual Magnum 2 3 wk	7.62 EC	0.95 lb ai/a	PRE	A	1.7 a	2.8 a	7.0 a
			3 WAP	B			
2 Dual Magnum 2 3 wk	7.62 EC	1.19 lb ai/a	PRE	A	6.7 a	4.5 a	3.3 a
			3 WAP	B			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	MOLVE C - C PHSU
Description	Carpetwd density #/25ft <sup>2</sup>
Rating Type	LimaBean Yield
Rating Unit	kg/20 ft
Rating Date	09/11/19
Trt Treatment No. Name	Form Form Conc Type Rate Rate Unit Appl Timing Appl Code
1 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a PRE A 3 WAP B
2 Dual Magnum 2 3 wk	7.62 EC 1.19 lb ai/a PRE A 3 WAP B
1 Dual Magnum 3 4 wk	7.62 EC 0.95 lb ai/a PRE A 4 WAP B
2 Dual Magnum 3 4 wk	7.62 EC 1.19 lb ai/a PRE A 4 WAP B
LSD P=.05	4.37
Standard Deviation	4.29
CV	73.08
TABLE OF B (POST treatment) C (POST Timing) MEANS	
1 Dual Magnum 1 2 wk	7.62 EC 0.714 lb ai/a POST B 2 WAP B
2 Dual Magnum 1 2 wk	7.62 EC 0.95 lb ai/a POST B 2 WAP B
1 Dual Magnum 2 3 wk	7.62 EC 0.714 lb ai/a POST B 3 WAP B
2 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a POST B 3 WAP B
1 Dual Magnum 3 4 wk	7.62 EC 0.714 lb ai/a POST B 4 WAP B
2 Dual Magnum 3 4 wk	7.62 EC 0.95 lb ai/a POST B 4 WAP B
LSD P=.05	4.37
Standard Deviation	4.29
CV	73.08
TABLE OF A (PRE treatment) B (POST treatment) C (POST Timing) MEANS	
1 Dual Magnum 1 2 wk	7.62 EC 0.95 lb ai/a PRE A 2 WAP B
2 Dual Magnum 1 2 wk	7.62 EC 1.19 lb ai/a PRE A 2 WAP B
1 Dual Magnum 1 2 wk	7.62 EC 0.714 lb ai/a POST B 2 WAP B
1 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a PRE A 2 WAP B
2 Dual Magnum 2 3 wk	7.62 EC 1.19 lb ai/a PRE A 2 WAP B
1 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a POST B 3 WAP B
2 Dual Magnum 2 3 wk	7.62 EC 1.19 lb ai/a PRE A 3 WAP B
1 Dual Magnum 2 3 wk	7.62 EC 0.714 lb ai/a POST B 3 WAP B
2 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a PRE A 3 WAP B
1 Dual Magnum 2 3 wk	7.62 EC 0.95 lb ai/a POST B 3 WAP B
2 Dual Magnum 2 3 wk	7.62 EC 1.19 lb ai/a PRE A 3 WAP B

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C -	IPOSS C -	XANOR C -	GGGAN C -						
Description	PalmerAm	Mornlry	C.cklbur	AnnGrass							
Rating Type	density	density	density	density							
Rating Unit	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>	#/25ft <sup>2</sup>							
Rating Date	07/03/19	07/03/19	07/03/19	07/03/19	07/03/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	0.95 lb ai/a	PRE	A		2.3 a	30.5 a	0.0 a	96.5 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	0.95 lb ai/a	POST	B					
					3 WAP	B					
2	Dual Magnum	7.62 EC	1.19 lb ai/a	1.19 lb ai/a	PRE	A		1.0 a	25.0 a	0.3 a	32.5 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	0.95 lb ai/a	POST	B					
					3 WAP	B					
1	Dual Magnum	7.62 EC	0.95 lb ai/a	0.95 lb ai/a	PRE	A		1.0 a	24.3 a	0.3 a	29.5 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	0.714 lb ai/a	POST	B					
					4 WAP	B					
2	Dual Magnum	7.62 EC	1.19 lb ai/a	1.19 lb ai/a	PRE	A		1.3 a	23.0 a	0.0 a	15.5 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	0.714 lb ai/a	POST	B					
					4 WAP	B					
1	Dual Magnum	7.62 EC	0.95 lb ai/a	0.95 lb ai/a	PRE	A		3.8 a	26.5 a	5.5 a	25.3 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	0.95 lb ai/a	POST	B					
					4 WAP	B					
2	Dual Magnum	7.62 EC	1.19 lb ai/a	1.19 lb ai/a	PRE	A		3.5 a	37.5 a	0.3 a	26.0 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	0.95 lb ai/a	POST	B					
					4 WAP	B					
LSD P=.05								4.62	25.03	5.16	69.14
Standard Deviation								3.21	17.40	3.59	48.06
CV								146.74	57.84	351.56	137.32

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C PHSLU	C PHSLU	C PHSLU			
Description	LimaBean stunting %	LimaBean If burn %	LimaBean drwstrng %			
Rating Type	07/05/19	07/05/19	07/05/19			
Rating Unit						
Rating Date						
Trt Treatment	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
No. Name						
1 Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A	
2 Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B	
2 3 wk				3 WAP	B	
2 Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A	
2 Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B	
2 3 wk				3 WAP	B	
1 Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A	
1 Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B	
3 4 wk				4 WAP	B	
2 Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A	
1 Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B	
3 4 wk				4 WAP	B	
1 Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A	
2 Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B	
3 4 wk				4 WAP	B	
2 Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A	
2 Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B	
3 4 wk				4 WAP	B	
LSD P=.05						0.62
Standard Deviation				0.00	0.00	0.41
CV				0.00	0.00	163.30

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm	GGGAN C - AnnGrass	PHSLU C LimaBean						
Description		control %	control %	drwstrng %						
Rating Type										
Rating Unit										
Rating Date		07/05/19	07/05/19	07/10/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A				0.3 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
					3 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A				3.8 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
					3 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A				0.0 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
					4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A				0.0 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
					4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A				0.8 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
					4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A				0.0 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
					4 WAP	B				
LSD P=.05					28.76		6.96		3.74	
Standard Deviation					19.08		4.62		2.60	
CV					21.43		5.24		188.95	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C Crop	PHSLU Lima Bean	AMAPA C - Palmer Am	MOLVE C - Carpetwd	GGGAN C - Ann Grass						
Description		Lf burn %	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>	density #/25ft <sup>2</sup>						
Rating Type		07/10/19	07/10/19	07/10/19	07/10/19						
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.0 a	12.0 a	5.0 a	89.0 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B						
				3 WAP	B						
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.0 a	3.3 a	3.0 a	122.3 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B						
				3 WAP	B						
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.0 a	8.8 a	5.8 a	348.5 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B						
				4 WAP	B						
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.0 a	8.3 a	4.3 a	60.0 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B						
				4 WAP	B						
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.0 a	13.0 a	3.8 a	126.3 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B						
				4 WAP	B						
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.0 a	14.3 a	2.8 a	65.0 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B						
				4 WAP	B						
LSD P=.05						.		11.05	4.67	218.66	
Standard Deviation						0.00		7.68	3.24	151.99	
CV						0.00		81.55	96.14	118.30	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm	MOLVE C - Carpetwd	C PHSLU LimaBean			
Description		density #/25ft <sup>2</sup> 07/16/19	density #/25ft <sup>2</sup> 07/16/19	drwstrng % 07/18/19			
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A	
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B	
					3 WAP	B	
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A	
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B	
					3 WAP	B	
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A	
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B	
					4 WAP	B	
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A	
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B	
					3 WAP	B	
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A	
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B	
					4 WAP	B	
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A	
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B	
					4 WAP	B	
LSD P=.05				5.38	6.98	6.13	
Standard Deviation				3.74	4.85	4.26	
CV				71.00	105.90	30.11	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code Crop Type, Code	C PHSLU	C PHSLU	AMAPA C -							
Description	LimaBean	LimaBean	PalmerAm							
Rating Type	Lf burn	drwstrng	density							
Rating Unit	%	%	#/25ft <sup>2</sup>							
Rating Date	07/18/19	07/25/19	07/25/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		3.3 a	5.0 a	5.5 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
					3 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		5.0 a	5.8 a	1.5 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
					3 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		5.0 a	0.5 a	4.3 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
					4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		5.0 a	0.8 a	5.0 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
					4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		5.0 a	7.0 a	5.3 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
					4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		11.7 a	0.8 a	4.3 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
					4 WAP	B				
LSD P=.05					7.51		3.27		5.30	
Standard Deviation					5.06		2.27		3.69	
CV					104.75		83.21		75.27	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

Pest Code		MOLVE							
Crop Type, Code		C - C	PHSLU						
Description		Carpetwd	Lima Bean						
Rating Type		density	Yield						
Rating Unit		#/25ft <sup>2</sup>	kg/20 ft						
Rating Date		07/25/19	09/11/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	4.3 a	0.6205 a
2	Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B		
2	3 wk				3 WAP	B			
2	Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	2.5 a	0.8025 a
2	Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B		
2	3 wk				3 WAP	B			
1	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	13.8 a	0.7663 a
1	Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B		
3	4 wk				4 WAP	B			
2	Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	4.3 a	0.5475 a
1	Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B		
3	4 wk				4 WAP	B			
1	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	7.0 a	0.5810 a
2	Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B		
3	4 wk				4 WAP	B			
2	Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	2.5 a	1.2177 a
2	Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B		
3	4 wk				4 WAP	B			
LSD P=.05				6.18	0.78900				
Standard Deviation				4.29	0.54557				
CV				73.08	79.52051				

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm density #/25ft2 07/03/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	457.312500				
R	3	55.729167	18.576389	1.803	0.1658	
A	1	13.020833	13.020833	1.264	0.2691	1.9
B	1	0.187500	0.187500	0.018	0.8935	1.9
AB	1	0.020833	0.020833	0.002	0.9644	2.7
C	2	3.375000	1.687500	0.164	0.8496	2.3
AC	2	6.791667	3.395833	0.330	0.7216	3.3
BC	2	37.625000	18.812500	1.826	0.1770	3.3
ABC	2	0.541667	0.270833	0.026	0.9741	4.6
ERROR	33	340.020833	10.303662			

## FACTORIAL/POOLED ERROR AOV For IPOSS C Mornlry density #/25ft2 07/03/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	14091.666667				
R	3	1543.166667	514.388889	1.699	0.1863	
A	1	290.083333	290.083333	0.958	0.3348	10.2
B	1	27.000000	27.000000	0.089	0.7671	10.2
AB	1	90.750000	90.750000	0.300	0.5877	14.5
C	2	522.791667	261.395833	0.863	0.4311	12.5
AC	2	622.791667	311.395833	1.028	0.3687	17.7
BC	2	929.625000	464.812500	1.535	0.2304	17.7
ABC	2	73.625000	36.812500	0.122	0.8859	25.0
ERROR	33	9991.833333	302.782828			

## FACTORIAL/POOLED ERROR AOV For XANOR C C.cklbur density #/25ft2 07/03/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	570.979167				
R	3	34.729167	11.576389	0.899	0.4522	
A	1	25.520833	25.520833	1.982	0.1686	2.1
B	1	15.187500	15.187500	1.179	0.2854	2.1
AB	1	6.020833	6.020833	0.467	0.4989	3.0
C	2	10.791667	5.395833	0.419	0.6612	2.6
AC	2	10.791667	5.395833	0.419	0.6612	3.7
BC	2	21.125000	10.562500	0.820	0.4492	3.7
ABC	2	21.791667	10.895833	0.846	0.4382	5.2
ERROR	33	425.020833	12.879419			

## FACTORIAL/POOLED ERROR AOV For GGGAN C AnnGrass density #/25ft2 07/03/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	107782.000000				
R	3	11692.166667	3897.388889	1.687	0.1887	
A	1	2760.333333	2760.333333	1.195	0.2823	28.2
B	1	468.750000	468.750000	0.203	0.6553	28.2
AB	1	24.083333	24.083333	0.010	0.9193	39.9
C	2	4903.125000	2451.562500	1.061	0.3575	34.6
AC	2	3231.541667	1615.770833	0.699	0.5041	48.9
BC	2	4787.375000	2393.687500	1.036	0.3661	48.9
ABC	2	3683.791667	1841.895833	0.797	0.4590	69.1
ERROR	33	76230.833333	2310.025253			

Randomized Complete Block (RCB) AOV For C PHSLU LimaBean stunting % 07/05/19 Missing factor C levels prevents analyzing column 5 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	0.000000			
Replicate	3	0.000000	0.000000	0.000	1.0000
Treatment	5	0.000000	0.000000	0.000	1.0000
ERROR	15	0.000000	0.000000		

Randomized Complete Block (RCB) AOV For C PHSLU LimaBean If burn % 07/05/19 Missing factor C levels prevents analyzing column 6 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	0.000000			
Replicate	3	0.000000	0.000000	0.000	1.0000
Treatment	5	0.000000	0.000000	0.000	1.0000
ERROR	15	0.000000	0.000000		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Randomized Complete Block (RCB) AOV For C PHSLU LimaBean drwstrng % 07/05/19 Missing factor C levels prevents analyzing column 7 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	3.333333			
Replicate	3	0.000000	0.000000	0.000	1.0000
Treatment	5	0.833333	0.166667	1.000	0.4509
ERROR	15	2.500000	0.166667		

Randomized Complete Block (RCB) AOV For AMAPA C PalmerAm control % 07/05/19 Missing factor C levels prevents analyzing column 8 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	36904.958333			
Replicate	3	895.791667	298.597222	0.820	0.5028
Treatment	5	30547.208333	6109.441667	16.778	0.0001
ERROR	15	5461.958333	364.130556		

Randomized Complete Block (RCB) AOV For GGGAN C AnnGrass control % 07/05/19 Missing factor C levels prevents analyzing column 9 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	23	28257.958333			
Replicate	3	67.125000	22.375000	1.048	0.3999
Treatment	5	27870.708333	5574.141667	261.186	0.0001
ERROR	15	320.125000	21.341667		

FACTORIAL/POOLED ERROR AOV For C PHSLU LimaBean drwstrng % 07/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	371.250000				
R	3	51.750000	17.250000	2.556	0.0721	
A	1	12.000000	12.000000	1.778	0.1916	1.5
B	1	6.750000	6.750000	1.000	0.3246	1.5
AB	1	8.333333	8.333333	1.235	0.2746	2.2
C	2	39.125000	19.562500	2.898	0.0693	1.9
AC	2	18.375000	9.187500	1.361	0.2704	2.6
BC	2	0.875000	0.437500	0.065	0.9374	2.6
ABC	2	11.291667	5.645833	0.836	0.4422	3.7
ERROR	33	222.750000	6.750000			

FACTORIAL/POOLED ERROR AOV For C PHSLU LimaBean Lf burn % 07/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	0.000000				
R	3	0.000000	0.000000	0.000	1.0000	
A	1	0.000000	0.000000	0.000	1.0000	.
B	1	0.000000	0.000000	0.000	1.0000	.
AB	1	0.000000	0.000000	0.000	1.0000	.
C	2	0.000000	0.000000	0.000	1.0000	.
AC	2	0.000000	0.000000	0.000	1.0000	.
BC	2	0.000000	0.000000	0.000	1.0000	.
ABC	2	0.000000	0.000000	0.000	1.0000	.
ERROR	33	0.000000	0.000000			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm density #/25ft2 07/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	4261.666667				
R	3	1854.833333	618.277778	10.484	0.0001	
A	1	147.000000	147.000000	2.493	0.1239	4.5
B	1	12.000000	12.000000	0.203	0.6549	4.5
AB	1	8.333333	8.333333	0.141	0.7094	6.4
C	2	68.791667	34.395833	0.583	0.5637	5.5
AC	2	103.875000	51.937500	0.881	0.4240	7.8
BC	2	102.375000	51.187500	0.868	0.4292	7.8
ABC	2	18.291667	9.145833	0.155	0.8570	11.0
ERROR	33	1946.166667	58.974747			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## University of Delaware

## FACTORIAL/POOLED ERROR AOV For MOLVE C Carpetwd density #/25ft2 07/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	519.250000				
R	3	115.083333	38.361111	3.644	0.0225	
A	1	6.750000	6.750000	0.641	0.4290	1.9
B	1	0.750000	0.750000	0.071	0.7912	1.9
AB	1	4.083333	4.083333	0.388	0.5377	2.7
C	2	14.625000	7.312500	0.695	0.5064	2.3
AC	2	1.625000	0.812500	0.077	0.9259	3.3
BC	2	23.625000	11.812500	1.122	0.3377	3.3
ABC	2	5.291667	2.645833	0.251	0.7792	4.7
ERROR	33	347.416667	10.527778			

## FACTORIAL/POOLED ERROR AOV For GGGAN C AnnGrass density #/25ft2 07/10/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	1203009.979167				
R	3	175415.562500	58471.854167	2.531	0.0740	
A	1	47439.187500	47439.187500	2.054	0.1613	89.3
B	1	39847.687500	39847.687500	1.725	0.1981	89.3
AB	1	58032.520833	58032.520833	2.512	0.1225	126.2
C	2	11997.166667	5998.583333	0.260	0.7729	109.3
AC	2	75842.000000	37921.000000	1.642	0.2091	154.6
BC	2	18418.500000	9209.250000	0.399	0.6744	154.6
ABC	2	13676.166667	6838.083333	0.296	0.7457	218.7
ERROR	33	762341.187500	23101.248106			

## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm density #/25ft2 07/16/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	845.479167				
R	3	211.062500	70.354167	5.023	0.0056	
A	1	88.020833	88.020833	6.285	0.0173	2.2
B	1	9.187500	9.187500	0.656	0.4238	2.2
AB	1	0.020833	0.020833	0.001	0.9695	3.1
C	2	14.291667	7.145833	0.510	0.6050	2.7
AC	2	36.291667	18.145833	1.296	0.2873	3.8
BC	2	21.375000	10.687500	0.763	0.4743	3.8
ABC	2	3.041667	1.520833	0.109	0.8974	5.4
ERROR	33	462.187500	14.005682			

## FACTORIAL/POOLED ERROR AOV For MOLVE C Carpetwd density #/25ft2 07/16/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	1813.666667				
R	3	354.500000	118.166667	5.015	0.0056	
A	1	310.083333	310.083333	13.161	0.0010	2.9
B	1	44.083333	44.083333	1.871	0.1806	2.9
AB	1	27.000000	27.000000	1.146	0.2922	4.0
C	2	23.041667	11.520833	0.489	0.6176	3.5
AC	2	78.041667	39.020833	1.656	0.2063	4.9
BC	2	124.291667	62.145833	2.638	0.0866	4.9
ABC	2	75.125000	37.562500	1.594	0.2183	7.0
ERROR	33	777.500000	23.560606			

## FACTORIAL/POOLED ERROR AOV For C PHSLU LimaBean drwstrng % 07/18/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	2457.979167				
R	3	63.562500	21.187500	1.168	0.3368	
A	1	25.520833	25.520833	1.407	0.2441	2.5
B	1	136.687500	136.687500	7.534	0.0097	2.5
AB	1	42.187500	42.187500	2.325	0.1368	3.5
C	2	1158.291667	579.145833	31.923	0.0001	3.1
AC	2	195.291667	97.645833	5.382	0.0095	4.3
BC	2	135.375000	67.687500	3.731	0.0346	4.3
ABC	2	102.375000	51.187500	2.821	0.0739	6.1
ERROR	33	598.687500	18.142045			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

FACTORIAL/POOLED ERROR AOV For C PHSLU LimaBean Lf burn % 07/18/19 Missing values in column 18 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	32	850.442130				
R	3	30.006944	10.002315	0.391	0.7607	
A	1	150.520833	150.520833	5.889	0.0260	3.1
B	1	42.187500	42.187500	1.651	0.2152	3.1
AB	1	0.520833	0.520833	0.020	0.8881	4.3
C	2	83.449074	41.724537	1.632	0.2231	3.8
AC	2	1.041667	0.520833	0.020	0.9799	5.3
BC	2	23.263889	11.631944	0.455	0.6415	5.3
ABC	2	59.375000	29.687500	1.161	0.3354	7.5
ERROR	18	460.076389	25.559799			

FACTORIAL/POOLED ERROR AOV For C PHSLU LimaBean drwstrng % 07/25/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	403.479167				
R	3	9.062500	3.020833	0.586	0.6286	
A	1	1.687500	1.687500	0.327	0.5712	1.3
B	1	42.187500	42.187500	8.180	0.0073	1.3
AB	1	15.187500	15.187500	2.945	0.0955	1.9
C	2	80.541667	40.270833	7.809	0.0017	1.6
AC	2	42.125000	21.062500	4.084	0.0260	2.3
BC	2	13.875000	6.937500	1.345	0.2744	2.3
ABC	2	28.625000	14.312500	2.775	0.0769	3.3
ERROR	33	170.187500	5.157197			

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm density #/25ft2 07/25/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	784.479167				
R	3	162.562500	54.187500	3.990	0.0157	
A	1	88.020833	88.020833	6.481	0.0158	2.2
B	1	15.187500	15.187500	1.118	0.2980	2.2
AB	1	0.187500	0.187500	0.014	0.9072	3.1
C	2	16.166667	8.083333	0.595	0.5573	2.7
AC	2	40.166667	20.083333	1.479	0.2426	3.7
BC	2	9.500000	4.750000	0.350	0.7075	3.7
ABC	2	4.500000	2.250000	0.166	0.8480	5.3
ERROR	33	448.187500	13.581439			

FACTORIAL/POOLED ERROR AOV For MOLVE C Carpetwd density #/25ft2 07/25/19

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	1577.250000				
R	3	114.250000	38.083333	2.066	0.1237	
A	1	352.083333	352.083333	19.102	0.0001	2.5
B	1	200.083333	200.083333	10.855	0.0024	2.5
AB	1	90.750000	90.750000	4.924	0.0335	3.6
C	2	60.125000	30.062500	1.631	0.2111	3.1
AC	2	65.041667	32.520833	1.764	0.1871	4.4
BC	2	36.291667	18.145833	0.984	0.3843	4.4
ABC	2	50.375000	25.187500	1.367	0.2690	6.2
ERROR	33	608.250000	18.431818			

FACTORIAL/POOLED ERROR AOV For C PHSLU LimaBean Yield kg/20 ft 09/11/19 Missing values in column 33 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	43	12.486825				
R	3	1.375100	0.458367	1.540	0.2252	
A	1	0.895349	0.895349	3.008	0.0935	0.3221
B	1	0.342000	0.342000	1.149	0.2926	0.3221
AB	1	0.310998	0.310998	1.045	0.3151	0.4555
C	2	0.272451	0.136225	0.458	0.6372	0.3945
AC	2	0.032982	0.016491	0.055	0.9462	0.5579
BC	2	0.086492	0.043246	0.145	0.8654	0.5579
ABC	2	0.539657	0.269828	0.907	0.4151	0.7890
ERROR	29	8.631796	0.297648			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Lima Bean Response to Multiple Postemergence Applications of Dual Magnum: Year 2**

Trial ID: Bean 5-19 Location: Field #14 Trial Year: 2019

Protocol ID: Bean 5-19 Investigator: Kurt Vollmer

Study Director:

Sponsor Contact:

**General Trial Information**

Study Director: Kurt Vollmer

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 06/06/19

Initiation Date: 03/01/19

Completion Date: 08/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

**Contacts**

Study Director: Kurt Vollmer

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C PHSU Phaseolus lunatus Lima bean

Entry Date: 01/23/20

Variety: Cypress

Planting Date: 06/20/19

Planting Rate: 8 S/ROWFT

Depth: 0.75 IN

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 IN

Planting Equipment: FE Field Equipment

Seed Bed: MEDIUM medium

Soil Moisture: NORMAL normal, adequate

Emergence Date: 06/27/19

Harvest Equipment: Hand harvested

Harvested Width: 5 FT

Harvested Length: 10 FT

**Site and Design**

Treated Plot Width: 4 m

Site Type: FIELD field

Treated Plot Length: 6 m

Treated Plot Area: 24 m<sup>2</sup> Treatments: 10 Tillage Type: CONTIL conventional-till

Replications: 4

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14C

% Sand: 79 % OM: 1.6 Texture: LS loamy sand

% Silt: 14 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes

% Clay: 7 CEC: 6.5 Fert. Level: E excellent

Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	06/20/19	07/03/19	07/17/19
Appl. Stop Time	04:40 PM	02:30 PM	10:40 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	2WAP	4WAP
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Appl. Entry Date	11/20/19	11/20/19	11/20/19
Air Temperature Start, Stop	88 89 F	90 91 F	87 92 F
% Relative Humidity Start, Stop	61 55	54 52	72 62
Wind Velocity+Dir. Start	7 MPH SW	4 MPH WNW	4 MPH SSW
Wind Velocity+Dir. Stop	11 MPH SW	3 MPH	6 MPH SSW
Wind Velocity+Dir. Max	14 MPH SW	3 MPH	6 MPH SSW
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	87 F	94 F	86 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	62	10	3
Moisture 6 Hours after Appl.	0.66 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.02 IN	0.53 IN	0.94 IN

**Application Equipment**

	A	B	C
Appl. Equipment	TRACTOR	TRACTOR	TRACTOR
Equipment Type	TRMOSP	TRMOSP	TRMOSP
Operation Pressure	40 PSI	40 PSI	40 PSI
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 IN	20 IN	20 IN
Nozzles/Row	6	6	6
Boom Length	9.5 FT	9.5 FT	9.5 FT
Boom Height	18 IN	26 IN	34 IN
Ground Speed	3 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER
Application Amount	20 GAL/AC	20 GAL/AC	20 GAL/AC
Propellant	COMAIR	COMAIR	COMAIR

Context	Date	By	Notes
STATUS	06/06/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/08/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

## Trial Comments

07/03/19: No injury observed with PRE herbicide applications.

07/25/19: Insect damage on plot 106.

## Lima Bean Response to Multiple Postemergence Applications of Dual Magnum: Year 2

Trial ID: Bean 5-19 Location: Field #14 Trial Year: 2019

Protocol ID: Bean 5-19 Investigator: Kurt Vollmer

Study Director:

Sponsor Contact:

Pest Code	C	PHSLU	C	PHSLU	C	PHSLU	AMAPA	GGGAN
Crop Type, Code			LimaBean	LimaBean	LimaBean	PalmerAm	C -	C -
Description			stunting %	LeafBurn %	drwstrng %	control %		
Rating Type			07/05/19	07/05/19	07/05/19	07/05/19		
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Hand-weeded check							
2	Multiple PREs							
	Dual Magnum	7.62 EC	1.27 lb ai/a	PRE	A			
	Pursuit	2 EC	0.0313 lb ai/a	PRE	A			
	Spartan Charge	3.5 EC	0.082 lb ai/a	PRE	A			
3	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			
	Dual Magnum	7.62 EC	1.43 lb ai/a	2 WAP	B			
	Dual Magnum	7.62 EC	1.43 lb ai/a	4 WAP	C			
4	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A			
	Dual Magnum	7.62 EC	0.714 lb ai/a	2 WAP	B			
	Dual Magnum	7.62 EC	0.476 lb ai/a	4 WAP	C			
5	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A			
	Dual Magnum	7.62 EC	0.476 lb ai/a	2 WAP	B			
	Dual Magnum	7.62 EC	0.714 lb ai/a	4 WAP	C			
6	Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A			
	Dual Magnum	7.62 EC	0.714 lb ai/a	2 WAP	B			
	Dual Magnum	7.62 EC	0.714 lb ai/a	4 WAP	C			
7	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			
	Dual Magnum	7.62 EC	0.95 lb ai/a	2 WAP	B			
8	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			
	Dual Magnum	7.62 EC	0.95 lb ai/a	4 WAP	C			
9	Dual Magnum	7.62 EC	1.9 lb ai/a	PRE	A			
	Dual Magnum	7.62 EC	1.9 lb ai/a	2 WAP	B			
10	Dual Magnum	7.62 EC	1.9 lb ai/a	PRE	A			
	Dual Magnum	7.62 EC	1.9 lb ai/a	4 WAP	C			
LSD P=.05				.	.	0.39	21.53	42.25
Standard Deviation				0.00	0.00	0.27	14.84	29.12
CV				0.0	0.0	360.61	18.11	41.05
Replicate F				0.000	0.000	1.253	1.328	0.042
Replicate Prob(F)				1.0000	1.0000	0.3101	0.2859	0.9885
Treatment F				0.000	0.000	0.797	16.363	3.815
Treatment Prob(F)				1.0000	1.0000	0.6217	0.0001	0.0033

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=8

Could not calculate LSD (% mean diff) for columns 1,2,7 because error mean square = 0.

Pest Code Crop Type, Code	C PHSLU	C PHSLU	AMAPA C -	GGGAN C -	C PHSLU							
Description	LimaBean	LimaBean	PalmerAm	AnnGrass	LimaBean							
Rating Type	drwstrng	LeafBurn	control	control	Drwstrng							
Rating Unit	%	%	%	%	%							
Rating Date	07/12/19	07/12/19	07/12/19	07/12/19	07/18/19							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code					
1	Hand-weeded check							0.0 c	0.0 a	100.0 a		0.0 c
2	Multiple PREs							0.0 c	0.0 a	98.3 a	95.0 a	6.3 bc
	Dual Magnum	7.62 EC	1.27 lb ai/a	PRE	A							
	Pursuit	2 EC	0.0313 lb ai/a	PRE	A							
	Spartan Charge	3.5 EC	0.082 lb ai/a	PRE	A							
3	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			1.5 bc	0.0 a	83.5 b	35.0 c	16.3 a
	Dual Magnum	7.62 EC	1.43 lb ai/a	2 WAP	B							
	Dual Magnum	7.62 EC	1.43 lb ai/a	4 WAP	C							
4	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A			2.3 ab	0.0 a	82.0 b	33.3 c	8.0 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	2 WAP	B							
	Dual Magnum	7.62 EC	0.476 lb ai/a	4 WAP	C							
5	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A			1.0 bc	0.0 a	81.5 b	25.0 c	11.8 ab
	Dual Magnum	7.62 EC	0.476 lb ai/a	2 WAP	B							
	Dual Magnum	7.62 EC	0.714 lb ai/a	4 WAP	C							
6	Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A			0.3 c	0.0 a	86.0 b	32.5 c	11.8 ab
	Dual Magnum	7.62 EC	0.714 lb ai/a	2 WAP	B							
	Dual Magnum	7.62 EC	0.714 lb ai/a	4 WAP	C							
7	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			3.5 a	0.0 a	89.0 ab	30.0 c	17.5 a
	Dual Magnum	7.62 EC	0.95 lb ai/a	2 WAP	B							
8	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.0 c	0.0 a	84.0 b	46.3 bc	8.8 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	4 WAP	C							
9	Dual Magnum	7.62 EC	1.9 lb ai/a	PRE	A			3.5 a	0.0 a	88.0 ab	78.8 ab	17.5 a
	Dual Magnum	7.62 EC	1.9 lb ai/a	2 WAP	B							
10	Dual Magnum	7.62 EC	1.9 lb ai/a	PRE	A			0.8 bc	0.0 a	77.0 b	55.0 abc	8.8 b
	Dual Magnum	7.62 EC	1.9 lb ai/a	4 WAP	C							
LSD P=.05								1.69	.	12.11	42.43	6.62
Standard Deviation								1.16	0.00	8.26	29.08	4.57
CV								91.29	0.0	9.5	60.75	42.87
Replicate F								2.135	0.000	2.228	2.164	0.539
Replicate Prob(F)								0.1192	1.0000	0.1134	0.1186	0.6597
Treatment F								5.637	0.000	3.127	2.771	5.856
Treatment Prob(F)								0.0002	1.0000	0.0140	0.0253	0.0002

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=8

Could not calculate LSD (% mean diff) for columns 1,2,7 because error mean square = 0.

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Means followed by same letter or symbol do not significantly differ ( $P < 0.05$ , LSD). Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Mean comparisons performed only when ASV treatment  
Missing data estimates are included in columns: Average=8

Could not calculate LSD (% mean diff) for columns 1,2,7 because error mean square = 0.

Pest Code Crop Type, Code	C PHSLU LimaBean Yield kg/20 ft 09/10/19							
Description								
Rating Type								
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Hand-weeded check							
2	Multiple PREs							1.5753 a
	Dual Magnum	7.62 EC	1.27 lb ai/a	PRE	A			
	Pursuit	2 EC	0.0313 lb ai/a	PRE	A			
	Spartan Charge	3.5 EC	0.082 lb ai/a	PRE	A			
3	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.8080 b
	Dual Magnum	7.62 EC	1.43 lb ai/a	2 WAP	B			
	Dual Magnum	7.62 EC	1.43 lb ai/a	4 WAP	C			
4	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A			0.6535 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	2 WAP	B			
	Dual Magnum	7.62 EC	0.476 lb ai/a	4 WAP	C			
5	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A			0.7520 b
	Dual Magnum	7.62 EC	0.476 lb ai/a	2 WAP	B			
	Dual Magnum	7.62 EC	0.714 lb ai/a	4 WAP	C			
6	Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A			1.0268 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	2 WAP	B			
	Dual Magnum	7.62 EC	0.714 lb ai/a	4 WAP	C			
7	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.6413 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	2 WAP	B			
8	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.7205 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	4 WAP	C			
9	Dual Magnum	7.62 EC	1.9 lb ai/a	PRE	A			0.9018 b
	Dual Magnum	7.62 EC	1.9 lb ai/a	2 WAP	B			
10	Dual Magnum	7.62 EC	1.9 lb ai/a	PRE	A			0.6540 b
	Dual Magnum	7.62 EC	1.9 lb ai/a	4 WAP	C			
LSD P=.05								0.49098
Standard Deviation								0.33643
CV								39.16
Replicate F								1.115
Replicate Prob(F)								0.3627
Treatment F								3.127
Treatment Prob(F)								0.0144

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Average=8

Could not calculate LSD (% mean diff) for columns 1,2,7 because error mean square = 0.

## University of Delaware

Palmer amaranth emergence using different rates of Dual Magnum PRE: Part 2  
Trial ID: Bean 6-19 Location: Field 14 Trial Year: 2019  
Protocol ID: Bean 6-19 Investigator: Kurt Vollmer  
Study Director:  
Sponsor Contact:

**General Trial Information**

Study Director: Kurt Vollmer  
Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
ARM Trial Created On: 06/10/19  
Initiation Date: 03/01/19  
Completion Date: 08/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
Longitude of LL Corner °: 75.455834 W  
Time Zone: America/New\_York

Conducted Under GLP: No  
Conducted Under GEP: No

**Contacts**

Study Director: Kurt Vollmer

Investigator: Mark VanGessel Title: Extension Weed Specialist  
Organization: University of Delaware  
Address: 16483 County Seat Hwy  
City+State/Prov: Georgetown, Delaware  
Postal Code: 19947 E-mail: mjv@udel.edu  
Country: USA United States

**Crop Description**

C  
Entry Date: 01/23/20  
Attributes: non-crop

**Site and Design**

Treated Plot Width: 4 m Site Type: FIELD field  
Treated Plot Length: 6 m  
Treated Plot Area: 24 m<sup>2</sup> Treatments: 6 Tillage Type: CONTIL conventional-till  
Replications: 6 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14C  
% Sand: 79 % OM: 1.6 Texture: LS loamy sand  
% Silt: 14 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes  
% Clay: 7 CEC: 6.5 Fert. Level: E excellent  
Soil Drainage: G good

**Application Description**

A	
Application Date	06/20/19
Appl. Start Time	04:00 PM
Appl. Stop Time	04:45 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	Johnson
Appl. Entry Date	11/20/19
Air Temperature Start, Stop	88 89 F
% Relative Humidity Start, Stop	61 55
Wind Velocity+Dir. Start	7 MPH SW
Wind Velocity+Dir. Stop	11 MPH SW
Wind Velocity+Dir. Max	14 MPH SW
Wet Leaves (Y/N)	N no
Soil Temperature	87 F
Soil Moisture	NORMAL
% Cloud Cover	62
Moisture 6 Hours after Appl.	0.66 IN
Moisture 1 Week after Appl.	1.02 IN

**Application Equipment**

A	
Appl. Equipment	TRACTOR
Equipment Type	TRMOSP
Operation Pressure	40 PSI
Nozzle Type	AIR MIX
Nozzle Size	11002
Nozzle Spacing	20 IN
Nozzles/Row	6
Boom Length	9.5 FT
Boom Height	18 IN
Ground Speed	3 MPH
Carrier	WATER
Application Amount	20 GAL/AC
Mix Size	1.4 GAL
Propellant	COMAIR

Context	Date	By	Notes
STATUS	06/10/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/01/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

06/20/19: plot 203, 206, 403, 405, 406, 606 did not get sprayed by tractor - ran out mix.

## University of Delaware

Palmer amaranth emergence using different rates of Dual Magnum PRE: Part 2

Trial ID: Bean 6-19 Location: Field 14 Trial Year: 2019

Protocol ID: Bean 6-19 Investigator: Kurt Vollmer

Study Director:

Sponsor Contact:

Pest Code Description		AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm										
Rating Type	Density No/25ft <sup>2</sup>	Density No/25ft <sup>2</sup>	>3in % of tot	Density No/25ft <sup>2</sup>	>3in % of tot											
Rating Unit	07/01/19	07/05/19	07/05/19	07/09/19	07/09/19											
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code										
1 untreated			104.2	a	147.0	a	12.08	a	68.2	a	71.6	a				
2 Dual Magnum	7.62 EC	0.476	lb ai/a	PRE	A		3.8	b	19.0	b	2.08	a	12.2	b	18.3	b
3 Dual Magnum	7.62 EC	0.95	lb ai/a	PRE	A		0.6	bc	2.8	b	0.00	a	1.3	c	4.2	b
4 Dual Magnum	7.62 EC	1.19	lb ai/a	PRE	A		0.8	bc	4.0	b	0.00	a	1.1	c	2.7	b
5 Dual Magnum	7.62 EC	1.43	lb ai/a	PRE	A		0.2	c	1.2	b	0.00	a	0.8	c	1.2	b
6 Dual Magnum	7.62 EC	1.9	lb ai/a	PRE	A		0.3	c	0.3	b	0.00	a	0.4	c	0.0	b
LSD P=.05			2.47 - 70.78		35.38		9.505		3.40 - 49.20		18.44					
Standard Deviation					0.41t		29.76		7.993		0.45t		15.47			
CV					73.15t		102.41		338.54		67.64t		94.77			
Replicate F					1.296		1.168		0.880		0.818		1.174			
Replicate Prob(F)					0.2971		0.3522		0.5090		0.5480		0.3505			
Treatment F					20.224		22.945		2.196		13.158		19.515			
Treatment Prob(F)					0.0001		0.0001		0.0868		0.0001		0.0001			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,8; Average=6,7,10,11

Pest Code Description						AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm
Rating Type						Density No/25ft	>3 in % of tot	Density No/25ft2	>3in % of tot	Density No/25ft2
Rating Unit						07/12/19	07/12/19	07/15/19	07/15/19	07/19/19
Rating Date	Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1 untreated						1.0 a	50.0 a	114.8 a	72.3 a	75.0 a
2 Dual Magnum	7.62 EC	0.476 lb ai/a	0.476	lb ai/a	PRE	A	25.8 a	37.5 a	29.0 b	47.3 ab
3 Dual Magnum	7.62 EC	0.95 lb ai/a	0.95	lb ai/a	PRE	A	2.4 a	30.0 a	5.5 c	25.0 b
4 Dual Magnum	7.62 EC	1.19 lb ai/a	1.19	lb ai/a	PRE	A	11.0 a	20.8 a	7.7 bc	13.3 b
5 Dual Magnum	7.62 EC	1.43 lb ai/a	1.43	lb ai/a	PRE	A	3.0 a	8.3 a	2.8 c	11.0 b
6 Dual Magnum	7.62 EC	1.9 lb ai/a	1.9	lb ai/a	PRE	A	1.5 a	13.3 a	1.7 c	10.0 b
LSD P=.05						24.71	42.41	21.99	43.23	36.90
Standard Deviation						20.51	35.21	18.46	36.36	30.73
CV						275.16	132.05	68.59	121.87	135.41
Replicate F						0.981	1.375	1.726	0.107	0.979
Replicate Prob(F)						0.4535	0.2755	0.1669	0.9896	0.4536
Treatment F						1.348	1.181	34.421	2.865	5.318
Treatment Prob(F)						0.2851	0.3530	0.0001	0.0353	0.0026

Means followed by same letter or symbol do not significantly differ ( $P=.05$ , LSD).

Means followed by same letter or symbol do not significantly differ ( $P > .05$ , LSD).  
t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,8; Average=6,7,10,11

Pest Code Description		AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm
Rating Type	>3in % of tot	Density No/25ft <sup>2</sup>	>3in % of tot	Density No/25ft <sup>2</sup>	>3in % of tot	
Rating Unit	07/19/19	07/22/19	07/22/19	07/26/19	07/26/19	
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	untreated			50.0	ab	
2	Dual Magnum	7.62 EC	0.476 lb	ai/a	PRE	A
3	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A
4	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A
5	Dual Magnum	7.62 EC	1.43 lb	ai/a	PRE	A
6	Dual Magnum	7.62 EC	1.9 lb	ai/a	PRE	A
LSD P=.05			49.46	26.76	55.16	49.28
Standard Deviation			41.19	22.22	45.80	41.44
CV			72.69	174.53	69.96	106.71
Replicate F			1.038	1.127	0.974	1.146
Replicate Prob(F)			0.4213	0.3780	0.4573	0.3628
Treatment F			3.384	2.872	1.468	11.294
Treatment Prob(F)			0.0213	0.0497	0.2492	0.0001
						0.1093

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,8; Average=6,7,10,11

Pest Code Description		AMAPA PalmerAm	AMAPA PalmerAm						
Rating Type		Density	>3in						
Rating Unit		No/25ft <sup>2</sup>	% of tot						
Rating Date		07/29/19	07/29/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	untreated			150.3	a	100.0	a		
2	Dual Magnum	7.62	EC	0.476	lb ai/a	PRE	A	48.3	b
3	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	14.5	b
4	Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	14.7	b
5	Dual Magnum	7.62	EC	1.43	lb ai/a	PRE	A	6.5	b
6	Dual Magnum	7.62	EC	1.9	lb ai/a	PRE	A	4.0	b
LSD P=.05				49.33		25.07			
Standard Deviation				41.49		21.08			
CV				104.44		22.32			
Replicate F				1.289		1.000			
Replicate Prob(F)				0.2999		0.4381			
Treatment F				11.123		2.500			
Treatment Prob(F)				0.0001		0.0574			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=5,8; Average=6,7,10,11

## University of Delaware

Evaluation of Rapid Burndown Options for Large Horseweed

Trial ID: Brndn1-19

Location: Field #3

Trial Year: 2019

Protocol ID: Brndn1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/26/19

Initiation Date: 03/01/19

Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

C

**Pest Description**

Pest 1 Type: W Code: ERICA Conyza canadensis

Common Name: Canada horseweed Entry Date: 12/09/19

Pest 2 Type: W Code: OEOLA Oenothera lacinata

Common Name: Cutleaf eveningprimrose Entry Date: 12/09/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 4 Tillage Type: NOTILL no-till

Replications: 3 Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 3

% Sand: 80 % OM: 0.8 Texture: LS loamy sand

% Silt: 12 pH: 6.6 Soil Name: Rockawalkin loamy sand, 0-2% slopes

% Clay: 8 CEC: 4.0 Fert. Level: G good

Soil Drainage: G good

**Application Description**

A	
Application Date	05/25/19
Appl. Stop Time	11:30 AM
Application Method	SPRAY
Application Timing	EPP
Application Placement	BROADC
Applied By	VanGessel
Appl. Entry Date	12/09/19
Air Temperature Start, Stop	69 69 F
% Relative Humidity Start, Stop	59 59
Wind Velocity+Dir. Start	6 mph SE
Wind Velocity+Dir. Stop	6 mph SE
Wind Velocity+Dir. Max	6 mph SE
Wet Leaves (Y/N)	N no
Soil Temperature	70 F
Soil Moisture	NORMAL
% Cloud Cover	99
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	1.87 IN

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	ERICA W
Stage Majority, Percent	bolt 100
Height Average	8 in
Height Minimum, Maximum	7 10
Pest 2 Code, Type, Scale	OEOLA W
Stage Majority, Percent	flower 100
Height Average	10 in
Height Minimum, Maximum	8 12

**Application Equipment**

A	
Appl. Equipment	Bckpck6Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	9 ft
Boom Height	28 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	05/26/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	06/18/19	Barb Scott	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

## University of Delaware

Evaluation of Rapid Burndown Options for Large Horseweed

Trial ID: Brndn1-19

Location: Field #3

Trial Year: 2019

Protocol ID: Brndn1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

## Trial Comments

6/5/19: anything less than 95 has green stems and regrowth is possible

## Evaluation of Rapid Burndown Options for Large Horseweed

Trial ID: Brndn1-19

Location: Field #3

Trial Year: 2019

Protocol ID: Brndn1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Description		ERICAHorsewd	OEOLACEprmrse	ERICAHorsewd	OEOLACEprmrse
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		05/29/19	05/29/19	05/31/19	05/31/19
Rating Date					
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code		
1 Roundup PowerMax..glyphosate	4.5 AS	1 lb ae/a	EPP	A	
Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	EPP	A	
Dry Ammonium Sulfate	100 D	0.9 % w/v	EPP	A	
No metribuzin				A	
2 Roundup PowerMax..glyphosate	4.5 AS	1 lb ae/a	EPP	A	
Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	EPP	A	
Dry Ammonium Sulfate	100 D	0.9 % w/v	EPP	A	
Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	EPP	A	
3 Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	EPP	A	
Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	EPP	A	
Nonionic Surfactant	100 L	0.25 % v/v	EPP	A	
Dry Ammonium Sulfate	100 D	0.9 % w/v	EPP	A	
No metribuzin				A	
4 Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	EPP	A	
Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	EPP	A	
Nonionic Surfactant	100 L	0.25 % v/v	EPP	A	
Dry Ammonium Sulfate	100 D	0.9 % w/v	EPP	A	
Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	EPP	A	
LSD P=.05		11.89	13.83	8.18	5.02
Standard Deviation		5.95	6.92	4.10	2.51
CV		7.72	9.08	4.75	2.85
Replicate F		0.059	0.130	0.417	0.119
Replicate Prob(F)		0.9434	0.8801	0.6766	0.8899
Treatment F		4.294	5.957	4.402	5.652
Treatment Prob(F)		0.0612	0.0313	0.0583	0.0350

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Description		ERICA Horsewd	OEOLA CEprmrse	VIORA FldPansy		
Rating Type		Control %	Control %	Control %		
Rating Unit		06/05/19	06/05/19	06/05/19		
Rating Date						
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing				
1 Roundup PowerMax..glyphosate Liberty 280.....glufosinate Dry Ammonium Sulfate No metribuzin	4.5 AS 2.34 SL 100 D	1 lb ae/a 0.585 lb ai/a 0.9 % w/v	EPP A EPP A EPP A	96.7 a	94.0 a	84.7 a
2 Roundup PowerMax..glyphosate Liberty 280.....glufosinate Dry Ammonium Sulfate Metribuzin.....metribuzin	4.5 AS 2.34 SL 100 D 75 DF	1 lb ae/a 0.585 lb ai/a 0.9 % w/v 0.188 lb ai/a	EPP A EPP A EPP A EPP A	95.3 a	94.0 a	99.0 a
3 Gramoxone SL....paraquat Liberty 280.....glufosinate Nonionic Surfactant Dry Ammonium Sulfate No metribuzin	2 SL 2.34 SL 100 L 100 D	0.75 lb ai/a 0.585 lb ai/a 0.25 % v/v 0.9 % w/v	EPP A EPP A EPP A EPP A	90.0 a	91.3 a	99.0 a
4 Gramoxone SL....paraquat Liberty 280.....glufosinate Nonionic Surfactant Dry Ammonium Sulfate Metribuzin.....metribuzin	2 SL 2.34 SL 100 L 100 D 75 DF	0.75 lb ai/a 0.585 lb ai/a 0.25 % v/v 0.9 % w/v 0.188 lb ai/a	EPP A EPP A EPP A EPP A EPP A	92.7 a	95.7 a	99.0 a
LSD P=.05		7.82	3.19	21.34		
Standard Deviation		3.91	1.60	10.68		
CV		4.18	1.71	11.19		
Replicate F		0.267	0.391	1.000		
Replicate Prob(F)		0.7745	0.6923	0.4219		
Treatment F		1.713	3.772	1.351		
Treatment Prob(F)		0.2629	0.0782	0.3440		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Evaluation of Pyridate for Cole Crops**

Trial ID: Cole1-19      Location: REC Fld #31      Trial Year: 2019  
 Protocol ID: Cole1-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 07/23/19  
 Initiation Date: 08/01/19  
 Completion Date: 11/30/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C BRSOB Brassica oleracea var. botrytis Cauliflower	Entry Date: 09/09/19	Planting Date: 08/28/19	Planting Method: TRAMAC transplanted - machine
	Variety: Denali	Rows per Plot: 1	Seed Bed: SMOOTH smooth
	Row Spacing: 48 IN	Spacing within Row: 9 IN	Soil Moisture: NORMAL normal, adequate
Crop 2: C BRSOK Brassica oleracea italicca	Asparagus broccoli		
	Entry Date: 09/09/19	Planting Date: 08/28/19	Planting Method: TRAMAC transplanted - machine
	Variety: Green Magic	Rows per Plot: 1	Seed Bed: SMOOTH smooth
	Row Spacing: 48 IN	Spacing within Row: 9 IN	Soil Moisture: NORMAL normal, adequate
Crop 3: C BRSOL Brassica oleracea capitata alb Head cabbage			
	Entry Date: 09/09/19	Planting Date: 08/28/19	Planting Method: TRAMAC transplanted - machine
	Variety: Platinum Dynasty	Rows per Plot: 1	Seed Bed: SMOOTH smooth
	Row Spacing: 48 IN	Spacing within Row: 9 IN	Soil Moisture: NORMAL normal, adequate

**Site and Design**

Treated Plot Width: 10 FT  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 250 FT<sup>2</sup> Treatments: 12  
 Replications: 3      Study Design: RACOBL Randomized Complete Block (RCB)

## Field Prep./Maintenance:

9/13/19: Farm crew cultivated cole crops without asking.

10/03/19: 40lb/A Nitrogen dribbled on.

**Soil Description**

Description Name: Field 31  
% Sand: 83 % OM: 1 Texture: LS loamy sand  
% Silt: 7 pH: 6.8 Soil Name: Rosedale loamy sand, 0-2% slopes  
% Clay: 10 CEC: 3.3 Fert. Level: G good  
Soil Drainage: G good

**Application Description**

	A	B
Application Date	08/27/19	09/18/19
Appl. Stop Time	11:00 AM	09:30 AM
Application Method	SPRAY	SPRAY
Application Timing	PRETRA	POST
Application Placement	BROADC	BROADC
Applied By	Quintin	Matt
Appl. Entry Date	09/09/19	09/18/19
Air Temperature Start, Stop	72 74 F	66 66 F
% Relative Humidity Start, Stop	79 76	75 75
Wind Velocity+Dir. Start	7 mph ENE	6 mph NNE
Wind Velocity+Dir. Stop	6 mph NE	6 mph NNE
Wind Velocity+Dir. Max	7 mph ENE	6 mph NNE
Wet Leaves (Y/N)	N no	Y yes
Soil Temperature	71 F	65 F
Soil Moisture	Normal	Normal
% Cloud Cover	100	2
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	0.25 IN	0 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	BRSOB BVBB	BRSOB BVBB
Stage Majority, Percent		4 lf
Stage Maximum, Percent		7 lf
Average Diameter		12 IN
Height Minimum, Maximum		10 14
Crop 2 Code, BBCH Scale	BRSOK BVBB	BRSOK BVBB
Stage Majority, Percent		6 lf
Stage Maximum, Percent		11 lf
Average Diameter		16 IN
Height Minimum, Maximum		10 18
Crop 3 Code, BBCH Scale	BRSOL BVHF	BRSOL BVHF
Stage Majority, Percent		7 lf
Stage Maximum, Percent		10 lf
Average Diameter		13 IN
Height Minimum, Maximum		11 16

**Application Equipment**

	A	B
Appl. Equipment	Bckpck6Nozl	Bckpck6Nozl
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	18 in
Boom Length	9 ft	9 ft
Boom Height	18 in	26 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	07/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	09/09/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

**Trial Comments**

Cole crops were cultivated on 9/13/19 by farm crew by mistake. Prior to that few to no weeds were prevalent.

09/09/19: Trts 6,9 have minimal bleaching on leaf margins, ~1 out of 5 plants except rep 3, trt9 cauliflower every plant has chlorotic leaf margins on oldest leaves.

09/25/19: Pyridate chlorosis is a blotchy yellowing. Goal Tender post was chlorotic speckling.

10/23/19: Copper sulfate (MasterCop) injuring broccoli - widespread leaf necrosis throughout the field. Copper treatments began Sept 23 and applied weekly. Trts 6 & 9 chorosis on leaf margins of cauliflower. Highly noticeable and NOT desirable but leaf surface area is minimal, <10% of leaf surface (chlorosis just on 1 cm band of margins).

10/29/19: Broccoli heads yielded if 5 inch diameter or greater.

11/06/19: Cabbage yielded if marketable size and tight heads. plots 305 and 306 had raccoon damaged heads (2 each).

## Evaluation of Pyridate for Cole Crops

Trial ID: Cole1-19

Location: REC Fld #31

Trial Year: 2019

Protocol ID: Cole1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code	C	BRSOB	C	BRSOK	C	BRSOL	C	BRSOB
Description		Caulflwr Injury %		Broccoli Injury %		Cabbage Injury %		Caulflwr Injury %
Rating Type		09/05/19		09/05/19		09/05/19		09/09/19
Rating Unit								
Rating Date								
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
1 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.625 lb ai/a	PRE POST	A B		0.0 b	0.0 b	3.3 a
2 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.262 lb ai/a	PRE POST	A B		15.0 a	9.0 a	4.7 a
3 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.9 lb ai/a	PRE POST	A B		3.3 b	5.7 a	4.7 a
4 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.377 lb ai/a	PRE POST	A B		6.3 b	6.3 a	4.7 a
5 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE PRE	A A		3.3 b	0.0 b	0.0 a
6 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE PRE	A A		3.3 b	0.0 b	0.0 a
7 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE PRE	A A		4.0 b	0.0 b	5.7 a
8 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE POST	A B		2.3 b	0.0 b	0.0 a
9 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE POST	A B		0.0 b	0.0 b	0.0 a
10 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE PRE	A B		0.0 b	0.0 b	3.3 a
11 Prowl H2O.....pendimethalin GoalTender.....oxyfluorfen	3.8 CS 4 FL	1 lb ai/a 0.5 lb ai/a	PRE POST	A B		3.3 b	0.0 b	0.0 a
12 Untreated Check						0.0 b	0.0 b	0.0 c
LSD P=.05						7.11	3.89	5.87
Standard Deviation						4.20	2.29	3.47
CV						122.89	131.12	158.04
Replicate F						2.274	1.472	0.806
Replicate Prob(F)						0.1266	0.2512	0.4594
Treatment F						2.954	6.033	1.403
Treatment Prob(F)						0.0147	0.0002	0.2396
								0.0276

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code		C BRSOK	C BRSOL	C BRSOB	C BRSOK
Description		Broccoli Injury %	Cabbage Injury %	Caulflwr Injury %	Broccoli Injury %
Rating Type		09/09/19	09/09/19	09/16/19	09/16/19
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc Form Type Rate	Appl Unit	Appl Timing		
1 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.625 lb ai/a	PRE POST	A B	3.3 a 8.7 a
2 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.262 lb ai/a	PRE POST	A B	6.0 ab 8.7 a
3 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.9 lb ai/a	PRE POST	A B	10.0 a 6.0 a
4 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.377 lb ai/a	PRE POST	A B	0.0 a 9.0 a
5 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE PRE	A A	4.0 ab 4.0 a
6 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE PRE	A A	10.7 a 6.7 a
7 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE	A	10.3 a 2.7 a
8 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE POST	A B	0.0 a 0.0 b
9 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE POST	A B	8.7 a 2.7 a
10 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE	A	4.0 a 4.0 ab
11 Prowl H2O.....pendimethalin GoalTender.....oxyfluorfen	3.8 CS 4 FL	1 lb ai/a 0.5 lb ai/a	PRE POST	A B	0.0 a 0.0 b
12 Untreated Check					0.0 a 0.0 b
LSD P=.05		7.36	7.38	9.46	7.75
Standard Deviation		4.34	4.36	5.59	4.58
CV		156.38	78.5	85.21	148.38
Replicate F		0.448	1.233	0.431	1.246
Replicate Prob(F)		0.6449	0.3109	0.6553	0.3071
Treatment F		1.090	2.550	1.881	1.399
Treatment Prob(F)		0.4123	0.0296	0.0999	0.2415

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code		C BRSOL	C BRSOB	C BRSOB	C BRSOK
Description		Cabbage Injury %	Caulflwr Stunting %	Caulflwr Chlrosis %	Broccoli Stunting %
Rating Type		09/16/19	09/25/19	09/25/19	09/25/19
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1	Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.625 lb ai/a	PRE POST	A B
2	Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.262 lb ai/a	PRE POST	A B
3	Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.9 lb ai/a	PRE POST	A B
4	Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.377 lb ai/a	PRE POST	A B
5	Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE PRE	A A
6	Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE PRE	A A
7	Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE	A
8	Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE POST	A B
9	Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE POST	A B
10	Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE PRE	A B
11	Prowl H2O.....pendimethalin GoalTender.....oxyfluorfen	3.8 CS 4 FL	1 lb ai/a 0.5 lb ai/a	PRE POST	A B
12	Untreated Check			0.0 d	0.0 c
LSD P=.05			9.21	8.98	4.97
Standard Deviation			5.44	5.31	2.94
CV			67.95	61.41	33.35
Replicate F			2.614	0.297	1.945
Replicate Prob(F)			0.0958	0.7460	0.1668
Treatment F			3.351	2.791	19.078
Treatment Prob(F)			0.0076	0.0194	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code		C BRSOK	C BRSOL	C BRSOL	C BRSOB
Description		Broccoli Chlrosis %	Cabbage Stunting %	Cabbage Chlrosis %	Caulflwr Stunting %
Rating Type		09/25/19	09/25/19	09/25/19	10/02/19
Rating Unit					
Rating Date					
Trt Treatment No.	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
Tough EC.....pyridate	5 EC		0.625 lb ai/a	POST	B
2 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
Lentagran.....pyridate	45 WP		0.262 lb ai/a	POST	B
3 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
Tough EC.....pyridate	5 EC		0.9 lb ai/a	POST	B
4 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
Lentagran.....pyridate	45 WP		0.377 lb ai/a	POST	B
5 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE	A
6 Command.....clomazone	3 ME		0.5 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE	A
7 Spartan Charge Premix	3.5 F		0.205 lb ai/a	PRE	A
----carfentrazone	0.35	0.0205			
----sulfentrazone	3.15	0.184			
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE	A
8 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST	B
9 Command.....clomazone	3 ME		0.5 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST	B
10 Spartan Charge Premix	3.5 F		0.205 lb ai/a	PRE	A
----carfentrazone	0.35	0.0205			
----sulfentrazone	3.15	0.184			
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST	B
11 Prowl H2O.....pendimethalin	3.8 CS		1 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST	B
12 Untreated Check				0.0 f	0.0 d
LSD P=.05			4.50	10.80	2.93
Standard Deviation			2.66	6.38	1.73
CV			23.7	58.88	19.91
Replicate F			0.263	0.371	0.454
Replicate Prob(F)			0.7710	0.6945	0.6408
Treatment F			68.593	3.038	58.200
Treatment Prob(F)			0.0001	0.0128	0.0001
					0.1524

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code		C BRSOB	C BRSOK	C BRSOK	C BRSOL
Description		Caulflwr Chlr/Ncro %	Broccoli Stunting %	Broccoli Chlr/Ncro %	Cabbage Stunting %
Rating Type		10/02/19	10/02/19	10/02/19	10/02/19
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
Tough EC.....pyridate	5 EC		0.625 lb ai/a	POST	B
2 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
Lentagran.....pyridate	45 WP		0.262 lb ai/a	POST	B
3 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
Tough EC.....pyridate	5 EC		0.9 lb ai/a	POST	B
4 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
Lentagran.....pyridate	45 WP		0.377 lb ai/a	POST	B
5 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE	A
6 Command.....clomazone	3 ME		0.5 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE	A
7 Spartan Charge Premix	3.5 F		0.205 lb ai/a	PRE	A
----carfentrazone	0.35	0.0205			
----sulfentrazone	3.15	0.184			
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE	A
8 Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST	B
9 Command.....clomazone	3 ME		0.5 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST	B
10 Spartan Charge Premix	3.5 F		0.205 lb ai/a	PRE	A
----carfentrazone	0.35	0.0205			
----sulfentrazone	3.15	0.184			
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST	B
11 Prowl H2O.....pendimethalin	3.8 CS		1 lb ai/a	PRE	A
GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST	B
12 Untreated Check			0.0 f		0.0 c
LSD P=.05			3.67	4.18	2.37
Standard Deviation			2.17	2.47	1.40
CV			40.6	58.44	25.0
Replicate F			0.231	2.195	4.081
Replicate Prob(F)			0.7956	0.1352	0.0311
Treatment F			16.763	21.405	78.896
Treatment Prob(F)			0.0001	0.0001	0.0001
					0.0026

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code		C BRSOL	C BRSOB	C BRSOB	C BRSOK
Description		Cabbage Chlr/Ncro %	Caulflwr Stunting %	Caulflwr Chlr/Ncro %	Broccoli Stunting %
Rating Type		10/02/19	10/10/19	10/10/19	10/10/19
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
					Appl Code
1	Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.625 lb ai/a	PRE POST	A B
2	Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.262 lb ai/a	PRE POST	A B
3	Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.9 lb ai/a	PRE POST	A B
4	Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.377 lb ai/a	PRE POST	A B
5	Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE PRE	A A
6	Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE PRE	A A
7	Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE	A
8	Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE POST	A B
9	Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE POST	A B
10	Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE POST	A B
11	Prowl H2O.....pendimethalin GoalTender.....oxyfluorfen	3.8 CS 4 FL	1 lb ai/a 0.5 lb ai/a	PRE POST	A B
12	Untreated Check			0.0 c	0.0 d
LSD P=.05			2.61	8.63	2.44
Standard Deviation			1.54	5.10	1.44
CV			46.2	63.03	86.6
Replicate F			0.105	1.338	1.000
Replicate Prob(F)			0.9004	0.2828	0.3840
Treatment F			20.907	4.286	21.818
Treatment Prob(F)			0.0001	0.0018	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code		C BRSOK	C BRSOL	C BRSOL	C BRSOB
Description		Broccoli Chlr/Ncro %	Cabbage Stunting %	Cabbage Chlr/Ncro %	Caulflwr Stunting %
Rating Type		10/10/19	10/10/19	10/10/19	10/23/19
Rating Unit					
Rating Date					
Trt Treatment No.	Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1	Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE A
	Tough EC.....pyridate	5 EC		0.625 lb ai/a	POST B
2	Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE A
	Lentagran.....pyridate	45 WP		0.262 lb ai/a	POST B
3	Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE A
	Tough EC.....pyridate	5 EC		0.9 lb ai/a	POST B
4	Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE A
	Lentagran.....pyridate	45 WP		0.377 lb ai/a	POST B
5	Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE A
	GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE A
6	Command.....clomazone	3 ME		0.5 lb ai/a	PRE A
	GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE A
7	Spartan Charge Premix	3.5 F		0.205 lb ai/a	PRE A
	----carfentrazone	0.35		0.0205	
	----sulfentrazone	3.15		0.184	
	GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	PRE A
8	Dual Magnum.....s-metolachlor	7.62 E		1.3 lb ai/a	PRE A
	GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST B
9	Command.....clomazone	3 ME		0.5 lb ai/a	PRE A
	GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST B
10	Spartan Charge Premix	3.5 F		0.205 lb ai/a	PRE A
	----carfentrazone	0.35		0.0205	
	----sulfentrazone	3.15		0.184	
	GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST B
11	Prowl H2O.....pendimethalin	3.8 CS		1 lb ai/a	PRE A
	GoalTender.....oxyfluorfen	4 FL		0.5 lb ai/a	POST B
12	Untreated Check			0.0 a	0.0 d
LSD P=.05				10.20	7.94
Standard Deviation			0.00	6.03	4.69
CV			0.0	66.95	91.24
Replicate F			0.000	3.376	0.000
Replicate Prob(F)			1.0000	0.0526	1.0000
Treatment F			0.000	4.231	0.000
Treatment Prob(F)			1.0000	0.0019	1.0000

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code		C BRSOK Broccoli Stunting % 10/23/19	C BRSOL Cabbage Stunting % 10/23/19	C BRSOK Brocoli Ttl # plts # 10/29/19	C BRSOK Brocoli Ttl2Harv #
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing Code			
1 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a PRE 0.625 lb ai/a POST B	11.7 ab	17.3 a	22.3 a
2 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a PRE 0.262 lb ai/a POST B	7.3 abc	10.7 ab	20.7 a
3 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a PRE 0.9 lb ai/a POST B	14.0 a	10.3 ab	22.0 a
4 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a PRE 0.377 lb ai/a POST B	5.7 bcd	5.0 bc	23.0 a
5 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a PRE 0.5 lb ai/a PRE A	0.0 d	0.0 c	22.0 a
6 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a PRE 0.5 lb ai/a PRE A	2.3 cd	0.0 c	22.7 a
7 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a PRE 0.0205 0.184 0.5 lb ai/a PRE A	2.3 cd	11.7 ab	21.0 a
8 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a PRE 0.5 lb ai/a POST B	0.0 d	8.3 abc	21.3 a
9 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a PRE 0.5 lb ai/a POST B	2.3 cd	2.3 bc	20.3 a
10 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a PRE 0.0205 0.184 0.5 lb ai/a POST B	5.7 bcd	2.3 bc	19.3 a
11 Prowl H2O.....pendimethalin GoalTender.....oxyfluorfen	3.8 CS 4 FL	1 lb ai/a PRE 0.5 lb ai/a POST B	0.0 d	0.0 c	21.3 a
12 Untreated Check			0.0 d	0.0 c	21.0 a
LSD P=.05		6.77	10.11	4.06	3.9
Standard Deviation		4.00	5.97	2.40	2.3
CV		93.48	105.31	11.2	17.16
Replicate F		0.215	0.803	0.362	0.397
Replicate Prob(F)		0.8079	0.4609	0.7001	0.6773
Treatment F		4.210	2.888	0.570	2.281
Treatment Prob(F)		0.0020	0.0165	0.8320	0.0480

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code	C BRSOK Brocoli Ttl2Harv lbs	C BRSOK Brocoli remaining #mrketab 11/05/19	C BRSOK Brocoli flowring # 11/11/19	C BRSOK Brocoli Ttl3Harv #		
Trt Treatment No. Name	Form Conc Form Type Rate Appl Unit Appl Timing Code					
1 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a PRE 0.625 lb ai/a POST B	7.16 bc	8.0 a	0.3 a	14 a
2 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a PRE 0.262 lb ai/a POST B	7.02 bc	8.0 a	0.0 a	14 a
3 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a PRE 0.9 lb ai/a POST B	6.46 c	10.7 a	0.3 a	13 a
4 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a PRE 0.377 lb ai/a POST B	8.40 abc	8.0 a	0.0 a	17 a
5 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a PRE 0.5 lb ai/a PRE A	9.09 ab	6.0 a	0.0 a	18 a
6 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a PRE 0.5 lb ai/a PRE A	10.23 a	6.0 a	0.3 a	18 a
7 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a PRE 0.0205 0.184 0.5 lb ai/a PRE A	7.63 bc	7.0 a	0.0 a	14 a
8 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a PRE 0.5 lb ai/a POST B	9.16 ab	6.7 a	0.0 a	16 a
9 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a PRE 0.5 lb ai/a POST B	10.35 a	4.0 a	0.0 a	18 a
10 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a PRE 0.0205 0.184 0.5 lb ai/a POST B	6.72 c	8.3 a	0.0 a	14 a
11 Prowl H2O.....pendimethalin GoalTender.....oxyfluorfen	3.8 CS 4 FL	1 lb ai/a PRE 0.5 lb ai/a POST B	8.63 abc	8.0 a	0.0 a	15 a
12 Untreated Check			8.49 abc	8.3 a	0.0 a	15 a
LSD P=.05		2.182	4.85	0.49	4.2	
Standard Deviation		1.289	2.86	0.29	2.5	
CV		15.57	38.62	346.41	16.05	
Replicate F		0.494	0.132	1.000	0.840	
Replicate Prob(F)		0.6170	0.8770	0.3840	0.4452	
Treatment F		3.074	0.998	0.818	1.782	
Treatment Prob(F)		0.0120	0.4780	0.6237	0.1198	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code		C BRSOK Brocoli Ttl3Harv lbs	C BRSOL Cabbage Stunting %	C BRSOL Cabbage TtlPlnts #	C BRSOL Cabbage TtlHarv #
Description					
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc Form Type Rate	Appl Unit	Appl Timing		
1 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.625 lb ai/a	PRE A POST B	7.63 cd	9.0 a
2 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.262 lb ai/a	PRE A POST B	7.99 bcd	8.7 a
3 Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.9 lb ai/a	PRE A POST B	7.26 d	5.0 a
4 Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.377 lb ai/a	PRE A POST B	9.59 abc	2.7 a
5 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE A PRE A	9.97 ab	2.7 a
6 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE A PRE A	10.69 a	0.0 a
7 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE A PRE A	8.38 bcd	5.0 a
8 Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE A POST B	9.86 ab	8.3 a
9 Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE A POST B	11.26 a	2.7 a
10 Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE A PRE A	8.23 bcd	0.0 a
11 Prowl H2O.....pendimethalin GoalTender.....oxyfluorfen	3.8 CS 4 FL	1 lb ai/a 0.5 lb ai/a	PRE A POST B	9.21 a-d	0.0 a
12 Untreated Check				9.57 abc	0.0 a
LSD P=.05		2.181	8.66	3.64	4.8
Standard Deviation		1.288	5.11	2.15	2.8
CV		14.1	139.47	9.99	25.92
Replicate F		1.034	1.874	0.384	1.849
Replicate Prob(F)		0.3724	0.1772	0.6854	0.1810
Treatment F		2.798	1.414	1.211	1.917
Treatment Prob(F)		0.0192	0.2351	0.3360	0.0934

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C	BRSOL		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	Total wt lbs
1	Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.625 lb ai/a	PRE POST	A B			12.07 a
2	Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.262 lb ai/a	PRE POST	A B			12.93 a
3	Dual Magnum.....s-metolachlor Tough EC.....pyridate	7.62 E 5 EC	1.3 lb ai/a 0.9 lb ai/a	PRE POST	A B			16.50 a
4	Dual Magnum.....s-metolachlor Lentagran.....pyridate	7.62 E 45 WP	1.3 lb ai/a 0.377 lb ai/a	PRE POST	A B			18.49 a
5	Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE PRE	A A			21.69 a
6	Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE PRE	A A			25.82 a
7	Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE	A			19.21 a
8	Dual Magnum.....s-metolachlor GoalTender.....oxyfluorfen	7.62 E 4 FL	1.3 lb ai/a 0.5 lb ai/a	PRE POST	A B			17.13 a
9	Command.....clomazone GoalTender.....oxyfluorfen	3 ME 4 FL	0.5 lb ai/a 0.5 lb ai/a	PRE POST	A B			24.36 a
10	Spartan Charge Premix ----carfentrazone ----sulfentrazone GoalTender.....oxyfluorfen	3.5 F 0.35 3.15 4 FL	0.205 lb ai/a 0.0205 0.184 0.5 lb ai/a	PRE	A			19.31 a
11	Prowl H2O.....pendimethalin GoalTender.....oxyfluorfen	3.8 CS 4 FL	1 lb ai/a 0.5 lb ai/a	PRE POST	A B			26.93 a
12	Untreated Check							24.85 a
LSD P=.05								10.855
Standard Deviation								6.410
CV								32.15
Replicate F								1.002
Replicate Prob(F)								0.3833
Treatment F								1.752
Treatment Prob(F)								0.1267

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 25,27 because error mean square = 0.

**Herbicide Evaluation for Peas**

Trial ID: Pea1-19      Location: Dill Farm      Trial Year: 2019  
 Protocol ID: Pea1-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 04/25/19  
 Initiation Date: 03/01/19  
 Completion Date: 07/01/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C PIBST Pisum sativum var. sativum Garden pea

Entry Date: 12/06/19

Variety: M-14

Planting Date: 04/24/19

Planting Rate: 120 LB/A

Depth: 0.75 IN

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 IN

Planting Equipment: FE Field Equipment

Seed Bed: SMOOTH smooth

Soil Temperature: 73 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 05/03/19

**Site and Design**

Treated Plot Width: 10 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 6 Tillage Type: CONTIL conventional-till

Replications: 3 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Dill Farm Field 8

% Sand: 81 % OM: 0.5 Texture: LS loamy sand

% Silt: 14 pH: 6.1 Soil Name: Pepperbox loamy sand, 0-2% slopes

% Clay: 5 CEC: 3.5 Fert. Level: F fair

Soil Drainage: G good

**Application Description**

	A	B
Application Date	04/25/19	05/15/19
Appl. Stop Time	12:00 PM	03:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	POST
Application Placement	BROADC	BROFOL
Applied By	VanGessel	K. Vollmer
Appl. Entry Date	12/06/19	05/16/19
Air Temperature Start, Stop	61 61 F	70 70 F
% Relative Humidity Start, Stop	70 70	36 36
Wind Velocity+Dir. Start	8 mph ENE	9 mph WNW
Wind Velocity+Dir. Stop	8 mph ENE	9 mph WNW
Wind Velocity+Dir. Max	8 mph ENE	9 mph WNW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	69 F	72 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	100	5
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.03 IN	0.05 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	PIBST BVPU	PIBST BVPU
Days after Emergence	-8	12
Stage Majority, Percent		veg 100
Height Average		3 in

**Application Equipment**

	A	B
Appl. Equipment	Bckpck6Nozl	Bckpck6Nozl
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	18 in
Boom Length	9 ft	9 ft
Boom Height	18 in	22 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	04/25/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/16/19	Kurt Vollmer	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

## Trial Comments

05/08/19: Stand of peas is very good, no treatment effect on stand.

05/30/19: Flowers have just begun to open and no differences in flowering observed.



## Herbicide Evaluation for Peas

Trial ID: Pea1-19

Location: Dill Farm

Trial Year: 2019

Protocol ID: Pea1-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code	C PIBST Pea Stunting % 05/01/19	C PIBST Pea LeafBurn % 05/01/19	C PIBST Pea Stunting % 05/08/19	C PIBST Pea Stunting % 05/24/19
Description				
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Rate	Form Type Rate	Rate Unit Appl Timing	Appl Code
1 Dual Magnum.....s-metolachlor	7.62 E	0.955 lb ai/a	PRE A	0.0 c
2 Dual Magnum.....s-metolachlor Sharpen.....saflufenacil	7.62 E 2.85 SC	0.478 lb ai/a 0.0334 lb ai/a	PRE A	8.0 b
3 Dual Magnum.....s-metolachlor Basagran.....bentazon Thistrol.....MCPB	7.62 E 4 L 2 L	0.478 lb ai/a 0.5 lb ai/a 0.75 lb ae/a	PRE A POST B POST B	7.0 b
4 Dual Magnum.....s-metolachlor Tough	7.62 E 5 EC	0.478 lb ai/a 0.313 lb ai/a	PRE A POST B	3.3 bc
5 Dual Magnum.....s-metolachlor Tough	7.62 E 5 EC	0.478 lb ai/a 0.625 lb ai/a	PRE A POST B	13.0 a
6 Dual Magnum.....s-metolachlor Tough Basagran.....bentazon	7.62 E 5 EC 4 L	0.478 lb ai/a 0.313 lb ai/a 0.5 lb ai/a	PRE A POST B POST B	8.0 b
LSD P=.05			4.93	2.07
Standard Deviation			2.71	1.14
CV			41.37	29.74
Replicate F			0.755	3.462
Replicate Prob(F)			0.4949	0.0720
Treatment F			8.097	88.692
Treatment Prob(F)			0.0027	0.0001
				0.294
				0.4521
				4.424
				53.158
				0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Crop Type, Code Description Rating Type Rating Unit Rating Date	C PIBST Pea Stunting %					
05/30/19						
Trt No. Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1 Dual Magnum.....s-metolachlor	7.62 E	0.955 lb ai/a	PRE	A	0.0	b
2 Dual Magnum.....s-metolachlor Sharpen.....saflufenacil	7.62 E 2.85 SC	0.478 lb ai/a 0.0334 lb ai/a	PRE PRE	A A	0.0	b
3 Dual Magnum.....s-metolachlor Basagran.....bentazon Thistrol.....MCPB	7.62 E 4 L 2 L	0.478 lb ai/a 0.5 lb ai/a 0.75 lb ae/a	PRE POST POST	A B B	9.7	a
4 Dual Magnum.....s-metolachlor Tough	7.62 E 5 EC	0.478 lb ai/a 0.313 lb ai/a	PRE POST	A B	0.0	b
5 Dual Magnum.....s-metolachlor Tough	7.62 E 5 EC	0.478 lb ai/a 0.625 lb ai/a	PRE POST	A B	9.7	a
6 Dual Magnum.....s-metolachlor Basagran.....bentazon	7.62 E 5 EC 4 L	0.478 lb ai/a 0.313 lb ai/a 0.5 lb ai/a	PRE POST POST	A B B	8.0	a
LSD P=.05					3.00	
Standard Deviation					1.65	
CV					36.22	
Replicate F					0.755	
Replicate Prob(F)					0.4950	
Treatment F					27.853	
Treatment Prob(F)					0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

**Sweet Potato Tolerance to Various Herbicides**

Trial ID: SwPot 1-19      Location: Field 14      Trial Year: 2019  
 Protocol ID: SwPot1-19      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 05/28/19  
 Initiation Date: 03/01/19  
 Completion Date: 08/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C IPOBA Ipomoea batatas Sweet potato  
 Entry Date: 07/24/19  
 Variety: Covington  
 Planting Date: 06/05/19      Planting Rate: 1 P/FT  
 Rows per Plot: 2      Planting Method: TRAMAC transplanted - machine  
 Row Spacing: 5 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth      Entry Date: 10/10/19  
 Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory      Entry Date: 10/10/19

**Site and Design**

Treated Plot Width: 10 FT      Site Type: FIELD field  
 Treated Plot Length: 25 FT  
 Treated Plot Area: 250 FT<sup>2</sup> Treatments: 14      Tillage Type: CONTIL conventional-till  
 Replications: 3      Study Design: RACOB Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Soil tilled June3.  
 June 27: 40 lb/A Nitrogen dribbled alongside rows. June 29: Hilled.

**Soil Description**

Description Name: Field 14C  
 % Sand: 79      % OM: 1.6      Texture: LS      loamy sand  
 % Silt: 14      pH: 6.4      Soil Name: Klej loamy sand, 0-2% slopes  
 % Clay: 7      CEC: 6.5      Fert. Level: E      excellent  
 Soil Drainage: G      good

**Application Description**

	A	B	C	D
Application Date	06/04/19	06/07/19	06/21/19	07/03/19
Appl. Start Time	08:20 AM	09:00 AM	07:50 AM	06:50 AM
Appl. Stop Time	08:50 AM	09:30 AM	08:00 AM	07:05 AM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRETRNS	2 DATRNS	14DATRNS	28DATRNS
Application Placement	BROADC	BROADC	BROADC	BROADC
Applied By	Matt	Matt	Matt	Matt
Appl. Entry Date	09/18/19	10/10/19	10/10/19	10/10/19
Air Temperature Start, Stop	59 64 F	75 75 F	75 75 F	73 73 F
% Relative Humidity Start, Stop	62 56	69 69	82 82	90 90
Wind Velocity+Dir. Start	4 mph NNW	5 mph ENE	4 mph W	3 mph
Wind Velocity+Dir. Stop	5 mph NNE	5 mph ENE	4 mph W	3 mph
Wind Velocity+Dir. Max	5 mph NNE	5 mph ENE	4 mph W	3 mph
Wet Leaves (Y/N)	N no	N no	N no	Y yes
Soil Temperature	63 F	75 F	76 F	77 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	0	65	24	1
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	1.71 IN	2.01 IN	0 IN	0.53 IN

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	IPOBA BVPP	IPOBA BVPP	IPOBA BVPP	IPOBA BVPP
Stage Majority, Percent		3LVS	8 LVS	Ea vine
Stage Minimum, Percent		1 LF		
Stage Maximum, Percent		5LVS		
Height Average		6 IN	8 IN	12 IN
Height Minimum, Maximum		5 7	6 8	9 12

**Pest Stage At Each Application**

	A	B	C	D
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W	AMAPA W
Height Average			1 IN	8 IN
Height Minimum, Maximum				3 10
Density Average			20 m2	24 m2
Density Min, Max			20 32	
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W	IPOSS W
Height Average			3 IN	6 IN
Height Minimum, Maximum				2 8
Density Average			6 m2	12 m2
Density Min, Max			6 8	

**Application Equipment**

	A	B	C	D
Appl. Equipment	6 NOZL BOOM	6 NOZL BOOM	6 NOZL BOOM	6 NOZL BOOM
Operation Pressure	30 PSI	30 PSI	30 PSI	30 PSI
Nozzle Size	11002	11002	11002	11002
Nozzle Spacing	18 IN	18 IN	18 IN	18 IN
Nozzles/Row	6	6	6	6
Boom Length	9.5 FT	9.5 FT	9.5 FT	9.5 FT
Boom Height	18 IN	18 IN	18 IN	18 IN
Ground Speed	3 MPH	3 MPH	3 MPH	3 MPH
Carrier	WATER	WATER	WATER	WATER
Application Amount	20 GAL/AC	20 GAL/AC	20 GAL/AC	20 GAL/AC
Propellant	COMCO2	COMCO2	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	05/26/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	07/24/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Planting Date entered.

## Trial Comments

6/18/19: Treatment 11 injury was chlorosis.  
 plot 307 had 4 plants in a row missing. Evidence of deer feeding in plots 309, 310.

7/1/19: Some plants buried from hillling - plots 205, 206, 210, 307, 312.

7/11/19: Leaf burn plots 103, 210, 303, 311 + 15,10,10,12, respectively.

7/24/19: Palmer control rating reflects herbicide control of oldest Palmer. Cultivation brought a flush of Palmer emergence in center of plots NOT reflected in this rating.

7/29/19: Rated newly emerged Palmer from cultivation. plots 214, 307,314 on right edge where sweet corn and palmer competed with sweet potato crop and thus more bare ground for seedling emergence. Morning glory present but not a major competitor with crop. Only Palmer to rate.

Sweet Potato Tolerance to Various Herbicides						
Trial ID: SwPot 1-19		Location: Field 14		Trial Year: 2019		
Protocol ID: SwPot1-19		Investigator: Mark VanGessel				
Study Director:					Sponsor Contact:	
Pest Code	Crop Type, Code			AMAPA C -	IPOSS C -	IPOSS C -
Description		SwPotato	PalmerAm	mornlry	mornlry	SwPotato
Rating Type		Injury %	Control %	Control %	Count #/plot	Stunting %
Rating Unit		06/18/19	06/18/19	06/18/19	06/18/19	06/27/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated			0.0 d	0.0 c	0.0 d
2	Devrinol Lorox DF	50 DF 50 DF	1 lb ai/a 0.5 lb ai/a	2DATrplnt 28DATrplnt	B D	83.3 b
3	Devrinol Lorox DF	50 DF 50 DF	1 lb ai/a 1 lb ai/a	2DATrplnt 28DATrplnt	B D	2.7 cd
4	Devrinol Lorox	50 DF 50 DF	1 lb ai/a 0.5 lb ai/a	2DATrplnt 14DATrplnt	B C	84.3 b
5	Devrinol Lorox	50 DF 50 DF	1 lb ai/a 1 lb ai/a	2DATrplnt 14DATrplnt	B C	77.7 b
6	Devrinol Reflex	50 DF 2 EC	1 lb ai/a 0.25 lb ai/a	2DATrplnt PRETrplnt	B A	6.7 bc
7	Devrinol Reflex	50 DF 2 EC	1 lb ai/a 0.5 lb ai/a	2DATrplnt PRETrplnt	B A	100.0 a
8	Valor Dual Magnum	51 WG 7.62 E	0.096 lb ai/a 0.95 lb ai/a	PRETrplnt 2DATrplnt	A B	100.0 a
9	Valor Dual Magnum	51 WG 7.62 E	0.08 lb ai/a 0.95 lb ai/a	PRETrplnt 2DATrplnt	A B	96.7 a
10	Command Dual Magnum	3 ME 7.62 E	0.75 lb ai/a 0.95 lb ai/a	2DATrplnt 2DATrplnt	B B	10.0 ab
11	Command Dual Magnum	3 ME 7.62 E	0.75 lb ai/a 1.24 lb ai/a	2DATrplnt 2DATrplnt	B B	3.3 cd
12	Valor Devrinol	51 WG 50 DF	0.096 lb ai/a 1 lb ai/a	PRETrplnt 2DATrplnt	A B	99.3 a
13	Valor Devrinol Command	51 WG 50 DF 3 ME	0.096 lb ai/a 1 lb ai/a 0.375 lb ai/a	PRETrplnt 2DATrplnt 2DATrplnt	A B B	15.0 cd
14	Valor Select Handweed as needed	51 WG 2 EC	0.08 lb ai/a 0.5 lb ai/a	PRETrplnt 28DATrplnt	A D	16.0 bcd
LSD P=.05				5.42	8.12	24.98
Standard Deviation				3.23	4.84	14.88
CV				101.13	5.58	45.27
Replicate F				6.980	3.701	3.047
Replicate Prob(F)				0.0037	0.0385	0.0648
Treatment F				4.673	89.381	19.761
Treatment Prob(F)				0.0004	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=14

Pest Code Crop Type, Code	C	IPOBA	AMAPA C -	IPOSS C -	IPOSS C -	C	IPOBA			
Description	SwPotato	PalmerAm	mornglry	mornglry	Count #/plot	Stunting %	SwPotato			
Rating Type	LeafBurn %	Control %	Control %	Count #/plot	06/27/19	06/27/19	07/01/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated									
2	Devrinol Lorox DF	50 DF 50 DF	1 lb ai/a 0.5 lb ai/a	2DATrplnt 28DATrplnt	B D	0.0 c	0.0 d	0.0 b	15.3 def	0.0 c
3	Devrinol Lorox DF	50 DF 50 DF	1 lb ai/a 1 lb ai/a	2DATrplnt 28DATrplnt	B D	0.0 c	75.3 bc	0.0 b	24.3 bcd	0.0 c
4	Devrinol Lorox	50 DF 50 DF	1 lb ai/a 0.5 lb ai/a	2DATrplnt 14DATrplnt	B C	22.0 b	100.0 a	60.0 a	19.3 cde	37.3 b
5	Devrinol Lorox	50 DF 50 DF	1 lb ai/a 1 lb ai/a	2DATrplnt 14DATrplnt	B C	45.0 a	99.3 a	68.3 a	10.3 ef	74.3 a
6	Devrinol Reflex	50 DF 2 EC	1 lb ai/a 0.25 lb ai/a	2DATrplnt PRETrplnt	B A	0.0 c	99.7 a	0.0 b	34.7 a	0.0 c
7	Devrinol Reflex	50 DF 2 EC	1 lb ai/a 0.5 lb ai/a	2DATrplnt PRETrplnt	B A	0.0 c	97.7 a	16.7 b	23.0 bcd	6.0 c
8	Valor Dual Magnum	51 WG 7.62 E	0.096 lb ai/a 0.95 lb ai/a	PRETrplnt 2DATrplnt	A B	0.0 c	100.0 a	87.3 a	5.7 f	4.0 c
9	Valor Dual Magnum	51 WG 7.62 E	0.08 lb ai/a 0.95 lb ai/a	PRETrplnt 2DATrplnt	A B	0.0 c	100.0 a	79.3 a	7.7 f	3.3 c
10	Command Dual Magnum	3 ME 7.62 E	0.75 lb ai/a 0.95 lb ai/a	2DATrplnt 2DATrplnt	B B	0.0 c	99.0 a	16.7 b	29.3 ab	7.7 c
11	Command Dual Magnum	3 ME 7.62 E	0.75 lb ai/a 1.24 lb ai/a	2DATrplnt 2DATrplnt	B B	0.0 c	98.0 a	16.7 b	28.7 abc	4.0 c
12	Valor Devrinol	51 WG 50 DF	0.096 lb ai/a 1 lb ai/a	PRETrplnt 2DATrplnt	A B	0.0 c	100.0 a	79.3 a	7.7 f	0.0 c
13	Valor Devrinol Command	51 WG 50 DF 3 ME	0.096 lb ai/a 1 lb ai/a 0.375 lb ai/a	PRETrplnt 2DATrplnt 2DATrplnt	A B B	0.0 c	97.3 a	77.3 a	8.7 f	3.3 c
14	Valor Select Handweed as needed	51 WG 2 EC	0.08 lb ai/a 0.5 lb ai/a	PRETrplnt 28DATrplnt	A D	0.0 c	84.0 b	69.3 a	10.0 ef	5.0 c
LSD P=.05			3.88	10.41	29.54	10.00	11.33			
Standard Deviation			2.31	6.20	17.60	5.96	6.75			
CV			48.36	7.13	43.16	32.58	65.2			
Replicate F			1.000	0.847	1.773	3.338	0.042			
Replicate Prob(F)			0.3816	0.4400	0.1897	0.0512	0.9587			
Treatment F			94.268	57.521	12.523	8.751	28.300			
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001	0.0001			

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=14

Pest Code Crop Type, Code		AMAPA C - PalmerAm	IPOSS C - mornglry	MOLVE C - Carpetwd	C IPOBA SwPotato	C IPOBA SwPotato
Description		Control % 07/01/19	Control % 07/01/19	Control % 07/01/19	Stunting % 07/11/19	BiomRed % 07/24/19
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated					
2	Devrinol Lorox DF	50 DF 50 DF	1 lb ai/a 0.5 lb ai/a	2DATrplnt 28DATrplnt	B D	58.3 b 18.3 fg
3	Devrinol Lorox DF	50 DF 50 DF	1 lb ai/a 1 lb ai/a	2DATrplnt 28DATrplnt	B D	70.0 b 36.0 ef
4	Devrinol Lorox	50 DF 50 DF	1 lb ai/a 0.5 lb ai/a	2DATrplnt 14DATrplnt	B C	100.0 a 85.0 abc
5	Devrinol Lorox	50 DF 50 DF	1 lb ai/a 1 lb ai/a	2DATrplnt 14DATrplnt	B C	100.0 a 90.7 ab
6	Devrinol Reflex	50 DF 2 EC	1 lb ai/a 0.25 lb ai/a	2DATrplnt PRETrplnt	B A	98.3 a 48.3 de
7	Devrinol Reflex	50 DF 2 EC	1 lb ai/a 0.5 lb ai/a	2DATrplnt PRETrplnt	B A	100.0 a 68.3 bcd
8	Valor Dual Magnum	51 WG 7.62 E	0.096 lb ai/a 0.95 lb ai/a	PRETrplnt 2DATrplnt	A B	100.0 a 95.7 a
9	Valor Dual Magnum	51 WG 7.62 E	0.08 lb ai/a 0.95 lb ai/a	PRETrplnt 2DATrplnt	A B	100.0 a 86.0 abc
10	Command Dual Magnum	3 ME 7.62 E	0.75 lb ai/a 0.95 lb ai/a	2DATrplnt 2DATrplnt	B B	93.7 a 67.0 cd
11	Command Dual Magnum	3 ME 7.62 E	0.75 lb ai/a 1.24 lb ai/a	2DATrplnt 2DATrplnt	B B	96.7 a 74.3 abc
12	Valor Devrinol	51 WG 50 DF	0.096 lb ai/a 1 lb ai/a	PRETrplnt 2DATrplnt	A B	100.0 a 89.3 abc
13	Valor Devrinol Command	51 WG 50 DF 3 ME	0.096 lb ai/a 1 lb ai/a 0.375 lb ai/a	PRETrplnt 2DATrplnt 2DATrplnt	A B B	100.0 a 83.7 abc 100.0 a
14	Valor Select Handweed as needed	51 WG 2 EC	0.08 lb ai/a 0.5 lb ai/a	PRETrplnt 28DATrplnt	A D	93.3 a 75.0 abc
LSD P=.05			13.11	23.62	11.77	10.92
Standard Deviation			7.81	14.07	7.01	6.50
CV			9.03	21.47	7.89	33.86
Replicate F			0.277	0.301	0.095	1.466
Replicate Prob(F)			0.7604	0.7426	0.9097	0.2500
Treatment F			38.466	12.937	43.985	39.759
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=14

Pest Code	Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm Control %	IPOSS C - mornglry Control %	AMAPA C - PalmerAm CntrlNew %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Untreated					0.0 d	0.0 d	
2	Devrinol Lorox DF	50 DF 50 DF	1 lb ai/a 0.5 lb ai/a	2DATrplnt 28DATrplnt	B D	83.0 c	80.7 c	33.3 d
3	Devrinol Lorox DF	50 DF 50 DF	1 lb ai/a 1 lb ai/a	2DATrplnt 28DATrplnt	B D	94.7 ab	84.3 abc	21.7 de
4	Devrinol Lorox	50 DF 50 DF	1 lb ai/a 0.5 lb ai/a	2DATrplnt 14DATrplnt	B C	94.7 ab	87.7 abc	40.0 cd
5	Devrinol Lorox	50 DF 50 DF	1 lb ai/a 1 lb ai/a	2DATrplnt 14DATrplnt	B C	90.7 bc	86.7 abc	11.7 e
6	Devrinol Reflex	50 DF 2 EC	1 lb ai/a 0.25 lb ai/a	2DATrplnt PRETrplnt	B A	94.7 ab	85.0 abc	94.3 a
7	Devrinol Reflex	50 DF 2 EC	1 lb ai/a 0.5 lb ai/a	2DATrplnt PRETrplnt	B A	99.3 a	83.3 bc	91.0 ab
8	Valor Dual Magnum	51 WG 7.62 E	0.096 lb ai/a 0.95 lb ai/a	PRETrplnt 2DATrplnt	A B	96.7 ab	91.0 a	80.3 ab
9	Valor Dual Magnum	51 WG 7.62 E	0.08 lb ai/a 0.95 lb ai/a	PRETrplnt 2DATrplnt	A B	96.0 ab	85.0 abc	83.7 ab
10	Command Dual Magnum	3 ME 7.62 E	0.75 lb ai/a 0.95 lb ai/a	2DATrplnt 2DATrplnt	B B	83.3 c	86.0 abc	74.7 b
11	Command Dual Magnum	3 ME 7.62 E	0.75 lb ai/a 1.24 lb ai/a	2DATrplnt 2DATrplnt	B B	85.3 c	81.7 c	75.7 b
12	Valor Devrinol	51 WG 50 DF	0.096 lb ai/a 1 lb ai/a	PRETrplnt 2DATrplnt	A B	96.7 ab	89.3 ab	74.0 b
13	Valor Devrinol Command	51 WG 50 DF 3 ME	0.096 lb ai/a 1 lb ai/a 0.375 lb ai/a	PRETrplnt 2DATrplnt 2DATrplnt	A B B	98.0 ab	87.7 abc	82.7 ab
14	Valor Select Handweed as needed	51 WG 2 EC	0.08 lb ai/a 0.5 lb ai/a	PRETrplnt 28DATrplnt	A D	91.0 bc	86.7 abc	53.7 c
LSD P=.05 Standard Deviation CV						8.11 4.83 5.62	7.35 4.38 5.5	18.62 11.05 17.59
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						1.343 0.2787 82.340 0.0001	1.845 0.1781 83.325 0.0001	2.822 0.0793 18.703 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=14

## University of Delaware

Processing Tomato Response to UPL Herbicides (Pre-Transplant)  
 Trial ID: Tom1-19 Location: Field 14 Trial Year: 2019  
 Protocol ID: Tom1-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: UPL

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
 ARM Trial Created On: 05/21/19  
 Initiation Date: 03/01/19  
 Completion Date: 08/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
 Longitude of LL Corner °: 75.455834 W  
 Time Zone: America/New\_York

Conducted Under GLP: No  
 Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
 Organization: University of Delaware  
 Address: 16483 County Seat Hwy  
 City+State/Prov: Georgetown, Delaware  
 Postal Code: 19947 E-mail: mjv@udel.edu  
 Country: USA United States

**Crop Description**

Crop 1: C LYPES Solanum lycopersicum Tomato

Entry Date: 10/31/19

Variety: H3402

Planting Date: 05/23/19

Planting Method: TRAMAC transplanted - machine  
 Planting Equipment: MT Transplanter, mechanical  
 Soil Moisture: NORMAL normal, adequate

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth Entry Date: 07/25/19

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory Entry Date: 07/25/19

**Site and Design**

Treated Plot Width: 10 FT

Treated Plot Length: 25 FT

Treated Plot Area: 250 FT<sup>2</sup> Treatments: 9

Replications: 4

Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Treatment 9 was hand weeded 3 times alongside rows, 10-12 inches out.

**Soil Description**

Description Name: Field 14B  
 % Sand: 81 % OM: 1.6 Texture: LS loamy sand  
 % Silt: 12 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 7 CEC: 6.5 Fert. Level: E excellent  
 Soil Drainage: G good

**Application Description**

	A	B
Application Date	05/22/19	06/18/19
Appl. Stop Time	10:45 AM	10:00 AM
Application Method	SPRAY	SPRAY
Application Timing	PRETRP	TOTAL POST
Application Placement	BRDCST	BRDCST
Applied By	VanGessel	Quintin
Appl. Entry Date	05/23/19	07/25/19
Air Temperature Start, Stop	68 69 F	81 82 F
% Relative Humidity Start, Stop	35 32	74 72
Wind Velocity+Dir. Start	5 MPH NE	6 MPH SW
Wind Velocity+Dir. Stop	6 MPH NE	6 MPH SW
Wind Velocity+Dir. Max	6 MPH ENE	6 MPH SW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	68 F	80 F
Soil Moisture	FAIR	FAIR
% Cloud Cover	20	33
Next Moisture Occurred On	05/23/19	
Time to Next Moisture	26 HR	
Moisture 6 Hours after Appl.	0 IN	0 IN
Moisture 1 Week after Appl.	1.68 IN	1.69 IN

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	LYPES BVSO	LYPES BVSO
Height Average		12 IN
Height Minimum, Maximum		10 14

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Height Average		4.5 IN
Height Minimum, Maximum		2 6
Density Average		36 m2
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Height Average		4 IN
Height Minimum, Maximum		2 5
Density Average		16 m2

**Application Equipment**

	A	B
Appl. Equipment	Bckpck4Nozl	Tractr4Nozl
Equipment Type	SPRBAC	TRMOSP
Operation Pressure	31 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	20 in
Boom Length	6 ft	6.7 ft
Boom Height	18 in	30 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMAIR

Context	Date	By	Notes
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	05/23/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

**Trial Comments**

05/30/19: Tomato stage in Untreated check - 3-6 inches tall, 4-6 branches. No injury symptomolgy except stunting. Sand splashed on plants from heavy rainfall. Morningglory species (pitted and ivy) only weed emerged at this timing.

06/22/19: Eastern black nightshade starting to come in, although emergence is variable. Trt 9 WFC was handweeded 4 times.

Processing Tomato Response to UPL Herbicides (Pre-Transplant)  
 Trial ID: Tom1-19 Location: Field 14 Trial Year: 2019  
 Protocol ID: Tom1-19 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: UPL

Pest Code	C LYPES	IPOSS C -	C LYPES	AMAPA C -						
Crop Type, Code	Tomato	Mornlry	Tomato	PalmerAm						
Description	Stunting	Control	Stunting	Control						
Rating Type	%	%	%	%						
Rating Unit	05/30/19	05/30/19	06/06/19	06/06/19						
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1 Untreated							0.0 d	0.0 e	0.0 d	0.0 d
2 Moccasin II Plus Tricor Matrix.....rimsulfuron NIS	7.64 EC 75 DF 25 WG 100 SL	1.27 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	ai/a POST	PRETRA A B B			9.3 b	26.3 d	14.5 b	96.3 a
3 Moccasin MTZ Matrix.....rimsulfuron NIS	540 SC 25 WG 100 SL	1.69 lb ai/a 0.0313 lb ai/a 0.25 % v/v	ai/a POST	PRETRA A B B			7.8 bc	49.5 c	15.0 b	97.5 a
4 Shutdown Tricor Matrix.....rimsulfuron NIS	4.16 SC 75 DF 25 WG 100 SL	0.114 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	ai/a POST	PRETRA A B B			16.5 a	84.3 a	22.5 a	98.8 a
5 Preview Matrix.....rimsulfuron NIS	3.28 SC 25 WG 100 SL	0.36 lb ai/a 0.0313 lb ai/a 0.25 % v/v	ai/a POST	PRETRA A B B			10.0 b	78.5 ab	11.5 bc	87.5 c
6 Satellite Hydrocap Tricor Matrix.....rimsulfuron NIS	3.8 EC 75 DF 25 WG 100 SL	0.71 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	ai/a POST	PRETRA A B B			12.5 ab	60.0 bc	8.0 c	94.5 ab
7 Tripzin Matrix.....rimsulfuron NIS	4 L 25 WG 100 SL	0.875 lb ai/a 0.0313 lb ai/a 0.25 % v/v	ai/a POST	PRETRA A B B			2.5 cd	37.0 cd	2.5 d	88.5 bc
8 Local Standard Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a 0.164 lb ai/a 0.0313 lb ai/a 0.25 % v/v	ai/a POST	PRETRA A B B			2.5 cd	15.0 de	1.8 d	83.5 c
9 Weed Free Check Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a 0.164 lb ai/a 0.0313 lb ai/a 0.25 % v/v	ai/a POST	PRETRA A B B			0.0 d	37.0 cd	2.0 d	100.0 a
LSD P=.05			6.15		23.21		5.20		6.62	
Standard Deviation			4.21		15.90		3.56		4.54	
CV			62.17		36.94		41.21		5.47	
Replicate F			6.220		5.011		4.064		0.880	
Replicate Prob(F)			0.0028		0.0077		0.0181		0.4655	
Treatment F			7.692		12.413		18.909		194.141	
Treatment Prob(F)			0.0001		0.0001		0.0001		0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code		IPOSS C - Mornglry	C LYPES Tomato	AMAPA C - PalmerAm	IPOSS C - Mornglry
Description		Control	Stunting	Control	Control
Rating Type		% 06/06/19	% 06/14/19	% 06/14/19	% 06/14/19
Rating Unit Rating Date					
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
1 Untreated		0.0 d	0.0 d	0.0 e	0.0 e
2 Moccasin II Plus Tricor Matrix.....rimsulfuron NIS	7.64 EC 75 DF 25 WG 100 SL	1.27 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B	30.0 c	8.8 bc 95.0 c 20.8 d
3 Moccasin MTZ Matrix.....rimsulfuron NIS	540 SC 25 WG 100 SL	1.69 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	41.3 c	3.0 cd 95.0 c 32.5 cd
4 Shutdown Tricor Matrix.....rimsulfuron NIS	4.16 SC 75 DF 25 WG 100 SL	0.114 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B	84.8 ab	18.5 a 98.8 ab 80.5 b
5 Preview Matrix.....rimsulfuron NIS	3.28 SC 25 WG 100 SL	0.36 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	74.0 b	10.5 b 97.5 b 75.5 b
6 Satellite Hydrocap Tricor Matrix.....rimsulfuron NIS	3.8 EC 75 DF 25 WG 100 SL	0.71 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B	44.5 c	7.3 bc 93.8 c 48.3 c
7 Tripzin Matrix.....rimsulfuron NIS	4 L 25 WG 100 SL	0.875 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	41.3 c	0.0 d 95.0 c 34.5 cd
8 Local Standard Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a 0.164 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B	12.5 d	0.0 d 85.8 d 22.5 d
9 Weed Free Check Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a 0.164 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B	100.0 a	0.0 d 100.0 a 100.0 a
LSD P=.05 Standard Deviation CV		17.11 11.73 24.65	6.42 4.40 82.42	2.49 1.71 2.02	17.91 12.27 26.65
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		5.918 0.0036 31.705 0.0001	3.481 0.0315 8.659 0.0001	1.964 0.1464 1399.535 0.0001	2.668 0.0705 28.553 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code	C LYPES	C LYPES	AMAPA C -	IPOSS C -						
Description	Tomato	Tomato	PalmerAm	Mornlry						
Rating Type	Stunting	Stunting	Control	Control						
Rating Unit	%	%	%	%						
Rating Date	06/22/19	07/01/19	07/01/19	07/01/19						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1 Untreated							0.0 d	0.0 b	0.0 d	0.0 d
2 Moccasin II Plus Tricor Matrix.....rimsulfuron NIS	7.64 EC 75 DF 25 WG 100 SL	1.27 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B				8.0 abc	1.8 b	94.3 ab	22.5 c
3 Moccasin MTZ Matrix.....rimsulfuron NIS	540 SC 25 WG 100 SL	1.69 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B				3.5 bcd	0.0 b	98.3 a	28.8 bc
4 Shutdown Tricor Matrix.....rimsulfuron NIS	4.16 SC 75 DF 25 WG 100 SL	0.114 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B				13.0 a	8.8 a	96.5 ab	76.8 a
5 Preview Matrix.....rimsulfuron NIS	3.28 SC 25 WG 100 SL	0.36 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B				10.5 ab	1.8 b	91.8 ab	49.5 b
6 Satellite Hydrocap Tricor Matrix.....rimsulfuron NIS	3.8 EC 75 DF 25 WG 100 SL	0.71 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B				6.8 a-d	0.0 b	89.5 ab	29.5 bc
7 Tripzin Matrix.....rimsulfuron NIS	4 L 25 WG 100 SL	0.875 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B				1.8 cd	0.0 b	86.5 b	24.5 c
8 Local Standard Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a 0.164 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B				0.0 d	0.0 b	72.3 c	0.0 d
9 Weed Free Check Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a 0.164 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A PRETRA A POST B POST B				0.0 d	0.0 b	73.8 c	78.8 a
LSD P=.05 Standard Deviation CV							7.73 5.29 109.52	3.57 2.44 179.51	10.32 7.07 9.05	21.50 14.73 42.74
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)							0.702 0.5602 3.459 0.0086	2.734 0.0659 5.529 0.0005	11.702 0.0001 75.464 0.0001	1.901 0.1564 15.318 0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm	IPOSS C - Morngly	SOLPT C - EBlkNtshd	AMAPA C - PalmerAm			
Rating Type	Control	Control	present abs	Control				
Rating Unit	%	%	1 / 0	%				
Rating Date	07/15/19	07/15/19	07/15/19	07/26/19				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit			
					Appl Timing			
					Appl Code			
1	Untreated			0.0 f	0.0 e		0.0 f	
2	Moccasin II Plus Tricor Matrix.....rimsulfuron NIS	7.64 EC 75 DF 25 WG 100 SL	1.27 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	95.0 ab	33.3 bc	0.0 b	95.3 ab
3	Moccasin MTZ Matrix.....rimsulfuron NIS	540 SC 25 WG 100 SL	1.69 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	98.0 a	44.3 bc	0.0 b	96.0 a
4	Shutdown Tricor Matrix.....rimsulfuron NIS	4.16 SC 75 DF 25 WG 100 SL	0.114 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	90.7 abc	50.7 b	0.0 b	92.3 abc
5	Preview Matrix.....rimsulfuron NIS	3.28 SC 25 WG 100 SL	0.36 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	89.3 bc	48.3 b	0.0 b	83.3 cd
6	Satellite Hydrocap Tricor Matrix.....rimsulfuron NIS	3.8 EC 75 DF 25 WG 100 SL	0.71 lb ai/a 0.28 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	80.3 d	26.7 cd	0.7 a	85.0 bcd
7	Tripzin Matrix.....rimsulfuron NIS	4 L 25 WG 100 SL	0.875 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	85.0 cd	13.3 de	1.0 a	81.3 d
8	Local Standard Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a 0.164 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	65.3 e	13.3 de	1.0 a	66.7 e
9	Weed Free Check Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a 0.164 lb ai/a 0.0313 lb ai/a 0.25 % v/v	PRETRA A POST B POST B	96.7 ab	90.0 a	1.0 a	98.3 a
LSD P=.05				8.01	19.74	0.36	10.69	
Standard Deviation				4.63	11.40	0.20	6.18	
CV				5.95	32.08	44.54	7.96	
Replicate F				0.759	8.755	1.000	1.126	
Replicate Prob(F)				0.4843	0.0027	0.3927	0.3488	
Treatment F				133.452	16.632	18.143	74.174	
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Pest Code Crop Type, Code Description Rating Type Rating Unit Rating Date	IPOSS C - Mornglry Control % 07/26/19	AMAPA C - PalmerAm Control % 08/14/19	IPOSS C - Mornglry Control % 08/14/19		
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code		
1 Untreated			0.0 d		
2 Moccasin II Plus Tricor Matrix.....rimsulfuron NIS	7.64 EC 75 DF 25 WG 100 SL	1.27 lb ai/a PRETRA A 0.28 lb ai/a PRETRA A 0.0313 lb ai/a POST B 0.25 % v/v POST B	6.7 d	96.3 a	6.7 cd
3 Moccasin MTZ Matrix.....rimsulfuron NIS	540 SC 25 WG 100 SL	1.69 lb ai/a PRETRA A 0.0313 lb ai/a POST B 0.25 % v/v POST B	27.7 bcd	96.3 a	39.3 b
4 Shutdown Tricor Matrix.....rimsulfuron NIS	4.16 SC 75 DF 25 WG 100 SL	0.114 lb ai/a PRETRA A 0.28 lb ai/a PRETRA A 0.0313 lb ai/a POST B 0.25 % v/v POST B	42.3 b	89.3 b	25.0 bc
5 Preview Matrix.....rimsulfuron NIS	3.28 SC 25 WG 100 SL	0.36 lb ai/a PRETRA A 0.0313 lb ai/a POST B 0.25 % v/v POST B	38.3 bc	84.3 bc	36.7 b
6 Satellite Hydrocap Tricor Matrix.....rimsulfuron NIS	3.8 EC 75 DF 25 WG 100 SL	0.71 lb ai/a PRETRA A 0.28 lb ai/a PRETRA A 0.0313 lb ai/a POST B 0.25 % v/v POST B	10.0 d	84.0 bc	23.3 bcd
7 Tripzin Matrix.....rimsulfuron NIS	4 L 25 WG 100 SL	0.875 lb ai/a PRETRA A 0.0313 lb ai/a POST B 0.25 % v/v POST B	13.3 cd	82.7 c	8.3 cd
8 Local Standard Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a PRETRA A 0.164 lb ai/a PRETRA A 0.0313 lb ai/a POST B 0.25 % v/v POST B	0.0 d	73.3 d	16.7 bcd
9 Weed Free Check Devrinol Tricor Matrix.....rimsulfuron NIS	50 DF 75 DF 25 WG 100 SL	1 lb ai/a PRETRA A 0.164 lb ai/a PRETRA A 0.0313 lb ai/a POST B 0.25 % v/v POST B	94.0 a	78.3 cd	71.7 a
LSD P=.05 Standard Deviation CV		28.05 16.20 62.77	6.18 3.57 4.69	24.30 14.04 55.5	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		1.905 0.1811 10.265 0.0001	2.708 0.0970 205.329 0.0001	5.376 0.0164 7.287 0.0004	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).  
 Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

## Processin Tomato Varietal (3) Response to UPL Hebicdes

Trial ID: Tom2-19

Location:

Trial Year: 2019

Protocol ID: Tom2-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Joe Reed

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

ARM Trial Created On: 05/28/19

Initiation Date: 03/01/19

Completion Date: 08/31/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N

Longitude of LL Corner °: 75.455834 W

Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist

Organization: University of Delaware

Address: 16483 County Seat Hwy

City+State/Prov: Georgetown, Delaware

Postal Code: 19947 E-mail: mjv@udel.edu

Country: USA United States

**Crop Description**

Crop 1: C LYPES Solanum lycopersicum Tomato

Entry Date: 07/25/19

Variety: H3402, H1301, H5108

Planting Date: 05/30/19

Planting Method: TRAMAC transplanted - machine

Planting Equipment: MT Transplanter, mechanical

Soil Moisture: NORMAL normal, adequate

**Site and Design**

Treated Plot Width: 15 FT

Site Type: FIELD field

Treated Plot Length: 25 FT

Treated Plot Area: 375 FT<sup>2</sup> Treatments: 3

Tillage Type: CONTIL conventional-till

Replications: 4

Study Design: RACOBL Randomized Complete Block (RCB)

## Field Prep./Maintenance:

Total Postemergence application Matrix 1 oz/A + NIS 0.25% v/v on 6-27 (reps 1-3 only).

**Soil Description**

Description Name: Field 14B

% Sand: 81

% OM: 1.6

Texture: LS

loamy sand

% Silt: 12

pH: 6.4

Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 7

CEC: 6.5

Fert. Level: E excellent

Soil Drainage: G

good

**Application Description**

A	
Application Date	05/29/19
Appl. Stop Time	09:00 AM
Application Method	Spray
Application Timing	PRETRP
Application Placement	Brdcst
Applied By	Matt
Appl. Entry Date	07/01/19
Air Temperature Start, Stop	78 81 F
% Relative Humidity Start, Stop	70 65
Wind Velocity+Dir. Start	4 MPH SSW
Wind Velocity+Dir. Stop	6 MPH W
Wind Velocity+Dir. Max	5 MPH SSW
Wet Leaves (Y/N)	N no
Soil Temperature	73 F
Soil Moisture	Moist
% Cloud Cover	0
Moisture 6 Hours after Appl.	0 IN
Moisture 1 Week after Appl.	0.46 IN

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	LYPES BVSO

**Application Equipment**

A	
Appl. Equipment	Bckpck4Nozl
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	6 ft
Boom Height	18 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	05/21/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	06/13/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**Trial Comments**

07/26/19: No differences observed with any treatment any variety of tomato with regard to injury.  
Note that trt 1 was handweeded twice.

## Processin Tomato Varietal (3) Response to UPL Hebcides

Trial ID: Tom2-19

Location:

Trial Year: 2019

Protocol ID: Tom2-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Joe Reed

Pest Code		C	LYPES	C	LYPES	C	LYPES	C	LYPES
Pest Name			Tomato Stunting		Tomato Stunting		Tomato Stunting		Tomato Stunting
Crop Type, Code									
Crop Name									
Rating Type									
Rating Unit		%		%		%		%	
Rating Date		06/04/19		06/04/19		06/04/19		06/14/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Weed Free								
	Devrinol	50 DF	1.12 kg ai/ha	PRETRA A					
	Tricor	75 DF	0.184 kg ai/ha	PRETRA A					
2	Preview	3.28 SC	0.288 kg ai/ha	PRETRA A					
3	Preview	3.28 SC	0.403 kg ai/ha	PRETRA A					
LSD P=.05					0.0 a	0.0 b	0.0 b	0.0 b	0.0 c
Standard Deviation					0.00	4.86	3.30	7.61	7.01
CV					0.0	2.81	1.91	4.40	4.05
Replicate F					0.000	37.45	42.39	63.62	48.14
Replicate Prob(F)					1.0000	1.845	3.450	1.818	1.670
Treatment F					0.000	0.2396	0.0919	0.2442	0.2712
Treatment Prob(F)					0.0000	22.183	19.168	8.139	18.157
					1.0000	0.0017	0.0025	0.0195	0.0029

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code Pest Name		C LYPES				
Crop Type, Code		Tomato Stunting				
Crop Name Rating Type		%	%	%	%	%
Rating Unit Rating Date		06/14/19	06/22/19	06/22/19	06/22/19	06/27/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Weed Free					
	Devrinol	50 DF	1.12 kg ai/ha	PRETRA A		
	Tricor	75 DF	0.184 kg ai/ha	PRETRA A		
2	Preview	3.28 SC	0.288 kg ai/ha	PRETRA A	6.0 ab	12.5 a
3	Preview	3.28 SC	0.403 kg ai/ha	PRETRA A	13.5 a	15.8 a
LSD P=.05					7.82	5.45
Standard Deviation					4.52	3.15
CV					69.56	33.44
Replicate F					0.332	0.748
Replicate Prob(F)					0.8034	0.5620
Treatment F					8.951	27.891
Treatment Prob(F)					0.0158	0.0009
					0.912	3.394
					0.4893	0.0946
					7.716	17.412
					77.17	46.31
					6.54	6.29
					3.78	3.64
					46.31	39.67
					2.311	
					0.1760	
					19.992	
					0.0032	
					0.0022	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code				AMAPA	IPOSS
Pest Name				Palmer amaranth	Morning glory
Crop Type, Code	C LYPES	C LYPES		C -	C -
Crop Name	Tomato	Tomato			
Rating Type	Stunting	Stunting		Control	Control
Rating Unit	%	%		%	%
Rating Date	06/27/19	06/27/19		06/27/19	06/27/19
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing
1	Weed Free				
	Devrinol	50 DF	1.12 kg ai/ha	PRETRA A	
	Tricor	75 DF	0.184 kg ai/ha	PRETRA A	
2	Preview	3.28 SC	0.288 kg ai/ha	PRETRA A	8.8 ab
3	Preview	3.28 SC	0.403 kg ai/ha	PRETRA A	22.5 a
LSD P=.05			15.60	12.13	11.33
Standard Deviation			9.01	7.01	6.55
CV			86.53	86.72	8.59
Replicate F			0.436	1.051	0.250
Replicate Prob(F)			0.7354	0.4362	0.8584
Treatment F			6.333	4.916	7.276
Treatment Prob(F)			0.0332	0.0544	0.0249
					0.484
					0.7054
					1.834
					0.2390

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code		AMAPA	IPOSS	SOLPT							
Pest Name		Palmer amaranth	Morning glory	Eastern black >							
Crop Type, Code		C -	C -	C -	C LYPES						
Crop Name											
Rating Type		Control	Control	Control	Tomato Stunting						
Rating Unit		%	%	%	%						
Rating Date		07/02/19	07/02/19	07/02/19	07/11/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Weed Free										
	Devrinol	50 DF	1.12 kg ai/ha	PRETRA A							
	Tricor	75 DF	0.184 kg ai/ha	PRETRA A							
2	Preview	3.28 SC	0.288 kg ai/ha	PRETRA A							
3	Preview	3.28 SC	0.403 kg ai/ha	PRETRA A							
LSD P=.05					10.65		16.51		9.98		11.41
Standard Deviation					6.16		9.54		5.77		6.59
CV					7.36		13.22		9.7		125.59
Replicate F					6.023		2.165		2.429		0.758
Replicate Prob(F)					0.0305		0.1933		0.1635		0.5569
Treatment F					3.704		1.366		322.003		1.915
Treatment Prob(F)					0.0896		0.3244		0.0001		0.2274

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code		C LYPES	C LYPES	AMAPA Palmer amaranth C -	IPOSS Morning glory C -			
Crop Name		Tomato Stunting	Tomato Stunting	Control	Control			
Rating Unit	%		%	%	%			
Rating Date	07/11/19		07/11/19	07/26/19	07/26/19			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Weed Free			0.0 b				
	Devrinol	50 DF	1.12 kg ai/ha	PRETRA A				
	Tricor	75 DF	0.184 kg ai/ha	PRETRA A				
2	Preview	3.28 SC	0.288 kg ai/ha	PRETRA A	2.5 ab	3.0 a	71.0 a	66.5 b
3	Preview	3.28 SC	0.403 kg ai/ha	PRETRA A	8.8 a	7.3 a	79.8 a	75.8 ab
LSD P=.05				6.61	8.63	15.65	9.87	
Standard Deviation				3.82	4.99	9.05	5.70	
CV				101.84	145.93	11.67	7.61	
Replicate F				2.429	0.960	1.809	8.009	
Replicate Prob(F)				0.1635	0.4701	0.2457	0.0161	
Treatment F				5.571	2.135	1.597	7.934	
Treatment Prob(F)				0.0429	0.1994	0.2779	0.0207	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code Pest Name Crop Type, Code	SOLPT Eastern black > C - C	LYPES #/plot Tomato Yield 8plts	LYPES MatureFruit Tomato red/orange	LYPES % 08/13/19 Tomato Yield 8plts	LYPES Wght lbs 08/13/19
Crop Name Rating Type	#/250FT2 07/26/19	Wght lbs 08/13/19	Wght lbs 08/13/19	% 08/13/19	Wght lbs 08/13/19
Rating Unit Rating Date					
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code					
1 Weed Free	9.7 a	5.173 a	29.7 a	27 a	7.053 a
Devrinol 50 DF 1.12 kg ai/ha PRETRA A					
Tricor 75 DF 0.184 kg ai/ha PRETRA A					
2 Preview 3.28 SC 0.288 kg ai/ha PRETRA A	5.7 a	2.920 b	19.1 a	26 a	5.633 a
3 Preview 3.28 SC 0.403 kg ai/ha PRETRA A	3.7 a	3.253 b	22.1 a	24 a	5.253 a
LSD P=.05	19.96	1.5307	8.90	21.3	3.2126
Standard Deviation	8.80	0.6752	3.93	9.4	1.4172
CV	139.0	17.85	16.61	36.58	23.7
Replicate F	0.271	0.537	0.911	1.065	0.877
Replicate Prob(F)	0.7756	0.6214	0.4721	0.4257	0.4832
Treatment F	0.361	9.733	5.868	0.057	1.345
Treatment Prob(F)	0.7174	0.0291	0.0646	0.9455	0.3576

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	C LYPES	C LYPES	C LYPES	C LYPES	C LYPES
Crop Name		Tomato	Tomato	Tomato	Tomato	Tomato	Tomato
Rating Type		Yield 8plts	Yield 8plts	Yield 8plts	MatureFruit	red/orange	
Rating Unit		Wght lbs	Wght lbs	Wght lbs	Wght lbs	%	
Rating Date		08/13/19	08/13/19	08/13/19	08/13/19	08/13/19	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	Weed Free						
	Devrinol	50 DF	1.12 kg ai/ha	PRETRA A			
	Tricor	75 DF	0.184 kg ai/ha	PRETRA A			
2	Preview	3.28 SC	0.288 kg ai/ha	PRETRA A	5.467 a	4.007 a	12.920 b
3	Preview	3.28 SC	0.403 kg ai/ha	PRETRA A	7.087 a	4.360 a	17.887 ab
LSD P=.05				9.4094	2.2824	5.8310	9.55
Standard Deviation				4.1507	1.0068	2.5722	4.21
CV				49.53	19.99	14.56	13.56
Replicate F				2.561	9.104	3.282	3.463
Replicate Prob(F)				0.1923	0.0324	0.1434	0.1340
Treatment F				2.425	6.541	9.765	15.838
Treatment Prob(F)				0.2042	0.0548	0.0289	0.0126
							0.3506
							0.394
							0.6982

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code		C LYPES	C LYPES	C LYPES						
Pest Name		Tomato	Tomato	Tomato						
Crop Type, Code		Yield 8plts	MatureFruit	red/orange						
Crop Name										
Rating Type										
Rating Unit		Wght lbs	Wght lbs	%						
Rating Date		08/13/19	08/13/19	08/13/19						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
1	Weed Free							5.393 a	40.4 a	56 a
	Devrinol	50 DF	1.12 kg ai/ha	PRETRA A						
	Tricor	75 DF	0.184 kg ai/ha	PRETRA A						
2	Preview	3.28 SC	0.288 kg ai/ha	PRETRA A				2.947 a	26.5 b	62 a
3	Preview	3.28 SC	0.403 kg ai/ha	PRETRA A				3.867 a	28.1 b	53 a
LSD P=.05					2.4214		9.78		10.5	
Standard Deviation					1.0681		4.31		4.6	
CV					26.25		13.61		8.13	
Replicate F					0.606		0.314		8.035	
Replicate Prob(F)					0.5892		0.7473		0.0397	
Treatment F					4.016		9.376		2.465	
Treatment Prob(F)					0.1105		0.0309		0.2006	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Weed Management Avenger AG Optima and MBI-014  
Trial ID: Veg3a-19 Location: REC Fld #14 Trial Year: 2019  
Protocol ID: Veg3a-19 Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established  
ARM Trial Created On: 08/14/19  
Initiation Date: 03/01/19  
Completion Date: 09/21/19

**Trial Location**

Country: USA United States

Latitude of LL Corner °: 38.640637 N  
Longitude of LL Corner °: 75.455834 W  
Time Zone: America/New\_York

Conducted Under GLP: No

Conducted Under GEP: No

Investigator: Mark VanGessel Title: Extension Weed Specialist  
Organization: University of Delaware  
Address: 16483 County Seat Hwy  
City+State/Prov: Georgetown, Delaware  
Postal Code: 19947 E-mail: mjv@udel.edu  
Country: USA United States

**Crop Description**

C

**Pest Description**

Pest 1 Type: W Code: IPOHE Ipomoea hederacea  
Common Name: Ivyleaf morningglory Entry Date: 12/09/19

Pest 2 Type: W Code: MOLVE Mollugo verticillata  
Common Name: Carpetweed Entry Date: 12/09/19

Pest 3 Type: W Code: AMAPA Amaranthus palmeri  
Common Name: Palmer amaranth Entry Date: 12/09/19

**Site and Design**

Treated Plot Width: 10 FT Site Type: FIELD field  
Treated Plot Length: 17 FT  
Treated Plot Area: 170 FT<sup>2</sup> Treatments: 10 Tillage Type: CONTIL conventional-till  
Replications: 4 Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 14C  
% Sand: 79 % OM: 1.6 Texture: LS loamy sand  
% Silt: 14 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes  
% Clay: 7 CEC: 6.5 Fert. Level: G good  
Soil Drainage: G good

**Application Description**

	A	B
Application Date	08/16/19	08/23/19
Appl. Stop Time	11:45 AM	02:05 PM
Application Method	SPRAY	SPRAY
Application Timing	2 WAP	3 WAP
Application Placement	BROADC	BROADC
Applied By	Q.Johnson	Q.Johnson
Appl. Entry Date	12/09/19	12/09/19
Air Temperature Start, Stop	79 81 F	77 77 F
% Relative Humidity Start, Stop	85 82	71 71
Wind Velocity+Dir. Start	6 mph E	8 mph NNE
Wind Velocity+Dir. Stop	4 mph	8 mph NNE
Wind Velocity+Dir. Max	6 mph E	8 mph NNE
Wet Leaves (Y/N)	N no	N no
Soil Temperature	80 F	82 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	69	100
Moisture 6 Hours after Appl.	0.04 IN	0.61 IN
Moisture 1 Week after Appl.	1.04 IN	0.61 IN

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	IPOHE W	IPOHE W
Stage Majority, Percent	3-4 If 100	veg 55
Stage Minimum, Percent		veg 55
Stage Maximum, Percent		run 45
Height Average	3 in	6 in
Height Minimum, Maximum	2 4	2 10
Density Average	20 m2	15 m2
Density Min, Max	15 25	10 20
Pest 2 Code, Type, Scale	MOLVE W	MOLVE W
Stage Majority, Percent	4-6-If 70	veg 100
Stage Minimum, Percent	3 leaf 15	
Stage Maximum, Percent	7 leaf 15	
Diameter	0.7 in	1.5 in
Height Minimum, Maximum	0.5 1	0.7 2
Density Average	80 m2	50 m2
Density Min, Max	60 100	0 100
Pest 3 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent	veg 100	veg 100
Height Average	2 in	4 in
Height Minimum, Maximum	1 3	3 5
Density Average	3 m2	1 m2
Density Min, Max	0 5	0 2

**Application Equipment**

	A	B
Appl. Equipment	Bckpck4Nozl	Bckpck4Nozl
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	18 in
Boom Length	6 ft	6 ft
Boom Height	20 in	22 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2

Context	Date	By	Notes
STATUS	08/14/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
STATUS	09/11/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

No.	Date	By	Deviations
1.08/16/19	Q. Johnson		Substituted Activator 90 for Brandt Ultra 90 in treatments 1-4
Reasons: Brandt Ultra 90 not available			

**Trial Comments**

08/27/19: observation of plots for Palmer amaranth control: only treatment 6 was very good; and treatment 8 was good; treatment 3 was fair. All other treatments were not acceptable  
Treatment 8 was a little better than other plots for morningglory control

Weed Management Avenger AG Optima and MBI-014

Trial ID: Veg3a-19

Location: REC Fld #14

Trial Year: 2019

Protocol ID: Veg3a-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code Description		AMAPA PalmerAm	IPOSS morngly	MOLVE Carpetwd	AMAPA PalmerAm
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		08/20/19	08/20/19	08/20/19	08/26/19
Trt Treatment No. Name	Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
1 MBI-014 Activator 90	100 WG 100 L	3 lb/a 0.78 % v/v	2 WAP A 2 WAP A	85.6 b	35.0 b
2 MBI-014 Activator 90	100 WG 100 L	5 lb/a 0.78 % v/v	2 WAP A 2 WAP A	75.7 b	31.3 b
3 MBI-014 Activator 90 MBI-014 Activator 90	100 WG 100 L 100 WG 100 L	3 lb/a 0.78 % v/v	2 WAP A 2 WAP A 3 WAP B 3 WAP B	77.0 b	31.3 b
4 MBI-014 Activator 90	100 WG 100 L	5 lb/a 0.78 % v/v	2 WAP A 2 WAP A	84.0 b	41.8 b
5 Avenger AG Optima...d-limonene	70 L	6.25 % v/v	2 WAP A	45.0 c	42.8 b
6 Avenger AG Optima...d-limonene	70 L	14.285 % v/v	2 WAP A	100.0 a	78.8 a
7 Avenger AG Optima...d-limonene Avenger AG Optima...d-limonene	70 L 70 L	6.25 % v/v 6.25 % v/v	2 WAP A 3 WAP B	50.8 c 41.3 b	80.5 bc 65.0 d
8 Avenger AG Optima...d-limonene Avenger AG Optima...d-limonene	70 L 70 L	14.285 % v/v 14.285 % v/v	2 WAP A 3 WAP B	100.0 a 78.0 a	100.0 a 98.0 a
9 Avenger AG Optima...d-limonene	70 L	6.25 % v/v	2 WAP A	50.0 c	44.0 b
10 Untreated Check				0.0 d	0.0 c
LSD P=.05				12.84	20.60
Standard Deviation				8.78	14.20
CV				13.14	33.48
Replicate F				0.724	0.403
Replicate Prob(F)				0.5480	0.7518
Treatment F				49.115	10.354
Treatment Prob(F)				0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Yates=1,4,7,10

Pest Code	Description	Rating Type	Rating Unit	Rating Date	IPOSS morngly Control %	MOLVE Carpetwd Control %	AMAPA PalmerAm Control %	IPOSS morngly Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1 MBI-014 Activator 90		100 WG 100 L		3 lb/a 0.78 % v/v	2 WAP A 2 WAP A	45.0 b	56.5 f	80.1 b
2 MBI-014 Activator 90		100 WG 100 L		5 lb/a 0.78 % v/v	2 WAP A 2 WAP A	18.8 d	61.3 f	68.8 b
3 MBI-014 Activator 90		100 WG 100 L		3 lb/a 0.78 % v/v	2 WAP A 2 WAP A	35.0 bcd	79.5 d	79.9 b
MBI-014 Activator 90		100 WG 100 L		3 lb/a 0.78 % v/v	3 WAP B 3 WAP B			20.0 c
4 MBI-014 Activator 90		100 WG 100 L		5 lb/a 0.78 % v/v	2 WAP A 2 WAP A	36.3 bcd	65.5 ef	77.2 b
5 Avenger AG Optima...d-limonene		70 L		6.25 % v/v	2 WAP A	25.8 cd	72.5 de	35.6 c
6 Avenger AG Optima...d-limonene		70 L		14.285 % v/v	2 WAP A	73.0 a	97.0 ab	96.8 a
7 Avenger AG Optima...d-limonene		70 L		6.25 % v/v	2 WAP A	38.8 bc	89.5 bc	38.3 c
Avenger AG Optima...d-limonene		70 L		6.25 % v/v	3 WAP B			0.0 d
8 Avenger AG Optima...d-limonene		70 L		14.285 % v/v	2 WAP A	81.3 a	100.0 a	98.3 a
Avenger AG Optima...d-limonene		70 L		14.285 % v/v	3 WAP B			63.0 a
9 Avenger AG Optima...d-limonene		70 L		6.25 % v/v	2 WAP A	48.8 b	81.5 cd	36.3 c
10 Untreated Check					0.0 e	0.0 g	0.0 d	0.0 d
LSD P=.05					18.11	9.21	13.22	12.13
Standard Deviation					12.48	6.35	8.99	8.36
CV					31.02	9.02	14.7	61.37
Replicate F					0.514	0.362	1.046	0.104
Replicate Prob(F)					0.6761	0.7812	0.3929	0.9569
Treatment F					14.790	81.864	50.656	29.633
Treatment Prob(F)					0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,7,10

Pest Code	Description	Rating Type	Rating Unit	Rating Date	MOLVE Carpetwd Control %	AMAPA PalmerAm Control %	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	MBI-014 Activator 90	100 WG 100 L	WG	3 lb/a 0.78 % v/v	2 WAP A 2 WAP A	18.3 d	79.1 b
2	MBI-014 Activator 90	100 WG 100 L	WG	5 lb/a 0.78 % v/v	2 WAP A 2 WAP A	23.8 d	77.5 b
3	MBI-014 Activator 90 MBI-014 Activator 90	100 WG 100 L 100 WG 100 L	WG	3 lb/a 0.78 % v/v 3 lb/a 0.78 % v/v	2 WAP A 2 WAP A 3 WAP B 3 WAP B	52.5 c	76.7 b
4	MBI-014 Activator 90	100 WG 100 L	WG	5 lb/a 0.78 % v/v	2 WAP A 2 WAP A	30.8 d	73.0 b
5	Avenger AG Optima...d-limonene	70 L	L	6.25 % v/v	2 WAP A	50.0 c	25.1 d
6	Avenger AG Optima...d-limonene	70 L	L	14.285 % v/v	2 WAP A	89.0 a	95.3 a
7	Avenger AG Optima...d-limonene Avenger AG Optima...d-limonene	70 L 70 L	L	6.25 % v/v 6.25 % v/v	2 WAP A 3 WAP B	75.0 b	50.1 c
8	Avenger AG Optima...d-limonene Avenger AG Optima...d-limonene	70 L 70 L	L	14.285 % v/v 14.285 % v/v	2 WAP A 3 WAP B	97.3 a	98.5 a
9	Avenger AG Optima...d-limonene	70 L	L	6.25 % v/v	2 WAP A	63.3 bc	52.5 c
10	Untreated Check					0.0 e	0.0 e
LSD P=.05					13.99	14.16	
Standard Deviation					9.64	9.68	
CV					19.29	15.42	
Replicate F					2.353	0.221	
Replicate Prob(F)					0.0944	0.8812	
Treatment F					43.632	41.474	
Treatment Prob(F)					0.0001	0.0001	

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Missing data estimates are included in columns:Yates=1,4,7,10

