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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 2018 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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Amvac Chemical Corp.	New Jersey Soybean Board
BASF Corp.	NuFarm
Bayer CropScience	Penn State – Dr. William Curran
Corteva	Penn State – Dwight Lingenfelter
Crop Production Services	Pennsylvania Vegetable Growers Assn.
Delaware Department of Agriculture	PictSweet
Delaware Soybean Board	Rutgers University
FMC Corp.	Seabrook Brothers & Sons
Freo	Southern States Seed
Furmano	Syngenta
Gowan	Syngenta Seeds
Hanover Foods, Inc.	United Phosphorus Inc.
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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, 5, 6, 7, 8a, 9a, 10a, 13, SCRN1, 2, 3, Milo1, 3, 4, DSB1, Soy1, 2, 3, 5a, 6a, 7, 10, 11, 12, 13, 14, 15, 16, 17, 18a, 19, 20, Bean5, Pmkn4, 5, SwPot2, 3, Tom2
Anoda, Spurred	ANVCR	<i>Anoda cristata</i> (L.) Schlecht	Soy3, 4
Carpetweed	MOLVE	<i>Mollugo verticillata</i> L.	Corn3, 5, 7, 9a, Soy6a, 11, 12, 13, 14, 16, 17, 20, Bean4, 5, Pmkn4, 5, SwPot2, Tom2
Chickweed, Jagged	HLOUM	<i>Holosteum umbellatum</i> L.	SG1, 2, 5, 8, 9, 10,
Crabgrass, Large	DIGSA	<i>Digitaria sanguinalis</i> (L.) Scop.	Corn1, 2, 3, 5, 6, 7, 8a, 9a, 10a, 13, SCRN1, 2, 3, Milo3, Soy1, 2, 3, 4, 5a, 6a, 7, 10, 11, 13, 14, 17, 19, 20, Bean4, 5, Pmkn4, 5, SwPot3
E.primrose, Cutleaf	OEOLA	<i>Oenothera laciniata</i> Hill	Corn2, 13
Foxtail, Giant	SETFA	<i>Setaria faberi</i> Herm.	Corn2, 3, 5, 7, SCRN3, Soy3, 4, 7
Grass, Annual	GGGAN		Corn2, Soy3, 7, 12, 15, 16, Bean4, SwPot2, Tom2
Henbit	LAMAM	<i>Lamium amplexicaule</i> L.	SG1, 2, 5, 9, 10
Horsenettle	SOLCA	<i>Solanum carolinense</i> L.	SCRN3
Horseweed	ERICA	<i>Erigeron canadensis</i> L.	Corn13
Lambsquarters, Cmn.	CHEAL	<i>Chenopodium album</i> L.	Corn1, 5, 6, 7, 8a, 10a, Bean4, 5, Pmkn4, 5, SwPot2

<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, 5, 6, 7, 8a, 9a, 10a, 13, SCRN1, 3, Milo3, Soy1, 2, 3, 4, 5a, 6a, 7, 10, 11, 13, 14, 15, 16, 17, 18a, 19, 20
Nutsedge, Yellow	CYPES	Cyperus esculentus L.	Corn3, 7, 9a, SCRN3, Pmkn4
Panicum, Fall	PANDI	Panicum dichotomiflorum (L.) Michx.	Corn1, SCRN1, 2, Soy10
Ragweed, Common	AMBEL	Ambrosia elatior L.	Corn2, 3, 5, 6, 7, 8a, 9a, 10a, 13, Soy6a, 9, 11, 12, 13, 15, 16, Pmkn5
Ryegrass, Annual	LOLMU	Lolium multiflorum Lam.	SG3
Sida, Prickly	SIDSP	Sida spinosa L.	Soy4, 10

## CHEMICAL INDEX

<u>Trade Name</u>	<u>Common Name</u>	<u>First Page of Trial</u>
A16003	"experimental"	Melon1, SwPot2
Abundit Extra	glyphosate	Corn2, Soy7
Acuron Premix	atrazine + bicyclopyrone + mesotrione + s-metolachlor	Corn1, Corn3, Corn8
Acuron Flexi Premix	bicyclopyrone + mesotrione + s-metolachlor	Corn8, SCRN1
Aim	carfentrazone	SwPot3
Anthem Flex Premix	pyroxasulfone + carfentrazone	Corn3, SG1
Anthem Maxx Premix	pyroxasulfone + fluthiacet	Corn3, Soy10, Soy12, Soy13, Soy18
Armezon / Impact	topramezone	Corn7, SCRN1
Atrazine	atrazine	Corn1, Corn2, Corn3, Corn5, Corn6, Corn7, Corn8, Corn9, Corn10, Corn13, SCRN1, SCRN2, SCRN3
Authority Elite / BroadAxe Premix	sulfentrazone + s-metolachlor	DSB1, Soy5, Soy12, Soy14, Tom2
Authority First Premix	sulfentrazone + cloransulam	Soy5
Authority Maxx	sulfentrazone + chlorimuron	Soy10
Authority MTZ Premix	sulfentrazone + metribuzin	Soy5, Soy9, Soy12, Soy13, Soy15, Tom2
Authority Supreme Premix	sulfentrazone + pyroxasulfone	Soy11, Soy14, Soy15
Authority XL Premix	sulfentrazone + chlorimuron	Soy5, Soy12
Avenger AG		SwPot3
Axial XL	pinoxaden	SG3
Axiom Premix	flufenacet + metribuzin	SG1, SG8, SG21
Balance Bean	isoxaflutole	Soy31
Balance Flexx	isoxaflutole	Corn1, Corn2, Corn6
Basagran	bentazon	SCRN1

<u>Trade Name</u>	<u>Common Name</u>	<u>First Page of Trial</u>
Basis Blend Premix	rimsulfuron + thifensulfuron	Corn2
Bicep II Magnum Premix	s-metolachlor + atrazine	Corn2, Corn3, Corn8, Corn9, Corn10, Corn13
Boundary Premix	s-metolachlor + metribuzin	Soy6, Soy14
Cadet	fluthiacet	SCRN1
Callisto	mesotrione	Corn2, Corn3, Corn10, Corn13, SCRN2, SCRN3
Canopy Premix	chlorimuron + metribuzin	Soy5, Soy6
Capreno Premix	tembotriione + thiencarbazone + Isoxadifen	Corn2, Corn5, Corn6
Cheetah	glufosinate	Soy4
Cinch ATZ Premix	s-metolachlor + atrazine	Corn2
Clarity	dicamba	SG10, SG12
Classic	chlorimuron	Soy5, Soy7, Soy11, Soy12
Cobra	lactofen	DSB1, Soy8
Command	clomazone	Soy23
Corvus Premix	thiencarbazone + isoxaflutole	Corn2, Corn6, Corn8
Credit Xtreme	glyphosate	Soy4
Devrinol 2-XT	napropamide	Tom2
DiFlexx	dicamba	Corn1
DiFlexx Duo Premix	dicamba + tembotriione	Corn2, Corn5
Dual II Magnum	s-metolachlor	SCRN1, SCRN2, SCRN3
Dual Magnum	s-metolachlor	DSB6, Soy5, Soy6, Soy12, Soy16, Soy17, Soy18, Soy31
Durango DMA	glyphosate	Corn1, Soy20
Elevore	halauxifen	Soy7
Engenia	dicamba	DSB1, Soy1, Soy12, Soy16, Soy17
Engenia Pro Premix	dicamba + pyroxasulfone	Soy16, Soy17

<u>Trade Name</u>	<u>Common Name</u>	<u>First Page of Trial</u>
Enlist Duo Premix	2,4-D choline + glyphosate	DSB1, Soy20
Envive Premix	chlorimuron + flumioxazin + thifensulfuron	Soy7, Soy11, Soy12
EverPreX	s-metolachlor	Soy7
Fierce Premix	flumioxazin + pyroxasulfone	Soy5, Soy9, Soy11, Soy12, Soy14, Soy15, Soy19
Fierce EZ Premix	flumioxazin + pyroxasulfone	Soy14, Soy15
Fierce MTZ Premix	flumioxazin + metribuzin + pyroxasulfone	Soy14, Soy15
Fierce XLT Premix	flumioxazin + pyroxasulfone + chlorimuron	Soy5
FirstRate	cloransulam	Soy5, Soy6, Soy7
Flexstar GT Premix	fomesafen + glyphosate	DSB1, Soy8
Flumioxazin	flumioxazin	DSB6, Soy5, Soy6, Soy9, Soy15, Soy16, Soy17, Soy19, Soy23
Glory	metribuzin	SG2, SG5
Glyphosate	glyphosate	Corn1, Corn2, Corn3, Corn5, Corn6, Corn13, DSB1, DSB6, Soy1, Soy2, Soy4, Soy7, Soy8, SCRN3, SG1, SG21
Gramoxone SL	paraquat	Corn13, Soy7
Glufosinate	glufosinate	Corn2, Corn5, Corn7, DSB1, Soy4, Soy10, Soy13, Soy14, SCRN1, SCRN3, Veg3a
Halex GT Premix	s-metolachlor + glyphosate + mesotrione	Corn1, Corn3, Corn5, Corn7, Corn10, Corn13
Harmony Extra SG Premix	thifensulfuron + tribenuron	SG2, SG5, SG8, SG9, SG10
Harness Xtra 5.6L Premix	acetochlor + atrazine	Corn1, Corn2, Corn7
Harness	acetochlor	Corn1, Corn7, SCRN2
Huskie Premix	pyrasulfotole + bromoxynil	SG2, SG5, SG8
Impact / Amazon	topramezone	Corn7, SCRN1
ImpactZ Premix	topramezone + atrazine	Corn7, SCRN3

<u>Trade Name</u>	<u>Common Name</u>	<u>First Page of Trial</u>
Instigate Premix	rimsulfuron + mesotrione	Corn2, Corn8
Intact Drift Retardant		Soy9, Soy10, Soy15
Keystone NXT Premix	acetochlor + atrazine	Corn2
KFD-308-01	experimental	Soy3
Lexar EZ Premix	s-metolachlor + mesotrione + atrazine	Corn6, Corn8, Corn9, Corn13
Liberty 280	glufosinate	Corn2, Corn5, Corn7, DSB1, Soy10, Soy13, Soy14, Soy18, Soy20, Soy31, SCRN1, SCRN3
Linex	linuron	Soy6, Soy23
Lumax EZ Premix	s-metolachlor + mesotrione + atrazine	Corn8, Corn9, Corn10, Corn13
Maverick	sulfosulfuron	SG21
MCPA ester 4	MCPA	SG3
Metribuzin/ Glory / TriCor / Dimetric EXT	metribuzin	SG1, SG2, SG5, SG8, SG9, SG21, Soy3, Soy5, Soy6, Soy7, Soy8, Soy9, Soy10, Soy11, Soy12, Soy15, Soy16, Soy17, Soy23, Soy31, Tom2
Moccasin MTZ Premiz	s-metolachlor + metribuzin	Soy3
On Target	adjuvant	Soy1, Soy2
Osprey	mesosulfuron	SG2, SG8, SG21
Osprey Xtra Premix	mesosulfuron + thiencarbazone	SG3, SG5, SG8, SG21
Outlook	dimethenamid-p	Soy12, Soy16, Soy31
Panther MTZ Premix	metribuzin + flumioxazin	Soy4
Panther Pro Premix	metribuzin + flumioxazin + imazethapyr	Soy4
PowerFlex HL	pyroxasulam	SG2, SG9, SG21
Prefix Premix	s-metolachlor + fomesafen	Soy5, Soy6, Soy18, Soy20
Prequel Premix	rimsulfuron + isoxaflutole	Corn8
Prowl H <sub>2</sub> O	pendimethalin	Corn8, Corn9, Corn10, corn13, Soy18, SRN1

<u>Trade Name</u>	<u>Common Name</u>	<u>First Page of Trial</u>
Quelex Premix	florasulam + halauxifen	SG2, SG5, SG9, SG10
Raptor	imazamox	Soy8
Realm Q Premix	rimsulfuron + mesotrione	Corn2, Corn10
Reflex	fomesafen	DBS1, Soy7, Soy8, Soy9, Soy16, Soy17, Soy18, Melon1
Rely 280	glufosinate	Veg3a
Resicore Premix	acetochlor + mesotrione + clopyralid	Corn1, Corn2, Corn8
Resolve SG	rimsulfuron	Corn9, Corn10
Resolve Q Multi-Pak	rimsulfuron + thifensulfuron	Corn2
		Corn1, Corn3, Corn5, Corn6, Corn13, DSB1, DSB6, Soy1, Soy2, Soy8, Soy9, Soy10, Soy12, Soy15, Soy16, Soy17, Soy31, SCRN3
Roundup PowerMax	glyphosate	
Roundup WeatherMax	glyphosate	SG1
Sandeal	halosulfuron	Meln1
Select Max	clethodim	Soy14
Sharpen	saflufenacil	Soy3, SCRN1, SG1
Shutdown	sulfentrazone	Soy3
Simazine	simazine	Corn9, Corn13
Sinbar	terbacil	Meln1
Spartan	sulfentrazone	Soy9, Soy23
Spartan Charge Premix	carfentrazone + sulfentrazone	Soy11, Tom2
Spitfire Premix	dicamba + 2,4-D ester	Soy4
Starane Ultra	fluroxypyr	SCRN1, SG2, SG10, SG12
Status Premix	diflufenzopyr + dicamba + safener	Corn1, Corn10
Storm Premix	bentazon + acifluorfen	Soy8
Sulfentrazone	sulfentrazone	Soy3, Soy9, So11, Soy23, Tom2
SureStart Premix	acetochlor + clopyralid + flumetsulam	Soy5, Soy6, Soy7, Soy20

<u>Trade Name</u>	<u>Common Name</u>	<u>First Page of Trial</u>
SureStart II Premix	acetochlor + clopyralid + flumetsulam	Corn8
Talinor Premix	bicyclopyrone + bromoxynil	SG2, SG5
Tricor	metribuzin	Soy3, Soy5, Soy6, Soy10, Soy23
TripleFlex II Premix	acetochlor + clopyralid + flumetsulam	Corn1
Tripzin ZC Premix	pendimethalin + metribuzin	Soy3
Trivence Premix	chlorimuron + metribuzin + flumioxazin	Soy5, Soy7
Ultra Blazer	acifluorfen	Soy8
Valor EZ	flumioxazin	Soy5, Soy6, Soy9, Soy15, Soy16, Soy17, Soy19, Soy23
Valor SX	flumioxazin	DSB6, SG1
Valor XLT Premix	flumioxazin + chlorimuron	Soy5, Soy6
Verdict Premix	saflufenacil + dimethenamid-p	Corn9
Warrant	acetochlor	Soy9, Soy10, Soy12, Soy15, Soy16, Soy17, Soy18
Warrant Ultra Premix	acetochlor + fomesafen	Soy9
Xtendimax	dicamba	Soy2, Soy9, Soy10, Soy12, Soy15, Soy16, Soy17, Soy17
Zidua	pyroxasulfone	SG1, SG21
Zidua PRO Premix	saflufenacil + imazethapyr + pyroxasulfone	Soy11, Soy12, Soy14, Soy15
Zidua SC	pyroxasulfone	Soy17, SG3
2,4-D amine	2,4-D amine	SG12
2,4-D ester	2,4-D ester	Corn2, Soy7, SG9, SG10

Daily Weather Data 09/01/17 to 11/30/18  
 University of Delaware Research and Education Center  
 Georgetown, Delaware

Data Source is ITERIS																
	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	Unit	Cover	Soil Temp	Temp Unit	Scaled Soil Moisture	Scaled Soil Moisture
9/1/2017	0	IN	rain	60	72	F	63	0	12	7	mph	75	70	F	0.78	0.99
9/2/2017	0.84	IN	rain	60	70	F	84	3	14	7	mph	99	67	F	0.87	1
9/3/2017	0	IN	rain	65	76	F	81	1	10	5	mph	61	70	F	0.92	1
9/4/2017	0	IN	rain	60	82	F	71	0	16	6	mph	4	70	F	0.85	1
9/5/2017	0.35	IN	rain	70	87	F	69	0	15	9	mph	16	74	F	0.83	1
9/6/2017	0.69	IN	rain	63	79	F	86	0	12	6	mph	79	74	F	1	1
9/7/2017	0.01	IN	rain	56	74	F	74	0	10	5	mph	48	69	F	0.96	1
9/8/2017	0	IN	rain	52	76	F	68	0	9	3	mph	25	66	F	0.87	1
9/9/2017	0	IN	rain	54	72	F	67	1	10	6	mph	15	65	F	0.83	1
9/10/2017	0	IN	rain	52	73	F	72	0	12	5	mph	12	64	F	0.79	0.99
9/11/2017	0	IN	rain	53	75	F	74	0	12	4	mph	49	65	F	0.76	0.95
9/12/2017	0	IN	rain	58	75	F	76	0	6	3	mph	68	66	F	0.74	0.91
9/13/2017	0.01	IN	rain	62	85	F	85	0	9	4	mph	57	70	F	0.74	0.9
9/14/2017	0	IN	rain	68	80	F	79	0	12	7	mph	58	73	F	0.72	0.89
9/15/2017	0	IN	rain	64	83	F	83	0	9	2	mph	52	74	F	0.68	0.88
9/16/2017	0	IN	rain	66	83	F	84	0	9	3	mph	63	75	F	0.66	0.87
9/17/2017	0	IN	rain	66	81	F	81	0	11	5	mph	73	74	F	0.64	0.85
9/18/2017	0	IN	rain	71	77	F	86	4	17	10	mph	96	74	F	0.62	0.83
9/19/2017	0.36	IN	rain	70	74	F	86	6	19	12	mph	99	72	F	0.71	0.81
9/20/2017	0	IN	rain	69	84	F	74	0	11	6	mph	46	74	F	0.76	0.81
9/21/2017	0	IN	rain	66	86	F	74	0	11	4	mph	27	74	F	0.69	0.79
9/22/2017	0	IN	rain	68	79	F	73	0	9	4	mph	74	73	F	0.65	0.78
9/23/2017	0	IN	rain	62	86	F	71	0	10	4	mph	7	73	F	0.61	0.76
9/24/2017	0	IN	rain	62	88	F	72	0	10	3	mph	3	73	F	0.58	0.74
9/25/2017	0	IN	rain	62	85	F	78	0	12	6	mph	30	73	F	0.53	0.72
9/26/2017	0	IN	rain	69	78	F	86	6	15	11	mph	99	74	F	0.5	0.7
9/27/2017	0	IN	rain	73	84	F	86	7	16	11	mph	67	76	F	0.48	0.68
9/28/2017	0	IN	rain	62	81	F	63	1	15	7	mph	9	74	F	0.46	0.66

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	7	66	F	0.45	0.63
9/29/2017	0	IN	rain	52	72	F	62	0	8	4	mph	7	66	F	0.45	0.63
9/30/2017	0	IN	rain	53	68	F	65	0	13	7	mph	40	63	F	0.43	0.61
10/1/2017	0	IN	rain	51	67	F	78	0	12	6	mph	29	62	F	0.42	0.59
10/2/2017	0	IN	rain	45	74	F	72	0	7	2	mph	3	62	F	0.42	0.58
10/3/2017	0	IN	rain	45	74	F	75	0	9	3	mph	16	63	F	0.41	0.58
10/4/2017	0	IN	rain	46	77	F	73	0	10	4	mph	10	63	F	0.41	0.58
10/5/2017	0	IN	rain	59	82	F	77	0	14	8	mph	40	67	F	0.41	0.57
10/6/2017	0	IN	rain	65	84	F	73	2	17	7	mph	43	70	F	0.4	0.57
10/7/2017	0	IN	rain	64	85	F	78	0	13	8	mph	50	72	F	0.38	0.56
10/8/2017	0	IN	rain	74	83	F	84	5	15	10	mph	89	76	F	0.36	0.54
10/9/2017	0.05	IN	rain	74	83	F	84	5	20	11	mph	89	77	F	0.35	0.53
10/10/2017	0	IN	rain	70	86	F	80	0	8	3	mph	58	78	F	0.32	0.52
10/11/2017	0.05	IN	rain	66	72	F	88	3	14	8	mph	95	73	F	0.31	0.52
10/12/2017	0.17	IN	rain	63	67	F	86	10	16	12	mph	100	68	F	0.43	0.52
10/13/2017	0	IN	rain	62	66	F	92	7	12	10	mph	100	66	F	0.41	0.53
10/14/2017	0	IN	rain	64	70	F	94	0	8	5	mph	100	70	F	0.38	0.52
10/15/2017	0	IN	rain	67	74	F	88	0	15	8	mph	68	71	F	0.35	0.52
10/16/2017	0.09	IN	rain	48	73	F	77	0	12	6	mph	66	65	F	0.38	0.52
10/17/2017	0	IN	rain	41	60	F	67	0	12	4	mph	2	56	F	0.37	0.51
10/18/2017	0	IN	rain	37	70	F	71	0	6	2	mph	1	55	F	0.33	0.5
10/19/2017	0	IN	rain	43	72	F	73	0	11	3	mph	10	57	F	0.3	0.48
10/20/2017	0	IN	rain	48	76	F	67	0	9	3	mph	4	59	F	0.28	0.47
10/21/2017	0	IN	rain	46	78	F	67	0	6	2	mph	16	60	F	0.27	0.46
10/22/2017	0	IN	rain	46	76	F	79	0	9	3	mph	40	61	F	0.27	0.45
10/23/2017	0	IN	rain	61	77	F	83	0	14	8	mph	84	66	F	0.27	0.45
10/24/2017	0.47	IN	rain	58	76	F	82	0	25	12	mph	63	70	F	0.58	0.48
10/25/2017	0	IN	rain	51	65	F	67	0	9	4	mph	40	62	F	0.49	0.48
10/26/2017	0	IN	rain	42	60	F	66	0	15	7	mph	33	55	F	0.42	0.47
10/27/2017	0	IN	rain	36	68	F	69	0	11	4	mph	1	53	F	0.36	0.45
10/28/2017	0	IN	rain	45	74	F	75	0	16	6	mph	36	57	F	0.31	0.43
10/29/2017	2.24	IN	rain	53	68	F	93	1	15	7	mph	100	63	F	0.78	0.5
10/30/2017	0.19	IN	rain	47	57	F	69	4	14	10	mph	42	55	F	0.85	0.63

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	9	53	F	0.72	0.63
10/31/2017	0	IN	rain	39	62	F	67	0	10	4	mph	9	53	F	0.72	0.63
11/1/2017	0	IN	rain	40	67	F	80	0	14	6	mph	60	55	F	0.69	0.62
11/2/2017	0	IN	rain	58	77	F	81	0	9	5	mph	48	63	F	0.67	0.62
11/3/2017	0	IN	rain	53	79	F	77	0	15	5	mph	26	64	F	0.64	0.62
11/4/2017	0	IN	rain	49	61	F	70	4	13	8	mph	65	60	F	0.59	0.61
11/5/2017	0.15	IN	rain	57	69	F	86	0	7	4	mph	84	62	F	0.68	0.62
11/6/2017	0	IN	rain	59	69	F	86	0	14	7	mph	80	64	F	0.62	0.61
11/7/2017	1.02	IN	rain	46	56	F	81	5	15	9	mph	78	55	F	0.81	0.63
11/8/2017	0.05	IN	rain	44	50	F	89	5	12	9	mph	91	51	F	0.86	0.7
11/9/2017	0	IN	rain	48	60	F	80	0	11	4	mph	94	54	F	0.72	0.7
11/10/2017	0.01	IN	rain	31	53	F	59	0	17	8	mph	28	48	F	0.66	0.69
11/11/2017	0	IN	rain	23	40	F	50	0	10	4	mph	28	38	F	0.61	0.68
11/12/2017	0	IN	rain	27	48	F	70	0	3	1	mph	59	40	F	0.59	0.65
11/13/2017	0.4	IN	rain	37	48	F	89	0	10	5	mph	93	44	F	0.75	0.66
11/14/2017	0	IN	rain	37	51	F	76	1	14	6	mph	36	44	F	0.67	0.66
11/15/2017	0	IN	rain	39	54	F	81	0	11	6	mph	81	48	F	0.63	0.65
11/16/2017	0	IN	rain	45	61	F	67	0	15	7	mph	43	50	F	0.6	0.65
11/17/2017	0	IN	rain	33	52	F	58	0	11	6	mph	17	45	F	0.56	0.64
11/18/2017	0	IN	rain	30	63	F	68	0	23	11	mph	44	44	F	0.54	0.63
11/19/2017	0.14	IN	rain	41	66	F	54	5	28	17	mph	51	53	F	0.62	0.64
11/20/2017	0	IN	rain	37	49	F	51	4	13	8	mph	18	44	F	0.54	0.63
11/21/2017	0.05	IN	rain	36	60	F	66	5	20	10	mph	45	45	F	0.54	0.63
11/22/2017	0.7	IN	rain	40	60	F	67	0	12	8	mph	57	50	F	0.87	0.68
11/23/2017	0	IN	rain	29	43	F	64	0	6	2	mph	14	40	F	0.71	0.69
11/24/2017	0	IN	rain	26	53	F	70	0	6	2	mph	0	38	F	0.66	0.69
11/25/2017	0	IN	rain	27	63	F	71	0	14	4	mph	23	42	F	0.61	0.69
11/26/2017	0	IN	rain	31	54	F	55	0	14	5	mph	4	45	F	0.55	0.68
11/27/2017	0	IN	rain	33	56	F	59	0	10	4	mph	15	41	F	0.51	0.68
11/28/2017	0	IN	rain	31	63	F	72	0	12	5	mph	4	43	F	0.48	0.68
11/29/2017	0	IN	rain	43	67	F	65	1	10	6	mph	4	49	F	0.47	0.68
11/30/2017	0.01	IN	rain	40	61	F	67	1	11	5	mph	42	46	F	0.44	0.67
12/1/2017	0	IN	rain	35	55	F	69	0	9	3	mph	18	47	F	0.45	0.66

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	40	43	F	0.44	0.64
12/2/2017	0	IN	rain	29	54	F	79	0	5	1	mph	40	43	F	0.44	0.64
12/3/2017	0.03	IN	rain	34	57	F	84	0	5	1	mph	52	43	F	0.45	0.63
12/4/2017	0	IN	rain	29	55	F	84	0	6	2	mph	51	42	F	0.45	0.61
12/5/2017	0.16	IN	rain	40	68	F	83	0	17	8	mph	90	52	F	0.45	0.59
12/6/2017	0.04	IN	rain	40	62	F	54	1	12	5	mph	94	51	F	0.58	0.6
12/7/2017	0	IN	rain	35	48	F	59	0	8	4	mph	61	42	F	0.45	0.57
12/8/2017	0.41	IN	rain	32	41	F	70	0	6	3	mph	91	39	F	0.42	0.55
12/9/2017	0.55	IN	rain	30	33	F	91	0	8	4	mph	100	37	F	0.44	0.54
12/10/2017	0	IN	rain	28	39	F	76	1	9	5	mph	47	36	F	0.35	0.52
12/11/2017	0	IN	rain	27	46	F	72	1	7	3	mph	53	36	F	0.29	0.5
12/12/2017	0	IN	rain	30	47	F	64	2	14	7	mph	73	39	F	0.25	0.49
12/13/2017	0.04	IN	rain	23	32	F	42	3	17	11	mph	42	32	F	0.24	0.47
12/14/2017	0	IN	rain	27	44	F	58	1	16	8	mph	49	34	F	0.24	0.46
12/15/2017	0.05	IN	rain	26	35	F	67	3	10	5	mph	81	32	F	0.26	0.45
12/16/2017	0	IN	rain	24	44	F	72	1	14	6	mph	32	33	F	0.26	0.45
12/17/2017	0	IN	rain	28	50	F	75	1	5	2	mph	51	36	F	0.26	0.44
12/18/2017	0	IN	rain	40	55	F	71	0	6	2	mph	59	43	F	0.23	0.43
12/19/2017	0	IN	rain	35	60	F	70	0	11	4	mph	53	45	F	0.17	0.42
12/20/2017	0	IN	rain	30	52	F	54	1	9	4	mph	67	44	F	0.08	0.41
12/21/2017	0	IN	rain	27	44	F	63	0	6	2	mph	4	37	F	0	0.4
12/22/2017	0	IN	rain	25	60	F	74	0	12	3	mph	68	39	F	0	0.39
12/23/2017	0.04	IN	rain	47	65	F	76	1	18	10	mph	90	50	F	0.03	0.39
12/24/2017	0.04	IN	rain	41	49	F	72	1	9	6	mph	87	47	F	0.01	0.38
12/25/2017	0	IN	rain	32	43	F	54	3	13	8	mph	78	41	F	0.03	0.37
12/26/2017	0	IN	rain	27	37	F	41	0	9	5	mph	38	34	F	0	0.36
12/27/2017	0	IN	rain	21	31	F	53	0	10	4	mph	66	33	F	0	0.35
12/28/2017	0	IN	rain	12	24	F	42	1	11	5	mph	8	28	F	0	0.34
12/29/2017	0	IN	rain	11	31	F	50	0	9	3	mph	50	27	F	0	0.33
12/30/2017	0.02	IN	rain	16	30	F	66	0	8	3	mph	74	27	F	0	0.32
12/31/2017	0	IN	rain	12	24	F	42	2	10	7	mph	44	25	F	0	0.31
1/1/2018	0	IN	rain	9	23	F	48	1	14	5	mph	7	21	F	0	0.3
1/2/2018	0	IN	rain	11	25	F	51	2	11	6	mph	0	22	F	0	0.29

Data Source is ITERIS																
	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	Scaled Soil	
1/3/2018	0.08	IN	rain	6	34	F	62	0	8	3	mph	29	23	F	0	0.28
1/4/2018	0.4	IN	rain	19	30	F	75	8	20	13	mph	86	28	F	0	0.27
1/5/2018	0	IN	rain	12	19	F	43	6	19	14	mph	4	26	F	0	0.27
1/6/2018	0	IN	rain	8	18	F	42	2	18	9	mph	4	23	F	0	0.27
1/7/2018	0	IN	rain	1	18	F	49	1	8	5	mph	5	22	F	0	0.26
1/8/2018	0.13	IN	rain	11	37	F	64	4	15	9	mph	49	24	F	0.08	0.26
1/9/2018	0	IN	rain	28	47	F	77	0	9	4	mph	33	31	F	0.52	0.28
1/10/2018	0	IN	rain	25	49	F	74	0	5	3	mph	49	32	F	0.79	0.28
1/11/2018	0	IN	rain	38	65	F	79	0	8	4	mph	84	36	F	0.79	0.28
1/12/2018	0.45	IN	rain	58	67	F	89	6	15	11	mph	100	50	F	0.61	0.3
1/13/2018	0.15	IN	rain	28	63	F	65	5	15	10	mph	73	45	F	0.59	0.37
1/14/2018	0	IN	rain	17	26	F	46	1	10	7	mph	6	31	F	0.43	0.36
1/15/2018	0	IN	rain	17	34	F	75	2	9	6	mph	84	30	F	0.39	0.35
1/16/2018	0	IN	rain	26	47	F	78	0	4	2	mph	70	32	F	0.35	0.33
1/17/2018	0	IN	rain	25	38	F	68	0	8	5	mph	93	32	F	0.29	0.31
1/18/2018	0	IN	rain	20	38	F	47	1	13	7	mph	17	31	F	0.24	0.28
1/19/2018	0	IN	rain	20	52	F	54	0	7	3	mph	0	32	F	0.21	0.26
1/20/2018	0	IN	rain	31	57	F	46	1	8	5	mph	4	35	F	0.18	0.24
1/21/2018	0	IN	rain	29	60	F	64	1	7	3	mph	50	38	F	0.12	0.23
1/22/2018	0	IN	rain	49	66	F	54	4	14	8	mph	73	48	F	0.05	0.22
1/23/2018	0.48	IN	rain	47	67	F	76	2	18	9	mph	62	52	F	0.41	0.26
1/24/2018	0	IN	rain	37	46	F	52	4	11	7	mph	45	43	F	0.28	0.28
1/25/2018	0	IN	rain	26	39	F	50	1	9	5	mph	32	39	F	0.16	0.27
1/26/2018	0	IN	rain	20	45	F	65	0	7	3	mph	4	36	F	0.13	0.26
1/27/2018	0	IN	rain	34	62	F	62	5	17	10	mph	24	43	F	0.1	0.25
1/28/2018	0.97	IN	rain	47	57	F	89	3	15	8	mph	99	50	F	0.54	0.34
1/29/2018	0.5	IN	rain	37	47	F	84	6	15	10	mph	99	44	F	0.56	0.46
1/30/2018	0.22	IN	rain	26	37	F	73	0	12	7	mph	82	37	F	0.54	0.54
1/31/2018	0	IN	rain	19	35	F	47	4	10	7	mph	15	32	F	0.47	0.55
2/1/2018	0	IN	rain	34	53	F	54	7	14	11	mph	52	39	F	0.37	0.55
2/2/2018	0.29	IN	rain	22	52	F	57	2	14	9	mph	56	39	F	0.48	0.59
2/3/2018	0	IN	rain	16	33	F	50	1	11	5	mph	2	31	F	0.39	0.58

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	
2/4/2018	0.74	IN	rain	26	53	F	80	1	12	7	mph	88	35	F	0.52	0.59
2/5/2018	0	IN	rain	24	39	F	68	1	12	5	mph	23	38	F	0.5	0.66
2/6/2018	0	IN	rain	22	45	F	70	0	8	3	mph	50	34	F	0.42	0.63
2/7/2018	0.53	IN	rain	28	60	F	82	1	14	7	mph	91	39	F	0.52	0.65
2/8/2018	0	IN	rain	25	40	F	58	1	10	6	mph	34	38	F	0.52	0.72
2/9/2018	0	IN	rain	23	44	F	71	0	11	4	mph	44	36	F	0.47	0.73
2/10/2018	0.35	IN	rain	38	59	F	89	1	9	5	mph	93	44	F	0.53	0.75
2/11/2018	0.87	IN	rain	56	70	F	88	1	17	10	mph	99	55	F	0.66	0.9
2/12/2018	1	IN	rain	38	67	F	77	1	13	6	mph	74	52	F	0.71	1
2/13/2018	0.02	IN	rain	31	38	F	65	1	14	6	mph	44	40	F	0.57	1
2/14/2018	0	IN	rain	36	49	F	80	1	10	5	mph	81	43	F	0.51	1
2/15/2018	0.08	IN	rain	49	65	F	82	7	15	9	mph	69	52	F	0.49	0.98
2/16/2018	0.07	IN	rain	46	67	F	73	2	15	8	mph	71	56	F	0.45	0.91
2/17/2018	0.61	IN	rain	32	44	F	69	0	9	4	mph	45	44	F	0.53	0.87
2/18/2018	0	IN	rain	32	51	F	71	0	8	4	mph	30	45	F	0.54	0.93
2/19/2018	0	IN	rain	32	60	F	83	0	12	6	mph	73	44	F	0.5	0.87
2/20/2018	0	IN	rain	58	71	F	84	9	17	12	mph	66	57	F	0.48	0.81
2/21/2018	0	IN	rain	64	76	F	77	7	18	12	mph	46	63	F	0.43	0.75
2/22/2018	0.07	IN	rain	41	67	F	78	1	15	10	mph	86	56	F	0.41	0.69
2/23/2018	0	IN	rain	41	48	F	91	1	14	8	mph	100	48	F	0.43	0.65
2/24/2018	0.02	IN	rain	48	55	F	90	1	10	5	mph	100	52	F	0.4	0.62
2/25/2018	0.06	IN	rain	46	60	F	91	0	7	4	mph	97	52	F	0.44	0.61
2/26/2018	0	IN	rain	38	52	F	74	0	7	2	mph	81	50	F	0.41	0.6
2/27/2018	0	IN	rain	31	57	F	51	0	9	4	mph	4	47	F	0.37	0.59
2/28/2018	0	IN	rain	37	59	F	51	5	16	10	mph	68	48	F	0.31	0.57
3/1/2018	0.2	IN	rain	46	56	F	74	1	9	5	mph	99	51	F	0.3	0.54
3/2/2018	0.5	IN	rain	36	52	F	73	2	22	14	mph	98	45	F	0.56	0.58
3/3/2018	0.01	IN	rain	39	50	F	51	8	20	14	mph	70	44	F	0.52	0.59
3/4/2018	0	IN	rain	37	49	F	48	5	15	10	mph	56	44	F	0.4	0.55
3/5/2018	0	IN	rain	30	46	F	44	1	12	7	mph	7	42	F	0.33	0.52
3/6/2018	0.47	IN	rain	26	50	F	66	1	12	4	mph	46	43	F	0.41	0.5
3/7/2018	0.59	IN	rain	37	43	F	87	1	13	8	mph	89	43	F	0.68	0.64

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	
3/8/2018	0	IN	rain	34	44	F	52	0	15	7	mph	28	F	0.57	0.65	
3/9/2018	0	IN	rain	32	45	F	46	2	16	9	mph	39	F	0.53	0.64	
3/10/2018	0	IN	rain	28	47	F	51	0	15	6	mph	6	F	0.51	0.62	
3/11/2018	0	IN	rain	29	49	F	56	0	10	4	mph	34	F	0.49	0.6	
3/12/2018	0.54	IN	rain	29	45	F	81	0	17	11	mph	79	F	0.63	0.6	
3/13/2018	0.01	IN	rain	31	45	F	63	0	16	10	mph	58	F	0.7	0.65	
3/14/2018	0	IN	rain	31	41	F	49	4	18	11	mph	53	F	0.57	0.62	
3/15/2018	0	IN	rain	32	50	F	47	0	17	8	mph	30	F	0.51	0.6	
3/16/2018	0	IN	rain	30	44	F	46	3	18	9	mph	26	F	0.47	0.57	
3/17/2018	0.02	IN	rain	27	45	F	57	1	11	5	mph	34	F	0.45	0.55	
3/18/2018	0	IN	rain	30	54	F	56	1	9	5	mph	6	F	0.42	0.52	
3/19/2018	0	IN	rain	33	56	F	67	2	9	6	mph	51	F	0.39	0.49	
3/20/2018	0.84	IN	rain	35	42	F	81	6	21	14	mph	98	F	0.76	0.55	
3/21/2018	0.4	IN	rain	33	37	F	90	5	18	12	mph	100	F	0.81	0.63	
3/22/2018	0	IN	rain	33	48	F	63	4	13	7	mph	53	F	0.71	0.66	
3/23/2018	0	IN	rain	35	48	F	42	5	12	8	mph	17	F	0.6	0.63	
3/24/2018	0	IN	rain	33	50	F	43	0	9	5	mph	23	F	0.55	0.61	
3/25/2018	0.05	IN	rain	28	47	F	65	0	21	9	mph	32	F	0.53	0.59	
3/26/2018	0	IN	rain	29	44	F	64	2	14	7	mph	44	F	0.5	0.57	
3/27/2018	0.02	IN	rain	26	48	F	72	1	8	4	mph	74	F	0.46	0.54	
3/28/2018	0.02	IN	rain	41	60	F	74	1	6	4	mph	99	F	0.44	0.51	
3/29/2018	0	IN	rain	48	79	F	69	0	12	6	mph	54	F	0.42	0.49	
3/30/2018	0.04	IN	rain	48	73	F	67	3	21	12	mph	90	F	0.4	0.46	
3/31/2018	0	IN	rain	39	60	F	50	1	14	7	mph	1	F	0.38	0.44	
4/1/2018	0	IN	rain	43	66	F	53	1	11	7	mph	54	F	0.35	0.42	
4/2/2018	0.07	IN	rain	38	50	F	78	1	16	7	mph	91	F	0.4	0.42	
4/3/2018	0.03	IN	rain	40	58	F	83	1	11	5	mph	83	F	0.38	0.42	
4/4/2018	0.05	IN	rain	45	75	F	61	2	22	13	mph	56	F	0.43	0.42	
4/5/2018	0	IN	rain	33	50	F	42	1	14	8	mph	6	F	0.39	0.41	
4/6/2018	0	IN	rain	35	69	F	54	2	21	12	mph	64	F	0.34	0.4	
4/7/2018	0.16	IN	rain	40	63	F	57	1	15	5	mph	100	F	0.47	0.4	
4/8/2018	0	IN	rain	34	48	F	42	1	12	6	mph	33	F	0.41	0.4	

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	81	45	F	0.38	0.38
4/9/2018	0	IN	rain	32	47	F	60	1	8	4	mph	81	45	F	0.38	0.38
4/10/2018	0.05	IN	rain	36	54	F	60	0	8	4	mph	48	51	F	0.4	0.38
4/11/2018	0	IN	rain	29	56	F	55	0	12	3	mph	38	50	F	0.36	0.37
4/12/2018	0	IN	rain	40	72	F	52	4	23	12	mph	35	56	F	0.33	0.35
4/13/2018	0	IN	rain	59	80	F	45	9	20	14	mph	21	65	F	0.29	0.33
4/14/2018	0	IN	rain	63	80	F	62	8	22	14	mph	12	68	F	0.26	0.31
4/15/2018	0.41	IN	rain	47	66	F	91	4	16	10	mph	80	59	F	0.39	0.31
4/16/2018	1.51	IN	rain	50	68	F	74	1	20	10	mph	93	59	F	0.96	0.5
4/17/2018	0.01	IN	rain	41	49	F	49	2	15	8	mph	88	52	F	0.75	0.57
4/18/2018	0	IN	rain	35	60	F	52	1	11	6	mph	18	53	F	0.66	0.56
4/19/2018	0.07	IN	rain	41	58	F	65	2	12	6	mph	75	53	F	0.65	0.56
4/20/2018	0	IN	rain	37	57	F	47	1	12	6	mph	17	52	F	0.59	0.56
4/21/2018	0	IN	rain	32	61	F	51	1	8	3	mph	15	53	F	0.52	0.54
4/22/2018	0	IN	rain	43	63	F	54	0	11	4	mph	49	57	F	0.47	0.51
4/23/2018	0	IN	rain	39	68	F	48	1	14	6	mph	45	57	F	0.41	0.49
4/24/2018	0.28	IN	rain	46	63	F	72	4	16	10	mph	88	55	F	0.47	0.48
4/25/2018	1.72	IN	rain	56	73	F	86	0	10	5	mph	89	63	F	0.94	0.63
4/26/2018	0	IN	rain	53	70	F	59	1	10	6	mph	29	63	F	0.99	1
4/27/2018	0.22	IN	rain	53	69	F	75	1	10	5	mph	67	62	F	0.94	1
4/28/2018	0.01	IN	rain	49	76	F	67	1	12	6	mph	41	65	F	0.78	1
4/29/2018	0.07	IN	rain	47	57	F	53	2	9	6	mph	50	62	F	0.74	1
4/30/2018	0	IN	rain	42	69	F	36	4	16	9	mph	13	57	F	0.65	1
5/1/2018	0	IN	rain	42	79	F	37	1	10	5	mph	4	62	F	0.58	0.95
5/2/2018	0	IN	rain	53	89	F	40	3	12	7	mph	4	69	F	0.52	0.87
5/3/2018	0	IN	rain	66	88	F	46	6	14	9	mph	10	73	F	0.46	0.8
5/4/2018	0	IN	rain	67	88	F	50	6	15	10	mph	20	76	F	0.41	0.73
5/5/2018	0.06	IN	rain	60	77	F	50	1	9	5	mph	84	73	F	0.4	0.68
5/6/2018	0	IN	rain	57	67	F	85	0	7	3	mph	97	66	F	0.43	0.65
5/7/2018	0	IN	rain	54	72	F	70	1	14	6	mph	58	67	F	0.41	0.62
5/8/2018	0	IN	rain	52	69	F	74	3	16	8	mph	38	66	F	0.38	0.58
5/9/2018	0	IN	rain	51	73	F	65	0	12	6	mph	42	66	F	0.34	0.54
5/10/2018	0.01	IN	rain	48	84	F	66	1	14	8	mph	35	68	F	0.31	0.5

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	16	73	F	0.28	0.48
5/11/2018	0	IN	rain	63	84	F	60	1	11	6	mph	16	73	F	0.28	0.48
5/12/2018	1.18	IN	rain	62	91	F	62	1	10	6	mph	44	75	F	0.38	0.47
5/13/2018	0.72	IN	rain	57	65	F	90	2	11	7	mph	97	67	F	0.94	0.67
5/14/2018	0.31	IN	rain	56	79	F	85	1	9	4	mph	84	68	F	1	0.94
5/15/2018	0.43	IN	rain	66	86	F	74	1	17	9	mph	59	74	F	0.99	0.96
5/16/2018	0.33	IN	rain	63	73	F	90	2	9	5	mph	99	70	F	1	1
5/17/2018	0.06	IN	rain	60	68	F	93	0	8	4	mph	100	69	F	0.93	1
5/18/2018	2.96	IN	rain	55	66	F	93	3	16	10	mph	100	64	F	1	1
5/19/2018	1.03	IN	rain	56	77	F	90	3	12	8	mph	98	65	F	1	1
5/20/2018	0	IN	rain	71	84	F	77	0	13	9	mph	72	73	F	0.91	1
5/21/2018	0	IN	rain	61	75	F	67	1	10	6	mph	35	73	F	0.82	1
5/22/2018	0.22	IN	rain	60	81	F	77	1	8	5	mph	82	71	F	0.84	1
5/23/2018	0	IN	rain	66	82	F	71	0	10	5	mph	47	74	F	0.88	1
5/24/2018	0	IN	rain	61	83	F	60	1	7	4	mph	0	74	F	0.78	1
5/25/2018	0	IN	rain	59	84	F	66	0	13	7	mph	4	73	F	0.72	1
5/26/2018	0	IN	rain	69	88	F	70	3	14	8	mph	39	77	F	0.66	1
5/27/2018	1.29	IN	rain	59	85	F	85	2	12	7	mph	94	76	F	1	1
5/28/2018	0.03	IN	rain	58	67	F	89	1	8	6	mph	100	68	F	0.98	1
5/29/2018	0	IN	rain	63	79	F	85	1	7	3	mph	95	72	F	0.86	1
5/30/2018	0	IN	rain	65	76	F	91	1	10	6	mph	97	72	F	0.83	0.97
5/31/2018	0.01	IN	rain	65	85	F	85	1	10	5	mph	91	74	F	0.82	0.95
6/1/2018	0.1	IN	rain	71	86	F	81	0	8	4	mph	55	78	F	0.86	0.95
6/2/2018	0	IN	rain	71	82	F	84	0	6	3	mph	74	77	F	0.77	0.95
6/3/2018	0.96	IN	rain	59	70	F	94	6	20	13	mph	98	69	F	0.98	1
6/4/2018	0.02	IN	rain	56	75	F	78	1	11	6	mph	58	69	F	0.9	1
6/5/2018	0	IN	rain	58	80	F	60	1	13	5	mph	32	72	F	0.77	1
6/6/2018	0	IN	rain	61	71	F	65	1	9	5	mph	55	72	F	0.71	0.98
6/7/2018	0	IN	rain	60	75	F	72	0	9	4	mph	56	72	F	0.68	0.91
6/8/2018	0	IN	rain	57	83	F	71	0	11	5	mph	51	73	F	0.66	0.85
6/9/2018	3.64	IN	rain	68	83	F	85	1	9	5	mph	71	74	F	0.99	0.99
6/10/2018	0.41	IN	rain	66	76	F	88	1	12	6	mph	96	73	F	1	1
6/11/2018	0.14	IN	rain	56	66	F	87	4	16	9	mph	89	67	F	1	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	IN	Type	Temp	Temp	Unit	Humidity	Wind	Wind	Wind	mph	41	69	F	0.94	1
6/12/2018	0	IN	rain	53	73	F	72	1	11	6	mph	41	69	F	0.94	1
6/13/2018	0.01	IN	rain	64	82	F	81	0	12	6	mph	72	73	F	0.89	1
6/14/2018	0	IN	rain	70	84	F	54	2	11	7	mph	23	77	F	0.84	1
6/15/2018	0	IN	rain	63	81	F	48	1	8	4	mph	12	75	F	0.77	1
6/16/2018	0	IN	rain	58	84	F	57	0	6	3	mph	20	75	F	0.71	0.98
6/17/2018	0	IN	rain	63	88	F	65	0	9	4	mph	26	78	F	0.66	0.93
6/18/2018	0	IN	rain	69	91	F	69	1	9	5	mph	47	81	F	0.63	0.88
6/19/2018	0	IN	rain	76	90	F	72	1	7	4	mph	69	82	F	0.6	0.84
6/20/2018	0	IN	rain	72	86	F	80	1	10	4	mph	69	82	F	0.59	0.81
6/21/2018	0	IN	rain	70	81	F	83	0	8	4	mph	71	81	F	0.57	0.8
6/22/2018	0.36	IN	rain	67	71	F	89	1	15	9	mph	97	73	F	0.7	0.81
6/23/2018	0.36	IN	rain	68	84	F	85	1	10	4	mph	70	76	F	0.79	0.85
6/24/2018	0.02	IN	rain	71	91	F	75	1	7	4	mph	44	80	F	0.76	0.87
6/25/2018	0	IN	rain	69	83	F	68	1	8	4	mph	37	79	F	0.68	0.87
6/26/2018	0	IN	rain	62	79	F	69	0	11	6	mph	24	76	F	0.62	0.86
6/27/2018	0	IN	rain	64	82	F	73	1	14	9	mph	78	74	F	0.6	0.85
6/28/2018	0	IN	rain	74	89	F	69	1	9	6	mph	45	80	F	0.58	0.83
6/29/2018	0	IN	rain	71	91	F	63	1	5	3	mph	15	82	F	0.56	0.81
6/30/2018	0	IN	rain	69	94	F	66	0	6	2	mph	12	83	F	0.54	0.77
7/1/2018	0	IN	rain	71	95	F	68	1	9	4	mph	17	84	F	0.52	0.74
7/2/2018	0	IN	rain	73	97	F	72	1	10	4	mph	10	86	F	0.49	0.71
7/3/2018	0	IN	rain	75	94	F	76	1	8	4	mph	41	87	F	0.47	0.68
7/4/2018	0	IN	rain	71	88	F	79	0	10	5	mph	49	84	F	0.45	0.67
7/5/2018	0.01	IN	rain	73	89	F	81	1	11	5	mph	35	84	F	0.44	0.65
7/6/2018	0.39	IN	rain	75	85	F	88	0	9	5	mph	79	82	F	0.64	0.67
7/7/2018	0	IN	rain	58	76	F	64	3	17	10	mph	58	76	F	0.64	0.68
7/8/2018	0	IN	rain	55	78	F	67	1	13	7	mph	7	73	F	0.56	0.66
7/9/2018	0	IN	rain	53	84	F	62	1	7	3	mph	6	74	F	0.5	0.65
7/10/2018	0	IN	rain	59	92	F	62	0	7	3	mph	4	78	F	0.45	0.63
7/11/2018	0	IN	rain	72	92	F	65	1	8	4	mph	35	81	F	0.41	0.61
7/12/2018	0	IN	rain	68	82	F	77	1	12	6	mph	40	79	F	0.38	0.58
7/13/2018	0	IN	rain	63	83	F	69	1	10	5	mph	23	77	F	0.36	0.56

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	7	77	F	0.34	0.54
7/14/2018	0	IN	rain	58	87	F	63	0	10	4	mph	7	77	F	0.34	0.54
7/15/2018	0	IN	rain	68	90	F	68	3	10	6	mph	41	79	F	0.32	0.53
7/16/2018	0	IN	rain	73	92	F	72	3	12	7	mph	26	82	F	0.31	0.52
7/17/2018	0.36	IN	rain	73	93	F	77	1	17	8	mph	47	83	F	0.42	0.52
7/18/2018	0	IN	rain	72	88	F	67	1	6	3	mph	38	82	F	0.59	0.53
7/19/2018	0	IN	rain	66	86	F	60	1	8	4	mph	24	80	F	0.46	0.52
7/20/2018	0	IN	rain	60	84	F	68	0	11	5	mph	25	77	F	0.39	0.51
7/21/2018	1.66	IN	rain	65	75	F	92	2	16	10	mph	89	73	F	0.8	0.58
7/22/2018	0	IN	rain	69	85	F	83	5	16	11	mph	75	78	F	0.89	0.68
7/23/2018	0.08	IN	rain	77	84	F	81	9	19	13	mph	85	80	F	0.81	0.67
7/24/2018	0.84	IN	rain	77	83	F	81	9	18	12	mph	90	80	F	0.85	0.68
7/25/2018	0.2	IN	rain	72	81	F	88	4	12	8	mph	86	78	F	1	0.76
7/26/2018	0	IN	rain	72	87	F	80	1	8	4	mph	58	80	F	0.86	0.75
7/27/2018	0.03	IN	rain	72	89	F	80	1	14	5	mph	55	81	F	0.74	0.72
7/28/2018	0	IN	rain	71	88	F	81	0	5	2	mph	60	82	F	0.69	0.7
7/29/2018	0	IN	rain	69	85	F	70	0	6	3	mph	36	79	F	0.63	0.68
7/30/2018	0.43	IN	rain	68	73	F	93	0	9	4	mph	81	74	F	0.8	0.69
7/31/2018	0.05	IN	rain	70	81	F	90	0	8	5	mph	89	77	F	0.79	0.71
8/1/2018	0	IN	rain	74	86	F	83	4	16	8	mph	66	80	F	0.73	0.7
8/2/2018	0.13	IN	rain	75	88	F	81	5	14	9	mph	41	81	F	0.7	0.69
8/3/2018	0.07	IN	rain	73	86	F	85	1	13	7	mph	46	80	F	0.72	0.69
8/4/2018	0.05	IN	rain	73	86	F	80	1	12	7	mph	53	81	F	0.7	0.68
8/5/2018	0	IN	rain	71	90	F	76	1	8	3	mph	18	82	F	0.64	0.67
8/6/2018	0.41	IN	rain	70	90	F	81	0	9	4	mph	19	81	F	0.7	0.67
8/7/2018	0	IN	rain	72	90	F	81	1	13	6	mph	29	82	F	0.73	0.67
8/8/2018	0	IN	rain	74	91	F	75	0	7	3	mph	31	84	F	0.64	0.66
8/9/2018	0	IN	rain	74	89	F	73	0	7	3	mph	30	83	F	0.58	0.64
8/10/2018	0	IN	rain	71	91	F	74	0	5	2	mph	17	83	F	0.54	0.62
8/11/2018	0.31	IN	rain	70	86	F	86	0	8	3	mph	72	80	F	0.56	0.6
8/12/2018	0.05	IN	rain	68	88	F	81	0	8	3	mph	62	81	F	0.64	0.59
8/13/2018	0	IN	rain	72	85	F	81	1	9	4	mph	67	81	F	0.57	0.57
8/14/2018	0.01	IN	rain	68	85	F	75	2	10	6	mph	33	79	F	0.51	0.56

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	23	80	F	0.46	0.54
8/15/2018	0	IN	rain	70	89	F	73	0	8	5	mph	23	80	F	0.46	0.54
8/16/2018	0	IN	rain	70	91	F	74	0	9	5	mph	30	80	F	0.43	0.52
8/17/2018	0	IN	rain	72	93	F	74	1	11	6	mph	41	82	F	0.41	0.51
8/18/2018	0	IN	rain	78	89	F	75	3	9	6	mph	63	83	F	0.38	0.49
8/19/2018	0.02	IN	rain	73	83	F	85	1	9	5	mph	72	81	F	0.37	0.48
8/20/2018	0	IN	rain	71	79	F	84	3	10	7	mph	92	78	F	0.36	0.47
8/21/2018	0.52	IN	rain	70	82	F	86	3	12	7	mph	86	78	F	0.43	0.47
8/22/2018	0	IN	rain	73	85	F	81	1	10	5	mph	69	80	F	0.63	0.5
8/23/2018	0	IN	rain	63	80	F	65	1	8	5	mph	12	76	F	0.52	0.49
8/24/2018	0	IN	rain	56	85	F	66	0	9	3	mph	6	75	F	0.47	0.48
8/25/2018	0	IN	rain	57	84	F	70	0	8	2	mph	43	74	F	0.44	0.47
8/26/2018	0	IN	rain	62	87	F	74	0	13	5	mph	16	75	F	0.41	0.46
8/27/2018	0	IN	rain	71	92	F	77	1	6	3	mph	17	80	F	0.38	0.45
8/28/2018	0	IN	rain	75	94	F	75	0	10	6	mph	8	82	F	0.36	0.43
8/29/2018	0	IN	rain	77	96	F	73	3	11	7	mph	5	84	F	0.33	0.41
8/30/2018	0	IN	rain	77	93	F	70	1	6	4	mph	24	85	F	0.31	0.39
8/31/2018	1.44	IN	rain	72	86	F	87	0	12	6	mph	84	81	F	0.6	0.42
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

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	73	76	F	0.74	0.72
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
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

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	
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
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

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	48	47	F	0.71	0.89
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

**Harness Max Weed Control Systems**

Trial ID: Corn1-18      Location: Field #18      Trial Year: 2018  
 Protocol ID: Corn1-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Monsanto

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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	Variety: D48SS38RIB	
Attributes: LL/RR	Planting Date: 04/24/18	Planting Rate: 30000 S/A
Depth: 2 in	Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 in	Planting Equipment: FE Field Equipment	Seed Bed: SMOOTH smooth
Soil Temperature: 62 F	Soil Moisture: ABONOR above normal, excessive	
Emergence Date: 05/03/18	Harvest Date: 09/27/18	Harvest Equipment: Plot combine
Harvest Date: 09/27/18	Harvested Width: 5 FT	
% Standard Moisture: 15.5	Harvested Length: 24 FT	

**Pest Description**

Pest 1 Type: W Code: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morningglory

Pest 3 Type: W Code: CYPES Cyperus esculentus  
 Common Name: Yellow nutsedge

**Site and Design**

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

**Soil Description**

Description Name: Field 18C	% Sand: 83	% OM: 1.2	Texture: LS	loamy sand
	% Silt: 10	pH: 6.4	Soil Name: Klej loamy sand, 0-2% slopes	
	% Clay: 7	CEC: 3.1	Fert. Level: F	fair
Soil Drainage: F				

**Application Description**

	A	B
Application Date	04/25/18	05/30/18
Appl. Stop Time	01:30 PM	12:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	4" wds
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	82 F	74 F
% Relative Humidity Start, Stop	49	83
Wind Velocity+Dir. Start	1 mph SW	3 mph E
Wet Leaves (Y/N)	N no	N no
Soil Temperature	82 F	74 F
Soil Moisture	NORMAL	WET
% Cloud Cover	85	80

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR
Stage Scale Used		DESC
Stage Majority, Percent		V5 100
Height Average		13 in
Height Minimum, Maximum		12 14

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	DIGSA W	DIGSA W
Stage Majority, Percent		veg 100
Height Average		5 in
Height Minimum, Maximum		4 6
Density Average		20 m2
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		1-2 lf 70
Stage Minimum, Percent		cot 10
Stage Maximum, Percent		3-If 20
Height Average		1.5 in
Height Minimum, Maximum		1 2
Density Average		2 m2
Pest 3 Code, Type, Scale	CYPES W	CYPES W
Stage Majority, Percent		veg 100
Height Average		4 in
Height Minimum, Maximum		5 5
Density Average		2 m2

**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
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	28 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

05/26/18: Fall panicum density is much higher in reps 2 and 3 compared to rep 1

05/30/18: Crabgrass spp. present only in untreated checks.

06/02/18: Ratings are based on PRE applications; No POST activity was included in the ratings

06/16/18: No corn injury observed. Roundup controlled emerged fall panicum and no new emergence was observed.

09/19/18: All treatments look good, no noticeable difference between treatments. Ear development and size looks variable due to standing water.

Harness Max Weed Control Systems									
Trial ID: Corn1-18		Location: Field #18		Trial Year: 2018					
Protocol ID: Corn1-18		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: Monsanto									
Pest Code									
Pest Name									
Crop Type, Code				C ZEAMX	C ZEAMX	AMAPA PalmerAm			
Crop Name						CHEAL C.lmsqtr			
Rating Type									
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
						Code			
1	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	PRE	A				
	----acetochlor	3.75	0.935						
	----flumetsulam	0.12	0.03						
	----clopyralid	0.38	0.095						
	Harness Max Premix	3.85 L	1.2 lb ai/a	4" wds	B				
	----acetochlor	3.52	1.1						
	----mesotrione	0.33	0.103						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" wds	B				
2	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE	A				
	----acetochlor	3.52	1.76						
	----mesotrione	0.33	0.165						
	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	4" wds	B				
	----acetochlor	3.75	0.935						
	----flumetsulam	0.12	0.03						
	----clopyralid	0.38	0.095						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" wds	B				
3	Harness Xtra 5.6L Premix	5.6 L	2.45 lb ai/a	PRE	A				
	----acetochlor	3.1	1.36						
	----atrazine	2.5	1.09						
	Harness Max Premix	3.85 L	1.2 lb ai/a	4" wds	B				
	----acetochlor	3.52	1.1						
	----mesotrione	0.33	0.103						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" wds	B				
4	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE	A				
	----acetochlor	3.52	1.76						
	----mesotrione	0.33	0.165						
	Harness Xtra 5.6L Premix	5.6 L	2.45 lb ai/a	4" wds	B				
	----acetochlor	3.1	1.36						
	----atrazine	2.5	1.09						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" wds	B				
5	Harness.....acetochlor	7 E	1.75 lb ai/a	PRE	A				
	Harness Max Premix	3.85 L	1.2 lb ai/a	4" wds	B				
	----acetochlor	3.52	1.1						
	----mesotrione	0.33	0.103						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" 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=2,4,7,8

## University of Delaware

Pest Code						AMAPA PalmerAm	CHEAL C.lmsqtr
Pest Name							
Crop Type, Code				C ZEAMX	C ZEAMX	C -	C -
Crop Name							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
6	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE	A		
	----acetochlor	3.52	1.76				
	----mesotrione	0.33	0.165				
	Harness.....acetochlor	7 E	1.09 lb ai/a	4"wds	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B		
7	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE	A		
	----acetochlor	3.52	1.76				
	----mesotrione	0.33	0.165				
	DiFlexx.....dicamba	4 L	0.5 lb ai/a	4"wds	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B		
8	Harness Max Premix	3.85 L	2.26 lb ai/a	PRE	A		
	----acetochlor	3.52	2.07				
	----mesotrione	0.33	0.194				
	Atrazine 4L	4 L	1 lb ai/a	PRE	A		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B		
9	Harness Max Premix	3.85 L	1.65 lb ai/a	PRE	A		
	----acetochlor	3.52	1.51				
	----mesotrione	0.33	0.141				
	Atrazine 4L	4 L	1 lb ai/a	PRE	A		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B		
10	Harness Max Premix	3.85 L	1.65 lb ai/a	PRE	A		
	----acetochlor	3.52	1.51				
	----mesotrione	0.33	0.141				
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds	B		
	----acetochlor	3.52	1.1				
	----mesotrione	0.33	0.103				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B		
11	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	PRE	A		
	----acetochlor	3.75	0.935				
	----flumetsulam	0.12	0.03				
	----clopyralid	0.38	0.095				
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds	B		
	----acetochlor	3.52	1.1				
	----mesotrione	0.33	0.103				
	Harness Xtra 5.6L Premix	5.6 L	1.4 lb ai/a	4"wds	B		
	----acetochlor	3.1	0.775				
	----atrazine	2.5	0.625				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B		
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"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=2,4,7,8

## University of Delaware

Pest Code						AMAPA PalmerAm	CHEAL C.lmsqtr
Pest Name							
Crop Type, Code				C ZEAMX	C ZEAMX	C -	C -
Crop Name							
Rating Type				Corn Stunting %	Corn Stunting %	Control %	Control %
Rating Unit				05/09/18	05/25/18	05/26/18	05/26/18
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
12	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			
	Halex GT Premix	4.376	SC	1.97 lb	ai/a	4"wd	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"wd	B
13	Resicore Premix	3.28	SE	1.48 lb	ai/a	PRE	A
	----acetochlor	2.8		1.26			
	----mesotrione	0.3		0.135			
	----clopyralid	0.18		0.081			
	Status Premix	56	WG	0.21 lb	ai/a	4"wd	B
	----diflufenzopyr	16		0.06			
	----dicamba	40		0.15			
	Durango DMA.....glyphosate	4	SL	1.13 lb	ae/a	4"wd	B
	Dry Ammonium Sulfate	100	D	1.02 %	w/v	4"wd	B
14	Harness Xtra 5.6L Premix	5.6	L	2.45 lb	ai/a	PRE	A
	----acetochlor	3.1		1.36			
	----atrazine	2.5		1.09			
	Balance Flexx...isoxaflutole	2	L	0.047 lb	ai/a	PRE	A
	DiFlexx.....dicamba	4	L	0.5 lb	ai/a	4"wd	B
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb	ae/a	4"wd	B
	Dry Ammonium Sulfate	100	D	1.02 %	w/v	4"wd	B
LSD P=.05				4.81		4.24	4.09
Standard Deviation				2.86		2.51	2.43
CV				87.83		53.0	2.46
Replicate F				1.622		0.493	4.272
Replicate Prob(F)				0.2169		0.6176	0.0249
Treatment F				1.969		7.335	1.960
Treatment Prob(F)				0.0686		0.0001	0.0700
							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=2,4,7,8

Pest Code Pest Name		IPOSS mornglry	DIGSA L.crbgrs	PANDI F.panicm	
Crop Type, Code Crop Name		C -	C -	C -	C ZEAMX Corn Stunting %
Rating Type		Control %	Control %	Control %	06/02/18
Rating Unit		05/26/18	05/26/18	05/26/18	
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	PRE	A
	----acetochlor	3.75	0.935		
	----flumetsulam	0.12	0.03		
	----clopyralid	0.38	0.095		
	Harness Max Premix	3.85 L	1.2 lb ai/a	4" wds	B
	----acetochlor	3.52	1.1		
	----mesotrione	0.33	0.103		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" wds	B
2	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE	A
	----acetochlor	3.52	1.76		
	----mesotrione	0.33	0.165		
	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	4" wds	B
	----acetochlor	3.75	0.935		
	----flumetsulam	0.12	0.03		
	----clopyralid	0.38	0.095		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" wds	B
3	Harness Xtra 5.6L Premix	5.6 L	2.45 lb ai/a	PRE	A
	----acetochlor	3.1	1.36		
	----atrazine	2.5	1.09		
	Harness Max Premix	3.85 L	1.2 lb ai/a	4" wds	B
	----acetochlor	3.52	1.1		
	----mesotrione	0.33	0.103		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" wds	B
4	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE	A
	----acetochlor	3.52	1.76		
	----mesotrione	0.33	0.165		
	Harness Xtra 5.6L Premix	5.6 L	2.45 lb ai/a	4" wds	B
	----acetochlor	3.1	1.36		
	----atrazine	2.5	1.09		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" wds	B
5	Harness.....acetochlor	7 E	1.75 lb ai/a	PRE	A
	Harness Max Premix	3.85 L	1.2 lb ai/a	4" wds	B
	----acetochlor	3.52	1.1		
	----mesotrione	0.33	0.103		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4" wds	B
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4" 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=2,4,7,8

## University of Delaware

Pest Code Pest Name		IPOSS morngly	DIGSA L.crbgrs	PANDI F.panicm				
Crop Type, Code Crop Name		C -	C -	C -	C ZEAMX Corn Stunting %			
Rating Type		Control %	Control %	Control %	06/02/18			
Rating Unit		05/26/18	05/26/18	05/26/18				
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code			
6	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.93 lb ai/a 1.76 0.165	PRE A	88.3 a	95.7 a	77.1 c	0.6 a
	Harness.....acetochlor	7 E	1.09 lb ai/a	4"wds B				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B				
7	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.93 lb ai/a 1.76 0.165	PRE A	86.3 ab	97.0 a	87.7 b	2.3 a
	DiFlexx.....dicamba	4 L	0.5 lb ai/a	4"wds B				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B				
8	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	2.26 lb ai/a 2.07 0.194	PRE A	91.7 a	97.0 a	93.0 ab	6.7 a
	Atrazine 4L	4 L	1 lb ai/a	PRE A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B				
9	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.65 lb ai/a 1.51 0.141	PRE A	84.0 ab	92.3 a	88.3 b	0.0 a
	Atrazine 4L	4 L	1 lb ai/a	PRE A				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B				
10	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.65 lb ai/a 1.51 0.141	PRE A	86.7 ab	97.7 a	91.7 ab	2.3 a
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds B				
	----acetochlor	3.52	1.1					
	----mesotrione	0.33	0.103					
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B				
11	TripleFlex II Premix ----acetochlor ----flumetsulam ----clopyralid	4.25 EC 3.75 0.12 0.38	1.06 lb ai/a 0.935 0.03 0.095	PRE A	82.7 ab	95.7 a	86.7 b	5.7 a
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds B				
	----acetochlor	3.52	1.1					
	----mesotrione	0.33	0.103					
	Harness Xtra 5.6L Premix	5.6 L	1.4 lb ai/a	4"wds B				
	----acetochlor	3.1	0.775					
	----atrazine	2.5	0.625					
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"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=2,4,7,8

## University of Delaware

Pest Code Pest Name	IPOSS mornglry	DIGSA L.crbgrs	PANDI F.panicm	
Crop Type, Code Crop Name	C -	C -	C -	C ZEAMX Corn Stunting %
Rating Type	Control %	Control %	Control %	06/02/18
Rating Unit	05/26/18	05/26/18	05/26/18	
Rating Date				
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Appl Timing	
12 Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4.376 SC 2.084 2.084 0.208 100 D	1.08 lb ai/a 0.314 0.0188 0.075 0.67 1.97 lb ai/a 0.94 0.94 0.094 1.02 % w/v	PRE A 4"wds B	63.3 c 93.7 a 85.7 b 0.0 a
13 Resicore Premix ----acetochlor ----mesotrione ----clopyralid Status Premix ----diflufenzopyr ----dicamba Durango DMA.....glyphosate Dry Ammonium Sulfate	3.28 SE 2.8 0.3 0.18 56 WG 16 40 4 SL 100 D	1.48 lb ai/a 1.26 0.135 0.081 0.21 lb ai/a 0.06 0.15 1.13 lb ae/a 1.02 % w/v	PRE A 4"wds B	76.7 b 96.3 a 74.6 c 7.6 a
14 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole DiFlexx.....dicamba Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 4 L 4.5 AS 100 D	2.45 lb ai/a 1.36 1.09 0.047 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE A 4"wds B	89.0 a 99.0 a 99.0 a 0.6 a
LSD P=.05 Standard Deviation CV		11.28 6.72 8.47	3.98 2.37 2.48	7.57 4.49 5.12 6.10 3.60 128.76
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		0.871 0.4306 12.646 0.0001	2.906 0.0726 1.948 0.0717	13.750 0.0001 5.582 0.0001 1.151 0.3348 1.519 0.1875

Means followed by same letter 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=2,4,7,8

Pest Code Pest Name		AMAPA PalmerAm	CHEAL C.lmsqtr	IPOSS mornglyr	PANDI F.panicm
Crop Type, Code Crop Name		C -	C -	C -	C -
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		06/02/18	06/02/18	06/02/18	06/02/18
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
1	TripleFlex II Premix	4.25 EC	1.06 lb	ai/a	PRE A
	----acetochlor	3.75	0.935		
	----flumetsulam	0.12	0.03		
	----clopyralid	0.38	0.095		
	Harness Max Premix	3.85 L	1.2 lb	ai/a	4"wds B
	----acetochlor	3.52	1.1		
	----mesotrione	0.33	0.103		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	4"wds B
	Dry Ammonium Sulfate	100 D	1.02 %	w/v	4"wds B
2	Harness Max Premix	3.85 L	1.93 lb	ai/a	PRE A
	----acetochlor	3.52	1.76		
	----mesotrione	0.33	0.165		
	TripleFlex II Premix	4.25 EC	1.06 lb	ai/a	4"wds B
	----acetochlor	3.75	0.935		
	----flumetsulam	0.12	0.03		
	----clopyralid	0.38	0.095		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	4"wds B
	Dry Ammonium Sulfate	100 D	1.02 %	w/v	4"wds B
3	Harness Xtra 5.6L Premix	5.6 L	2.45 lb	ai/a	PRE A
	----acetochlor	3.1	1.36		
	----atrazine	2.5	1.09		
	Harness Max Premix	3.85 L	1.2 lb	ai/a	4"wds B
	----acetochlor	3.52	1.1		
	----mesotrione	0.33	0.103		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	4"wds B
	Dry Ammonium Sulfate	100 D	1.02 %	w/v	4"wds B
4	Harness Max Premix	3.85 L	1.93 lb	ai/a	PRE A
	----acetochlor	3.52	1.76		
	----mesotrione	0.33	0.165		
	Harness Xtra 5.6L Premix	5.6 L	2.45 lb	ai/a	4"wds B
	----acetochlor	3.1	1.36		
	----atrazine	2.5	1.09		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	4"wds B
	Dry Ammonium Sulfate	100 D	1.02 %	w/v	4"wds B
5	Harness.....acetochlor	7 E	1.75 lb	ai/a	PRE A
	Harness Max Premix	3.85 L	1.2 lb	ai/a	4"wds B
	----acetochlor	3.52	1.1		
	----mesotrione	0.33	0.103		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb	ae/a	4"wds B
	Dry Ammonium Sulfate	100 D	1.02 %	w/v	4"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=2,4,7,8

## University of Delaware

Pest Code Pest Name		AMAPA PalmerAm	CHEAL C.lmsqtr	IPOSS mornglry	PANDI F.panictm
Crop Type, Code Crop Name		C -	C -	C -	C -
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		06/02/18	06/02/18	06/02/18	06/02/18
Rating Date					
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Appl Timing	Appl Code	
6 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.93 lb ai/a 1.76 0.165	PRE	A	100.0 a
Harness.....acetochlor Roundup PowerMax..glyphosate Dry Ammonium Sulfate	7 E 4.5 AS 100 D	1.09 lb ai/a 1.13 lb ae/a 1.02 % w/v	4"wds	B	100.0 a
7 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.93 lb ai/a 1.76 0.165	PRE	A	100.0 a
DiFlexx.....dicamba Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4 L 4.5 AS 100 D	0.5 lb ai/a 1.13 lb ae/a 1.02 % w/v	4"wds	B	100.0 a
8 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	2.26 lb ai/a 2.07 0.194	PRE	A	100.0 a
Atrazine 4L Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4 L 4.5 AS 100 D	1 lb ai/a 1.13 lb ae/a 1.02 % w/v	4"wds	B	100.0 a
9 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.65 lb ai/a 1.51 0.141	PRE	A	97.3 a
Atrazine 4L Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4 L 4.5 AS 100 D	1 lb ai/a 1.13 lb ae/a 1.02 % w/v	4"wds	B	100.0 a
10 Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.65 lb ai/a 1.51 0.141	PRE	A	98.7 a
Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.2 lb ai/a 1.1 0.103	4"wds	B	99.7 a
Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	4"wds	B	85.0 a
11 TripleFlex II Premix ----acetochlor ----flumetsulam ----clopyralid	4.25 EC 3.75 0.12 0.38	1.06 lb ai/a 0.935 0.03 0.095	PRE	A	99.0 a
Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.2 lb ai/a 1.1 0.103	4"wds	B	100.0 a
Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	1.4 lb ai/a 0.775 0.625	4"wds	B	73.3 a
Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	4"wds	B	77.7 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=2,4,7,8

## University of Delaware

Pest Code Pest Name		AMAPA PalmerAm	CHEAL C.lmsqtr	IPOSS mornglry	PANDI F.panicle		
Crop Type, Code Crop Name		C -	C -	C -	C -		
Rating Type		Control %	Control %	Control %	Control %		
Rating Unit		06/02/18	06/02/18	06/02/18	06/02/18		
Rating Date							
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Appl Timing	Appl Code			
12 Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4.376 SC 2.084 2.084 0.208 100 D	1.08 lb ai/a 0.314 0.0188 0.075 0.67 1.97 lb ai/a 0.94 0.94 0.094 1.02 % w/v	PRE A 4"wds B	97.3 a	100.0 a	78.3 a	82.3 a
13 Resicore Premix ----acetochlor ----mesotrione ----clopyralid Status Premix ----diflufenzopyr ----dicamba Durango DMA.....glyphosate Dry Ammonium Sulfate	3.28 SE 2.8 0.3 0.18 56 WG 16 40 4 SL 100 D	1.48 lb ai/a 1.26 0.135 0.081 0.21 lb ai/a 0.06 0.15 1.13 lb ae/a 1.02 % w/v	PRE A 4"wds B	100.0 a	100.0 a	76.7 a	68.3 a
14 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole DiFlexx.....dicamba Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 4 L 4.5 AS 100 D	2.45 lb ai/a 1.36 1.09 0.047 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE A 4"wds B	98.3 a	100.0 a	75.7 a	94.0 a
LSD P=.05 Standard Deviation CV		7.31 4.35 4.42	6.46 3.85 3.96	12.85 7.66 9.66	16.40 9.77 12.06		
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		2.127 0.1395 0.830 0.6270	1.664 0.2089 12.783 0.0001	3.116 0.0612 1.849 0.0884	16.313 0.0001 1.312 0.2680		

Means followed by same letter 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=2,4,7,8

Pest Code Pest Name			AMAPA PalmerAm	IPOSS mornglry	DIGSA L.crbgrs	AMAPA PalmerAm
Crop Type, Code Crop Name			C -	C -	C -	C -
Rating Type			Control %	Control %	Control %	Control %
Rating Unit			06/16/18	06/16/18	06/16/18	07/05/18
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	PRE	A	
	----acetochlor	3.75	0.935			
	----flumetsulam	0.12	0.03			
	----clopyralid	0.38	0.095			
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wd	B	
	----acetochlor	3.52	1.1			
	----mesotrione	0.33	0.103			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wd	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wd	B	
2	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE	A	
	----acetochlor	3.52	1.76			
	----mesotrione	0.33	0.165			
	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	4"wd	B	
	----acetochlor	3.75	0.935			
	----flumetsulam	0.12	0.03			
	----clopyralid	0.38	0.095			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wd	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wd	B	
3	Harness Xtra 5.6L Premix	5.6 L	2.45 lb ai/a	PRE	A	
	----acetochlor	3.1	1.36			
	----atrazine	2.5	1.09			
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wd	B	
	----acetochlor	3.52	1.1			
	----mesotrione	0.33	0.103			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wd	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wd	B	
4	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE	A	
	----acetochlor	3.52	1.76			
	----mesotrione	0.33	0.165			
	Harness Xtra 5.6L Premix	5.6 L	2.45 lb ai/a	4"wd	B	
	----acetochlor	3.1	1.36			
	----atrazine	2.5	1.09			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wd	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wd	B	
5	Harness.....acetochlor	7 E	1.75 lb ai/a	PRE	A	
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wd	B	
	----acetochlor	3.52	1.1			
	----mesotrione	0.33	0.103			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wd	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wd	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=2,4,7,8

## University of Delaware

Pest Code Pest Name			AMAPA PalmerAm	IPOSS mornglry	DIGSA L.crbgrs	AMAPA PalmerAm
Crop Type, Code Crop Name			C -	C -	C -	C -
Rating Type			Control %	Control %	Control %	Control %
Rating Unit			06/16/18	06/16/18	06/16/18	07/05/18
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
6	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.93 lb ai/a 1.76 0.165	PRE	A	94.7 b
	Harness.....acetochlor	7 E	1.09 lb ai/a	4"wds	B	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B	
7	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.93 lb ai/a 1.76 0.165	PRE	A	100.0 a
	DiFlexx.....dicamba	4 L	0.5 lb ai/a	4"wds	B	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B	
8	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	2.26 lb ai/a 2.07 0.194	PRE	A	100.0 a
	Atrazine 4L	4 L	1 lb ai/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B	
9	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.65 lb ai/a 1.51 0.141	PRE	A	91.7 b
	Atrazine 4L	4 L	1 lb ai/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B	
10	Harness Max Premix ----acetochlor ----mesotrione	3.85 L 3.52 0.33	1.65 lb ai/a 1.51 0.141	PRE	A	100.0 a
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds	B	
	----acetochlor	3.52	1.1			
	----mesotrione	0.33	0.103			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds	B	
11	TripleFlex II Premix ----acetochlor ----flumetsulam ----clopyralid	4.25 EC 3.75 0.12 0.38	1.06 lb ai/a 0.935 0.03 0.095	PRE	A	100.0 a
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds	B	
	----acetochlor	3.52	1.1			
	----mesotrione	0.33	0.103			
	Harness Xtra 5.6L Premix	5.6 L	1.4 lb ai/a	4"wds	B	
	----acetochlor	3.1	0.775			
	----atrazine	2.5	0.625			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"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=2,4,7,8

## University of Delaware

Pest Code Pest Name		AMAPA PalmerAm	IPOSS mornglry	DIGSA L.crbgrs	AMAPA PalmerAm
Crop Type, Code Crop Name		C -	C -	C -	C -
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		06/16/18	06/16/18	06/16/18	07/05/18
Rating Date					
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit	Appl Timing	Code
12 Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4.376 SC 2.084 2.084 0.208 100 D	1.08 lb ai/a 0.314 0.0188 0.075 0.67 1.97 lb ai/a 0.94 0.94 0.094 1.02 % w/v	PRE A	4"wds B	
13 Resicore Premix ----acetochlor ----mesotrione ----clopyralid Status Premix ----diflufenzopyr ----dicamba Durango DMA.....glyphosate Dry Ammonium Sulfate	3.28 SE 2.8 0.3 0.18 56 WG 16 40 4 SL 100 D	1.48 lb ai/a 1.26 0.135 0.081 0.21 lb ai/a 0.06 0.15 1.13 lb ae/a 1.02 % w/v	PRE A	4"wds B	
14 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole DiFlexx.....dicamba Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 4 L 4.5 AS 100 D	2.45 lb ai/a 1.36 1.09 0.047 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE A	4"wds B	
LSD P=.05 Standard Deviation CV		5.07 3.02 3.05	8.42 5.02 5.17	1.81 1.08 1.08	2.85 1.70 1.72
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		1.225 0.3101 2.140 0.0478	0.796 0.4618 1.094 0.4057	1.000 0.3816 2.469 0.0241	1.000 0.3816 1.000 0.4786

Means followed by same letter 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=2,4,7,8

Pest Code		IPOSS morngly	DIGSA				
Pest Name		C -	L.crbgrs	C -			
Crop Type, Code		Control	Control	ZEAMX			
Crop Name		%	%	Corn Yield			
Rating Type		07/05/18	07/05/18	Bu/A			
Rating Unit				09/27/18			
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate			
				Appl Unit			
1	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	PRE A	97.7 ab	99.0 a	202.5 a
	----acetochlor	3.75	0.935				
	----flumetsulam	0.12	0.03				
	----clopyralid	0.38	0.095				
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds B			
	----acetochlor	3.52	1.1				
	----mesotrione	0.33	0.103				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B			
2	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE A	98.3 ab	99.0 a	188.0 a
	----acetochlor	3.52	1.76				
	----mesotrione	0.33	0.165				
	TripleFlex II Premix	4.25 EC	1.06 lb ai/a	4"wds B			
	----acetochlor	3.75	0.935				
	----flumetsulam	0.12	0.03				
	----clopyralid	0.38	0.095				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B			
3	Harness Xtra 5.6L Premix	5.6 L	2.45 lb ai/a	PRE A	98.3 ab	99.0 a	193.9 a
	----acetochlor	3.1	1.36				
	----atrazine	2.5	1.09				
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds B			
	----acetochlor	3.52	1.1				
	----mesotrione	0.33	0.103				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B			
4	Harness Max Premix	3.85 L	1.93 lb ai/a	PRE A	99.0 a	99.0 a	178.8 a
	----acetochlor	3.52	1.76				
	----mesotrione	0.33	0.165				
	Harness Xtra 5.6L Premix	5.6 L	2.45 lb ai/a	4"wds B			
	----acetochlor	3.1	1.36				
	----atrazine	2.5	1.09				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"wds B			
5	Harness.....acetochlor	7 E	1.75 lb ai/a	PRE A	97.0 ab	98.3 a	183.2 a
	Harness Max Premix	3.85 L	1.2 lb ai/a	4"wds B			
	----acetochlor	3.52	1.1				
	----mesotrione	0.33	0.103				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4"wds B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	4"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=2,4,7,8

## University of Delaware

Pest Code		IPOSS morngly	DIGSA							
Pest Name		C -	L.crbgrs	C						
Crop Type, Code		Control	Control	ZEAMX						
Crop Name		%	%	Corn						
Rating Type		07/05/18	07/05/18	Yield						
Rating Unit				Bu/A						
Rating Date				09/27/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
6	Harness Max Premix ----acetochlor ----mesotrione Harness.....acetochlor Roundup PowerMax..glyphosate Dry Ammonium Sulfate	3.85 L 3.52 0.33 7 E 4.5 AS 100 D	1.93 lb ai/a 1.76 0.165 1.09 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE 4"wds B	A	94.0 bc	99.0 a	196.8 a		
7	Harness Max Premix ----acetochlor ----mesotrione DiFlexx.....dicamba Roundup PowerMax..glyphosate Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 4.5 AS 100 D	1.93 lb ai/a 1.76 0.165 0.5 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE 4"wds B	A	99.0 a	99.0 a	157.9 a		
8	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L Roundup PowerMax..glyphosate Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 4.5 AS 100 D	2.26 lb ai/a 2.07 0.194 1 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE A	4"wds B	97.7 ab	99.0 a	191.2 a		
9	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L Roundup PowerMax..glyphosate Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 4.5 AS 100 D	1.65 lb ai/a 1.51 0.141 1 lb ai/a 1.13 lb ae/a 1.02 % w/v	PRE A	4"wds B	91.7 c	99.0 a	181.4 a		
10	Harness Max Premix ----acetochlor ----mesotrione Harness Max Premix ----acetochlor ----mesotrione Roundup PowerMax..glyphosate Dry Ammonium Sulfate	3.85 L 3.52 0.33 3.85 L 3.52 0.33 4.5 AS 100 D	1.65 lb ai/a 1.51 0.141 1.2 lb ai/a 1.1 0.103 1.13 lb ae/a 1.02 % w/v	PRE A	4"wds B	99.0 a	99.0 a	190.2 a		
11	TripleFlex II Premix ----acetochlor ----flumetsulam ----clopyralid Harness Max Premix ----acetochlor ----mesotrione Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup PowerMax..glyphosate Dry Ammonium Sulfate	4.25 EC 3.75 0.12 0.38 3.85 L 3.52 0.33 5.6 L 3.1 2.5 4.5 AS 100 D	1.06 lb ai/a 0.935 0.03 0.095 1.2 lb ai/a 1.1 0.103 1.4 lb ai/a 0.775 0.625 1.13 lb ae/a 1.02 % w/v	PRE A	4"wds B	94.7 abc	99.0 a	189.4 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=2,4,7,8

## University of Delaware

Pest Code		IPOSS morngly	DIGSA							
Pest Name		C -	L.crbgrs	C						
Crop Type, Code		Control	Control	ZEAMX						
Crop Name		%	%	Corn						
Rating Type		07/05/18	07/05/18	Yield						
Rating Unit				Bu/A						
Rating Date				09/27/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
12	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Dry Ammonium Sulfate	3.44 1 0.06 0.24 2.14 4.376 2.084 2.084 0.208 100 D	ZC lb ai/a 0.314 0.0188 0.075 0.67 SC lb ai/a 1.97 4"wds B 0.94 0.94 0.094 % w/v 4"wds B	1.08 0.314 0.0188 0.075 0.67 1.97 0.94 0.94 0.094 1.02	PRE A	98.3 ab	99.0 a	180.2 a		
13	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Status Premix ----diflufenzopyr ----dicamba Durango DMA....glyphosate Dry Ammonium Sulfate	3.28 2.8 0.3 0.18 56 16 40 4 SL 100 D	SE lb ai/a 1.48 1.26 0.135 0.081 WG lb ai/a 0.21 4"wds B 0.06 0.15 lb ae/a 1.13 4"wds B % w/v 4"wds B	1.48 1.26 0.135 0.081 0.21 0.06 0.15 1.13 0.02	PRE A	99.0 a	99.0 a	196.8 a		
14	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Balance Flexx...isoxaflutole DiFlexx.....dicamba Roundup PowerMax..glyphosate Dry Ammonium Sulfate	5.6 L 3.1 2.5 2 L 4 L 4.5 AS 100 D	2.45 lb ai/a 1.36 1.09 0.047 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 0.02 % w/v 4"wds B	2.45 1.36 1.09 0.047 0.5 1.13 0.02	PRE A	99.0 a	99.0 a	187.2 a		
LSD P=.05					4.44	0.52	22.01			
Standard Deviation					2.64	0.31	13.11			
CV					2.72	0.31	7.01			
Replicate F					3.654	1.000	20.395			
Replicate Prob(F)					0.0400	0.3816	0.0001			
Treatment F					2.232	1.000	2.042			
Treatment Prob(F)					0.0395	0.4786	0.0588			

Means followed by same letter 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=2,4,7,8

## University of Delaware

Pest Code						ERICA	AMBEL	DIGSA
Pest Name					Horsewd	C.ragwd	L.crbgrs	
Crop Type, Code					C	C	C	
Crop Name					ZEAMX	-	-	
Rating Type					Corn			
Rating Unit					Injury			
Rating Date					%			
05/24/18	05/24/18	05/24/18	05/24/18	05/24/18				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
7	Balance Flexx...isoxaflutole	2 L	0.0625 lb ai/a	PRE	A			
	Atrazine 4L	4 L	1 lb ai/a	PRE	A			
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B			
	Capreno Premix	3.45 SC	0.081 lb ai/a	V3-4	B			
	----thienencarbazone	0.57	0.0134					
	----tembotrione	2.88	0.0676					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B			
8	Corvus Premix	2.63 SC	0.072 lb ai/a	PRE	A			
	----thienencarbazone	0.75	0.0205					
	----isoxaflutole	1.88	0.0515					
	Atrazine 4L	4 L	1 lb ai/a	PRE	A			
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B			
	DiFlexx Duo Premix	2.13 SC	0.4 lb ai/a	V3-4	B			
	----dicamba	1.86	0.35					
	----tembotrione	0.27	0.0507					
9	Harness Max Premix	3.85 L	1.2 lb ai/a	PRE	A			
	----acetochlor	3.52	1.1					
	----mesotrione	0.33	0.103					
	Atrazine 4L	4 L	1 lb ai/a	PRE	A			
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B			
10	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	V3-4	B			
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B			
	Atrazine 4L	4 L	1.25 lb ai/a	V3-4	B			
	Nonionic Surfactant	100 L	0.25 % v/v	V3-4	B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B			
LSD P=.05					.	29.19	.	3.65
Standard Deviation					0.00	17.02	0.00	2.13
CV					0.0	19.78	0.0	2.39
Replicate F					0.000	0.663	0.000	0.803
Replicate Prob(F)					1.0000	0.5273	1.0000	0.4632
Treatment F					0.000	10.341	0.000	654.467
Treatment Prob(F)					1.0000	0.0001	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.  
Could not calculate LSD (% mean diff) for columns 1,3 because error mean square = 0.

Pest Code		ERICAHorsewd	IPOSSmorngly	OEOSSCEPrmrse							
Pest Name											
Crop Type, Code	C ZEAMX	C -	C -	C -							
Crop Name	Corn Injury %	Control %	Control %	Control %							
Rating Type	06/04/18	06/04/18	06/04/18	06/04/18							
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1	Untreated Check							0.0 a	0.0 c	0.0 c	0.0 d
2	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate Crop Oil Concentrate	3.28 SE 2.8 0.3 0.18 4 L 5.5 SL 100 L	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a 1.38 lb ae/a 1 % v/v	PRE A			0.0 a	100.0 a	48.3 b	98.3 a	
3	Keystone NXT Premix ----acetochlor ----atrazine Abundit Edge....glyphosate Resolve Q Multi-Pak ----rimsulfuron ----thifensulfuron Abundit Edge....glyphosate	5.6 SE 3.1 2.5 5.5 SL 22.4 DF 18.4 4 5.5 SL	2.8 lb ai/a 1.55 1.25 1.38 lb ae/a 0.0175 lb ai/a 0.0144 0.00313 1.38 lb ae/a	PRE A	V3-4	B	5.0 a	83.3 a	56.7 b	91.7 ab	
4	Basis Blend Premix ----rimsulfuron ----thifensulfuron 2,4-D ester Abundit Edge....glyphosate Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate	30 SG 20 10 3.8 L 5.5 SL 3.28 SE 2.8 0.3 0.18 4 L 5.5 SL	0.0155 lb ai/a 0.0103 0.00517 0.475 lb ae/a 1.38 lb ae/a 1.03 lb ai/a 0.88 0.094 0.0565 1 lb ai/a 1.38 lb ae/a	PRE A	V5 C	C	0.0 a	83.3 a	25.0 bc	100.0 a	
5	Cinch ATZ Premix ----s-metolachlor ----atrazine Instigate Premix ----rimsulfuron ----mesotrione Abundit Edge....glyphosate Abundit Edge....glyphosate	5.5 L 2.4 3.1 45.8 WG 4.15 41.65 5.5 SL 5.5 SL	3.1 lb ai/a 1.35 1.75 0.172 lb ai/a 0.0156 0.156 1.38 lb ae/a 1.38 lb ae/a	PRE A	A	A	2.3 a	100.0 a	41.7 b	78.3 b	
6	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate Crop Oil Concentrate Realm Q Premix ----rimsulfuron ----mesotrione Abundit Edge....glyphosate	3.28 SE 2.8 0.3 0.18 4 L 5.5 SL 100 L 38.7 WG 7.5 31.2 5.5 SL	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a 1.38 lb ae/a 1 % v/v 0.097 lb ai/a 0.0188 0.078 1.38 lb ae/a	PRE A	V5 C	C	0.0 a	70.0 ab	50.0 b	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 1,3 because error mean square = 0.

## University of Delaware

Pest Code						ERICA	IPOSS	OEOSS
Pest Name					Horsewd	morngly	CEprmrse	
Crop Type, Code					C	-	-	-
Crop Name					ZEAMX			
Rating Type					Corn			
Rating Unit					Injury			
Rating Date					%			
06/04/18					06/04/18	Control %	Control %	Control %
06/04/18					06/04/18	06/04/18	06/04/18	06/04/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
7	Balance Flexx...isoxaflutole	2 L	0.0625 lb ai/a	PRE	A			
	Atrazine 4L	4 L	1 lb ai/a	PRE	A			
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B			
	Capreno Premix	3.45 SC	0.081 lb ai/a	V3-4	B			
	----thiencarbazone	0.57	0.0134					
	----tembotrione	2.88	0.0676					
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B			
8	Corvus Premix	2.63 SC	0.072 lb ai/a	PRE	A			
	----thiencarbazone	0.75	0.0205					
	----isoxaflutole	1.88	0.0515					
	Atrazine 4L	4 L	1 lb ai/a	PRE	A			
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B			
	DiFlexx Duo Premix	2.13 SC	0.4 lb ai/a	V3-4	B			
	----dicamba	1.86	0.35					
	----tembotrione	0.27	0.0507					
9	Harness Max Premix	3.85 L	1.2 lb ai/a	PRE	A			
	----acetochlor	3.52	1.1					
	----mesotrione	0.33	0.103					
	Atrazine 4L	4 L	1 lb ai/a	PRE	A			
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B			
10	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	V3-4	B			
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B			
	Atrazine 4L	4 L	1.25 lb ai/a	V3-4	B			
	Nonionic Surfactant	100 L	0.25 % v/v	V3-4	B			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B			
LSD P=.05					4.00	39.85	35.32	15.71
Standard Deviation					2.33	23.23	20.59	9.16
CV					194.44	30.1	33.58	11.41
Replicate F					0.000	4.237	0.709	0.393
Replicate Prob(F)					1.0000	0.0311	0.5052	0.6809
Treatment F					1.649	6.096	8.766	36.710
Treatment Prob(F)					0.1751	0.0006	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 1,3 because error mean square = 0.

Pest Code Pest Name		DIGSA L.crbgrs	SETFA G.foxtl	ERICA Horsewd	IPOSS mornlgy			
Crop Type, Code Crop Name		C -	C -	C -	C -			
Rating Type	Control %	Control %	Control %	Control %	Control %			
Rating Unit	06/04/18	06/04/18	06/18/18	06/18/18	06/18/18			
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing			
1	Untreated Check			0.0 c	0.0 c	0.0 c	0.0 c	
2	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate Crop Oil Concentrate	3.28 SE 2.8 0.3 0.18 4 L 5.5 SL 100 L	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a 1.38 lb ae/a 1 % v/v	PRE A	100.0 a	100.0 a	100.0 a	33.3 bc
3	Keystone NXT Premix ----acetochlor ----atrazine Abundit Edge....glyphosate Resolve Q Multi-Pak ----rimsulfuron ----thifensulfuron Abundit Edge....glyphosate	5.6 SE 3.1 2.5 5.5 SL 22.4 DF 18.4 4 5.5 SL	2.8 lb ai/a 1.55 1.25 1.38 lb ae/a 0.0175 lb ai/a 0.0144 0.00313 1.38 lb ae/a	PRE A	100.0 a	100.0 a	70.0 b	71.7 ab
4	Basis Blend Premix ----rimsulfuron ----thifensulfuron 2,4-D ester Abundit Edge....glyphosate Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate	30 SG 20 10 3.8 L 5.5 SL 3.28 SE 2.8 0.3 0.18 4 L 5.5 SL	0.0155 lb ai/a 0.0103 0.00517 0.475 lb ae/a 1.38 lb ae/a 1.03 lb ai/a 0.88 0.094 0.0565 1 lb ai/a 1.38 lb ae/a	PRE A	79.3 b	76.7 b	100.0 a	100.0 a
5	Cinch ATZ Premix ----s-metolachlor ----atrazine Instigate Premix ----rimsulfuron ----mesotrione Abundit Edge....glyphosate Abundit Edge....glyphosate	5.5 L 2.4 3.1 45.8 WG 4.15 41.65 5.5 SL 5.5 SL	3.1 lb ai/a 1.35 1.75 0.172 lb ai/a 0.0156 0.156 1.38 lb ae/a 1.38 lb ae/a	PRE A	91.7 ab	100.0 a	100.0 a	60.0 ab
6	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate Crop Oil Concentrate Realm Q Premix ----rimsulfuron ----mesotrione Abundit Edge....glyphosate	3.28 SE 2.8 0.3 0.18 4 L 5.5 SL 100 L 38.7 WG 7.5 31.2 5.5 SL	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a 1.38 lb ae/a 1 % v/v 0.097 lb ai/a 0.0188 0.078 1.38 lb ae/a	PRE A	100.0 a	98.3 a	100.0 a	85.0 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 1,3 because error mean square = 0.

## University of Delaware

Pest Code		DIGSA L.crbgrs	SETFA G.foxtl	ERICA Horsewd	IPOSS mornglry						
Pest Name		C -	C -	C -	C -						
Crop Type, Code		Control %	Control %	Control %	Control %						
Crop Name		06/04/18	06/04/18	06/18/18	06/18/18						
Rating Type											
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
7	Balance Flexx...isoxaflutole	2 L	0.0625	lb ai/a	PRE	A	96.7 a	98.3 a	100.0 a	91.7 a	
	Atrazine 4L	4 L		1 lb ai/a	PRE	A					
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	V3-4	B					
	Capreno Premix	3.45 SC		0.081 lb ai/a	V3-4	B					
	----thienencarbazone	0.57		0.0134							
	----tembotrione	2.88		0.0676							
	Dry Ammonium Sulfate	100 D		1.02 % w/v	V3-4	B					
8	Corvus Premix	2.63 SC		0.072 lb ai/a	PRE	A	93.3 ab	100.0 a	100.0 a	86.7 a	
	----thienencarbazone	0.75		0.0205							
	----isoxaflutole	1.88		0.0515							
	Atrazine 4L	4 L		1 lb ai/a	PRE	A					
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	V3-4	B					
	DiFlexx Duo Premix	2.13 SC		0.4 lb ai/a	V3-4	B					
	----dicamba	1.86		0.35							
	----tembotrione	0.27		0.0507							
9	Harness Max Premix	3.85 L		1.2 lb ai/a	PRE	A	100.0 a	100.0 a	100.0 a	59.0 ab	
	----acetochlor	3.52		1.1							
	----mesotrione	0.33		0.103							
	Atrazine 4L	4 L		1 lb ai/a	PRE	A					
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	V3-4	B					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	V3-4	B					
10	Bicep II Magnum Premix	5.5 L		2.2 lb ai/a	PRE	A	100.0 a	100.0 a	100.0 a	90.0 a	
	----s-metolachlor	2.4		0.96							
	----atrazine	3.1		1.24							
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V3-4	B					
	Callisto.....mesotrione	4 SC		0.094 lb ai/a	V3-4	B					
	Atrazine 4L	4 L		1.25 lb ai/a	V3-4	B					
	Nonionic Surfactant	100 L		0.25 % v/v	V3-4	B					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	V3-4	B					
LSD P=.05							15.94	13.85	28.19	46.16	
Standard Deviation							9.29	8.07	16.43	26.91	
CV							10.79	9.24	18.89	39.73	
Replicate F							1.671	0.972	1.000	4.410	
Replicate Prob(F)							0.2159	0.3975	0.3874	0.0276	
Treatment F							33.280	45.744	11.370	3.999	
Treatment Prob(F)							0.0001	0.0001	0.0001	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.  
Could not calculate LSD (% mean diff) for columns 1,3 because error mean square = 0.

Pest Code	Pest Name		OEOSS CEprmrse	GGGAN AnnGrass	AMAPA PalmerAm	IPOSS morngly
Crop Type, Code	Crop Name		C -	C -	C -	C -
Rating Type	Rating Unit		Control %	Control %	Control %	Control %
Rating Date			06/18/18	06/18/18	07/02/18	07/02/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
1	Untreated Check				0.0 b	0.0 c
2	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate Crop Oil Concentrate	3.28 SE 2.8 0.3 0.18 4 L 5.5 SL 100 L	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a 1.38 lb ae/a 1 % v/v	PRE A	100.0 a	90.0 b
3	Keystone NXT Premix ----acetochlor ----atrazine Abundit Edge....glyphosate Resolve Q Multi-Pak ----rimsulfuron ----thifensulfuron Abundit Edge....glyphosate	5.6 SE 3.1 2.5 5.5 SL 22.4 DF 18.4 4 5.5 SL	2.8 lb ai/a 1.55 1.25 1.38 lb ae/a 0.0175 lb ai/a 0.0144 0.00313 1.38 lb ae/a	PRE A	100.0 a	100.0 a
4	Basis Blend Premix ----rimsulfuron ----thifensulfuron 2,4-D ester Abundit Edge....glyphosate Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate	30 SG 20 10 3.8 L 5.5 SL 3.28 SE 2.8 0.3 0.18 4 L 5.5 SL	0.0155 lb ai/a 0.0103 0.00517 0.475 lb ae/a 1.38 lb ae/a 1.03 lb ai/a 0.88 0.094 0.0565 1 lb ai/a 1.38 lb ae/a	PRE A	100.0 a	100.0 a
5	Cinch ATZ Premix ----s-metolachlor ----atrazine Instigate Premix ----rimsulfuron ----mesotrione Abundit Edge....glyphosate Abundit Edge....glyphosate	5.5 L 2.4 3.1 45.8 WG 4.15 41.65 5.5 SL 5.5 SL	3.1 lb ai/a 1.35 1.75 0.172 lb ai/a 0.0156 0.156 1.38 lb ae/a 1.38 lb ae/a	PRE A	100.0 a	98.3 a
6	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate Crop Oil Concentrate Realm Q Premix ----rimsulfuron ----mesotrione Abundit Edge....glyphosate	3.28 SE 2.8 0.3 0.18 4 L 5.5 SL 100 L 38.7 WG 7.5 31.2 5.5 SL	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a 1.38 lb ae/a 1 % v/v 0.097 lb ai/a 0.0188 0.078 1.38 lb ae/a	PRE A	95.0 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 1,3 because error mean square = 0.

## University of Delaware

Pest Code	Pest Name	OEOSS	GGGAN	AMAPA	IPOSS						
Crop Type, Code		CEprmrse	AnnGrass	PalmerAm	mornglry						
Crop Name		C -	C -	C -	C -						
Rating Type		Control	Control	Control	Control						
Rating Unit		%	%	%	%						
Rating Date		06/18/18	06/18/18	07/02/18	07/02/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
7	Balance Flexx...isoxaflutole Atrazine 4L Liberty 280....glufosinate Capreno Premix ----thienencarbazone ----tembotrione Dry Ammonium Sulfate	2 L 4 L 2.34 SL 3.45 SC 0.57 2.88 100 D	0.0625 lb ai/a 1 lb ai/a 0.585 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.02 % w/v	lb ai/a lb ai/a lb ai/a lb ai/a V3-4 V3-4 V3-4	PRE PRE V3-4 B	A	97.7 a	100.0 a	100.0 a	66.7 a	
8	Corvus Premix ----thienencarbazone ----isoxaflutole Atrazine 4L Liberty 280....glufosinate DiFlexx Duo Premix ----dicamba ----tembotrione	2.63 SC 0.75 1.88 4 L 2.34 SL 2.13 SC 1.86 0.27	0.072 lb ai/a 0.0205 0.0515 1 lb ai/a 0.585 lb ai/a 0.4 lb ai/a 0.35 0.0507	lb ai/a lb ai/a lb ai/a 1 lb ai/a V3-4 V3-4 V3-4	PRE V3-4 B	A	100.0 a	98.3 a	97.3 b	61.7 a	
9	Harness Max Premix ----acetochlor ----mesotrione Atrazine 4L Liberty 280....glufosinate Dry Ammonium Sulfate	3.85 L 3.52 0.33 4 L 2.34 SL 100 D	1.2 lb ai/a 1.1 0.103 1 lb ai/a 0.585 lb ai/a 1.02 % w/v	lb ai/a lb ai/a lb ai/a 1 lb ai/a V3-4 V3-4	PRE V3-4 B	A	91.7 a	96.7 a	100.0 a	63.3 a	
10	Bicep II Magnum Premix ----s-metolachlor ----atrazine Roundup PowerMax..glyphosate Callisto.....mesotrione Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	5.5 L 2.4 3.1 4.5 AS 4 SC 4 L 100 L 100 D	2.2 lb ai/a 0.96 1.24 1.13 lb ae/a 0.094 lb ai/a 1.25 lb ai/a 0.25 % v/v 1.02 % w/v	lb ai/a lb ai/a lb ai/a ae/a V3-4 V3-4 V3-4 B	PRE V3-4 B	A	100.0 a	99.3 a	100.0 a	66.7 a	
LSD P=.05							8.60	4.03	2.51	73.48	
Standard Deviation							5.01	2.35	1.46	42.84	
CV							5.67	2.66	1.63	83.56	
Replicate F							2.932	0.296	1.000	4.292	
Replicate Prob(F)							0.0790	0.7475	0.3874	0.0299	
Treatment F							116.293	527.590	1398.917	1.153	
Treatment Prob(F)							0.0001	0.0001	0.0001	0.3788	

Means followed by same letter 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 1,3 because error mean square = 0.

Pest Code Pest Name			GGGAN AnnGrass				
Crop Type, Code Crop Name			C -				
Rating Type			Control %				
Rating Unit							
Rating Date			07/02/18				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check						0.0 b
2	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate Crop Oil Concentrate	3.28 SE 2.8 0.3 0.18 4 L 5.5 SL 100 L	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a 1.38 lb ae/a 1 % v/v	PRE PRE PRE	A A A		94.3 a
3	Keystone NXT Premix ----acetochlor ----atrazine Abundit Edge....glyphosate Resolve Q Multi-Pak ----rimsulfuron ----thifensulfuron Abundit Edge....glyphosate	5.6 SE 3.1 2.5 5.5 SL 22.4 DF 18.4 4 5.5 SL	2.8 lb ai/a 1.55 1.25 1.38 lb ae/a 0.0175 lb ai/a 0.0144 0.00313 1.38 lb ae/a	PRE PRE PRE V3-4	A A B B		97.7 a
4	Basis Blend Premix ----rimsulfuron ----thifensulfuron 2,4-D ester Abundit Edge....glyphosate Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate	30 SG 20 10 3.8 L 5.5 SL 3.28 SE 2.8 0.3 0.18 4 L 5.5 SL	0.0155 lb ai/a 0.0103 0.00517 0.475 lb ae/a 1.38 lb ae/a 1.03 lb ai/a 0.88 0.094 0.0565 1 lb ai/a 1.38 lb ae/a	PRE PRE PRE V5 V5	A A C C C		100.0 a
5	Cinch ATZ Premix ----s-metolachlor ----atrazine Instigate Premix ----rimsulfuron ----mesotrione Abundit Edge....glyphosate Abundit Edge....glyphosate	5.5 L 2.4 3.1 45.8 WG 4.15 41.65 5.5 SL 5.5 SL	3.1 lb ai/a 1.35 1.75 0.172 lb ai/a 0.0156 0.156 1.38 lb ae/a 1.38 lb ae/a	PRE PRE PRE V5 V5	A A A C		98.3 a
6	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L Abundit Edge....glyphosate Crop Oil Concentrate Realm Q Premix ----rimsulfuron ----mesotrione Abundit Edge....glyphosate	3.28 SE 2.8 0.3 0.18 4 L 5.5 SL 100 L 38.7 WG 7.5 31.2 5.5 SL	2.05 lb ai/a 1.75 0.188 0.113 1 lb ai/a 1.38 lb ae/a 1 % v/v 0.097 lb ai/a 0.0188 0.078 1.38 lb ae/a	PRE PRE PRE V5 V5	A A A C C		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.  
Could not calculate LSD (% mean diff) for columns 1,3 because error mean square = 0.

## University of Delaware

Pest Code				GGGAN		
Pest Name				AnnGrass		
Crop Type, Code				C	-	
Crop Name				Control	%	
Rating Type				07/02/18		
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
7	Balance Flexx...isoxaflutole	2 L	0.0625 lb ai/a	PRE	A	100.0 a
	Atrazine 4L	4 L	1 lb ai/a	PRE	A	
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B	
	Capreno Premix	3.45 SC	0.081 lb ai/a	V3-4	B	
	----thiencarbazone	0.57	0.0134			
	----tembotrione	2.88	0.0676			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B	
8	Corvus Premix	2.63 SC	0.072 lb ai/a	PRE	A	98.0 a
	----thiencarbazone	0.75	0.0205			
	----isoxaflutole	1.88	0.0515			
	Atrazine 4L	4 L	1 lb ai/a	PRE	A	
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B	
	DiFlexx Duo Premix	2.13 SC	0.4 lb ai/a	V3-4	B	
	----dicamba	1.86	0.35			
	----tembotrione	0.27	0.0507			
9	Harness Max Premix	3.85 L	1.2 lb ai/a	PRE	A	97.7 a
	----acetochlor	3.52	1.1			
	----mesotrione	0.33	0.103			
	Atrazine 4L	4 L	1 lb ai/a	PRE	A	
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	V3-4	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B	
10	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	PRE	A	97.0 a
	----s-metolachlor	2.4	0.96			
	----atrazine	3.1	1.24			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3-4	B	
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B	
	Atrazine 4L	4 L	1.25 lb ai/a	V3-4	B	
	Nonionic Surfactant	100 L	0.25 % v/v	V3-4	B	
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B	
LSD P=.05						8.58
Standard Deviation						5.00
CV						5.7
Replicate F						0.745
Replicate Prob(F)						0.4887
Treatment F						114.465
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.  
Could not calculate LSD (% mean diff) for columns 1,3 because error mean square = 0.

**Anthem Flex / Anthem Max in Field Corn**

Trial ID: Corn3-18      Location: Field #18      Trial Year: 2018  
Protocol ID: Corn3-18      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: FMC

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Initiation Date: 03/01/18  
Completion Date: 09/30/18

**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	Variety: D48SS38RIB	
Attributes: LL/RR	Planting Date: 05/09/18	Planting Rate: 30000 S/A
Depth: 2 in	Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 in	Planting Equipment: FE Field Equipment	Seed Bed: SMOOTH smooth
Soil Temperature: 72 F	Soil Moisture: ABONOR above normal, excessive	
Emergence Date: 05/15/18	Harvest Equipment: Plot combine	
Harvest Date: 09/28/18	Harvested Width: 5 FT	Harvested Length: 24 FT
% Standard Moisture: 15.5		

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.  
Common Name: Morningglory

Pest 2 Type: W Code: MOLVE Mollugo verticillata  
Common Name: Carpetweed

Pest 3 Type: W Code: CYPES Cyperus esculentus  
Common Name: Yellow nutsedge

**Site and Design**

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

**Soil Description**

Description Name: Field 18C	% Sand: 83	% OM: 1.2	Texture: LS	loamy sand
	% Silt: 10	pH: 6.4	Soil Name: Klej loamy sand, 0-2% slopes	
	% Clay: 7	CEC: 3.1	Fert. Level: F	fair
Soil Drainage: F	fair			

**Application Description**

	A	B
Application Date	05/09/18	06/01/18
Appl. Stop Time	02:00 PM	02:00 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	V3-4
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	70 F	83 F
% Relative Humidity Start, Stop	44	73
Wind Velocity+Dir. Start	3 mph NE	2 mph SW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	70 F	83 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	0	25

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR
Stage Scale Used		DESC
Stage Majority, Percent		V4 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
Stage Majority, Percent		veg 100
Height Average		2.5 in
Height Minimum, Maximum		2 3
Density Average		5 m2
Pest 2 Code, Type, Scale	MOLVE W	MOLVE W
Stage Majority, Percent		veg 100
Diameter		1 in
Height Minimum, Maximum		0.6 1.2
Density Average		80 m2
Pest 3 Code, Type, Scale	CYPES W	CYPES W
Stage Majority, Percent		veg 100
Height Average		4 in
Height Minimum, Maximum		3 5
Density Average		3 m2

**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
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

Date	Notes
06/18/18	Poor weed pressure in study area.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

09/19/18: All treatments look good; no differences observed between treatments.

Anthem Flex / Anthem Max in Field Corn									
Trial ID: Corn3-18		Location: Field #18		Trial Year: 2018					
Protocol ID: Corn3-18		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: FMC									
Pest Code							AMAPA		
Pest Name							PalmerAm		
Crop Type, Code				C	ZEAMX	C	ZEAMX		
Crop Name					Corn		Corn		
Rating Type					Injury		Injury		
Rating Unit					%		%		
Rating Date				05/25/18		06/06/18	06/06/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check								
2	Anthem Flex Premix	4 SE	0.14 lb ai/a	PRE	A	0.0 a	3.3 a		
	----pyroxasulfone	3.733	0.131				100.0 a		
	----carfentrazone	0.267	0.0093						
	Atrazine 4L	4 L	1 lb ai/a	PRE	A				
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B				
	Atrazine 4L	4 L	0.5 lb ai/a	V3-4	B				
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B				
	Crop Oil Concentrate	100 L	1 % v/v	V3-4	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B				
3	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	PRE	A	0.0 a	3.3 a		
	----pyroxasulfone	4.174	0.13				100.0 a		
	----fluthiacet	0.126	0.00393						
	Atrazine 4L	4 L	1 lb ai/a	PRE	A				
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B				
	Atrazine 4L	4 L	0.5 lb ai/a	V3-4	B				
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B				
	Crop Oil Concentrate	100 L	1 % v/v	V3-4	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B				
4	Anthem Flex Premix	4 SE	0.14 lb ai/a	PRE	A	0.0 a	3.3 a		
	----pyroxasulfone	3.733	0.131				100.0 a		
	----carfentrazone	0.267	0.0093						
	Atrazine 4L	4 L	1.5 lb ai/a	PRE	A				
	Callisto.....mesotrione	4 SC	0.188 lb ai/a	PRE	A				
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B				
	Crop Oil Concentrate	100 L	1 % v/v	V3-4	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B				
5	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	PRE	A	0.0 a	3.3 a		
	----pyroxasulfone	4.174	0.13				70.0 b		
	----fluthiacet	0.126	0.00393						
	Atrazine 4L	4 L	1.5 lb ai/a	PRE	A				
	Callisto.....mesotrione	4 SC	0.188 lb ai/a	PRE	A				
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B				
	Crop Oil Concentrate	100 L	1 % v/v	V3-4	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B				
6	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	V3-4	B	0.0 a	3.3 a		
	----pyroxasulfone	4.174	0.13				100.0 a		
	----fluthiacet	0.126	0.00393						
	Atrazine 4L	4 L	1.5 lb ai/a	V3-4	B				
	Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B				
	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B				
	Crop Oil Concentrate	100 L	1 % v/v	V3-4	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	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.  
Could not calculate LSD (% mean diff) for columns 1,5,6,7,16 because error mean square = 0.

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Pest Code Pest Name		C	ZEAMX Corn Injury %	C	ZEAMX Corn Injury %	AMAPA PalmerAm
Crop Type, Code Crop Name						C -
Rating Type						Control %
Rating Unit						
Rating Date		05/25/18		06/06/18		06/06/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
7	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Crop Oil Concentrate Dry Ammonium Sulfate	3.44 1 0.06 0.24 2.14 4.5 AS 100 L 100 D	ZC 0.5 0.03 0.12 1.07 lb ae/a 1 % v/v 1.02 % w/v	1.72 V3-4 B		
					0.0 a	1.7 a
8	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L	4.376 2.084 2.084 0.208 4 L	SC 0.94 0.94 0.094 1.5 lb ai/a	1.97 V3-4 B		0.0 a
					0.0 a	100.0 a
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208		2.2 lb ai/a PRE	A	
				0.96 1.24 1.97 lb ai/a 0.94 0.94 0.094		0.0 a
10	Bicep II Magnum Premix ----s-metolachlor ----atrazine Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5.5 L 2.4 3.1 4 SC 4 L 4.5 AS 100 L 100 D		2.2 lb ai/a PRE	A	
				0.96 1.24 0.094 lb ai/a 1.25 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v		0.0 a
LSD P=.05 Standard Deviation CV					.	3.80 2.22 120.83
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					0.00 0.0000 0.0000 1.0000	16.43 0.3874 11.370 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 1,5,6,7,16 because error mean square = 0.

Pest Code Pest Name		IPOSS mornglry	MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm
Crop Type, Code Crop Name		C -	C -	C -	C -
Rating Type	Control %	Control %	Control %	Control %	Control %
Rating Unit					
Rating Date	06/06/18	06/06/18	06/06/18	06/06/18	06/18/18
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Unit	Appl Timing	Appl Code	
1 Untreated Check			0.0 c	0.0 b	0.0 b
2 Anthem Flex Premix ----pyroxasulfone ----carfentrazone	4 SE 3.733 0.267	0.14 lb ai/a 0.131 0.0093	PRE	A	100.0 a
Atrazine 4L Callisto.....mesotrione	4 L 4 SC	1 lb ai/a 0.094 lb ai/a	V3-4	B	
Atrazine 4L Roundup PowerMax..glyphosate	4 L 4.5 AS	0.5 lb ai/a 0.77 lb ae/a	V3-4	B	
Crop Oil Concentrate Dry Ammonium Sulfate	100 L 100 D	1 % v/v 1.02 % w/v	V3-4	B	
3 Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	4.3 SC 4.174 0.126	0.134 lb ai/a 0.13 0.00393	PRE	A	100.0 a
Atrazine 4L Callisto.....mesotrione	4 L 4 SC	1 lb ai/a 0.094 lb ai/a	V3-4	B	
Atrazine 4L Roundup PowerMax..glyphosate	4 L 4.5 AS	0.5 lb ai/a 0.77 lb ae/a	V3-4	B	
Crop Oil Concentrate Dry Ammonium Sulfate	100 L 100 D	1 % v/v 1.02 % w/v	V3-4	B	
4 Anthem Flex Premix ----pyroxasulfone ----carfentrazone	4 SE 3.733 0.267	0.14 lb ai/a 0.131 0.0093	PRE	A	85.0 b
Atrazine 4L Callisto.....mesotrione	4 L 4 SC	1.5 lb ai/a 0.188 lb ai/a	PRE	A	
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B	
Crop Oil Concentrate Dry Ammonium Sulfate	100 L 100 D	1 % v/v 1.02 % w/v	V3-4	B	
5 Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	4.3 SC 4.174 0.126	0.134 lb ai/a 0.13 0.00393	PRE	A	85.0 b
Atrazine 4L Callisto.....mesotrione	4 L 4 SC	1.5 lb ai/a 0.188 lb ai/a	PRE	A	
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B	
Crop Oil Concentrate Dry Ammonium Sulfate	100 L 100 D	1 % v/v 1.02 % w/v	V3-4	B	
6 Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	4.3 SC 4.174 0.126	0.134 lb ai/a 0.13 0.00393	V3-4	B	100.0 a
Atrazine 4L Callisto.....mesotrione	4 L 4 SC	1.5 lb ai/a 0.094 lb ai/a	V3-4	B	
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B	
Crop Oil Concentrate Dry Ammonium Sulfate	100 L 100 D	1 % v/v 1.02 % w/v	V3-4	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.  
Could not calculate LSD (% mean diff) for columns 1,5,6,7,16 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		IPOSS mornglry	MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm			
Crop Type, Code Crop Name		C -	C -	C -	C -			
Rating Type	Control %	Control %	Control %	Control %	Control %			
Rating Unit								
Rating Date	06/06/18	06/06/18	06/06/18	06/06/18	06/18/18			
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing	Appl Code				
7 Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Crop Oil Concentrate Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4.5 AS 100 L 100 D	1.72 lb ai/a 0.5 0.03 0.12 1.07 0.77 lb ae/a 1 % v/v 1.02 % w/v	V3-4 B V3-4 B V3-4 B		93.3 ab	100.0 a	100.0 a	100.0 a
8 Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L	4.376 SC 2.084 2.084 0.208 4 L	1.97 lb ai/a 0.94 0.94 0.094 1.5 lb ai/a	V3-4 B V3-4 B V3-4 B		100.0 a	100.0 a	100.0 a	100.0 a
9 Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208	2.2 lb ai/a 0.96 1.24 1.97 lb ai/a 0.94 0.94 0.094	PRE A V3-4 B		95.0 ab	100.0 a	100.0 a	100.0 a
10 Bicep II Magnum Premix ----s-metolachlor ----atrazine Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5.5 L 2.4 3.1 4 SC 4 L 4.5 AS 100 L 100 D	2.2 lb ai/a 0.96 1.24 0.094 lb ai/a 1.25 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	PRE A V3-4 B V3-4 B V3-4 B		100.0 a	100.0 a	100.0 a	100.0 a
LSD P=.05 Standard Deviation CV		14.88 8.68 10.11						
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		2.402 0.1189 37.694 0.0001	0.000 1.0000 0.000 1.0000	0.000 1.0000 0.000 1.0000	0.000 1.0000 0.000 1.0000	0.000 1.0000 0.000 1.0000	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 1,5,6,7,16 because error mean square = 0.

Pest Code	Pest Name		AMBEL C.ragwd	IPOSS mornlry	MOLVE Carpetwd	DIGSA L.crbgrs
Crop Type, Code	Crop Name		C -	C -	C -	C -
Rating Type	Rating Unit		Control %	Control %	Control %	Control %
Rating Date			06/18/18	06/18/18	06/18/18	06/18/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated Check					
2	Anthem Flex Premix	4 SE	0.14 lb ai/a	PRE	A	98.3 b
----pyroxasulfone	3.733	0.131				
----carfentrazone	0.267	0.0093				
Atrazine 4L	4 L	1 lb ai/a	PRE	A		
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B		
Atrazine 4L	4 L	0.5 lb ai/a	V3-4	B		
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B		
Crop Oil Concentrate	100 L	1 % v/v	V3-4	B		
Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B		
3	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	PRE	A	100.0 a
----pyroxasulfone	4.174	0.13				
----fluthiacet	0.126	0.00393				
Atrazine 4L	4 L	1 lb ai/a	PRE	A		
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B		
Atrazine 4L	4 L	0.5 lb ai/a	V3-4	B		
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B		
Crop Oil Concentrate	100 L	1 % v/v	V3-4	B		
Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B		
4	Anthem Flex Premix	4 SE	0.14 lb ai/a	PRE	A	100.0 a
----pyroxasulfone	3.733	0.131				
----carfentrazone	0.267	0.0093				
Atrazine 4L	4 L	1.5 lb ai/a	PRE	A		
Callisto.....mesotrione	4 SC	0.188 lb ai/a	PRE	A		
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B		
Crop Oil Concentrate	100 L	1 % v/v	V3-4	B		
Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B		
5	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	PRE	A	100.0 a
----pyroxasulfone	4.174	0.13				
----fluthiacet	0.126	0.00393				
Atrazine 4L	4 L	1.5 lb ai/a	PRE	A		
Callisto.....mesotrione	4 SC	0.188 lb ai/a	PRE	A		
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B		
Crop Oil Concentrate	100 L	1 % v/v	V3-4	B		
Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	B		
6	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	V3-4	B	100.0 a
----pyroxasulfone	4.174	0.13				
----fluthiacet	0.126	0.00393				
Atrazine 4L	4 L	1.5 lb ai/a	V3-4	B		
Callisto.....mesotrione	4 SC	0.094 lb ai/a	V3-4	B		
Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	V3-4	B		
Crop Oil Concentrate	100 L	1 % v/v	V3-4	B		
Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-4	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.  
Could not calculate LSD (% mean diff) for columns 1,5,6,7,16 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		AMBEL C.ragwd	IPOSS mornlry	MOLVE Carpetwd	DIGSA L.crbgrs			
Crop Type, Code Crop Name		C -	C -	C -	C -			
Rating Type		Control %	Control %	Control %	Control %			
Rating Unit								
Rating Date		06/18/18	06/18/18	06/18/18	06/18/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing Appl Code			
7	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor Roundup PowerMax..glyphosate Crop Oil Concentrate Dry Ammonium Sulfate	3.44 ZC 1 0.06 0.24 2.14 4.5 AS 100 L 100 D	ZC 0.5 0.03 0.12 1.07 lb ae/a 1 % v/v 1.02 % w/v	1.72 lb ai/a V3-4 B	100.0 a	100.0 a	100.0 a	100.0 a
8	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L	4.376 SC 2.084 2.084 0.208 4 L	SC 0.94 0.94 0.094 1.5 lb ai/a	1.97 lb ai/a V3-4 B	100.0 a	93.3 a	100.0 a	100.0 a
9	Bicep II Magnum Premix ----s-metolachlor ----atrazine Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione	5.5 L 2.4 3.1 4.376 SC 2.084 2.084 0.208	L 0.96 1.24 SC 0.94 0.94 0.094	2.2 lb ai/a PRE A	100.0 a	100.0 a	100.0 a	100.0 a
10	Bicep II Magnum Premix ----s-metolachlor ----atrazine Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5.5 L 2.4 3.1 4 SC 4 L 4.5 AS 100 L 100 D	L 0.96 1.24 SC 0.94 0.94 0.094 lb ai/a V3-4 B	2.2 lb ai/a PRE A	100.0 a	93.3 a	100.0 a	100.0 a
LSD P=.05 Standard Deviation CV					1.57 0.91 1.02	11.01 6.42 7.41	0.63 0.37 0.41	1.57 0.91 1.02
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					1.000 0.3874 3587.667 0.0001	3.539 0.0505 68.180 0.0001	1.000 0.3874 22467.669 0.0001	1.000 0.3874 3587.667 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 1,5,6,7,16 because error mean square = 0.

Pest Code	Pest Name		CYPES Y.nutsge	AMAPA PalmerAm	AMBEL C.ragwd	IPOSS morngly			
Crop Type, Code	Crop Name		C -	C -	C -	C -			
Rating Type	Rating Unit		Control %	Control %	Control %	Control %			
Rating Date			06/18/18	07/02/18	07/02/18	07/02/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
	1 Untreated Check				0.0 c	0.0 b	0.0 b	0.0 c	
2	Anthem Flex Premix	4 SE	0.14 lb ai/a	PRE	A	94.3 ab	96.7 a	100.0 a	66.7 ab
----pyroxasulfone		3.733	0.131						
----carfentrazone		0.267	0.0093						
Atrazine 4L		4 L	1 lb ai/a	PRE	A				
Callisto.....mesotrione		4 SC	0.094 lb ai/a	V3-4	B				
Atrazine 4L		4 L	0.5 lb ai/a	V3-4	B				
Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V3-4	B				
Crop Oil Concentrate		100 L	1 % v/v	V3-4	B				
Dry Ammonium Sulfate		100 D	1.02 % w/v	V3-4	B				
3	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	PRE	A	100.0 a	100.0 a	100.0 a	66.7 ab
----pyroxasulfone		4.174	0.13						
----fluthiacet		0.126	0.00393						
Atrazine 4L		4 L	1 lb ai/a	PRE	A				
Callisto.....mesotrione		4 SC	0.094 lb ai/a	V3-4	B				
Atrazine 4L		4 L	0.5 lb ai/a	V3-4	B				
Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V3-4	B				
Crop Oil Concentrate		100 L	1 % v/v	V3-4	B				
Dry Ammonium Sulfate		100 D	1.02 % w/v	V3-4	B				
4	Anthem Flex Premix	4 SE	0.14 lb ai/a	PRE	A	91.0 ab	100.0 a	100.0 a	33.3 bc
----pyroxasulfone		3.733	0.131						
----carfentrazone		0.267	0.0093						
Atrazine 4L		4 L	1.5 lb ai/a	PRE	A				
Callisto.....mesotrione		4 SC	0.188 lb ai/a	PRE	A				
Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V3-4	B				
Crop Oil Concentrate		100 L	1 % v/v	V3-4	B				
Dry Ammonium Sulfate		100 D	1.02 % w/v	V3-4	B				
5	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	PRE	A	96.7 ab	96.7 a	100.0 a	66.7 ab
----pyroxasulfone		4.174	0.13						
----fluthiacet		0.126	0.00393						
Atrazine 4L		4 L	1.5 lb ai/a	PRE	A				
Callisto.....mesotrione		4 SC	0.188 lb ai/a	PRE	A				
Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V3-4	B				
Crop Oil Concentrate		100 L	1 % v/v	V3-4	B				
Dry Ammonium Sulfate		100 D	1.02 % w/v	V3-4	B				
6	Anthem Maxx Premix	4.3 SC	0.134 lb ai/a	V3-4	B	100.0 a	100.0 a	96.7 a	100.0 a
----pyroxasulfone		4.174	0.13						
----fluthiacet		0.126	0.00393						
Atrazine 4L		4 L	1.5 lb ai/a	V3-4	B				
Callisto.....mesotrione		4 SC	0.094 lb ai/a	V3-4	B				
Roundup PowerMax..glyphosate		4.5 AS	0.77 lb ae/a	V3-4	B				
Crop Oil Concentrate		100 L	1 % v/v	V3-4	B				
Dry Ammonium Sulfate		100 D	1.02 % w/v	V3-4	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.  
Could not calculate LSD (% mean diff) for columns 1,5,6,7,16 because error mean square = 0.

## University of Delaware

Pest Code		CYPES	AMAPA	AMBEL	IPOSS						
Pest Name		Y.nutsge	PalmerAm	C.ragwd	mornlgy						
Crop Type, Code		C -	C -	C -	C -						
Crop Name		Control	Control	Control	Control						
Rating Type		%	%	%	%						
Rating Unit		06/18/18	07/02/18	07/02/18	07/02/18						
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code					
7	Acuron Premix	3.44	ZC	1.72 lb	ai/a	V3-4	B	100.0 a	100.0 a	100.0 a	86.7 ab
	----atrazine	1		0.5							
	----bicyclopyrone	0.06		0.03							
	----mesotrione	0.24		0.12							
	----s-metolachlor	2.14		1.07							
	Roundup PowerMax..glyphosate	4.5	AS	0.77 lb	ae/a	V3-4	B				
	Crop Oil Concentrate	100	L	1 %	v/v	V3-4	B				
	Dry Ammonium Sulfate	100	D	1.02 %	w/v	V3-4	B				
8	Halex GT Premix	4.376	SC	1.97 lb	ai/a	V3-4	B	99.3 a	98.3 a	100.0 a	100.0 a
	----s-metolachlor	2.084		0.94							
	----glyphosate	2.084		0.94							
	----mesotrione	0.208		0.094							
	Atrazine 4L	4	L	1.5 lb	ai/a	V3-4	B				
9	Bicep II Magnum Premix	5.5	L	2.2 lb	ai/a	PRE	A	70.0 b	100.0 a	97.7 a	100.0 a
	----s-metolachlor	2.4		0.96							
	----atrazine	3.1		1.24							
	Halex GT Premix	4.376	SC	1.97 lb	ai/a	V3-4	B				
	----s-metolachlor	2.084		0.94							
	----glyphosate	2.084		0.94							
	----mesotrione	0.208		0.094							
10	Bicep II Magnum Premix	5.5	L	2.2 lb	ai/a	PRE	A	100.0 a	100.0 a	96.7 a	66.7 ab
	----s-metolachlor	2.4		0.96							
	----atrazine	3.1		1.24							
	Callisto.....mesotrione	4	SC	0.094 lb	ai/a	V3-4	B				
	Atrazine 4L	4	L	1.25 lb	ai/a	V3-4	B				
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb	ae/a	V3-4	B				
	Nonionic Surfactant	100	L	0.25 %	v/v	V3-4	B				
	Dry Ammonium Sulfate	100	D	1.02 %	w/v	V3-4	B				
LSD P=.05						28.54	4.76	4.88	55.99		
Standard Deviation						16.64	2.77	2.84	32.64		
CV						19.54	3.11	3.19	47.53		
Replicate F						1.237	0.759	1.275	6.772		
Replicate Prob(F)						0.3137	0.4825	0.3035	0.0064		
Treatment F						10.614	383.916	364.769	2.894		
Treatment Prob(F)						0.0001	0.0001	0.0001	0.0263		

Means followed by same letter 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 1,5,6,7,16 because error mean square = 0.

Pest Code					SETFA			
Pest Name				G.foxtl	C -	ZEAMX		
Crop Type, Code				Control	%	Corn Yield		
Crop Name				07/02/18		Bu/A		
Rating Type						09/28/18		
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing		
1	Untreated Check							
2	Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate Crop Oil Concentrate Dry Ammonium Sulfate	4 SE 3.733 0.267 4 L 4 SC 4 L 4.5 AS 100 L 100 D		0.14 lb ai/a 0.131 0.0093 1 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 0.77 lb ae/a 1 % v/v 1.02 % w/v	PRE A V3-4 V3-4 V3-4 V3-4	A	100.0 a	188.3 a
3	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Atrazine 4L Callisto.....mesotrione Atrazine 4L Roundup PowerMax..glyphosate Crop Oil Concentrate Dry Ammonium Sulfate	4.3 SC 4.174 0.126 4 L 4 SC 4 L 4.5 AS 100 L 100 D		0.134 lb ai/a 0.13 0.00393 1 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 0.77 lb ae/a 1 % v/v 1.02 % w/v	PRE A V3-4 V3-4 V3-4 V3-4	A	100.0 a	178.7 a
4	Anthem Flex Premix ----pyroxasulfone ----carfentrazone Atrazine 4L Callisto.....mesotrione Roundup PowerMax..glyphosate Crop Oil Concentrate Dry Ammonium Sulfate	4 SE 3.733 0.267 4 L 4 SC 4.5 AS 100 L 100 D		0.14 lb ai/a 0.131 0.0093 1.5 lb ai/a 0.188 lb ai/a 0.77 lb ae/a 1 % v/v 1.02 % w/v	PRE A V3-4 V3-4 V3-4 V3-4	A	100.0 a	193.8 a
5	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Atrazine 4L Callisto.....mesotrione Roundup PowerMax..glyphosate Crop Oil Concentrate Dry Ammonium Sulfate	4.3 SC 4.174 0.126 4 L 4 SC 4.5 AS 100 L 100 D		0.134 lb ai/a 0.13 0.00393 1.5 lb ai/a 0.188 lb ai/a 0.77 lb ae/a 1 % v/v 1.02 % w/v	PRE A V3-4 V3-4 V3-4 V3-4	A	100.0 a	187.8 a
6	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Atrazine 4L Callisto.....mesotrione Roundup PowerMax..glyphosate Crop Oil Concentrate Dry Ammonium Sulfate	4.3 SC 4.174 0.126 4 L 4 SC 4.5 AS 100 L 100 D		0.134 lb ai/a 0.13 0.00393 1.5 lb ai/a 0.094 lb ai/a 0.77 lb ae/a 1 % v/v 1.02 % w/v	V3-4 B V3-4 B V3-4 B V3-4	B	100.0 a	188.3 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 1,5,6,7,16 because error mean square = 0.

## University of Delaware

Pest Code		SETFA			
Pest Name		G.foxtl			
Crop Type, Code		C -	C	ZEAMX	
Crop Name				Corn	
Rating Type				Yield	
Rating Unit				Bu/A	
Rating Date		07/02/18		09/28/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
7	Acuron Premix	3.44	ZC	1.72 lb ai/a	V3-4 B
	----atrazine	1		0.5	
	----bicyclopyrone	0.06		0.03	
	----mesotrione	0.24		0.12	
	----s-metolachlor	2.14		1.07	
	Roundup PowerMax..glyphosate	4.5	AS	0.77 lb ae/a	V3-4 B
	Crop Oil Concentrate	100	L	1 % v/v	V3-4 B
	Dry Ammonium Sulfate	100	D	1.02 % w/v	V3-4 B
8	Halex GT Premix	4.376	SC	1.97 lb ai/a	V3-4 B
	----s-metolachlor	2.084		0.94	
	----glyphosate	2.084		0.94	
	----mesotrione	0.208		0.094	
	Atrazine 4L	4	L	1.5 lb ai/a	V3-4 B
9	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	
	Halex GT Premix	4.376	SC	1.97 lb ai/a	V3-4 B
	----s-metolachlor	2.084		0.94	
	----glyphosate	2.084		0.94	
	----mesotrione	0.208		0.094	
10	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	
	Callisto.....mesotrione	4	SC	0.094 lb ai/a	V3-4 B
	Atrazine 4L	4	L	1.25 lb ai/a	V3-4 B
	Roundup PowerMax..glyphosate	4.5	AS	1.13 lb ae/a	V3-4 B
	Nonionic Surfactant	100	L	0.25 % v/v	V3-4 B
	Dry Ammonium Sulfate	100	D	1.02 % w/v	V3-4 B
LSD P=.05				.	26.73
Standard Deviation				0.00	15.58
CV				0.0	8.56
Replicate F				0.000	1.728
Replicate Prob(F)				1.0000	0.2058
Treatment F				0.000	7.766
Treatment Prob(F)				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.  
Could not calculate LSD (% mean diff) for columns 1,5,6,7,16 because error mean square = 0.

DiFlexx Duo Efficacy and Tolerance in Field Corn  
 Trial ID: Corn5-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: Corn5-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Bayer CropScience

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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	Variety: D48SS38RIB	
Attributes: LL/RR	Planting Date: 04/24/18	Planting Rate: 30000 S/A
Depth: 2 in	Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 in	Planting Equipment: FE Field Equipment	Seed Bed: SMOOTH smooth
Soil Temperature: 62 F	Harvest Equipment: Plot combine	Soil Moisture: ABONOR above normal, excessive
Emergence Date: 05/03/18	Harvested Width: 5 FT	
% Standard Moisture: 15.5	Harvested Length: 24 FT	

**Pest Description**

Pest 1 Type: W Code: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morningglory

Pest 3 Type: W Code: CYPES Cyperus esculentus  
 Common Name: Yellow nutsedge

**Site and Design**

Treated Plot Width: 6.67 FT	Site Type: FIELD field
Treated Plot Length: 25 FT	Tillage Type: CONTIL conventional-till
Treated Plot Area: 166.75 FT <sup>2</sup>	Study Design: RACOBL Randomized Complete Block (RCB)
Treatments: 6	Replications: 3

**Field Prep./Maintenance:**

Total preemergence application of Dual II Magnum at 0.67 pt/A on 04-25-18.

**Soil Description**

Description Name: Field 18C  
% Sand: 83 % OM: 1.2 Texture: LS loamy sand  
% Silt: 10 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes  
% Clay: 7 CEC: 3.1 Fert. Level: F fair  
Soil Drainage: F fair

**Application Description**

	A
Application Date	05/24/18
Appl. Stop Time	11:00 AM
Application Method	SPRAY
Application Timing	V3-4
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	76 F
% Relative Humidity Start, Stop	50
Wind Velocity+Dir. Start	1 mph N
Wet Leaves (Y/N)	N no
Soil Temperature	76 F
Soil Moisture	WET
% Cloud Cover	30

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	ZEAMX BCOR
Stage Scale Used	DESC
Stage Majority, Percent	V4 55
Stage Minimum, Percent	V4 55
Stage Maximum, Percent	V5 45
Height Average	11 in
Height Minimum, Maximum	10 12

**Pest Stage At Each Application**

	A
Pest 1 Code, Type, Scale	DIGSA W
Stage Majority, Percent	veg 100
Height Average	3 in
Height Minimum, Maximum	2 4
Density Average	3 m2
Pest 2 Code, Type, Scale	IPOSS W
Stage Majority, Percent	2 If 80
Stage Minimum, Percent	1-If 10
Stage Maximum, Percent	3-If 10
Height Average	1 in
Density Average	1 m2
Pest 3 Code, Type, Scale	CYPES W
Stage Majority, Percent	veg 100
Height Average	3 in
Density Average	1 m2

**Application Equipment**

	A
Appl. Equipment	Backpack
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

Date	Notes
06/15/18	Corn nearest road is shorter. Low area, soil still wet.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

09/19/18: Morningglory control looks similar for all treatments. Ear development and size looks variable due to standing water.

DiFlexx Duo Efficacy and Tolerance in Field Corn Trial ID: Corn5-18      Location: Field #18      Trial Year: 2018 Protocol ID: Corn5-18      Investigator: Mark VanGessel Study Director: Sponsor Contact: Bayer CropScience									
Pest Code Pest Name						AMAPA PalmerAm	AMBEL C.ragwd	IPOSS mornlgy	
Crop Type, Code			C	ZEAMX		C	-	C	-
Crop Name					Corn Injury %	Control %	Control %	Abs/Pres	
Rating Type					06/01/18	06/01/18	06/01/18	0-1	
Rating Unit									
Rating Date									06/01/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check						0.0 a	0.0 b	0.0 b
2	DiFlexx Duo Premix ----dicamba ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 4.5 AS 4 L 100 D	0.53 lb ai/a 0.463 0.067 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A		11.0 a	100.0 a	100.0 a	1.0 a
3	DiFlexx Duo Premix ----dicamba ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 4.5 AS 4 L 100 D	0.4 lb ai/a 0.35 0.0507 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A		6.7 a	100.0 a	100.0 a	0.3 bc
4	DiFlexx Duo Premix ----dicamba ----tembotriione Liberty 280.....glufosinate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 2.34 SL 4 L 100 D	0.4 lb ai/a 0.35 0.0507 0.585 lb ai/a 0.5 lb ai/a 1.02 % w/v	V3-4 A		6.0 a	100.0 a	100.0 a	1.0 a
5	Capreno Premix ----thien carbazole ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	3.45 SC 0.57 2.88 4.5 AS 4 L 100 D	0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A		6.7 a	100.0 a	100.0 a	0.7 ab
6	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	1.98 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v 1.02 % w/v	V3-4 A		10.0 a	100.0 a	100.0 a	1.0 a
LSD P=.05						7.54	.	.	0.58
Standard Deviation						4.14	0.00	0.00	0.32
CV						61.62	0.0	0.0	47.43
Replicate F						12.642	0.000	0.000	1.667
Replicate Prob(F)						0.0018	1.0000	1.0000	0.2373
Treatment F						2.615	0.000	0.000	5.333
Treatment Prob(F)						0.0919	1.0000	1.0000	0.0120

Means followed by same letter 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 2,3,6,7,8,10 because error mean square = 0.

Pest Code Pest Name			SETFA G.foxtl	AMAPA PalmerAm	AMBEL C.ragwd	CHEAL C.lmsqtr
Crop Type, Code Crop Name			C -	C -	C -	C -
Rating Type			Control %	Control %	Control %	Control %
Rating Unit						
Rating Date			06/01/18	06/15/18	06/15/18	06/15/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated Check					
2	DiFlexx Duo Premix ----dicamba ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 4.5 AS 4 L 100 D	0.53 lb ai/a 0.463 0.067 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4	99.3 a	100.0 a 100.0 a 100.0 a
3	DiFlexx Duo Premix ----dicamba ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 4.5 AS 4 L 100 D	0.4 lb ai/a 0.35 0.0507 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4	100.0 a	100.0 a 100.0 a 100.0 a
4	DiFlexx Duo Premix ----dicamba ----tembotriione Liberty 280.....glufosinate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 2.34 SL 4 L 100 D	0.4 lb ai/a 0.35 0.0507 0.585 lb ai/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4	100.0 a	100.0 a 100.0 a 100.0 a
5	Capreno Premix ----thien carbazole ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	3.45 SC 0.57 2.88 4.5 AS 4 L 100 D	0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4	100.0 a	100.0 a 100.0 a 100.0 a
6	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotriione Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	4.376 SC 2.084 2.084 0.208 4 L 100 L 100 D	1.98 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v 1.02 % w/v	V3-4 A V3-4 A V3-4	100.0 a	100.0 a 100.0 a 100.0 a
LSD P=.05			0.86			
Standard Deviation			0.47	0.00	0.00	0.00
CV			0.57	0.0	0.0	0.0
Replicate F			1.000	0.000	0.000	0.000
Replicate Prob(F)			0.4019	1.0000	1.0000	1.0000
Treatment F			22441.002	0.000	0.000	0.000
Treatment Prob(F)			0.0001	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.  
Could not calculate LSD (% mean diff) for columns 2,3,6,7,8,10 because error mean square = 0.

Pest Code Pest Name		IPOSS morngly	MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm			
Crop Type, Code Crop Name		C -	C -	C -	C -			
Rating Type		Control %	Control %	Control %	Control %			
Rating Unit								
Rating Date		06/15/18	06/15/18	06/15/18	07/02/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Untreated Check							
2	DiFlexx Duo Premix ----dicamba ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 4.5 AS 4 L 100 D	0.53 lb ai/a 0.463 0.067 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4	100.0 a	100.0 a	100.0 a	100.0 a
3	DiFlexx Duo Premix ----dicamba ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 4.5 AS 4 L 100 D	0.4 lb ai/a 0.35 0.0507 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4	93.3 ab	100.0 a	100.0 a	100.0 a
4	DiFlexx Duo Premix ----dicamba ----tembotriione Liberty 280.....glufosinate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 2.34 SL 4 L 100 D	0.4 lb ai/a 0.35 0.0507 0.585 lb ai/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4	100.0 a	100.0 a	98.3 a	100.0 a
5	Capreno Premix ----thien carbazole ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	3.45 SC 0.57 2.88 4.5 AS 4 L 100 D	0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4	86.7 b	100.0 a	98.3 a	98.3 a
6	Halex GT Premix ----s-metolachlor ----glyphosate ----mesotriione Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate	4.376 SC 2.084 2.084 0.208 4 L 100 L 100 D	1.98 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v 1.02 % w/v	V3-4 A V3-4 A V3-4	100.0 a	100.0 a	100.0 a	100.0 a
LSD P=.05					13.29	.	3.18	2.14
Standard Deviation					7.30	0.00	1.75	1.18
CV					9.13	0.0	2.11	1.42
Replicate F					0.000	0.000	0.455	1.000
Replicate Prob(F)					1.0000	1.0000	0.6472	0.4019
Treatment F					88.000	0.000	1615.273	3577.000
Treatment Prob(F)					0.0001	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 2,3,6,7,8,10 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	AMBEL C.ragwd C -	IPOSS mornglry C -	SETFA G.foxtl C -	C ZEAMX Corn Yield Bu/A	09/27/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1	Untreated Check							0.0 b	0.0 a	0.0 b	55.7 b
2	DiFlexx Duo Premix ----dicamba ----tembotrione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 4.5 AS 4 L 100 D		0.53 lb ai/a 0.463 0.067 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4		100.0 a	66.7 a	97.7 a	165.1 a	
3	DiFlexx Duo Premix ----dicamba ----tembotrione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 4.5 AS 4 L 100 D		0.4 lb ai/a 0.35 0.0507 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4		97.7 a	66.7 a	97.0 a	155.1 a	
4	DiFlexx Duo Premix ----dicamba ----tembotrione Liberty 280....glufosinate Atrazine 4L Dry Ammonium Sulfate	2.13 SC 1.86 0.27 2.34 SL 4 L 100 D		0.4 lb ai/a 0.35 0.0507 0.585 lb ai/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4		100.0 a	56.7 a	100.0 a	165.4 a	
5	Capreno Premix ----thienicarbazone ----tembotrione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	3.45 SC 0.57 2.88 4.5 AS 4 L 100 D		0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 0.5 lb ai/a 1.02 % w/v	V3-4 A V3-4 A V3-4		96.0 a	66.7 a	100.0 a	173.6 a	
6	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		1.98 lb ai/a 0.94 0.94 0.094 0.5 lb ai/a 0.25 % v/v 1.02 % w/v	V3-4 A V3-4 A V3-4		91.7 a	90.0 a	97.7 a	172.6 a	
LSD P=.05							10.37	68.93	4.97	45.73	
Standard Deviation							5.70	37.89	2.73	25.13	
CV							7.05	65.58	3.33	16.99	
Replicate F							2.308	4.009	1.125	2.091	
Replicate Prob(F)							0.1499	0.0526	0.3625	0.1744	
Treatment F							145.737	1.929	650.887	9.910	
Treatment Prob(F)							0.0001	0.1762	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.  
Could not calculate LSD (% mean diff) for columns 2,3,6,7,8,10 because error mean square = 0.

**Weed Control in Roundup Ready Field Corn**

Trial ID: Corn6-18      Location: Field #18      Trial Year: 2018  
Protocol ID: Corn6-18      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: Bayer

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Initiation Date: 03/01/18  
Completion Date: 09/30/18

**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	Variety: D48SS38RIB	
Attributes: LL/RR	Planting Date: 05/09/18	Planting Rate: 30000 S/A
Depth: 2 in	Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 in	Planting Equipment: FE Field Equipment	Seed Bed: SMOOTH smooth
Soil Temperature: 72 F	Soil Moisture: ABONOR above normal, excessive	
Emergence Date: 05/15/18	Harvest Equipment: Plot combine	
Harvest Date: 09/28/18	Harvested Width: 5 FT	Harvested Length: 24 FT
% Standard Moisture: 15.5		

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.  
Common Name: Morningglory

Pest 2 Type: W Code: MOLVE Mollugo verticillata  
Common Name: Carpetweed

Pest 3 Type: W Code: CYPES Cyperus esculentus  
Common Name: Yellow nutsedge

**Site and Design**

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

**Soil Description**

Description Name: Field 18C	% Sand: 83	% OM: 1.2	Texture: LS	loamy sand
	% Silt: 10	pH: 6.4	Soil Name: Klej loamy sand, 0-2% slopes	
	% Clay: 7	CEC: 3.1	Fert. Level: F	fair
Soil Drainage: F	fair			

**Application Description**

	A	B
Application Date	05/09/18	05/31/18
Appl. Stop Time	01:30 PM	08:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	V3
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	70 F	76 F
% Relative Humidity Start, Stop	44	91
Wind Velocity+Dir. Start	3 mph NE	1 mph SE
Wet Leaves (Y/N)	N no	N no
Soil Temperature	70 F	76 F
Soil Moisture	NORMAL	WET
% Cloud Cover	0	30

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR
Stage Scale Used		DESC
Stage Majority, Percent		V4 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
Stage Majority, Percent		veg 100
Height Average		2.5 in
Height Minimum, Maximum		2 3
Density Average		5 m2
Pest 2 Code, Type, Scale	MOLVE W	MOLVE W
Stage Majority, Percent		veg 100
Diameter		1 in
Height Minimum, Maximum		0.6 1.2
Density Average		80 m2
Pest 3 Code, Type, Scale	CYPES W	CYPES W
Stage Majority, Percent		veg 100
Height Average		4 in
Height Minimum, Maximum		3 5
Density Average		3 m2

**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
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

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

06/02/18: Common ragweed control was fair to poor with treatments 3, 5, 6, 10, 12, 14 / and poor with treatments 7, 8, 9

06/16/18: No corn injury observed

07/07/18: Carpetweed control is poor with treatments 2, 3, 4, 5, 6, 10, 4; poor control of fall panicum with treatments 2, 3, 4, 5, 10.

09/19/18: Treatments with POST applications have very good weed control. Other treatments have a few large weeds in the plots.

## Weed Control in Roundup Ready Field Corn

Trial ID: Corn6-18

Location: Field #18

Trial Year: 2018

Protocol ID: Corn6-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Bayer

Pest Code							AMAPA	
Pest Name							PalmerAm	
Crop Type, Code					C ZEAMX	C ZEAMX	C -	
Crop Name								
Rating Type								
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Untreated Check							
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	SC 0.068 lb ai/a 0.0194 0.0486 2.52 lb ai/a 1.4 1.13	lb ai/a PRE	A	0.0 c	9.0 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	SC 0.082 lb ai/a 0.0234 0.0586 2.52 lb ai/a 1.4 1.13	lb ai/a PRE	A	7.0 a	10.7 a	94.0 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	SC 0.0925 lb ai/a 0.0264 0.066 2.52 lb ai/a 1.4 1.13	lb ai/a PRE	A	7.0 a	9.7 a	96.0 a
5	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 2.52 lb ai/a 1.4 1.13	lb ai/a PRE	A	0.0 c	11.3 a	100.0 a
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	L 0.078 lb ai/a 2.52 lb ai/a 1.4 1.13	lb ai/a PRE	A	4.7 ab	6.3 a	91.7 a
7	Corvus Premix ----thienecarbazone ----isoxaflutole Atrazine 4L Capreno Premix ----thienecarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.63 SC 0.75 1.88 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L 100 D	SC 0.068 lb ai/a 0.0194 0.0486 L 0.081 lb ai/a 0.0134 0.0676 AS L D	lb ai/a PRE	A	1.7 bc	11.7 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.

Missing data estimates are included in columns:Yates=4,8,9,11,16

## University of Delaware

Pest Code						AMAPA
Pest Name						PalmerAm
Crop Type, Code				C ZEAMX	C ZEAMX	C -
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
8	Balance Flexx...isoxaflutole	2 L	0.047	lb ai/a	PRE	A
	Atrazine 4L	4 L		1 lb ai/a	PRE	A
	Capreno Premix	3.45 SC	0.081	lb ai/a	V3	B
	----thienecarbazone	0.57	0.0134			
	----tembotriione	2.88	0.0676			
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	V3	B
	Atrazine 4L	4 L		1 lb ai/a	V3	B
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V3	B
9	Harness Xtra 5.6L Premix	5.6 L	2.52	lb ai/a	PRE	A
	----acetochlor	3.1		1.4		
	----atrazine	2.5		1.13		
	Capreno Premix	3.45 SC	0.081	lb ai/a	V3	B
	----thienecarbazone	0.57	0.0134			
	----tembotriione	2.88	0.0676			
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	V3	B
	Atrazine 4L	4 L		1 lb ai/a	V3	B
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V3	B
10	Lexar EZ Premix	3.71 SC	2.78	lb ai/a	PRE	A
	----s-metolachlor	1.742819		1.3		
	----mesotrione	0.2243629		0.168		
	----atrazine	1.742819		1.3		
LSD P=.05					4.14	7.50
Standard Deviation					2.41	4.37
CV					88.19	55.84
Replicate F					0.866	0.111
Replicate Prob(F)					0.4374	0.8951
Treatment F					4.306	2.064
Treatment Prob(F)					0.0041	0.0911
						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=4,8,9,11,16

Pest Code		CHEAL	IPOSS	DIGSA	AMAPA				
Pest Name		C.lmsqtr	mornlry	L.crbgrs	PalmerAm				
Crop Type, Code		C -	C -	C -	C -				
Crop Name		Control	Control	Control	Control				
Rating Type		%	%	%	%				
Rating Unit		06/02/18	06/02/18	06/02/18	06/16/18				
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing Appl Code				
1	Untreated Check					0.0 b	0.0 b	0.0 b	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 2.52 lb ai/a 1.4 1.13	lb ai/a PRE A	100.0 a	71.7 a	97.0 a	79.3 b	
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 2.52 lb ai/a 1.4 1.13	lb ai/a PRE A	100.0 a	78.3 a	94.7 a	86.7 ab	
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 2.52 lb ai/a 1.4 1.13	lb ai/a PRE A	99.0 a	75.0 a	95.7 a	91.0 ab	
5	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.0625 lb ai/a 2.52 lb ai/a 1.4 1.13	lb ai/a PRE A	100.0 a	75.0 a	93.3 a	85.0 b	
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.078 lb ai/a 2.52 lb ai/a 1.4 1.13	lb ai/a PRE A	95.0 a	76.7 a	94.7 a	87.3 ab	
7	Corvus Premix ----thienecarbazone ----isoxaflutole Atrazine 4L Capreno Premix ----thienecarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.63 SC 0.75 1.88 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L 100 D	0.068 lb ai/a 0.0194 0.0486 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a 1.02 % w/v	lb ai/a PRE A V3 B	96.7 a	75.0 a	93.0 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=4,8,9,11,16

## University of Delaware

Pest Code		CHEAL	IPOSS	DIGSA	AMAPA						
Pest Name		C.lmsqtr	morngly	L.crbgrs	PalmerAm						
Crop Type, Code		C -	C -	C -	C -						
Crop Name		Control	Control	Control	Control						
Rating Type		%	%	%	%						
Rating Unit		06/02/18	06/02/18	06/02/18	06/16/18						
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code				
8	Balance Flexx...isoxaflutole	2 L	0.047	lb ai/a	PRE	A	90.0 a	73.3 a	92.3 a	100.0 a	
	Atrazine 4L	4 L	1	lb ai/a	PRE	A					
	Capreno Premix	3.45 SC	0.081	lb ai/a	V3	B					
	----thienicarbazone	0.57	0.0134								
	----tembotriione	2.88	0.0676								
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	V3	B					
	Atrazine 4L	4 L	1	lb ai/a	V3	B					
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V3	B					
9	Harness Xtra 5.6L Premix	5.6 L	2.52	lb ai/a	PRE	A	88.9 a	74.0 a	95.0 a	100.0 a	
	----acetochlor	3.1	1.4								
	----atrazine	2.5	1.13								
	Capreno Premix	3.45 SC	0.081	lb ai/a	V3	B					
	----thienicarbazone	0.57	0.0134								
	----tembotriione	2.88	0.0676								
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	V3	B					
	Atrazine 4L	4 L	1	lb ai/a	V3	B					
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V3	B					
10	Lexar EZ Premix	3.71 SC	2.78	lb ai/a	PRE	A	100.0 a	80.3 a	95.7 a	90.7 ab	
	----s-metolachlor	1.742819	1.3								
	----mesotrione	0.2243629	0.168								
	----atrazine	1.742819	1.3								
LSD P=.05						12.89	10.42	5.41	13.70		
Standard Deviation						7.48	6.07	3.15	7.99		
CV						8.6	8.94	3.71	9.74		
Replicate F						0.709	0.101	0.245	0.876		
Replicate Prob(F)						0.5063	0.9042	0.7856	0.4335		
Treatment F						50.984	46.842	270.318	41.354		
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=4,8,9,11,16

Pest Code	Pest Name	AMBEL C.ragwd	CHEAL C.lmsqtr	IPOSS mornlry	DIGSA L.crbgrs			
Crop Type, Code	Crop Name	C -	C -	C -	C -			
Rating Type	Rating Unit	Control %	Control %	Control %	Control %			
Rating Date		06/16/18	06/16/18	06/16/18	06/16/18			
Trt No.	Treatment Name	Form Conc	Form Type Rate	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 2.52 lb ai/a 1.4 1.13	PRE A	70.0 bc	89.4 ab	63.3 bc	86.7 cd
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 2.52 lb ai/a 1.4 1.13	PRE A	76.7 b	90.0 ab	65.0 bc	93.3 b
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 2.52 lb ai/a 1.4 1.13	PRE A	69.5 bc	99.0 a	70.0 b	89.1 bcd
5	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.0625 lb ai/a 2.52 lb ai/a 1.4 1.13	PRE A	60.0 c	81.7 b	65.0 bc	88.3 bcd
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.078 lb ai/a 2.52 lb ai/a 1.4 1.13	PRE A	61.7 c	86.0 ab	63.3 bc	82.9 d
7	Corvus Premix ----thiencarbazone ----isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.63 SC 0.75 1.88 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L 100 D	0.068 lb ai/a 0.0194 0.0486 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a 1.02 % w/v	PRE A V3 B V3 B V3 B	100.0 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.  
Missing data estimates are included in columns:Yates=4,8,9,11,16

## University of Delaware

Pest Code		AMBEL	CHEAL	IPOSS	DIGSA								
Pest Name		C.ragwd	C.lmsqtr	mornglry	L.crbgrs								
Crop Type, Code		C -	C -	C -	C -								
Crop Name		Control	Control	Control	Control								
Rating Type		%	%	%	%								
Rating Unit		06/16/18	06/16/18	06/16/18	06/16/18								
Rating Date													
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code						
8	Balance Flexx...isoxaflutole	2 L	0.047	lb ai/a	PRE	A	100.0	a	100.0	a	100.0	a	
	Atrazine 4L	4 L		1 lb ai/a	PRE	A							
	Capreno Premix	3.45 SC		0.081	lb ai/a	V3	B						
	----thienecarbazone	0.57		0.0134									
	----tembotrione	2.88		0.0676									
	Roundup PowerMax..glyphosate	4.5 AS		1.13	lb ae/a	V3	B						
	Atrazine 4L	4 L		1 lb ai/a	V3	B							
	Dry Ammonium Sulfate	100 D		1.02 % w/v	V3	B							
9	Harness Xtra 5.6L Premix	5.6 L		2.52	lb ai/a	PRE	A	100.0	a	100.0	a	100.0	a
	----acetochlor	3.1		1.4									
	----atrazine	2.5		1.13									
	Capreno Premix	3.45 SC		0.081	lb ai/a	V3	B						
	----thienecarbazone	0.57		0.0134									
	----tembotrione	2.88		0.0676									
	Roundup PowerMax..glyphosate	4.5 AS		1.13	lb ae/a	V3	B						
	Atrazine 4L	4 L		1 lb ai/a	V3	B							
	Dry Ammonium Sulfate	100 D		1.02 % w/v	V3	B							
10	Lexar EZ Premix	3.71 SC		2.78	lb ai/a	PRE	A	60.0	c	99.0	a	60.0	c
	----s-metolachlor	1.742819		1.3									
	----mesotrione	0.2243629		0.168									
	----atrazine	1.742819		1.3									
LSD P=.05						14.89	15.23	9.75	6.41				
Standard Deviation						8.64	8.84	5.68	3.70				
CV						12.39	10.46	8.28	4.46				
Replicate F						0.763	3.996	0.799	1.786				
Replicate Prob(F)						0.4814	0.0378	0.4649	0.1994				
Treatment F						35.296	35.573	80.676	194.200				
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=4,8,9,11,16

Pest Code	Pest Name		AMAPA PalmerAm	AMBEL C.ragwd	CHEAL C.lmsqtr	IPOSS morngly
Crop Type, Code	Crop Name		C -	C -	C -	C -
Rating Type	Rating Unit	Control %	Control %	Control %	Control %	Control %
Rating Date		07/07/18	07/07/18	07/07/18	07/07/18	07/07/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Untreated Check				0.0 c	0.0 d
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 2.52 lb ai/a 1.4 1.13	PRE A	79.3 b	56.7 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	0.082 lb ai/a 0.0234 0.0586 2.52 lb ai/a 1.4 1.13	PRE A	78.3 b	56.7 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 2.52 lb ai/a 1.4 1.13	PRE A	85.0 b	70.0 b
5	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.0625 lb ai/a 2.52 lb ai/a 1.4 1.13	PRE A	83.3 b	53.3 bc
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	0.078 lb ai/a 2.52 lb ai/a 1.4 1.13	PRE A	78.3 b	56.7 bc
7	Corvus Premix ----thiencarbazone ----isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotriione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.63 SC 0.75 1.88 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L 100 D	0.068 lb ai/a 0.0194 0.0486 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a 1.02 % w/v	PRE A V3 B V3 B V3 B	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=4,8,9,11,16

## University of Delaware

Pest Code				AMAPA PalmerAm	AMBEL C.ragwd	CHEAL C.lmsqtr	IPOSS mornlry	
Pest Name				C -	C -	C -	C -	
Crop Type, Code				Control %	Control %	Control %	Control %	
Crop Name				07/07/18	07/07/18	07/07/18	07/07/18	
Rating Type								
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
8	Balance Flexx...isoxaflutole	2 L	0.047	lb ai/a	PRE	A		
	Atrazine 4L	4 L	1	lb ai/a	PRE	A		
	Capreno Premix	3.45 SC	0.081	lb ai/a	V3	B		
	----thiencarbazone	0.57	0.0134					
	----tembotrione	2.88	0.0676					
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	V3	B		
	Atrazine 4L	4 L	1	lb ai/a	V3	B		
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V3	B		
9	Harness Xtra 5.6L Premix	5.6 L	2.52	lb ai/a	PRE	A		
	----acetochlor	3.1	1.4					
	----atrazine	2.5	1.13					
	Capreno Premix	3.45 SC	0.081	lb ai/a	V3	B		
	----thiencarbazone	0.57	0.0134					
	----tembotrione	2.88	0.0676					
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	V3	B		
	Atrazine 4L	4 L	1	lb ai/a	V3	B		
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V3	B		
10	Lexar EZ Premix	3.71 SC	2.78	lb ai/a	PRE	A		
	----s-metolachlor	1.742819	1.3					
	----mesotrione	0.2243629	0.168					
	----atrazine	1.742819	1.3					
LSD P=.05					10.61	18.32	14.66	11.80
Standard Deviation					6.18	10.68	8.55	6.88
CV					7.9	16.69	10.24	10.87
Replicate F					0.409	0.351	4.346	0.387
Replicate Prob(F)					0.6704	0.7089	0.0288	0.6849
Treatment F					66.402	25.117	40.011	55.154
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=4,8,9,11,16

Pest Code		DIGSA							
Pest Name		L.crbgrs							
Crop Type, Code		C -	C ZEAMX						
Crop Name			Corn						
Rating Type			Yield						
Rating Unit			Bu/A						
Rating Date		07/07/18	09/28/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 d	120.2 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 2.52 lb ai/a 1.4 1.13		PRE	A		75.0 b	163.4 ab
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 2.52 lb ai/a 1.4 1.13		PRE	A		78.3 b	172.0 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 2.52 lb ai/a 1.4 1.13		PRE	A		75.0 b	164.4 ab
5	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	lb ai/a 0.0625 lb ai/a 2.52 lb ai/a 1.4 1.13		PRE	A		60.0 c	157.4 ab
6	Balance Flexx...isoxaflutole Harness Xtra 5.6L Premix ----acetochlor ----atrazine	2 L 5.6 L 3.1 2.5	lb ai/a 0.078 lb ai/a 2.52 lb ai/a 1.4 1.13		PRE	A		81.6 b	161.4 ab
7	Corvus Premix ----thiencarbazone ----isoxaflutole Atrazine 4L Capreno Premix ----thiencarbazone ----tembotrione Roundup PowerMax..glyphosate Atrazine 4L Dry Ammonium Sulfate	2.63 SC 0.75 1.88 4 L 3.45 SC 0.57 2.88 4.5 AS 4 L 100 D	SC 0.068 lb ai/a 0.0194 0.0486 1 lb ai/a 0.081 lb ai/a 0.0134 0.0676 1.13 lb ae/a 1 lb ai/a 1.02 % w/v		PRE	A		100.0 a	175.9 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=4,8,9,11,16

## University of Delaware

Pest Code		DIGSA							
Pest Name	L.crbgrs	C	ZEAMX						
Crop Type, Code	C -	C	Corn						
Crop Name			Yield						
Rating Type		%	Bu/A						
Rating Unit	07/07/18		09/28/18						
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8	Balance Flexx...isoxaflutole	2 L	0.047	lb ai/a	PRE	A		100.0 a	183.0 a
	Atrazine 4L	4 L		1 lb ai/a	PRE	A			
	Capreno Premix	3.45 SC	0.081	lb ai/a	V3	B			
	----thien carbazole	0.57	0.0134						
	----tembotrione	2.88	0.0676						
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	V3	B			
	Atrazine 4L	4 L		1 lb ai/a	V3	B			
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V3	B			
9	Harness Xtra 5.6L Premix	5.6 L	2.52	lb ai/a	PRE	A		100.0 a	168.8 ab
	----acetochlor	3.1		1.4					
	----atrazine	2.5		1.13					
	Capreno Premix	3.45 SC	0.081	lb ai/a	V3	B			
	----thien carbazole	0.57	0.0134						
	----tembotrione	2.88	0.0676						
	Roundup PowerMax..glyphosate	4.5 AS	1.13	lb ae/a	V3	B			
	Atrazine 4L	4 L		1 lb ai/a	V3	B			
	Dry Ammonium Sulfate	100 D	1.02	% w/v	V3	B			
10	Lexar EZ Premix	3.71 SC	2.78	lb ai/a	PRE	A		78.3 b	148.7 bc
	----s-metolachlor	1.742819		1.3					
	----mesotrione	0.2243629		0.168					
	----atrazine	1.742819		1.3					
LSD P=.05							15.00	28.92	
Standard Deviation							8.71	16.86	
CV							11.63	10.44	
Replicate F							0.414	9.125	
Replicate Prob(F)							0.6677	0.0018	
Treatment F							34.266	3.208	
Treatment Prob(F)							0.0001	0.0169	

Means followed by same letter 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=4,8,9,11,16

**Impact and ImpactZ in Field Corn**

Trial ID: Corn7-18      Location: Field #18      Trial Year: 2018  
 Protocol ID: Corn7-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: AMVAC

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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	Variety: D48SS38RIB	
Attributes: LL/RR	Planting Date: 05/09/18	Planting Rate: 30000 S/A
Depth: 2 in	Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 in	Planting Equipment: FE Field Equipment	Seed Bed: SMOOTH smooth
Soil Temperature: 72 F	Soil Moisture: ABONOR above normal, excessive	
Emergence Date: 05/15/18	Harvest Equipment: Plot combine	Harvested Width: 5 FT
Harvest Date: 09/28/18	Harvested Length: 24 FT	
% Standard Moisture: 15.5		

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morningglory

Pest 2 Type: W Code: MOLVE Mollugo verticillata  
 Common Name: Carpetweed

Pest 3 Type: W Code: CYPES Cyperus esculentus  
 Common Name: Yellow nutsedge

Pest 4 Type: W Code: AMBEL Ambrosia artemisiifolia  
 Common Name: Common ragweed

Pest 5 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth

**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 18C  
 % Sand: 83 % OM: 1.2 Texture: LS loamy sand  
 % Silt: 10 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes  
 % Clay: 7 CEC: 3.1 Fert. Level: F fair  
 Soil Drainage: F fair

**Application Description**

	A	B	C
Application Date	05/09/18	05/31/18	06/15/18
Appl. Stop Time	01:30 PM	08:30 PM	02:00 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	2-4"wds	2-4"wds
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Air Temperature Start, Stop	70 F	76 F	79 F
% Relative Humidity Start, Stop	44	91	37
Wind Velocity+Dir. Start	3 mph NE	1 mph SE	2 mph NW
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	70 F	76 F	79 F
Soil Moisture	NORMAL	WET	WET
% Cloud Cover	0	30	5

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR	ZEAMX BCOR
Stage Scale Used		DESC	DESC
Stage Majority, Percent		V4 100	V7-8 100
Height Average		9 in	20 in
Height Minimum, Maximum		8 10	

**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 70
Stage Minimum, Percent			veg 30
Stage Maximum, Percent			run 70
Height Average		2.5 in	7 in
Height Minimum, Maximum		2 3	5 10
Density Average		5 m <sup>2</sup>	5 m <sup>2</sup>
Pest 2 Code, Type, Scale	MOLVE W	MOLVE W	MOLVE W
Stage Majority, Percent		veg 100	
Diameter		1 in	
Height Minimum, Maximum		0.6 1.2	
Density Average		80 m <sup>2</sup>	
Pest 3 Code, Type, Scale	CYPES W	CYPES W	CYPES W
Stage Majority, Percent		veg 100	veg 100
Height Average		4 in	7 in
Height Minimum, Maximum		3 5	4 10
Density Average		3 m <sup>2</sup>	1 m <sup>2</sup>
Pest 4 Code, Type, Scale	AMBEL W	AMBEL W	AMBEL W
Stage Majority, Percent		veg 100	veg 100
Height Average		1 in	5 in
Height Minimum, Maximum			4 7
Density Average		2 m <sup>2</sup>	2 m <sup>2</sup>
Pest 5 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100	veg 100
Height Average		1 in	5 in
Height Minimum, Maximum			3 6
Density Average		1 m <sup>2</sup>	1 m <sup>2</sup>

**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
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	18 in	24 in	36 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

Date	By	Notes
05/24/18	Vollmer, K.	Very few weeds at this rating date. IPOSS and AMBEL spotted sporadically

**SE Definitions**

	1.
Crop Type, Code	C

**Impact and ImpactZ in Field Corn**

Trial ID: Corn7-18      Location: Field #18      Trial Year: 2018  
Protocol ID: Corn7-18      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: AMVAC

**Trial Comments**

09/19/18: Excellent weed control in treatments 6, 7, and 8.

Impact and ImpactZ in Field Corn						
Trial ID: Corn7-18		Location: Field #18		Trial Year: 2018		
Protocol ID: Corn7-18		Investigator: Mark VanGessel				
Study Director:						
Sponsor Contact: AMVAC						
Pest Code						AMAPA
Pest Name						PalmerAm
Crop Type, Code						
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Untreated Check					
2	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	2.52 lb ai/a 1.4 1.13	PRE	A	0.0 a
3	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 100 L 100 D	2.52 lb ai/a 1.4 1.13 0.356 lb ai/a 0.0217 0.334 1 % v/v 1.02 % w/v	PRE 2-4" wds C 2-4" wds C	A	0.0 a
4	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 4.5 AS 100 L 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v	PRE 2-4" wds C 2-4" wds C	A	0.0 a
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 2.34 SL 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v	PRE 2-4" wds C 2-4" wds C	A	0.0 a
6	Harness.....acetochlor Impact.....topramezone Atrazine 4L Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 100 L 100 D	1.64 lb ai/a 0.022 lb ai/a 0.5 lb ai/a 0.25 % v/v 1.02 % w/v	2-4" wds B 2-4" wds B 2-4" wds B	B	0.0 a
7	Harness.....acetochlor Impact.....topramezone Atrazine 4L Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 4.5 AS 100 L 100 D	1.64 lb ai/a 0.0165 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	2-4" wds B 2-4" wds B 2-4" wds B	B	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.  
Could not calculate LSD (% mean diff) for columns 1,2 because error mean square = 0.

## University of Delaware

Pest Code		C	ZEAMX	C	ZEAMX	AMAPA
Pest Name			Corn Injury %	Corn Injury %		PalmerAm
Crop Type, Code		05/24/18		06/06/18		C -
Crop Name						Control %
Rating Type						06/06/18
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
8	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	0.5 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
LSD P=.05						
Standard Deviation						
CV						
Replicate F						
Replicate Prob(F)						
Treatment F						
Treatment Prob(F)						

Means followed by same letter 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 1,2 because error mean square = 0.

Pest Code Pest Name		AMBEL C.ragwd	IPOSS morngly	MOLVE Carpetwd	DIGSA L.crbgrs
Crop Type, Code Crop Name		C -	C -	C -	C -
Rating Type		Control %	Control %	Control %	Control %
Rating Unit					
Rating Date		06/06/18	06/06/18	06/06/18	06/06/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
1	Untreated Check				
2	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	2.52 lb ai/a 1.4 1.13	PRE	A
3	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 100 L 100 D	2.52 lb ai/a 1.4 1.13 0.356 lb ai/a 0.0217 0.334 1 % v/v 1.02 % w/v	PRE	A
4	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 4.5 AS 100 L 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v	PRE	A
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 2.34 SL 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v	PRE	A
6	Harness.....acetochlor Impact.....topramezone Atrazine 4L Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 100 L 100 D	1.64 lb ai/a 0.022 lb ai/a 0.5 lb ai/a 0.25 % v/v 1.02 % w/v	2-4"wds B	100.0 a
7	Harness.....acetochlor Impact.....topramezone Atrazine 4L Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 4.5 AS 100 L 100 D	1.64 lb ai/a 0.0165 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	2-4"wds B	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 1,2 because error mean square = 0.

## University of Delaware

Pest Code Pest Name	AMBEL C.ragwd	IPOSS mornglry	MOLVE Carpetwd	DIGSA L.crbgrs				
Crop Type, Code Crop Name	C -	C -	C -	C -				
Rating Type	Control %	Control %	Control %	Control %				
Rating Unit	06/06/18	06/06/18	06/06/18	06/06/18				
Rating Date								
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code				
8 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 0.5 lb ai/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	100.0 a	100.0 a	100.0 a	100.0 a	
LSD P=.05 Standard Deviation CV				54.64 31.20 41.03	60.04 34.29 63.79	36.70 20.96 25.86	35.54 20.29 22.5	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				1.227 0.3227 2.258 0.0923	3.009 0.0818 3.941 0.0139	0.686 0.5200 3.302 0.0272	1.197 0.3311 3.884 0.0148	

Means followed by same letter 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 1,2 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	AMAPA PalmerAm C -	AMBEL C.ragwd C -	IPOSS mornglry C -	MOLVE Carpetwd C -
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Control %	Control %	Control %	Control %
1	Untreated Check						0.0 c	0.0 b	0.0 c	0.0 c
2	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	2.52 lb ai/a 1.4 1.13		PRE	A	66.7 ab	50.0 ab	33.3 bc	56.7 b
3	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4	2.52 lb ai/a 1.4 1.13 0.356 lb ai/a 0.0217 0.334		PRE	A	58.7 b	60.0 a	96.7 a	63.3 ab
4	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 4.5 AS 100 L 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v		PRE	A	86.7 ab	96.7 a	63.3 ab	86.0 ab
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 2.34 SL 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v		PRE	A	70.0 ab	51.7 ab	95.0 a	72.7 ab
6	Harness.....acetochlor Impact.....topramezone Atrazine 4L Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 100 L 100 D	1.64 lb ai/a 0.022 lb ai/a 0.5 lb ai/a 0.25 % v/v 1.02 % w/v		2-4"wds B		100.0 a	100.0 a	90.0 a	100.0 a
7	Harness.....acetochlor Impact.....topramezone Atrazine 4L Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 4.5 AS 100 L 100 D	1.64 lb ai/a 0.0165 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v		2-4"wds B		100.0 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 1,2 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA	AMBEL	IPOSS	MOLVE
Pest Name	PalmerAm	C.ragwd	morngly	Carpetwd	
Crop Type, Code	C -	C -	C -	C -	C -
Crop Name					
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
8 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	0.5	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
LSD P=.05			40.82	53.96	49.78
Standard Deviation			23.31	30.81	28.42
CV			32.04	44.15	39.32
Replicate F			1.694	0.521	1.324
Replicate Prob(F)			0.2193	0.6050	0.2974
Treatment F			6.277	4.128	5.190
Treatment Prob(F)			0.0018	0.0116	0.0044
					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.  
Could not calculate LSD (% mean diff) for columns 1,2 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	DIGSA L.crbgrs C -	CYPES Y.nutsge C -	AMAPA PalmerAm C -	AMBEL C.ragwd C -
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Control % 06/19/18	Control % 06/19/18	Control % 07/02/18	Control % 07/02/18
1	Untreated Check						0.0 c	0.0 c	0.0 c	0.0 b
2	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	2.52 lb ai/a 1.4 1.13		PRE	A	89.0 b	72.7 ab	60.0 ab	76.7 a
3	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 100 L 100 D	2.52 lb ai/a 1.4 1.13 0.356 lb ai/a 0.0217 0.334 1 % v/v 1.02 % w/v		PRE	A	95.0 a	47.7 b	83.3 ab	83.3 a
4	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 4.5 AS 100 L 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v		PRE	A	96.7 a	66.7 ab	50.0 b	99.3 a
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 2.34 SL 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v		PRE	A	96.7 a	78.7 ab	78.3 ab	83.3 a
6	Harness.....acetochlor Impact.....topramezone Atrazine 4L Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 100 L 100 D	1.64 lb ai/a 0.022 lb ai/a 0.5 lb ai/a 0.25 % v/v 1.02 % w/v		2-4"wds B		100.0 a	71.0 ab	100.0 a	100.0 a
7	Harness.....acetochlor Impact.....topramezone Atrazine 4L Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 4.5 AS 100 L 100 D	1.64 lb ai/a 0.0165 lb ai/a 0.5 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v		2-4"wds B		100.0 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 1,2 because error mean square = 0.

## University of Delaware

Pest Code	DIGSA L.crbgrs C -	CYPES Y.nutsge C -	AMAPA PalmerAm C -	AMBEL C.ragwd C -						
Pest Name	Control %	Control %	Control %	Control %						
Crop Type, Code	06/19/18	06/19/18	07/02/18	07/02/18						
Crop Name										
Rating Type										
Rating Unit										
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
8 Halex GT Premix	4.376	SC	1.97	lb ai/a	2-4"	wds B	100.0	a	100.0 a	100.0 a
----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	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				
LSD P=.05			5.90		43.18		47.74		36.06	
Standard Deviation			3.37		24.66		27.26		20.59	
CV			3.98		36.76		38.15		25.64	
Replicate F			1.335		0.500		0.590		0.784	
Replicate Prob(F)			0.2946		0.6167		0.5675		0.4754	
Treatment F			312.730		5.093		4.803		8.091	
Treatment Prob(F)			0.0001		0.0047		0.0061		0.0005	

Means followed by same letter 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 1,2 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	CHEAL C.lmsqtr C - Control % 07/02/18	IPOSS mornglry C - Control % 07/02/18	SETFA G.foxtl C - Control % 07/02/18	C ZEAMX Corn Yield Bu/A 09/28/18
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 c	85.9 b
2	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	2.52 lb ai/a 1.4 1.13		PRE	A	63.3 b	100.0 a	81.7 b	150.1 a
3	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4	2.52 lb ai/a 1.4 1.13 0.356 lb ai/a 0.0217 0.334		PRE	A	88.3 a	66.7 a	95.0 a	163.8 a
4	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 4.5 AS 100 L 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v	2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	PRE	A	96.7 a	66.7 a	93.3 a	165.3 a
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	5.6 L 3.1 2.5 4.26 SC 0.26 4 2.34 SL 100 D	2.52 lb ai/a 1.4 1.13 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v	2-4"wds C 2-4"wds C 2-4"wds C 2-4"wds C	PRE	A	88.3 a	100.0 a	95.0 a	170.2 a
6	Harness.....acetochlor Impact.....topramezone Atrazine 4L Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 100 L 100 D	1.64 lb ai/a 0.022 lb ai/a 0.5 lb ai/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			100.0 a	100.0 a	100.0 a	174.1 a
7	Harness.....acetochlor Impact.....topramezone Atrazine 4L Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7 E 2.81 SC 4 L 4.5 AS 100 L 100 D	1.64 lb ai/a 0.0165 lb ai/a 0.5 lb ai/a 1.13 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			100.0 a	100.0 a	100.0 a	169.5 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.  
Could not calculate LSD (% mean diff) for columns 1,2 because error mean square = 0.

## University of Delaware

Pest Code		CHEAL	IPOSS	SETFA										
Pest Name		C.lmsqtr	morngly	G.foxtl	C ZEAMIX									
Crop Type, Code		C -	C -	C -	Corn									
Crop Name					Yield									
Rating Type		Control	Control	Control	Bu/A									
Rating Unit		%	%	%										
Rating Date		07/02/18	07/02/18	07/02/18	09/28/18									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code							
8	Halex GT Premix	4.376	SC	1.97	lb ai/a	2-4"	wds	B	100.0	a	100.0	a	167.5	a
	----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	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						
LSD P=.05						17.25		52.33		11.06		30.89		
Standard Deviation						9.85		29.88		6.32		17.64		
CV						12.38		37.74		7.6		11.32		
Replicate F						3.135		0.467		0.940		1.547		
Replicate Prob(F)						0.0750		0.6365		0.4138		0.2472		
Treatment F						36.632		4.200		87.608		8.183		
Treatment Prob(F)						0.0001		0.0108		0.0001		0.0005		

Means followed by same letter 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 1,2 because error mean square = 0.

## University of Delaware

Soil-Applied Herbicide Evaluation in Field Corn Premium Products Course-Textured Soils

Trial ID: Corn8a-18 Location: REC Field #18 Trial Year: 2016

Protocol ID: Corn8-a18 Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 03/01/18

Completion Date: 09/30/18

**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

Variety: D48SS38RIB

Attributes: LL/RR

Planting Date: 04/24/18

Planting Rate: 30000 S/A

Depth: 2 in

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 in

Planting Equipment: FE Field Equipment

Seed Bed: SMOOTH smooth

Soil Temperature: 62 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 05/03/18

Harvest Date: 09/27/18

Harvest Equipment: Plot combine

Harvested Width: 5 FT

% Standard Moisture: 15.5

Harvested Length: 24 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: CONTIL conventional-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 18C

% Sand: 83

% OM: 1.2

Texture: LS

loamy sand

% Silt: 10

pH: 6.4

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

% Clay: 7

CEC: 3.1

Fert. Level: F fair

Soil Drainage: F

fair

**Application Description**

		A
Application Date	04/25/18	
Appl. Stop Time	02:00 PM	
Application Method	SPRAY	
Application Timing	PRE	
Application Placement	BROADC	
Applied By	Johnson	
Air Temperature Start, Stop	82 F	
% Relative Humidity Start, Stop	49	
Wind Velocity+Dir. Start	1 mph SW	
Wet Leaves (Y/N)	N no	
Soil Temperature	82 F	
Soil Moisture	NORMAL	
% Cloud Cover	85	

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	ZEAMX BCOR

**Application Equipment**

		A
Appl. Equipment	Tractor	
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	18 in	
Ground Speed	3 mph	
Carrier	WATER	
Application Amount	20 gal/ac	
Propellant	COMAIR	

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

05/28/18: Common ragweed was observed in the untreated checks but not observed in any of the treated plots. Poor control of fall panicum in treatments 2, 3, 5.

06/04/18: Common ragweed was observed in the untreated checks but still not observed in any of the treated plots. Poor control of fall panicum in treatments 2-5 and 8.

06/18/18: Stunting observed in treatments 8 and 11 (about 10%)

Fall panicum control: Poor/Fair: treatments 9-12; Poot/No control: treatments 2-6, 8; Poor carpetweed control in treatments 5, 8-11.

07/07/18: Poor fall panicum control in treatments 2-6 8,9 11, 12.

09/19/18: No treatment provided very good to excellent weed control.

Soil-Applied Herbicide Evaluation in Field Corn Premium Products Course-Textured Soils							
Trial ID: Corn8a-18		Location: REC Field #18		Trial Year: 2016			
Protocol ID: Corn8-a18		Investigator: Mark VanGessel					
Study Director:							
Sponsor Contact:							
Pest Code							
Pest Name							
Crop Type, Code							
Crop Name							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	AMAPA PalmerAm C.Imsqtr
1	Untreated Check						0.0 c
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.67 SC 2.49 0.25 0.93	SC	2.48 lb ai/a 1.68 0.169 0.63	PRE	A	3.3 a 100.0 a
3	Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.71 SC 1.742819 0.2243629 1.742819	SC	2.78 lb ai/a 1.3 0.168 1.3	PRE	A	2.3 a 100.0 a
4	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L	3.67 SC 2.49 0.25 0.93 4 L	SC	2.48 lb ai/a 1.68 0.169 0.63 0.75 lb ai/a	PRE	A	3.3 a 100.0 a
5	Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001	ZC	1.63 lb ai/a 0.04	PRE	A	2.3 a 100.0 a
6	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor	3.44 ZC 1 0.06 0.24 2.14	ZC	2.15 lb ai/a 0.625 0.0375 0.15 1.34	PRE	A	0.0 a 100.0 a
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	5.5 L 2.4 3.1 3.8 CS	L	2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	PRE	A	3.3 a 0.0 a 99.0 a 88.3 b
8	Instigate Premix ---- rimsulfuron ---- mesotrione ____ mesotrione ____ rimsulfuron Atrazine 4L	45.8 WG 4.15 41.65 50 WG 25 SG 4 L	WG	0.15 lb ai/a 0.0136 0.136 0.136 lb ai/a 0.0136 lb ai/a 1 lb ai/a	PRE	A	2.3 a 8.0 a 99.0 a
9	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L	3.28 SE 2.8 0.3 0.18 4 L	SE	1.85 lb ai/a 1.58 0.17 0.102 1 lb ai/a	PRE	A	4.7 a 3.3 a 100.0 a
10	Corvus Premix ----thien carbazole ----isoxaflutole Atrazine 4L	2.63 SC 0.75 1.88 4 L	SC	0.068 lb ai/a 0.0194 0.0486 1 lb ai/a	PRE	A	1.7 a 2.3 a 99.7 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=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		C ZEAMX Corn Stunting %	C ZEAMX Corn Stunting %	AMAPA PalmerAm	CHEAL C.lmsqtr		
Crop Type, Code Crop Name Rating Type Rating Unit Rating Date		05/08/18	05/28/18	C -	C -		
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
11 SureStart II Premix ----acetochlor ----clopyralid ----flumetsulam Atrazine 4L	4.25 SE 3.75 0.38 0.12	0.8 lb ai/a 0.706 0.0715 0.0226	A	6.3 a	2.3 a	100.0 a	100.0 a
4 L		1 lb ai/a					
12 Prequel Premix ----rimsulfuron ----isoxaflutole Atrazine 4L	45 DF 15 30	0.045 lb ai/a 0.015 0.03	A	4.7 a	6.3 a	100.0 a	100.0 a
4 L		1 lb ai/a					
LSD P=.05 Standard Deviation CV				4.69 2.77 98.77	4.98 2.94 108.08	1.14 0.67 0.74	5.09 3.00 3.31
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				0.069 0.9338 1.937 0.0900	0.860 0.4369 2.036 0.0750	3.011 0.0698 5508.263 0.0001	1.000 0.3840 274.818 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=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

Pest Code	Pest Name		IPOSS morngly	DIGSA L.crbgrs		AMAPA PalmerAm	
Crop Type, Code	Crop Name		C -	C -	C	ZEAMX Corn Stunting %	C -
Rating Type	Rating Unit	Control %	Control %	05/28/18	05/28/18	06/04/18	Control %
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code	
1	Untreated Check						0.0 c
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.67 SC 2.49 0.25 0.93	2.48 lb ai/a PRE	A	84.0 ab	99.0 a	2.3 bc 100.0 a
3	Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.71 SC 1.742819 0.2243629 1.742819	2.78 lb ai/a PRE	A	90.7 a	98.3 a	4.7 abc 100.0 a
4	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 PRE 1.68 0.169 0.63 0.75 lb ai/a PRE	A	75.0 cd	97.0 ab	0.0 c 100.0 a
5	Acuron Flexi Premix ----bicyclopyrone ----mesotrione ----s-metolachlor	3.26 ZC .08000001 0.32 2.86	1.63 lb ai/a PRE	A	65.2 e	97.3 ab	2.3 bc 100.0 a
6	Acuron Premix ----atrazine ----bicyclopyrone ----mesotrione ----s-metolachlor	3.44 ZC 1 0.06 0.24 2.14	2.15 lb ai/a PRE	A	88.3 ab	100.0 a	3.3 bc 98.3 a
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	5.5 L 2.4 3.1 3.8 CS	2.2 lb ai/a PRE 0.96 1.24 1.19 lb ai/a PRE	A	87.0 ab	99.0 a	0.0 c 98.3 a
8	Instigate Premix ----rimsulfuron ----mesotrione ____mesotrione ____rimsulfuron Atrazine 4L	45.8 WG 4.15 41.65 50 WG 25 SG 4 L	0.15 lb ai/a PRE 0.0136 0.136 0.136 lb ai/a PRE 0.0136 lb ai/a PRE 1 lb ai/a PRE	A	81.7 bc	81.7 d	2.3 bc 100.0 a
9	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L	3.28 SE 2.8 0.3 0.18 4 L	1.85 lb ai/a PRE 1.58 0.17 0.102 1 lb ai/a PRE	A	85.0 ab	100.0 a	7.3 ab 100.0 a
10	Corvus Premix ----thien carbazole ----isoxaflutole Atrazine 4L	2.63 SC 0.75 1.88 4 L	0.068 lb ai/a PRE 0.0194 0.0486 1 lb ai/a PRE	A	71.7 de	90.0 c	9.7 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=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		IPOSS morngly	DIGSA L.crbgrs		AMAPA PalmerAm						
Crop Type, Code Crop Name		C -	C -	C ZEAMX Corn Stunting	C -						
Rating Type		Control %	Control %	%	Control %						
Rating Unit											
Rating Date		05/28/18	05/28/18	06/04/18	06/04/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
11	SureStart II Premix ----acetochlor ----clopyralid ----flumetsulam Atrazine 4L	4.25 3.75 0.38 0.12 4 L	SE 0.706 0.0715 0.0226 1 lb ai/a	0.8 lb ai/a 0.015 0.03 1 lb ai/a	PRE A A	73.3 d	90.7 c	6.3 ab	100.0 a		
12	Prequel Premix ----rimsulfuron ----isoxaflutole Atrazine 4L	45 15 30 4 L	DF 0.045 0.015 0.03 1 lb ai/a	lb ai/a 0.5229 0.0320 0.0001	PRE A A	86.5 ab	92.8 bc	4.7 abc	92.7 b		
LSD P=.05				8.04	4.73	5.84	3.59				
Standard Deviation				4.71	2.79	3.45	2.12				
CV				6.36	3.2	96.28	2.34				
Replicate F				0.405	0.669	4.040	1.874				
Replicate Prob(F)				0.6728	0.5229	0.0320	0.1771				
Treatment F				81.847	302.273	2.389	547.188				
Treatment Prob(F)				0.0001	0.0001	0.0395	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=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

Pest Code	CHEAL	IPOSS	DIGSA	AMAPA						
Pest Name	C.lmsqtr	morngly	L.crbgrs	PalmerAm						
Crop Type, Code	C -	C -	C -	C -						
Crop Name	Control %	Control %	Control %	Control %						
Rating Type	06/04/18	06/04/18	06/04/18	06/18/18						
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code				
1	Untreated Check						0.0 b	0.0 c	0.0 d	0.0 c
2	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	A	100.0 a	78.3 ab	98.3 ab	88.3 ab	
	----s-metolachlor	2.49	1.68							
	----mesotrione	0.25	0.169							
	----atrazine	0.93	0.63							
3	Lexar EZ Premix	3.71 SC	2.78 lb ai/a	PRE	A	100.0 a	84.3 ab	99.0 a	95.0 ab	
	----s-metolachlor	1.742819	1.3							
	----mesotrione	0.2243629	0.168							
	----atrazine	1.742819	1.3							
4	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	A	100.0 a	77.3 ab	99.0 a	95.0 ab	
	----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					
5	Acuron Flexi Premix	3.26 ZC	1.63 lb ai/a	PRE	A	100.0 a	78.3 ab	98.3 ab	83.3 b	
	----bicyclopyrone	.08000001	0.04							
	----mesotrione	0.32	0.16							
	----s-metolachlor	2.86	1.43							
6	Acuron Premix	3.44 ZC	2.15 lb ai/a	PRE	A	100.0 a	85.0 ab	91.0 bc	91.7 ab	
	----atrazine	1	0.625							
	----bicyclopyrone	0.06	0.0375							
	----mesotrione	0.24	0.15							
	----s-metolachlor	2.14	1.34							
7	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	PRE	A	100.0 a	90.7 a	97.0 abc	93.3 ab	
	----s-metolachlor	2.4	0.96							
	----atrazine	3.1	1.24							
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A					
8	Instigate Premix	45.8 WG	0.15 lb ai/a	PRE	A	100.0 a	81.7 ab	89.7 c	86.0 ab	
	----rimosulfuron	4.15	0.0136							
	----mesotrione	41.65	0.136							
	____ mesotrione	50 WG	0.136 lb ai/a	PRE	A					
	____ rimosulfuron	25 SG	0.0136 lb ai/a	PRE	A					
	Atrazine 4L	4 L	1 lb ai/a	PRE	A					
9	Resicore Premix	3.28 SE	1.85 lb ai/a	PRE	A	100.0 a	83.3 ab	98.3 ab	98.7 a	
	----acetochlor	2.8	1.58							
	----mesotrione	0.3	0.17							
	----clopyralid	0.18	0.102							
	Atrazine 4L	4 L	1 lb ai/a	PRE	A					
10	Corvus Premix	2.63 SC	0.068 lb ai/a	PRE	A	100.0 a	75.3 b	93.3 abc	95.0 ab	
	----thien carbazole	0.75	0.0194							
	----isoxaflutole	1.88	0.0486							
	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.

Missing data estimates are included in columns: Yates=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

## University of Delaware

Pest Code	CHEAL	IPOSS	DIGSA	AMAPA						
Pest Name	C.lmsqtr	morngly	L.crbgrs	PalmerAm						
Crop Type, Code	C -	C -	C -	C -						
Crop Name	Control %	Control %	Control %	Control %						
Rating Type	06/04/18	06/04/18	06/04/18	06/18/18						
Rating Unit										
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
11 SureStart II Premix	4.25 SE	0.8 lb ai/a	PRE	A	100.0	a	74.0 b	97.0 abc	89.0 ab	
----acetochlor	3.75	0.706								
----clopyralid	0.38	0.0715								
----flumetsulam	0.12	0.0226								
Atrazine 4L	4 L	1 lb ai/a	PRE	A						
12 Prequel Premix	45 DF	0.045 lb ai/a	PRE	A	100.0	a	77.3 ab	93.3 abc	85.0 ab	
----rimsulfuron	15	0.015								
----isoxaflutole	30	0.03								
Atrazine 4L	4 L	1 lb ai/a	PRE	A						
LSD P=.05		.			13.37		7.89		14.63	
Standard Deviation		0.00			7.90		4.66		8.64	
CV		0.0			10.7		5.3		10.36	
Replicate F			0.000		0.836		3.960		5.509	
Replicate Prob(F)			1.0000		0.4469		0.0340		0.0115	
Treatment F			0.000		27.068		107.169		28.603	
Treatment Prob(F)			1.0000		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=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

Pest Code Pest Name			AMBEL C.ragwd	CHEAL C.lmsqtr	IPOSS mornlgy	DIGSA L.crbgrs
Crop Type, Code Crop Name			C -	C -	C -	C -
Rating Type			Control %	Control %	Control %	Control %
Rating Unit			06/18/18	06/18/18	06/18/18	06/18/18
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code
1	Untreated Check				1.1 d	0.0 b
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.67 SC 2.49 0.25 0.93	2.48 lb ai/a 1.68 0.169 0.63	PRE A	100.0 a	100.0 a
3	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	100.0 a	100.0 a
4	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	100.0 a	100.0 a
5	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	PRE A	70.0 c	100.0 a
6	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	100.0 a	99.0 a
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	5.5 L 2.4 3.1 3.8 CS	2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	PRE A	100.0 a	95.0 a
8	Instigate Premix ----rimsulfuron ----mesotrione ____mesotrione ____rimsulfuron Atrazine 4L	45.8 WG 4.15 41.65 50 WG 25 SG 4 L	0.15 lb ai/a 0.0136 0.136 0.136 lb ai/a 0.0136 lb ai/a 1 lb ai/a	PRE A	85.0 b	100.0 a
9	Resicore Premix ----acetochlor ----mesotrione ----clopyralid Atrazine 4L	3.28 SE 2.8 0.3 0.18 4 L	1.85 lb ai/a 1.58 0.17 0.102 1 lb ai/a	PRE A	100.0 a	100.0 a
10	Corvus Premix ----thien carbazole ----isoxaflutole Atrazine 4L	2.63 SC 0.75 1.88 4 L	0.068 lb ai/a 0.0194 0.0486 1 lb ai/a	PRE A	100.0 a	96.0 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=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		AMBEL C.ragwd	CHEAL C.lmsqtr	IPOSS morngly	DIGSA L.crbgrs
Crop Type, Code Crop Name		C -	C -	C -	C -
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		06/18/18	06/18/18	06/18/18	06/18/18
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
11 SureStart II Premix ----acetochlor ----clopyralid ----flumetsulam Atrazine 4L	4.25 3.75 0.38 0.12	SE 0.706 0.0715 0.0226	0.8 lb ai/a 1 lb ai/a	PRE A	90.0 ab 100.0 a
12 Prequel Premix ----rimsulfuron ----isoxaflutole Atrazine 4L	45 DF 15 30 4 L	0.045 lb ai/a 0.015 0.03	1 lb ai/a	PRE A	100.0 a 99.0 a
LSD P=.05 Standard Deviation CV					11.45 6.75 7.74
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					5.07 3.00 3.3
					17.32 10.20 16.19
					8.78 5.17 6.23
					1.283 0.2981 13.677
					1.376 0.2744 84.420
					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=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

Pest Code	Pest Name		AMAPA PalmerAm	AMBEL C.ragwd	IPOSS morngly	DIGSA L.crbgrs
Crop Type, Code	Crop Name		C -	C -	C -	C -
Rating Type	Rating Unit	Control %	Control %	Control %	Control %	Control %
Rating Date		07/07/18	07/07/18	07/07/18	07/07/18	07/07/18
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code
1	Untreated Check				0.0 d	0.0 c
2	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	A	85.0 abc
	----s-metolachlor	2.49	1.68			
	----mesotrione	0.25	0.169			
	----atrazine	0.93	0.63			
3	Lexar EZ Premix	3.71 SC	2.78 lb ai/a	PRE	A	83.3 abc
	----s-metolachlor	1.742819	1.3			
	----mesotrione	0.2243629	0.168			
	----atrazine	1.742819	1.3			
4	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	A	94.3 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	
5	Acuron Flexi Premix	3.26 ZC	1.63 lb ai/a	PRE	A	80.0 bc
	----bicyclopyrone	.08000001	0.04			
	----mesotrione	0.32	0.16			
	----s-metolachlor	2.86	1.43			
6	Acuron Premix	3.44 ZC	2.15 lb ai/a	PRE	A	85.0 abc
	----atrazine	1	0.625			
	----bicyclopyrone	0.06	0.0375			
	----mesotrione	0.24	0.15			
	----s-metolachlor	2.14	1.34			
7	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	PRE	A	91.3 ab
	----s-metolachlor	2.4	0.96			
	----atrazine	3.1	1.24			
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A	
8	Instigate Premix	45.8 WG	0.15 lb ai/a	PRE	A	85.0 abc
	----rimsulfuron	4.15	0.0136			
	----mesotrione	41.65	0.136			
	____ mesotrione	50 WG	0.136 lb ai/a	PRE	A	
	____ rimsulfuron	25 SG	0.0136 lb ai/a	PRE	A	
	Atrazine 4L	4 L	1 lb ai/a	PRE	A	
9	Resicore Premix	3.28 SE	1.85 lb ai/a	PRE	A	94.3 a
	----acetochlor	2.8	1.58			
	----mesotrione	0.3	0.17			
	----clopyralid	0.18	0.102			
	Atrazine 4L	4 L	1 lb ai/a	PRE	A	
10	Corvus Premix	2.63 SC	0.068 lb ai/a	PRE	A	84.7 abc
	----thien carbazole	0.75	0.0194			
	----isoxaflutole	1.88	0.0486			
	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.

Missing data estimates are included in columns: Yates=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		AMAPA PalmerAm	AMBEL C.ragwd	IPOSS mornglry	DIGSA L.crbgrs
Crop Type, Code Crop Name		C -	C -	C -	C -
Rating Type		Control %	Control %	Control %	Control %
Rating Unit		07/07/18	07/07/18	07/07/18	07/07/18
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
11	SureStart II Premix	4.25	SE	0.8 lb ai/a	PRE A
	----acetochlor	3.75		0.706	
	----clobopyralid	0.38		0.0715	
	----flumetsulam	0.12		0.0226	
	Atrazine 4L	4 L		1 lb ai/a	PRE A
12	Prequel Premix	45	DF	0.045 lb ai/a	PRE A
	----rimsulfuron	15		0.015	
	----isoxaflutole	30		0.03	
	Atrazine 4L	4 L		1 lb ai/a	PRE A
LSD P=.05				13.64	12.76
Standard Deviation				8.05	7.53
CV				10.27	8.52
Replicate F				0.818	2.068
Replicate Prob(F)				0.4542	0.1503
Treatment F				29.644	44.141
Treatment Prob(F)				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=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

Pest Code					C ZEAMX
Pest Name					Corn Yield
Crop Type, Code					Bu/A
Crop Name					09/27/18
Rating Type					
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing Appl Code
1	Untreated Check				53.6 c
2	Lumax EZ Premix	3.67 SC	2.48 lb ai/a PRE	A	184.4 a
	----s-metolachlor	2.49	1.68		
	----mesotrione	0.25	0.169		
	----atrazine	0.93	0.63		
3	Lexar EZ Premix	3.71 SC	2.78 lb ai/a PRE	A	170.1 ab
	----s-metolachlor	1.742819	1.3		
	----mesotrione	0.2243629	0.168		
	----atrazine	1.742819	1.3		
4	Lumax EZ Premix	3.67 SC	2.48 lb ai/a PRE	A	152.5 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 PRE	A	
5	Acuron Flexi Premix	3.26 ZC	1.63 lb ai/a PRE	A	169.5 ab
	----bicyclopyrone	.08000001	0.04		
	----mesotrione	0.32	0.16		
	----s-metolachlor	2.86	1.43		
6	Acuron Premix	3.44 ZC	2.15 lb ai/a PRE	A	165.9 ab
	----atrazine	1	0.625		
	----bicyclopyrone	0.06	0.0375		
	----mesotrione	0.24	0.15		
	----s-metolachlor	2.14	1.34		
7	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a PRE	A	160.9 ab
	----s-metolachlor	2.4	0.96		
	----atrazine	3.1	1.24		
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a PRE	A	
8	Instigate Premix	45.8 WG	0.15 lb ai/a PRE	A	152.2 b
	----rimosulfuron	4.15	0.0136		
	----mesotrione	41.65	0.136		
	____ mesotrione	50 WG	0.136 lb ai/a PRE	A	
	____ rimosulfuron	25 SG	0.0136 lb ai/a PRE	A	
	Atrazine 4L	4 L	1 lb ai/a PRE	A	
9	Resicore Premix	3.28 SE	1.85 lb ai/a PRE	A	160.2 ab
	----acetochlor	2.8	1.58		
	----mesotrione	0.3	0.17		
	----clopyralid	0.18	0.102		
	Atrazine 4L	4 L	1 lb ai/a PRE	A	
10	Corvus Premix	2.63 SC	0.068 lb ai/a PRE	A	165.8 ab
	----thiencarbazone	0.75	0.0194		
	----isoxaflutole	1.88	0.0486		
	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.

Missing data estimates are included in columns:Yates=5,6,13,15,16,19

Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

## University of Delaware

Pest Code							C	ZEAMX	
Pest Name								Corn	
Crop Type, Code								Yield	
Crop Name								Bu/A	
Rating Type									
Rating Unit									
Rating Date									09/27/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code		
11	SureStart II Premix ----acetochlor ----clopyralid ----flumetsulam Atrazine 4L	4.25 3.75 0.38 0.12 4 L	SE 0.706 0.0715 0.0226 1 lb ai/a	0.8 lb ai/a	PRE	A		148.9 b	
12	Prequel Premix ----rimsulfuron ----isoxaflutole Atrazine 4L	45 15 30 4 L	DF 0.015 0.03 1 lb ai/a	0.045 lb ai/a	PRE	A		172.3 ab	
LSD P=.05								26.54	
Standard Deviation								15.67	
CV								10.13	
Replicate F								1.644	
Replicate Prob(F)								0.2160	
Treatment F								13.583	
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=5,6,13,15,16,19  
 Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

**Soil-Applied Herbicide Evaluation in Field Corn for Coarse-Textured Soils**  
 Trial ID: Corn9a-18 Location: REC Field #18 Trial Year: 2016  
 Protocol ID: Corn9a-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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	Variety: D48SS38RIB	
Attributes: LL/RR	Planting Date: 05/09/18	Planting Rate: 30000 S/A
Depth: 2 in	Rows per Plot: 4	Planting Method: PLANTD planted
Row Spacing: 30 in	Planting Equipment: FE Field Equipment	Seed Bed: SMOOTH smooth
Soil Temperature: 72 F	Soil Moisture: ABONOR above normal, excessive	
Emergence Date: 05/15/18	Harvest Equipment: Plot combine	
Harvest Date: 09/28/18	Harvested Width: 5 FT	Harvested Length: 24 FT
% Standard Moisture: 15.5		

**Site and Design**

Treated Plot Width: 6.67 FT	Treated Plot Length: 25 FT	Site Type: FIELD field
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 18C			
% Sand: 83	% OM: 1.2	Texture: LS	loamy sand
% Silt: 10	pH: 6.4	Soil Name: Klej loamy sand, 0-2% slopes	
% Clay: 7	CEC: 3.1	Fert. Level: F	fair
Soil Drainage: F	fair		

<b>Application Description</b>	
	A
Application Date	05/10/18
Appl. Stop Time	09:30 AM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	69 F
% Relative Humidity Start, Stop	65
Wind Velocity+Dir. Start	3 mph S
Wet Leaves (Y/N)	N no
Soil Temperature	69 F
Soil Moisture	NORMAL
% Cloud Cover	10

<b>Crop Stage At Each Application</b>	
	A
Crop 1 Code, BBCH Scale	ZEAMX BCOR

<b>Application Equipment</b>	
	A
Appl. Equipment	Tractor
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	18 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

Date	Notes
05/24/18	Very few weeds at this rating date. IPOSS spotted sporadically.
06/06/18	Common ragweed sporadic. Present in plots 104, 105, 107, 108, 110, 201, 203, 205, 207, 208, 209, and 307.

<b>SE Definitions</b>	
	1.
Crop Type, Code	C

<b>Trial Comments</b>	
09/19/18: No treatment provided good weed control, all treatments needed a POST application.	

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

Means followed by same letter(s) by superscript sign indicate P(F) < 0.05, LSD.

## University of Delaware

Pest Code		C	ZEAMX	C	ZEAMX	AMAPA	IPOSS
Pest Name						PalmerAm	morngly
Crop Type, Code						C -	C -
Crop Name							
Rating Type						Control	Control
Rating Unit						%	%
Rating Date						06/06/18	06/06/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
12	Verdict Premix ----saflufenacil ----dimethenamid Atrazine 4L	5.57 0.57 5 4 L	EC 0.053 0.467 1.25 lb ai/a	0.52 0.053 0.467 1.25 lb ai/a	ai/a	PRE	A
					0.0 a	0.0 a	48.3 ab
LSD P=.05					.	2.04	38.82
Standard Deviation					0.00	1.20	22.93
CV					0.0	433.8	54.48
Replicate F					0.000	0.478	0.194
Replicate Prob(F)					1.0000	0.6262	0.8249
Treatment F					0.000	0.870	4.610
Treatment Prob(F)					1.0000	0.5803	0.0011
							0.7204

Means followed by same letter 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			MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm	AMBEL C.ragwd		
Crop Type, Code Crop Name			C -	C -	C -	C -		
Rating Type			Control %	Control %	Control %	Control %		
Rating Unit			06/06/18	06/06/18	06/18/18	06/18/18		
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing		
1	Untreated Check							
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	85.0 a	86.7 bc	83.3 a	100.0 a
3	Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine Simazine	3.71 SC 1.742819 0.2243629 1.742819 4 L	2.78 lb ai/a 1.3 0.168 1.3 1.5 lb ai/a	PRE A	85.0 a	95.7 a	50.0 abc	58.3 ab
4	Bicep II Magnum Premix ----s-metolachlor ----atrazine	5.5 L 2.4 3.1	2.9 lb ai/a 1.27 1.63	PRE A	16.7 bc	90.7 abc	20.0 cd	66.7 ab
5	Bicep II Magnum Premix ----s-metolachlor ----atrazine	5.5 L 2.4 3.1	2.2 lb ai/a 0.96 1.24	PRE A	16.7 bc	89.3 abc	40.0 bc	0.0 c
6	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	72.7 a	90.0 abc	56.7 ab	66.7 ab
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	5.5 L 2.4 3.1 3.8 CS	2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	PRE A	83.3 a	91.7 abc	30.0 bcd	33.3 bc
8	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	2.38 lb ai/a 1.32 1.06	PRE A	23.3 bc	93.3 ab	43.3 bc	100.0 a
9	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	4.2 lb ai/a 2.32 1.88	PRE A	81.7 a	96.7 a	60.0 ab	66.7 ab
10	Zidua.....pyroxasulfone Atrazine 4L	85 WG 4 L	0.08 lb ai/a 1.25 lb ai/a	PRE A	53.3 ab	94.0 ab	3.3 d	36.7 bc
11	Zidua.....pyroxasulfone Atrazine 4L	85 WG 4 L	0.133 lb ai/a 1.25 lb ai/a	PRE A	83.3 a	91.0 abc	43.3 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 because error mean square = 0.

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Pest Code Pest Name	MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm	AMBEL C.ragwd					
Crop Type, Code Crop Name	C -	C -	C -	C -					
Rating Type	Control %	Control %	Control %	Control %					
Rating Unit	06/06/18	06/06/18	06/18/18	06/18/18					
Rating Date									
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code				
12 Verdict Premix ----saflufenacil ----dimethenamid Atrazine 4L	5.57 0.57 5 4 L	EC 0.053 0.467 1.25 lb ai/a	0.52 lb ai/a 0.053 0.467 1.25 lb ai/a	PRE A	0.0 c	85.0 c	38.3 bc	100.0 a	
LSD P=.05			38.86	7.48	33.86	55.39			
Standard Deviation			22.95	4.42	20.00	32.71			
CV			45.83	5.28	51.24	53.89			
Replicate F			0.143	0.090	1.314	6.827			
Replicate Prob(F)			0.8677	0.9145	0.2889	0.0049			
Treatment F			7.317	108.533	4.169	3.820			
Treatment Prob(F)			0.0001	0.0001	0.0021	0.0036			

Means followed by same letter 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	Crop Name	Rating Type	Rating Unit	Rating Date	IPOSS mornglry C -	MOLVE Carpetwd C -	DIGSA Lcrbgars C -	CYPES Y.nutsge C -
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1	Untreated Check						0.0 c	0.0 d	0.0 e	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	100.0 a	63.3 a	88.3 a	100.0 a		
3	Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine Simazine	3.71 SC 1.742819 0.2243629 1.742819 4 L	2.78 lb ai/a 1.3 0.168 1.3 1.5 lb ai/a	PRE A	100.0 a	66.7 a	87.7 ab	100.0 a		
4	Bicep II Magnum Premix ----s-metolachlor ----atrazine	5.5 L 2.4 3.1	2.9 lb ai/a 1.27 1.63	PRE A	58.3 ab	16.7 cd	85.0 ab	100.0 a		
5	Bicep II Magnum Premix ----s-metolachlor ----atrazine	5.5 L 2.4 3.1	2.2 lb ai/a 0.96 1.24	PRE A	50.0 abc	55.0 ab	73.3 bcd	99.3 a		
6	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	91.7 a	60.0 ab	70.0 cd	95.0 a		
7	Bicep II Magnum Premix ----s-metolachlor ----atrazine Prowl H2O.....pendimethalin	5.5 L 2.4 3.1 3.8 CS	2.2 lb ai/a 0.96 1.24 1.19 lb ai/a	PRE A	50.0 abc	71.7 a	86.7 ab	95.0 a		
8	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	2.38 lb ai/a 1.32 1.06	PRE A	85.0 ab	55.0 ab	86.7 ab	95.0 a		
9	Harness Xtra 5.6L Premix ----acetochlor ----atrazine	5.6 L 3.1 2.5	4.2 lb ai/a 2.32 1.88	PRE A	83.3 ab	63.3 a	90.0 a	100.0 a		
10	Zidua.....pyroxasulfone Atrazine 4L	85 WG 4 L	0.08 lb ai/a 1.25 lb ai/a	PRE A	33.3 bc	53.3 ab	78.3 abc	66.7 b		
11	Zidua.....pyroxasulfone Atrazine 4L	85 WG 4 L	0.133 lb ai/a 1.25 lb ai/a	PRE A	56.7 ab	71.0 a	70.0 cd	83.3 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.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

## University of Delaware

Pest Code	IPOSS	MOLVE	DIGSA	CYPES				
Pest Name	mornglry	Carpetwd	Lcrbgrs	Y.nutsge				
Crop Type, Code	C -	C -	C -	C -				
Crop Name								
Rating Type	Control	Control	Control	Control				
Rating Unit	%	%	%	%				
Rating Date	06/18/18	06/18/18	06/18/18	06/18/18				
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing Code				
12 Verdict Premix ----saflufenacil ----dimethenamid Atrazine 4L	5.57 EC 0.57 5 4 L	0.52 lb ai/a 0.053 0.467 1.25 lb ai/a	PRE A	100.0 a	33.3 bc	61.7 d	95.0 a	
LSD P=.05				56.43	29.80	14.78	17.24	
Standard Deviation				33.32	17.60	8.73	10.18	
CV				49.47	34.66	11.94	11.87	
Replicate F				1.982	2.356	1.352	2.924	
Replicate Prob(F)				0.1617	0.1183	0.2794	0.0748	
Treatment F				2.664	4.920	24.194	23.848	
Treatment Prob(F)				0.0243	0.0007	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 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	AMAPA PalmerAm C -	AMBEL C.ragwd C -	IPOSS morngly C -	DIGSA L.crbgra C -
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Control %	Control %	Control %	Control %
1	Untreated Check						0.0 a	0.0 b	0.0 a	0.0 f
2	Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	A		70.0 a	100.0 a	66.7 a	65.0 a-d
	----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	Lexar EZ Premix	3.71 SC	2.78 lb ai/a	PRE	A		56.7 a	86.7 a	33.3 a	88.3 a
	----s-metolachlor	1.742819	1.3							
	----mesotrione	0.2243629	0.168							
	----atrazine	1.742819	1.3							
	Simazine	4 L	1.5 lb ai/a	PRE	A					
4	Bicep II Magnum Premix	5.5 L	2.9 lb ai/a	PRE	A		16.7 a	88.3 a	100.0 a	85.0 a
	----s-metolachlor	2.4	1.27							
	----atrazine	3.1	1.63							
5	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	PRE	A		40.0 a	70.0 a	66.7 a	41.7 cde
	----s-metolachlor	2.4	0.96							
	----atrazine	3.1	1.24							
6	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	PRE	A		36.7 a	83.3 a	33.3 a	60.0 a-d
	----s-metolachlor	2.4	0.96							
	----atrazine	3.1	1.24							
	Resolve SG..... rimsulfuron	25 SG	0.0156 lb ai/a	PRE	A					
7	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	PRE	A		45.0 a	88.3 a	100.0 a	73.3 abc
	----s-metolachlor	2.4	0.96							
	----atrazine	3.1	1.24							
	Prowl H2O..... pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A					
8	Harness Xtra 5.6L Premix	5.6 L	2.38 lb ai/a	PRE	A		58.3 a	88.3 a	33.3 a	76.7 ab
	----acetochlor	3.1	1.32							
	----atrazine	2.5	1.06							
9	Harness Xtra 5.6L Premix	5.6 L	4.2 lb ai/a	PRE	A		60.0 a	88.3 a	66.7 a	88.3 a
	----acetochlor	3.1	2.32							
	----atrazine	2.5	1.88							
10	Zidua..... pyroxasulfone	85 WG	0.08 lb ai/a	PRE	A		10.0 a	100.0 a	66.7 a	46.7 b-e
	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A					
11	Zidua..... pyroxasulfone	85 WG	0.133 lb ai/a	PRE	A		30.0 a	86.7 a	100.0 a	40.0 de
	Atrazine 4L	4 L	1.25 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.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA	AMBEL	IPOSS	DIGSA						
Pest Name	PalmerAm	C.ragwd	morngly	L.crbgra							
Crop Type, Code	C -	C -	C -	C -							
Crop Name											
Rating Type	Control	Control	Control	Control							
Rating Unit	%	%	%	%							
Rating Date	07/02/18	07/02/18	07/02/18	07/02/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
12	Verdict Premix ----saflufenacil ----dimethenamid Atrazine 4L	5.57 0.57 5 4 L	EC 0.053 0.467 1.25 lb ai/a	0.52 lb ai/a 0.053 0.467 1.25 lb ai/a	PRE A		50.0 a	100.0 a	66.7 a	20.0 ef	
LSD P=.05							42.50	30.02	80.28	32.78	
Standard Deviation							25.10	17.73	47.41	19.36	
CV							63.63	21.71	77.58	33.92	
Replicate F							0.762	2.465	0.865	0.272	
Replicate Prob(F)							0.4787	0.1082	0.4348	0.7641	
Treatment F							2.248	6.978	1.303	6.347	
Treatment Prob(F)							0.0510	0.0001	0.2862	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 because error mean square = 0.

Pest Code						C ZEAMX	
Pest Name						Corn	
Crop Type, Code						Yield	
Crop Name						Bu/A	
Rating Type						09/28/18	
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code	
1	Untreated Check					74.3 c	
2	Lumax EZ Premix	3.67 SC		2.48 lb ai/a	PRE	A	120.7 ab
	----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	Lexar EZ Premix	3.71 SC		2.78 lb ai/a	PRE	A	134.8 ab
	----s-metolachlor	1.742819		1.3			
	----mesotrione	0.2243629		0.168			
	----atrazine	1.742819		1.3			
	Simazine	4 L		1.5 lb ai/a	PRE	A	
4	Bicep II Magnum Premix	5.5 L		2.9 lb ai/a	PRE	A	125.1 ab
	----s-metolachlor	2.4		1.27			
	----atrazine	3.1		1.63			
5	Bicep II Magnum Premix	5.5 L		2.2 lb ai/a	PRE	A	123.7 ab
	----s-metolachlor	2.4		0.96			
	----atrazine	3.1		1.24			
6	Bicep II Magnum Premix	5.5 L		2.2 lb ai/a	PRE	A	116.3 b
	----s-metolachlor	2.4		0.96			
	----atrazine	3.1		1.24			
	Resolve SG..... rimsulfuron	25 SG		0.0156 lb ai/a	PRE	A	
7	Bicep II Magnum Premix	5.5 L		2.2 lb ai/a	PRE	A	132.3 ab
	----s-metolachlor	2.4		0.96			
	----atrazine	3.1		1.24			
	Prowl H2O..... pendimethalin	3.8 CS		1.19 lb ai/a	PRE	A	
8	Harness Xtra 5.6L Premix	5.6 L		2.38 lb ai/a	PRE	A	139.2 ab
	----acetochlor	3.1		1.32			
	----atrazine	2.5		1.06			
9	Harness Xtra 5.6L Premix	5.6 L		4.2 lb ai/a	PRE	A	133.5 ab
	----acetochlor	3.1		2.32			
	----atrazine	2.5		1.88			
10	Zidua..... pyroxasulfone	85 WG		0.08 lb ai/a	PRE	A	143.5 a
	Atrazine 4L	4 L		1.25 lb ai/a	PRE	A	
11	Zidua..... pyroxasulfone	85 WG		0.133 lb ai/a	PRE	A	126.0 ab
	Atrazine 4L	4 L		1.25 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.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

## University of Delaware

Pest Code							C ZEAMX
Pest Name							Corn
Crop Type, Code							Yield
Crop Name							Bu/A
Rating Type							09/28/18
Rating Unit							
Rating Date							
Trt	Treatment	Form	Form	Rate	Appl	Appl	
No.	Name	Conc	Type	Rate	Unit	Timing	Code
12	Verdict Premix	5.57	EC	0.52 lb ai/a	PRE	A	121.5 ab
	----saflufenacil	0.57		0.053			
	----dimethenamid	5		0.467			
	Atrazine 4L	4 L		1.25 lb ai/a	PRE	A	
LSD P=.05							23.62
Standard Deviation							13.95
CV							11.23
Replicate F							0.178
Replicate Prob(F)							0.8384
Treatment F							4.819
Treatment Prob(F)							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.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

## University of Delaware

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

Trial ID: Crn10a-18 Location: REC Field #18 Trial Year: 2017

Protocol ID: Crn10a-18 Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 03/01/18

Completion Date: 09/30/18

**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

Variety: D48SS38RIB

Attributes: LL/RR

Planting Date: 04/24/18

Planting Rate: 30000 S/A

Depth: 2 in

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 in

Planting Equipment: FE Field Equipment

Seed Bed: SMOOTH smooth

Soil Temperature: 62 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 05/03/18

Harvest Date: 09/28/18

Harvest Equipment: Plot combine

Harvested Width: 5 FT

% Standard Moisture: 15.5

Harvested Length: 24 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth

Pest 2 Type: W Code: CHEAL Chenopodium album

Common Name: Common lambsquarters

Pest 3 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory

Pest 4 Type: W Code: DIGSA Digitaria sanguinalis

Common Name: large crabgrass

Pest 5 Type: W Code: CYPES Cyperus esculentus

Common Name: Yellow nutsedge

**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 18C  
 % Sand: 83 % OM: 1.2 Texture: LS loamy sand  
 % Silt: 10 pH: 6.4 Soil Name: Klej loamy sand, 0-2% slopes  
 % Clay: 7 CEC: 3.1 Fert. Level: F fair  
 Soil Drainage: F fair

**Application Description**

	A	B	C	D
Application Date	04/25/18	05/08/18	05/15/18	05/24/18
Appl. Stop Time	12:00 PM	11:00 AM	04:00 PM	10:30 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
Air Temperature Start, Stop	82 F	65 F	83 F	76 F
% Relative Humidity Start, Stop	49	61	66	50
Wind Velocity+Dir. Start	1 mph SW	3 mph NE	7 mph SW	1 mph N
Wet Leaves (Y/N)	N no	N no	N no	N no
Soil Temperature	82 F	65 F	83 F	76 F
Soil Moisture	NORMAL	NORMAL	WET	WET
% Cloud Cover	85	5	15	30

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	ZEAMX BCOR	ZEAMX BCOR	ZEAMX BCOR	ZEAMX BCOR
Stage Scale Used		DESC	DESC	DESC
Stage Majority, Percent		V1-2 100	V3 100	V4-5 100
Height Average		2.5 in	6 in	11 in
Height Minimum, Maximum		2 3	5 7	10 12

**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		1-leaf 70	veg 100	veg 100
Stage Minimum, Percent		cot 15		
Stage Maximum, Percent		2-leaf 15		
Height Average		0.1 in	0.5 in	5 in
Height Minimum, Maximum			0.2 0.7	3 7
Density Average		3 m2	3 m2	3 m2
Pest 2 Code, Type, Scale	CHEAL W	CHEAL W	CHEAL W	CHEAL W
Stage Majority, Percent		cot 60	veg 100	veg 100
Stage Minimum, Percent		cot 60		
Stage Maximum, Percent		1-If 40		
Height Average		0.1 in	0.6 in	3 in
Height Minimum, Maximum			0.2 1	2 4
Density Average		5 m2	8 m2	8 m2
Pest 3 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		cot 100	cot 100	veg
Height Average		1 in	1 in	3 in
Height Minimum, Maximum				2 4
Density Average		1 m2	2 m2	2 m2
Pest 4 Code, Type, Scale	DIGSA W	DIGSA W	DIGSA W	DIGSA W
Stage Majority, Percent		cot 55	1-If 60	veg 100
Stage Minimum, Percent		cot 55	cot 10	
Stage Maximum, Percent		1-If 45	2-If 30	
Height Average		0.2 in	0.8 in	3 in
Height Minimum, Maximum			0.5 1	2 5
Density Average		10 m2	10 m2	10 m2
Pest 5 Code, Type, Scale	CYPES W	CYPES W	CYPES W	CYPES W
Stage Majority, Percent		1-leaf 100	2-leaf 80	veg 100
Stage Minimum, Percent			3-leaf 20	
Height Average		1 in	2.5 in	5 in
Height Minimum, Maximum			2 3	3 8
Density Average		8 m2	8 m2	8 m2

**Application Equipment**

	A	B	C	D
Appl. Equipment	Tractor	Tractor	Tractor	Backpack
Equipment Type	TRMOSP	TRMOSP	TRMOSP	SPRBAC
Operation Pressure	40 psi	40 psi	40 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in	18 in
Boom Length	6.7 ft	6.7 ft	6.7 ft	6 ft
Boom Height	18 in	20 in	24 in	28 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	COMCO2

**SE Definitions**

	1.
Crop Type, Code	C

#### Trial Comments

05/28/18: No leaf burn or chlorosis observed from POST treatments.

06/04/18: Common ragweed was in the untreated plots and running checks, but was not observed in any treated plot.

06/19/18: Very poor control of fall panicum with treatments 2, 7, 8

09/19/18: Treatment 9 looked the best, probably due to higher atrazine rates for morningglory control

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

Trial ID: Crn10a-18

Location: REC Field #18

Trial Year: 2017

Protocol ID: Crn10a-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code	Pest Name					AMAPA
Crop Type, Code		C	ZEAMX	C	ZEAMX	Palmer amaranth
Crop Name				Corn	Corn	
Rating Type				Stunting %	Stunting %	
Rating Unit				05/09/18	05/28/18	Control %
Rating Date						05/28/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated Check					
2	Lumax EZ Premix	3.67	SC	2.48 lb ai/a	PRE	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
	----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
	----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
	----acetochlor	3.1		1.86		
	----atrazine	2.5		1.5		
	Roundup WeatherMax..glyphosate	4.5	AS	0.77 lb ae/a	V5	D
	Status Premix	56	WG	0.175 lb ai/a	V5	D
	----diflufenzoxyr	16		0.05		
	----dicamba	40		0.125		
6	Bicep II Magnum Premix	5.5	L	1.79 lb ai/a	PRE	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
	----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

Means followed by same letter 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 9 because error mean square = 0.

## University of Delaware

Pest Code							AMAPA
Pest Name							Palmer amaranth
Crop Type, Code							C -
Crop Name							
Rating Type							Corn
Rating Unit							Stunting
Rating Date							%
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
8	Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	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		
	----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		
10	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A		
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A		
	Status Premix	56 WG	0.175 lb ai/a	V3	C		
	----diflufenzopyr	16	0.05				
	----dicamba	40	0.125				
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	C		
11	Halex GT Premix	4.376 SC	1.97 lb ai/a	V1-2	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	V1-2	B		
	Nonionic Surfactant	100 L	0.25 % v/v	V1-2	B		
12	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V1-2	B		
	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	V1-2	B		
	----s-metolachlor	2.4	0.96				
	----atrazine	3.1	1.24				
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	V1-2	B		
LSD P=.05						2.71	1.41
Standard Deviation						1.58	0.83
CV						131.76	0.91
Replicate F						1.000	1.000
Replicate Prob(F)						0.3874	0.3840
Treatment F						5.724	3590.091
Treatment Prob(F)						0.0008	0.0001
						0.0371	

Means followed by same letter 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		CHEAL	IPOSS						
Pest Name		Common lambsqu>	Morning glory						
Crop Type, Code		C -	C -						
Crop Name									
Rating Type		Control	Control						
Rating Unit		%	%						
Rating Date		05/28/18	05/28/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 c	0.0 d
2	Lumax EZ Premix	3.67	SC	2.48 lb ai/a	PRE	A		100.0 a	83.3 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	A			
3	Bicep II Magnum Premix	5.5	L	2.2 lb ai/a	PRE	A		100.0 a	85.7 bc
	----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		100.0 a	94.0 ab
	----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		100.0 a	99.0 a
	----acetochlor	3.1		1.86					
	----atrazine	2.5		1.5					
	Roundup WeatherMax..glyphosate	4.5	AS	0.77 lb ae/a	V5	D			
	Status Premix	56	WG	0.175 lb ai/a	V5	D			
	----diflufenzopyr	16		0.05					
	----dicamba	40		0.125					
6	Bicep II Magnum Premix	5.5	L	1.79 lb ai/a	PRE	A		100.0 a	98.0 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		100.0 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			

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

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## University of Delaware

Pest Code		CHEAL	IPOSS						
Pest Name	Common lambsquarters	Morning glory							
Crop Type, Code		C -	C -						
Crop Name									
Rating Type		Control	Control						
Rating Unit		%	%						
Rating Date	05/28/18	05/28/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8	Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	A			96.7 b	96.7 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			100.0 a	98.3 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				
10	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A			99.0 ab	97.3 a
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A				
	Status Premix	56 WG	0.175 lb ai/a	V3	C				
	----diflufenzopyr	16	0.05						
	----dicamba	40	0.125						
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	C				
11	Halex GT Premix	4.376 SC	1.97 lb ai/a	V1-2	B			100.0 a	86.0 bc
	----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	V1-2	B				
	Nonionic Surfactant	100 L	0.25 % v/v	V1-2	B				
12	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V1-2	B			100.0 a	91.7 abc
	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	V1-2	B				
	----s-metolachlor	2.4	0.96						
	----atrazine	3.1	1.24						
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	V1-2	B				
LSD P=.05								2.98	8.54
Standard Deviation								1.76	5.04
CV								1.93	5.88
Replicate F								0.707	5.362
Replicate Prob(F)								0.5039	0.0127
Treatment F								800.113	89.838
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 9 because error mean square = 0.

Pest Code Pest Name						DIGSA large crabgrass	
Crop Type, Code						C - C	ZEAMX
Crop Name						Control %	Corn Stunting %
Rating Type							
Rating Unit						05/28/18	06/04/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check					0.0 c	0.0 a
2	Lumax EZ Premix	3.67	SC	2.48 lb ai/a	PRE	A	100.0 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	98.3 ab
	----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	100.0 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	100.0 a
	----acetochlor	3.1		1.86			
	----atrazine	2.5		1.5			
	Roundup WeatherMax..glyphosate	4.5	AS	0.77 lb ae/a	V5	D	
	Status Premix	56	WG	0.175 lb ai/a	V5	D	
	----diflufenzypr	16		0.05			
	----dicamba	40		0.125			
6	Bicep II Magnum Premix	5.5	L	1.79 lb ai/a	PRE	A	100.0 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	100.0 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	

Means followed by same letter 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 9 because error mean square = 0.

## University of Delaware

Pest Code	DIGSA								
Pest Name	large crabgrass								
Crop Type, Code	C - C	ZEAMX							
Crop Name		Corn							
Rating Type	Control	Stunting							
Rating Unit	%	%							
Rating Date	05/28/18	06/04/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
8	Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	A			100.0 a	4.7 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			100.0 a	2.3 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				
10	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A			100.0 a	7.3 a
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A				
	Status Premix	56 WG	0.175 lb ai/a	V3	C				
	----diflufenzoypyr	16	0.05						
	----dicamba	40	0.125						
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	C				
11	Halex GT Premix	4.376 SC	1.97 lb ai/a	V1-2	B			100.0 a	4.7 a
	----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	V1-2	B				
	Nonionic Surfactant	100 L	0.25 % v/v	V1-2	B				
12	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V1-2	B			96.7 b	4.7 a
	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	V1-2	B				
	----s-metolachlor	2.4	0.96						
	----atrazine	3.1	1.24						
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	V1-2	B				
LSD P=.05								2.08	8.20
Standard Deviation								1.23	4.84
CV								1.35	116.99
Replicate F							0.000	0.062	
Replicate Prob(F)							1.0000	0.9404	
Treatment F							1637.125	1.697	
Treatment Prob(F)							0.0001	0.1402	

Means followed by same letter 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 9 because error mean square = 0.

Pest Code Pest Name		AMAPA Palmer amaranth	CHEAL Common lambsqu>					
Crop Type, Code Crop Name		C -	C -					
Rating Type		Control %	Control %					
Rating Unit								
Rating Date		06/04/18	06/04/18					
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1 Untreated Check							0.0 c	0.0 b
2 Lumax EZ Premix	3.67 SC	2.48 lb ai/a	PRE	A			99.7 a	100.0 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			99.0 a	100.0 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			100.0 a	100.0 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			100.0 a	100.0 a
----acetochlor	3.1	1.86						
----atrazine	2.5	1.5						
Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V5	D				
Status Premix	56 WG	0.175 lb ai/a	V5	D				
----diflufenzoypyr	16	0.05						
----dicamba	40	0.125						
6 Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	A			100.0 a	100.0 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			100.0 a	100.0 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				

Means followed by same letter 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 9 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA	CHEAL						
Pest Name		Palmer amaranth	Common lambsqu>						
Crop Type, Code		C -	C -						
Crop Name									
Rating Type		Control %	Control %						
Rating Unit									
Rating Date		06/04/18	06/04/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8	Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	A			99.0 a	100.0 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			100.0 a	100.0 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				
10	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A			99.0 a	100.0 a
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A				
	Status Premix	56 WG	0.175 lb ai/a	V3	C				
	----diflufenzopyr	16	0.05						
	----dicamba	40	0.125						
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	C				
11	Halex GT Premix	4.376 SC	1.97 lb ai/a	V1-2	B			100.0 a	100.0 a
	----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	V1-2	B				
	Nonionic Surfactant	100 L	0.25 % v/v	V1-2	B				
12	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V1-2	B			94.0 b	100.0 a
	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	V1-2	B				
	----s-metolachlor	2.4	0.96						
	----atrazine	3.1	1.24						
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	V1-2	B				
LSD P=.05							4.08		
Standard Deviation							2.41	0.00	
CV							2.65	0.0	
Replicate F							1.470	0.000	
Replicate Prob(F)							0.2516	1.0000	
Treatment F							425.181	0.000	
Treatment Prob(F)							0.0001	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 9 because error mean square = 0.

Pest Code		IPOSS	DIGSA						
Pest Name		Morning glory	large crabgrass						
Crop Type, Code		C -	C -						
Crop Name									
Rating Type		Control	Control						
Rating Unit		%	%						
Rating Date	06/04/18	06/04/18	06/04/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							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			93.0 a	97.7 b
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			80.0 b	99.0 ab
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			97.3 a	100.0 a
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup WeatherMax..glyphosate Status Premix ----diflufenzoypyr ----dicamba	5.6 L 3.1 2.5 4.5 AS 56 WG 16 40	3.36 lb ai/a 1.86 1.5 0.77 lb ae/a 0.175 lb ai/a V5 D	PRE	A			98.0 a	100.0 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			97.3 a	99.7 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			98.7 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 9 because error mean square = 0.

## University of Delaware

Pest Code		IPOSS	DIGSA						
Pest Name		Morning glory	large crabgrass						
Crop Type, Code		C -	C -						
Crop Name									
Rating Type		Control	Control						
Rating Unit		%	%						
Rating Date		06/04/18	06/04/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8	Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	A			98.0 a	100.0 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			97.3 a	99.7 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				
10	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A			96.0 a	99.7 a
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A				
	Status Premix	56 WG	0.175 lb ai/a	V3	C				
	----diflufenzopyr	16	0.05						
	----dicamba	40	0.125						
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	C				
11	Halex GT Premix	4.376 SC	1.97 lb ai/a	V1-2	B			94.7 a	99.7 a
	----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	V1-2	B				
	Nonionic Surfactant	100 L	0.25 % v/v	V1-2	B				
12	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V1-2	B			93.0 a	98.7 ab
	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	V1-2	B				
	----s-metolachlor	2.4	0.96						
	----atrazine	3.1	1.24						
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	V1-2	B				
LSD P=.05								9.24	1.41
Standard Deviation								5.46	0.83
CV								6.28	0.92
Replicate F								1.747	0.478
Replicate Prob(F)								0.1977	0.6262
Treatment F								78.088	3550.044
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 9 because error mean square = 0.

Pest Code			AMAPA	AMBEL					
Pest Name			Palmer amaranth	Common ragweed					
Crop Type, Code			C -	C -					
Crop Name									
Rating Type			Control	Control					
Rating Unit			%	%					
Rating Date			06/19/18	06/19/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 c	0.0 c
2	Lumax EZ Premix	3.67	SC	2.48 lb ai/a	PRE	A		97.3 ab	100.0 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		89.0 b	90.0 b
	----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		100.0 a	100.0 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		100.0 a	100.0 a
	----acetochlor	3.1		1.86					
	----atrazine	2.5		1.5					
	Roundup WeatherMax..glyphosate	4.5	AS	0.77 lb ae/a	V5	D			
	Status Premix	56	WG	0.175 lb ai/a	V5	D			
	----diflufenzoxyr	16		0.05					
	----dicamba	40		0.125					
6	Bicep II Magnum Premix	5.5	L	1.79 lb ai/a	PRE	A		100.0 a	100.0 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		100.0 a	100.0 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			

Means followed by same letter 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 9 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA	AMBEL						
Pest Name		Palmer amaranth	Common ragweed						
Crop Type, Code		C -	C -						
Crop Name									
Rating Type		Control %	Control %						
Rating Unit									
Rating Date		06/19/18	06/19/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8	Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	A			96.7 ab	100.0 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			90.0 ab	100.0 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				
10	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A			87.7 b	100.0 a
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A				
	Status Premix	56 WG	0.175 lb ai/a	V3	C				
	----diflufenzoxyr	16	0.05						
	----dicamba	40	0.125						
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	C				
11	Halex GT Premix	4.376 SC	1.97 lb ai/a	V1-2	B			95.0 ab	100.0 a
	----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	V1-2	B				
	Nonionic Surfactant	100 L	0.25 % v/v	V1-2	B				
12	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V1-2	B			91.7 ab	100.0 a
	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	V1-2	B				
	----s-metolachlor	2.4	0.96						
	----atrazine	3.1	1.24						
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	V1-2	B				
LSD P=.05								10.80	8.47
Standard Deviation								6.38	5.00
CV								7.31	5.5
Replicate F								2.327	1.000
Replicate Prob(F)								0.1211	0.3840
Treatment F								57.257	99.182
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 9 because error mean square = 0.

Pest Code Pest Name	CHEAL Common lambsqu>	IPOSS Morning glory						
Crop Type, Code Crop Name	C -	C -						
Rating Type	Control %	Control %						
Rating Unit	06/19/18	06/19/18						
Rating Date								
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 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		100.0 a	68.3 b
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		91.7 b	64.0 b
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		100.0 a	93.0 a
5 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup WeatherMax..glyphosate Status Premix ----diflufenzoypyr ----dicamba	5.6 L 3.1 2.5 4.5 AS 56 WG 16 40		3.36 lb ai/a 1.86 1.5 0.77 lb ae/a 0.175 lb ai/a	V5	D		100.0 a	91.0 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		100.0 a	87.7 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		100.0 a	87.3 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 9 because error mean square = 0.

## University of Delaware

Pest Code Pest Name	CHEAL Common lambsqu>	IPOSS Morning glory							
Crop Type, Code Crop Name	C -	C -							
Rating Type	Control %	Control %							
Rating Unit	06/19/18	06/19/18							
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8	Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	A			95.0 ab	88.3 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			100.0 a	85.0 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				
10	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A			100.0 a	84.7 a
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A				
	Status Premix	56 WG	0.175 lb ai/a	V3	C				
	----diflufenzopyr	16	0.05						
	----dicamba	40	0.125						
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	C				
11	Halex GT Premix	4.376 SC	1.97 lb ai/a	V1-2	B			100.0 a	86.3 a
	----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	V1-2	B				
	Nonionic Surfactant	100 L	0.25 % v/v	V1-2	B				
12	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V1-2	B			100.0 a	85.0 a
	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	V1-2	B				
	----s-metolachlor	2.4	0.96						
	----atrazine	3.1	1.24						
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	V1-2	B				
LSD P=.05								5.88	15.55
Standard Deviation								3.47	9.18
CV								3.83	11.97
Replicate F								0.058	2.614
Replicate Prob(F)								0.9442	0.0958
Treatment F								204.105	23.439
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 9 because error mean square = 0.

Pest Code		DIGSA	AMAPA						
Pest Name		large crabgrass	Palmer amaranth						
Crop Type, Code		C -	C -						
Crop Name									
Rating Type		Control	Control						
Rating Unit		%	%						
Rating Date	06/19/18	07/07/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 d	0.0 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			89.0 c	88.3 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			90.7 bc	83.3 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			99.0 a	99.3 a
5	Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup WeatherMax..glyphosate Status Premix ----diflufenzoxyr ----dicamba	5.6 L 3.1 2.5 4.5 AS 56 WG 16 40	3.36 lb ai/a 1.86 1.5 0.77 lb ae/a 0.175 lb ai/a V5 D	PRE	A			98.3 a	99.3 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			97.7 ab	94.3 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			99.0 a	99.3 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 9 because error mean square = 0.

## University of Delaware

Pest Code Pest Name	DIGSA large crabgrass	AMAPA Palmer amaranth			
Crop Type, Code Crop Name	C -	C -			
Rating Type	Control %	Control %			
Rating Unit	06/19/18	07/07/18			
Rating Date					
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code		
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	PRE V3 C V3 C	98.0 a	95.7 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	PRE V3 C V3	97.7 ab	91.7 abc
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 C V3	93.0 abc	85.7 bc
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	93.7 abc	92.0 abc
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	98.0 a	89.7 abc
LSD P=.05 Standard Deviation CV				7.11 4.20 4.78	10.96 6.48 7.63
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				0.430 0.6560 132.076 0.0001	0.837 0.4462 53.152 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 9 because error mean square = 0.

Pest Code Pest Name		IPOSS Morning glory	DIGSA large crabgrass			
Crop Type, Code Crop Name		C -	C -	ZEAMX Corn Yield Bu/A		
Rating Type	Control %	Control %	07/07/18	09/28/18		
Rating Unit						
Rating Date						
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code		
1 Untreated Check				0.0 f	0.0 c	60.5 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	68.3 e	93.3 a	171.9 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	68.3 e	84.0 b	173.5 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	92.0 abc	98.7 a	174.0 a
5 Harness Xtra 5.6L Premix ----acetochlor ----atrazine Roundup WeatherMax..glyphosate Status Premix ----diflufenzoypyr ----dicamba	5.6 L 3.1 2.5 4.5 AS 56 WG 16 40	3.36 lb ai/a 1.86 1.5 0.77 lb ae/a 0.175 lb ai/a V5 D	PRE A	98.3 a	98.3 a	173.5 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	PRE A V3 C	74.0 de	97.7 a	177.6 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	PRE A V3 C	93.7 ab	95.7 a	186.0 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 9 because error mean square = 0.

## University of Delaware

Pest Code		IPOSS	DIGSA							
Pest Name		Morning glory	large crabgrass							
Crop Type, Code		C -	C -	ZEAMX						
Crop Name		Control %	Control %	Corn Yield						
Rating Type		07/07/18	07/07/18	Bu/A						
Rating Unit										
Rating Date				09/28/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
8	Bicep II Magnum Premix	5.5 L	1.79 lb ai/a	PRE	A			94.0 ab	98.7 a	178.4 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			84.0 a-d	97.3 a	176.0 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					
10	Atrazine 4L	4 L	1.25 lb ai/a	PRE	A			81.0 b-e	89.7 ab	170.4 a
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	PRE	A					
	Status Premix	56 WG	0.175 lb ai/a	V3	C					
	----diflufenzopyr	16	0.05							
	----dicamba	40	0.125							
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V3	C					
11	Halex GT Premix	4.376 SC	1.97 lb ai/a	V1-2	B			66.7 e	92.3 ab	175.2 a
	----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	V1-2	B					
	Nonionic Surfactant	100 L	0.25 % v/v	V1-2	B					
12	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	V1-2	B			78.3 cde	92.3 ab	170.2 a
	Bicep II Magnum Premix	5.5 L	2.2 lb ai/a	V1-2	B					
	----s-metolachlor	2.4	0.96							
	----atrazine	3.1	1.24							
	Prowl H2O.....pendimethalin	3.8 CS	1.19 lb ai/a	V1-2	B					
LSD P=.05								14.33	9.09	31.79
Standard Deviation								8.47	5.37	18.77
CV								11.3	6.2	11.34
Replicate F								3.805	1.097	0.698
Replicate Prob(F)								0.0381	0.3515	0.5084
Treatment F								28.372	79.325	9.481
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.  
Could not calculate LSD (% mean diff) for columns 9 because error mean square = 0.

Comparison of Approaches for Weed Control in No-Tillage Field Corn  
 Trial ID: Crn13-18 Location: Field #7 Trial Year: 2016  
 Protocol ID: Crn13-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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  
 Variety: D48SS38RIB  
 Attributes: LL/RR  
 Planting Date: 05/31/18 Planting Rate: 19000 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 Temperature: 72 F Soil Moisture: ABONOR above normal, excessive  
 Emergence Date: 06/08/18

**Pest Description**

Pest 1 Type: W Code: SECCE Secale cereale  
 Common Name: Rye

Pest 2 Type: W Code: CERVU Cerastium fontanum vulgare  
 Common Name: Mouse-ear chickweed

Pest 3 Type: W Code: HLOUM Holostium umbellatum  
 Common Name: Jagged chickweed

Pest 4 Type: W Code: OEOLA Oenothera laciniata  
 Common Name: Cutleaf eveningprimrose

Pest 5 Type: W Code: IPOLA Ipomoea lacunosa  
 Common Name: Pitted morningglory

Pest 6 Type: W Code: DIGSS Digitaria sp.  
 Common Name: Crabgrass

**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 7  
 % Sand: 79 % OM: 2.1 Texture: LS loamy sand  
 % Silt: 13 pH: 6.2 Soil Name: Rockawalkin loamy sand, 0-2% slopes  
 % Clay: 8 CEC: 5.6 Fert. Level: G good  
 Soil Drainage: G good

**Application Description**

	A	B	C	D	E
Application Date	04/26/18	05/10/18	05/31/18	06/21/18	06/27/18
Appl. Stop Time	01:45 PM	11:30 AM	05:00 PM	10:15 AM	01:20 PM
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
Air Temperature Start, Stop	66 F	77 F	81 F	81 F	77 F
% Relative Humidity Start, Stop	47	51	78	72	65
Wind Velocity+Dir. Start	3 mph W	4 mph S	2 mph SE	3 mph NW	6 mph S
Wet Leaves (Y/N)	N no				
Soil Temperature	66 F	77 F	81 F	81 F	77 F
Soil Moisture	WET	NORMAL	WET	NORMAL	NORMAL
% Cloud Cover	15	0	35	70	70

**Crop Stage At Each Application**

	A	B	C	D	E
Crop 1 Code, BBCH Scale	ZEAMX BCOR				
Stage Scale Used				DESC	DESC
Stage Majority, Percent				V4-5 100	V5-7 100
Height Average				9 in	14 in
Height Minimum, Maximum				8 11	12 15

<b>Pest Stage At Each Application</b>					
	A	B	C	D	E
Pest 1 Code, Type, Scale	SECCE W	SECCE W	SECCE W	SECCE W	SECCE W
Stage Majority, Percent	Feeks8 100	Head 100			
Height Average	10 in	18 in			
Height Minimum, Maximum	8 12	15 22			
Pest 2 Code, Type, Scale	CERVU W	CERVU W	CERVU W	CERVU W	CERVU W
Stage Majority, Percent	Flower 65	Seed 100			
Stage Minimum, Percent	Flower 65				
Stage Maximum, Percent	Seed 45				
Diameter	8 in	9 in			
Height Minimum, Maximum	7 9	8 10			
Density Average	10 m2	10 m2			
Pest 3 Code, Type, Scale	HLOUM W	HLOUM W	HLOUM W	HLOUM W	HLOUM W
Stage Majority, Percent	seed 100	senes 100			
Height Average	9 in	9 in			
Height Minimum, Maximum	8 10	8 10			
Density Average	10 m2	10 m2			
Pest 4 Code, Type, Scale	OEOLA W	OEOLA W	OEOLA W	OEOLA W	OEOLA W
Stage Majority, Percent	veg 100	Flowr 100	eaFlwr 60		
Stage Minimum, Percent			veg 40		
Stage Maximum, Percent			eaFlwr 60		
Diameter	8 in				
Height Average		13 in	6 in		
Height Minimum, Maximum	5 12	12 15	5 8		
Density Average	2 m2	2 m2	3 m2		
Pest 5 Code, Type, Scale	IPOLA W	IPOLA W	IPOLA W	IPOLA W	IPOLA W
Stage Majority, Percent			veg 55	run 100	run 100
Stage Minimum, Percent			veg 55		
Stage Maximum, Percent			run 45		
Height Average			6 in	16 in	18 in
Height Minimum, Maximum			4 8	8 20	8 24
Density Average			8 m2	8 m2	8 m2
Pest 6 Code, Type, Scale	DIGSS W	DIGSS W	DIGSS W	DIGSS W	DIGSS W
Stage Majority, Percent			veg 100	tilred 100	tilred 100
Height Average			2 in	7 in	8 in
Height Minimum, Maximum			1 3	6 9	7 10
Density Average			5 m2	6 m2	6 m2

<b>Application Equipment</b>					
	A	B	C	D	E
Appl. Equipment	Tractor	Tractor	Tractor	Tractor	Tractor
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	28 in	38 in	30 in	30 in	30 in
Ground Speed	3 mph				
Carrier	WATER	WATER	WATER	WATER	WATER
Application Amount	20 gal/ac				
Propellant	COMAIR	COMAIR	COMAIR	COMAIR	COMAIR

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

06/02/18: Note that planting was delayed and the preplant days in the treatment list do not match the actual delay between application and planting. Palmer amaranth seedling (cotyledon to 2 lvs) emerging, but not rated at this date.

06/19/18: Treatment 11 had poor to no control of common ragweed.

08/03/18: Poor control of fall panicum with treatments 2 and 5; Poo control of prickly sida with treatments 3, 7, 12.

Severe deer feeding in this trial. Corn stand was reduced and most of the plots had damaged upper leaves and tassels due to feeding.

Comparison of Approaches for Weed Control in No-Tillage Field Corn  
 Trial ID: Crn13-18 Location: Field #7 Trial Year: 2016  
 Protocol ID: Crn13-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code						ERICACan.hrswd	OEOLACEprmrse
Crop Type, Code						C -	C -
Crop Name						Control %	Control %
Rating Type						06/02/18	06/02/18
Rating Unit						06/02/18	06/02/18
Rating Date							
Trt No.	Treatment 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	100.0 a
2	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21	DPP	A	93.7 d
	Simazine	4 L	1.5 lb ai/a	21	DPP	A	74.0 b
	Nonionic Surfactant	100 L	0.25 % v/v	21	DPP	A	50.0 de
	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	95.3 bcd
	Bicep II Magnum Premix	5.5 L	1.72 lb ai/a	21	DPP	A	80.0 ab
	----s-metolachlor	2.4	0.75				48.3 de
	----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	100.0 a
	Bicep II Magnum Premix	5.5 L	2.9 lb ai/a	21	DPP	A	92.7 ab
	----s-metolachlor	2.4	1.27				66.7 bcd
	----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	98.0 abc
	Bicep II Magnum Premix	5.5 L	1.72 lb ai/a	21	DPP	A	100.0 a
	----s-metolachlor	2.4	0.75				28.3 e
	----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=8,13,14,17,18

Pest Code Description	IPOSS Mornglry	DIGSA L.crbgrs	ERICA Can.hrswd					
Crop Type, Code	C -	C -	C -					
Crop Name	Control %	Control %	Control %					
Rating Type								
Rating Unit								
Rating Date	06/02/18	06/02/18	06/19/18					
Trt No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
1 Untreated Check						53.3 bcd	100.0 a	76.7 b
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				
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				
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				
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				
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=8,13,14,17,18

Pest Code Description	OEOLA CEprmrse	AMAPA PalmerAm	IPOSS Mornlgy					
Crop Type, Code	C -	C -	C -					
Crop Name	Control %	Control %	Control %					
Rating Type	06/19/18	06/19/18	06/19/18					
Rating Unit								
Rating Date								
Trt No. Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
1 Untreated Check						100.0 a	83.5 a	36.7 fgh
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		95.0 a	100.0 a	97.0 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		78.3 a	100.0 a	71.7 cde
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		76.7 a	90.0 a	33.3 fgh
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		89.0 a	100.0 a	92.3 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=8,13,14,17,18

Pest Code	Description	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	DIGSA L.crbgrs C - Control % 06/19/18	C ZEAMX Corn Injury % 07/03/18	ERIC Can.hrswd C - Control % 07/10/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Appl Timing	Appl Code		
1	Untreated Check Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	7 DPP	B	58.3 de	0.0 c	40.0 b
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 A 21 DPP A 21 DPP A PRE C PRE C PRE C PRE C		99.0 a	0.0 c	100.0 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 A 21 DPP A 21 DPP A PRE C PRE C PRE C PRE C		91.7 abc	0.0 c	90.0 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 A 21 DPP A 21 DPP A 21 DPP A V5 E V5 E V5 E V5 E		71.7 b-e	4.7 a	90.7 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 A 21 DPP A 21 DPP A 21 DPP A PRE C V5 E V5 E V5 E V5 E		90.0 abc	3.7 ab	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=8,13,14,17,18

Pest Code			AMAPA PalmerAm C -	AMBEL C.ragwd C -	IPOSS Mornlry C -	DIGSA L.crbgrs C -
Description			Control % 07/10/18	Control % 07/10/18	Control % 07/10/18	Control % 07/10/18
Crop Type, Code						
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing
1	Untreated Check					
	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	
	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	
	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	
	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	
	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=8,13,14,17,18

Pest Code					AMAPA PalmerAm C -	AMBEL C.ragwd C -	IPOSS Mornlry C -	DIGSA L.crbgrs C -
Crop Type, Code					Control % 08/03/18	Control % 08/03/18	Control % 08/03/18	Control % 07/10/18
Crop Name								
Rating Type								
Rating Unit								
Rating Date								
Trt No.	Treatment 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		
2	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		
	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		
	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		
	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		
	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=8,13,14,17,18

## University of Delaware

Pest Code Description	Crop Type, Code Crop Name	Rating Type	Rating Unit	Rating Date	ERICACan.hrs wd	OEOLAOEpmrse			
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code		
6	Gramoxone SL....paraquat Simazine Nonionic Surfactant Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate		2 SL 4 L 100 L 4.376 SC 2.084 2.084 0.208 4 L 100 L 100 D	0.5 lb ai/a 1.5 lb ai/a 0.25 % v/v 1.97 lb ai/a 0.94 0.94 0.094 1 lb ai/a 0.25 % v/v 1.02 % w/v	21 DPP A 21 DPP A 21 DPP A V3 D V3 D V3 D	94.3 cd	31.7 c	56.7 cde	
7	Gramoxone SL....paraquat Lexar EZ Premix ----s-metolachlor ----mesotrione ----atrazine Simazine Nonionic Surfactant		2 SL 3.71 SC 1.742819 0.2243629 1.742819 4 L 100 L	0.5 lb ai/a 3.25 lb ai/a 1.53 0.197 1.53 1.5 lb ai/a 0.25 % v/v	7 DPP B 7 DPP B 7 DPP B 7 DPP B 7 DPP B	100.0 a	100.0 a	90.0 ab	
8	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	7 DPP B 7 DPP B 7 DPP B PRE C C	98.3 ab	86.7 ab	88.3 ab	
9	Gramoxone SL....paraquat Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L Nonionic Surfactant Roundup PowerMax..glyphosate Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate		2 SL 3.67 SC 2.49 0.25 0.93 4 L 100 L 4.5 AS 4 SC 100 L 100 L	0.5 lb ai/a 2.48 lb ai/a 1.68 0.169 0.63 0.75 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	7 DPP B 7 DPP B 7 DPP B 7 DPP B 7 DPP B B	100.0 a	100.0 a	95.0 ab	
10	Gramoxone SL....paraquat Simazine Nonionic Surfactant Halex GT Premix ----s-metolachlor ----glyphosate ----mesotrione Atrazine 4L Nonionic Surfactant Dry Ammonium Sulfate		2 SL 4 L 100 L 4.376 SC 2.084 2.084 0.208 4 L 100 L 100 D	0.5 lb ai/a 1 lb ai/a 0.25 % v/v 1.97 lb ai/a 0.94 0.94 0.094 1 lb ai/a 0.25 % v/v 1.02 % w/v	7 DPP B 7 DPP B 7 DPP B V3 D D D D	99.7 a	100.0 a	85.0 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=8,13,14,17,18

## University of Delaware

Pest Code Description			IPOSS Mornglry	DIGSA L.crbgrs	ERICA Can.hrswd			
Crop Type, Code		C -	C -	C -				
Crop Name								
Rating Type			Control	Control	Control			
Rating Unit		%	%	%	%			
Rating Date		06/02/18	06/02/18	06/19/18				
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=8,13,14,17,18

## University of Delaware

Pest Code Description		OEOLA CEprmrse	AMAPA PalmerAm	IPOSS Mornlgy					
Crop Type, Code		C -	C -	C -					
Crop Name		Control %	Control %	Control %					
Rating Type		06/19/18	06/19/18	06/19/18					
Rating Unit									
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=8,13,14,17,18

## University of Delaware

Pest Code							DIGSA L.crbgrs C -	C ZEAMX Corn Injury % 06/19/18	ERICA Can.hrswd C - Control % 07/10/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate 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=8,13,14,17,18

## University of Delaware

Pest Code	Description	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	AMAPA PalmerAm C -	AMBEL C.ragwd C -	IPOSS Mornlry C -	DIGSA L.crbgrs C -
Trt	Treatment	Form	Form	Rate	Appl	Appl	Control % 07/10/18	Control % 07/10/18	Control % 07/10/18	Control % 07/10/18
No.	Name	Conc	Type	Rate	Unit	Timing	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=8,13,14,17,18

## University of Delaware

Pest Code	Description	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	AMAPA PalmerAm C -	AMBEL C.ragwd C -	IPOSS Morngrly C -	DIGSA L.crbgrs C -
Trt	Treatment	Form	Form	Rate	Appl	Appl	Control % 08/03/18	Control % 08/03/18	Control % 08/03/18	Control % 07/10/18
No.	Name	Conc	Type	Rate	Unit	Timing	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=8,13,14,17,18

## University of Delaware

Pest Code Description	C	SECCE Rye Control %	ERIC Can.hrs wd	OEOLA CEprmrse				
Crop Type, Code Crop Name Rating Type Rating Unit Rating Date			C - Control % 06/02/18	C - Control % 06/02/18				
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		98.0 abc	95.0 ab	100.0 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		100.0 a	100.0 a	95.0 ab
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		100.0 a	100.0 a	86.7 abc
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		97.7 abc	86.7 ab	56.7 cde
LSD P=.05 Standard Deviation CV						3.81	22.46	30.35
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						2.167 0.1348 2.948 0.0092	0.884 0.4251 5.635 0.0001	0.357 0.7032 4.427 0.0006

Means followed by same letter 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=8,13,14,17,18

## University of Delaware

Pest Code Description		IPOSS Mornglry	DIGSA L.crbgrs	ERICA Can.hrswd					
Crop Type, Code		C -	C -	C -					
Crop Name		Control %	Control %	Control %					
Rating Type		06/02/18	06/02/18	06/19/18					
Rating Unit									
Rating Date									
Trt No.	Treatment 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	61.7 bcd	100.0 a	87.7 ab	
	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	71.7 ab	90.0 a	93.3 ab	
	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	66.7 abc	93.3 a	100.0 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				
14	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	21 DPP A		40.0 de	90.0 a	100.0 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				
LSD P=.05						24.63	20.80	17.13	
Standard Deviation						14.68	12.40	10.21	
CV						25.32	13.21	11.24	
Replicate F						2.606	2.782	0.496	
Replicate Prob(F)						0.0930	0.0804	0.6149	
Treatment F						3.539	0.671	8.740	
Treatment Prob(F)						0.0029	0.7723	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=8,13,14,17,18

## University of Delaware

Pest Code Description		OEOLA CEprmrse	AMAPA PalmerAm	IPOSS Mornlry					
Crop Type, Code		C -	C -	C -					
Crop Name		Control %	Control %	Control %					
Rating Type		06/19/18	06/19/18	06/19/18					
Rating Unit									
Rating Date									
Trt No.	Treatment 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		91.7 a	93.3 a	56.7 def
	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		100.0 a	81.7 a	46.7 fg
	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		100.0 a	85.0 a	50.0 efg
	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			63.3 a	49.8 a	26.7 gh
	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						40.30	34.11	24.30	
Standard Deviation						24.01	20.19	14.48	
CV						27.54	22.58	24.66	
Replicate F						0.210	1.379	0.789	
Replicate Prob(F)						0.8119	0.2719	0.4648	
Treatment F						0.840	1.440	10.148	
Treatment Prob(F)						0.6183	0.2150	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=8,13,14,17,18

## University of Delaware

Pest Code	Description	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	DIGSA L.crbgrs C -	ZEAMX Corn Injury % 06/19/18	ERIC Can.hrswd C - Control % 07/03/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
11	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B				
	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				
	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				
	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					
	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						25.33	2.93	12.24	
Standard Deviation						15.09	1.75	7.30	
CV						18.93	100.41	7.79	
Replicate F						3.414	0.571	1.149	
Replicate Prob(F)						0.0482	0.5721	0.3324	
Treatment F						3.018	5.340	14.191	
Treatment Prob(F)						0.0080	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=8,13,14,17,18

Pest Code	Description	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	AMAPA PalmerAm C - Control % 07/10/18	AMBEL C.ragwd C - Control % 07/10/18	IPOSS Mornlry C - Control % 07/10/18	DIGSA L.crbgrs C - Control % 07/10/18	
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				100.0 a	100.0 a	96.7 a	100.0 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				83.3 abc	100.0 a	87.0 a-d	99.0 ab
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				66.7 c	100.0 a	76.7 b-e	95.7 ab
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				68.3 bc	100.0 a	68.3 ef	98.3 ab
LSD P=.05								23.57	18.04	18.29	18.21
Standard Deviation								14.02	10.73	10.90	10.85
CV								16.83	12.05	14.97	12.57
Replicate F								3.431	1.210	0.586	0.583
Replicate Prob(F)								0.0482	0.3150	0.5638	0.5652
Treatment F								10.815	18.796	17.234	19.342
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=8,13,14,17,18

## University of Delaware

Pest Code	Description	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	AMAPA PalmerAm C - Control % 08/03/18	AMBEL C.ragwd C - Control % 08/03/18	IPOSS Mornlry C - Control % 08/03/18	DIGSA L.crbgrs C - Control % 07/10/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
11	Gramoxone SL....paraquat	2 SL	0.5 lb ai/a	7 DPP	B						
	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						
	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						
	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							
	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							26.64	5.29	19.35	16.80	
Standard Deviation							15.84	3.15	11.53	10.01	
CV							19.21	3.41	18.21	11.67	
Replicate F							2.585	0.962	0.959	1.358	
Replicate Prob(F)							0.0954	0.3960	0.3966	0.2749	
Treatment F							8.071	215.089	9.837	24.502	
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=8,13,14,17,18

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

Trial ID: SCRN1-18

Location: Field #18

Trial Year: 2018

Protocol ID: SCRN1-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 03/01/18

Completion Date: 09/30/18

**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

Variety: BC0805

Attributes: LL

Planting Date: 06/08/18

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: 81 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 06/14/18

**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

**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: CONTIL conventional-till

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

**Soil Description**

Description Name: Field 18A

% Sand: 81

% OM: 1.0 Texture: LS

loamy sand

% Silt: 12

pH: 6.5

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

% Clay: 7

CEC: 3.5

Fert. Level: G good

Soil Drainage: G

good

**Application Description**

	A	B
Application Date	06/08/18	07/05/18
Appl. Stop Time	02:00 PM	10:15 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	28 DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	76 F	85 F
% Relative Humidity Start, Stop	64	70
Wind Velocity+Dir. Start	2 mph SW	3 mph SE
Wet Leaves (Y/N)	N no	N no
Soil Temperature	76 F	85 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	20	90

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMS BCOR	ZEAMS BCOR
Stage Scale Used		DESC
Stage Majority, Percent		V6 100
Height Average		13 in
Height Minimum, Maximum		8 18

**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		4 7
Density Average		1 plot
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		run 70
Stage Minimum, Percent		veg 30
Stage Maximum, Percent		run 70
Height Average		7 in
Height Minimum, Maximum		5 8
Density Average		2 plot

**Application Equipment**

	A	B
Appl. Equipment	Tractor	Tractor
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

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

08/09/18: Common ragweed control was poor to none with treatment 2; lambsquarters control was poor with treatment 3.

Sweet Corn Weed Control to Allow Rotational Flexibility						
Trial ID: SCRN1-18	Location: Field #18	Trial Year: 2018				
Protocol ID: SCRN1-18	Investigator: Mark VanGessel					
Study Director:						
Sponsor Contact:						
Pest Code					AMAPA	IPOSS
Pest Name					Palmer amaranth	Morning glory
Crop Type, Code					C -	C -
Crop Name						
Rating Type					Control %	Control %
Rating Unit					07/05/18	07/05/18
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
1	Untreated Check					
0.0	c	0.0	c	0.0	c	
2	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	
3	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	
4	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	
5	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...fluoxypyr	2.8 EC	0.14 lb ae/a	28DAP	B	
	Nonionic Surfactant	100 L	0.5 % v/v	28DAP	B	
6	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	
7	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	
	Atrazine 4L	4 L	0.5 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	
8	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	
9	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	
10	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				8.40	7.75	15.85
Standard Deviation				4.72	4.36	8.91
CV				65.24	5.38	16.79
Replicate F				0.367	1.702	1.681
Replicate Prob(F)				0.7002	0.2235	0.2273
Treatment F				7.846	216.652	53.778
Treatment Prob(F)				0.0013	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	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	DIGSA large crabgrass C -	PANDI Fall panicum C -	C ZEAMS Sweet corn Lf Burn %
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Control %	Control %	07/11/18
1	Untreated Check						0.0 c	0.0 c	0.0 d
2	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Basagran.....bentazon Nonionic Surfactant	7.64 E 0.91 EC 4 L 100 L	0.64 lb ai/a 0.0064 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B			91.7 b	85.7 b	11.7 ab
3	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Basagran.....bentazon Nonionic Surfactant	7.64 E 0.91 EC 4 L 100 L	1.43 lb ai/a 0.0064 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B			98.7 a	91.3 ab	10.3 ab
4	Dual II Magnum..s-metolachlor Prowl H2O.....pendimethalin Basagran.....bentazon Nonionic Surfactant	7.64 E 3.8 CS 4 L 100 L	1.43 lb ai/a 1.43 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE PRE 28DAP B 28DAP B			99.7 a	95.7 a	8.0 bc
5	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Starane Ultra...fluoroypyrr Nonionic Surfactant	7.64 E 0.91 EC 2.8 EC 100 L	1.43 lb ai/a 0.0064 lb ai/a 0.14 lb ae/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B					13.0 a
6	Dual II Magnum..s-metolachlor Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate	7.64 E 2.81 SC 100 L 100 L	1.43 lb ai/a 0.0165 lb ai/a 1.25 % v/v 2 % v/v	PRE 28DAP B 28DAP B 28DAP B					0.0 d
7	Dual II Magnum..s-metolachlor Impact.....topramezone Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate	7.64 E 2.81 SC 4 L 100 L 100 L	1.43 lb ai/a 0.0165 lb ai/a 0.5 lb ai/a 1.25 % v/v 2 % v/v	PRE 28DAP B 28DAP B 28DAP B 28DAP B					4.7 c
8	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.106 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE 28DAP B 28DAP B			100.0 a	100.0 a	0.0 d
9	Dual II Magnum..s-metolachlor Sharpen.....saflufenacil Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.85 SC 2.34 SL 100 D	1.43 lb ai/a 0.0223 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE PRE 28DAP B 28DAP B			99.7 a	97.0 a	0.0 d
10	Dual II Magnum..s-metolachlor Sharpen.....saflufenacil Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.85 SC 2.34 SL 100 D	1.43 lb ai/a 0.0445 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE PRE 28DAP B 28DAP B			99.7 a	94.0 ab	0.0 d
LSD P=.05							2.46	9.62	3.76
Standard Deviation							1.38	5.41	2.19
CV							1.64	6.72	45.95
Replicate F							0.100	0.666	1.216
Replicate Prob(F)							0.9060	0.5319	0.3196
Treatment F							2175.452	131.419	18.796
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.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	C ZEAMS	AMAPA Palmer amaranth C -	IPOSS Morning glory C -
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check						0.0 e	0.0 e	0.0 e
2	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Basagran.....bentazon Nonionic Surfactant	7.64 E 0.91 EC 4 L 100 L	0.64 lb ai/a 0.0064 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B			0.0 e	63.3 cd	23.3 de
3	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Basagran.....bentazon Nonionic Surfactant	7.64 E 0.91 EC 4 L 100 L	1.43 lb ai/a 0.0064 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B			11.3 bcd	58.3 d	40.0 cd
4	Dual II Magnum..s-metolachlor Prowl H2O.....pendimethalin Basagran.....bentazon Nonionic Surfactant	7.64 E 3.8 CS 4 L 100 L	1.43 lb ai/a 1.43 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE PRE 28DAP B 28DAP B			14.0 b	77.7 bc	60.0 bc
5	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Starane Ultra...fluoroxypr Nonionic Surfactant	7.64 E 0.91 EC 2.8 EC 100 L	1.43 lb ai/a 0.0064 lb ai/a 0.14 lb ae/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B			11.7 bcd	95.0 ab	88.3 a
6	Dual II Magnum..s-metolachlor Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate	7.64 E 2.81 SC 100 L 100 L	1.43 lb ai/a 0.0165 lb ai/a 1.25 % v/v 2 % v/v	PRE 28DAP B 28DAP B 28DAP B			8.7 cd	88.3 ab	63.3 bc
7	Dual II Magnum..s-metolachlor Impact.....topramezone Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate	7.64 E 2.81 SC 4 L 100 L 100 L	1.43 lb ai/a 0.0165 lb ai/a 0.5 lb ai/a 1.25 % v/v 2 % v/v	PRE 28DAP B 28DAP B 28DAP B 28DAP B			12.3 bc	100.0 a	64.3 b
8	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.106 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE 28DAP B 28DAP B			21.7 a	100.0 a	77.7 ab
9	Dual II Magnum..s-metolachlor Sharpen.....saflufenacil Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.85 SC 2.34 SL 100 D	1.43 lb ai/a 0.0223 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE PRE 28DAP B 28DAP B			7.3 d	96.0 a	70.0 ab
10	Dual II Magnum..s-metolachlor Sharpen.....saflufenacil Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.85 SC 2.34 SL 100 D	1.43 lb ai/a 0.0445 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE PRE 28DAP B 28DAP B				96.0 a	74.0 ab
LSD P=.05							4.75	18.00	23.69
Standard Deviation							2.74	10.50	13.81
CV							28.38	13.55	24.62
Replicate F							2.893	0.779	2.618
Replicate Prob(F)							0.0846	0.4737	0.1005
Treatment F							18.432	26.308	11.594
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.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	DIGSA large crabgrass C -	PANDI Fall panicum C -
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Control %	Control %
1	Untreated Check						0.0 c	0.0 e
2	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Basagran.....bentazon Nonionic Surfactant	7.64 E 0.91 EC 4 L 100 L	0.64 lb ai/a 0.0064 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B			83.3 b	46.7 d
3	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Basagran.....bentazon Nonionic Surfactant	7.64 E 0.91 EC 4 L 100 L	1.43 lb ai/a 0.0064 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B			89.0 b	53.3 cd
4	Dual II Magnum..s-metolachlor Prowl H2O.....pendimethalin Basagran.....bentazon Nonionic Surfactant	7.64 E 3.8 CS 4 L 100 L	1.43 lb ai/a 1.43 lb ai/a 0.75 lb ai/a 0.5 % v/v	PRE PRE 28DAP B 28DAP B			83.3 b	60.0 c
5	Dual II Magnum..s-metolachlor Cadet.....fluthiacet Starane Ultra...fluoroxypr Nonionic Surfactant	7.64 E 0.91 EC 2.8 EC 100 L	1.43 lb ai/a 0.0064 lb ai/a 0.14 lb ae/a 0.5 % v/v	PRE 28DAP B 28DAP B 28DAP B			85.0 b	53.3 cd
6	Dual II Magnum..s-metolachlor Impact.....topramezone Crop Oil Concentrate 30% Urea Ammonium Nitrate	7.64 E 2.81 SC 100 L 100 L	1.43 lb ai/a 0.0165 lb ai/a 1.25 % v/v 2 % v/v	PRE 28DAP B 28DAP B 28DAP B			96.3 a	86.3 b
7	Dual II Magnum..s-metolachlor Impact.....topramezone Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate	7.64 E 2.81 SC 4 L 100 L 100 L	1.43 lb ai/a 0.0165 lb ai/a 0.5 lb ai/a 1.25 % v/v 2 % v/v	PRE 28DAP B 28DAP B 28DAP B 28DAP B			98.0 a	94.0 ab
8	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.106 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE 28DAP B 28DAP B			98.0 a	96.7 ab
9	Dual II Magnum..s-metolachlor Sharpen.....saflufenacil Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.85 SC 2.34 SL 100 D	1.43 lb ai/a 0.0223 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE PRE 28DAP B 28DAP B			100.0 a	100.0 a
10	Dual II Magnum..s-metolachlor Sharpen.....saflufenacil Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.85 SC 2.34 SL 100 D	1.43 lb ai/a 0.0445 lb ai/a 0.366 lb ai/a 1.02 % w/v	PRE PRE 28DAP B 28DAP B			98.0 a	89.0 ab
LSD P=.05							6.11	12.09
Standard Deviation							3.56	7.05
CV							4.29	10.38
Replicate F							1.157	2.987
Replicate Prob(F)							0.3366	0.0758
Treatment F							211.835	59.514
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.

Zidua vs Dual II Magnum in Sweet Corn

Trial ID: SCRN2-18      Location: Field #18      Trial Year: 2018  
 Protocol ID: SCRN2-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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

Variety: Overland

Attributes: Early planted

Planting Date: 04/24/18

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: 62 F

Seed Bed: SMOOTH smooth

Emergence Date: 05/04/18

Soil Moisture: ABONOR above normal, excessive

Crop 2: C ZEAMS Zea mays saccharata Sweet corn

Variety: Overland

Attributes: Late planted

Planting Date: 06/01/18

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: 85 F

Seed Bed: SMOOTH smooth

Emergence Date: 06/07/18

Soil Moisture: NORMAL normal, adequate

**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: DIGSA Digitaria sanguinalis

Common Name: large crabgrass

**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: SPLPLO Split-Plot

**Soil Description**

Description Name: Field 18A  
 % Sand: 81 % OM: 1.0 Texture: LS loamy sand  
 % Silt: 12 pH: 6.5 Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 7 CEC: 3.5 Fert. Level: G good  
 Soil Drainage: G good

**Application Description**

	A	B	C	D
Application Date	04/25/18	06/01/18	05/30/18	07/05/18
Appl. Stop Time	12:30 PM	02:00 PM	12:30 PM	10:00 AM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	PRE	5WAP	5WAP
Application Placement	BROADC	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson	Johnson
Air Temperature Start, Stop	82 F	83 F	74 F	85 F
% Relative Humidity Start, Stop	49	73	83	70
Wind Velocity+Dir. Start	1 mph SW	2 mph SW	3 mph E	3 mph SE
Wet Leaves (Y/N)	N no	N no	N no	N no
Soil Temperature	82 F	83 F	74 F	85 F
Soil Moisture	NORMAL	NORMAL	WET	NORMAL
% Cloud Cover	85	25	80	90

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	ZEAMS BCOR	ZEAMS BCOR	ZEAMS BCOR	ZEAMS BCOR
Stage Scale Used			DESC	
Stage Majority, Percent			V6 100	
Height Average			8 in	
Height Minimum, Maximum			7 9	
Crop 2 Code, BBCH Scale	ZEAMS BCOR	ZEAMS BCOR	ZEAMS BCOR	ZEAMS BCOR
Stage Scale Used				DESC
Stage Majority, Percent				V7 100
Height Average				18 in
Height Minimum, Maximum				16 20

**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			4 in	10 in
Height Minimum, Maximum			3 5	6 12
Density Average			1 m2	2 m2
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent			veg 100	run 70
Stage Minimum, Percent				veg 30
Stage Maximum, Percent				run 70
Height Average			3 in	7 in
Height Minimum, Maximum			2 4	5 8
Density Average			1 m2	1 m2
Pest 3 Code, Type, Scale	DIGSA W	DIGSA W	DIGSA W	DIGSA W
Stage Majority, Percent			veg 100	tillr 100
Height Average			4 in	6 in
Height Minimum, Maximum			3 5	4 7
Density Average			150 m2	30 m2

**Application Equipment**

	A	B	C	D
Appl. Equipment	Tractr6Nozl	Tractr6Nozl	Tractr6Nozl	Tractr6Nozl
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	10 ft	10 ft	10 ft	10 ft
Boom Height	18 in	18 in	26 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

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

05/26/18: Sweet corn planted in the border was sprayed with Impact+Atrazine+Dual and had 17% stunted corn, but excellent weed control.

## Zidua vs Dual II Magnum in Sweet Corn

Trial ID: SCRN2-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: SCRN2-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	Pest Name					DIGSA	PANDI
Crop Type, Code	Crop Name		C ZEAMS	C ZEAMS	C -	L.crbgrs	F.panicm
Rating Type			Sweet corn	Sweet corn	Control		
Rating Unit		%	Stunting	Stunting	Control		
Rating Date		05/09/18		05/26/18	05/26/18		05/26/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Early (April 10) 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	3.3 b	4.2 a
2	Early (April 10) 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	0.0 c	0.0 a
3	Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A	7.0 a	5.7 a
4	Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A	9.0 a	4.7 a
5	Early (April 10) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	A A	8.0 a	4.7 a
6	Early (April 10) 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	0.0 a
7	Late (May 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		
8	Late (May 1) 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		
9	Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A		
10	Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A		
11	Late (May 1) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	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=2,8,16,26

Pest Code Pest Name	C	ZEAMS Sweet corn Stunting	DIGSA L.crbgrs	PANDI F.panicm
Crop Type, Code Crop Name	C	-	C	-
Rating Type	Control	Control	Control	Control
Rating Unit Rating Date	%	06/04/18	%	06/04/18
Rating Unit Rating Date	%	06/04/18	%	06/14/18
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1 Early (April 10) 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
2 Early (April 10) 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
3 Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A
4 Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A
5 Early (April 10) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	A A
6 Early (April 10) 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
7 Late (May 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
8 Late (May 1) 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
9 Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A
10 Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A
11 Late (May 1) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	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=2,8,16,26

Pest Code Pest Name	DIGSA L.crbgrs	PANDI F.panicm		DIGSA L.crbgrs
Crop Type, Code Crop Name	C -	C -	C ZEAMS Sweet corn Stunting	C -
Rating Type	Control	Control	%	Control
Rating Unit Rating Date	% 06/14/18	% 06/14/18	% 07/05/18	% 07/05/18
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Appl Timing	Code
1 Early (April 10) 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
2 Early (April 10) 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
3 Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A
4 Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A
5 Early (April 10) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	A A
6 Early (April 10) 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
7 Late (May 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
8 Late (May 1) 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
9 Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A
10 Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A
11 Late (May 1) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	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=2,8,16,26

Pest Code Pest Name		PANDI F.panicm	AMAPA PalmerAm	DIGSA L.crbgrs	PANDI F.panicm
Crop Type, Code Crop Name		C -	C -	C -	C -
Rating Type		Control	Control	Control	Control
Rating Unit Rating Date		% 07/05/18	% 07/05/18	% 08/09/18	% 08/09/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing Code
1	Early (April 10) 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
2	Early (April 10) 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
3	Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A
4	Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A
5	Early (April 10) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	A A
6	Early (April 10) 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
7	Late (May 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
8	Late (May 1) 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
9	Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE PRE	A A
10	Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE PRE	A A
11	Late (May 1) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE PRE	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=2,8,16,26

Pest Code Pest Name			AMAPA PalmerAm			DIGSA L.crbgrs
Crop Type, Code Crop Name			C - Control	C ZEAMS Sweet corn Stunt 2 wks	C ZEAMS Sweet corn Stunt 4 wks	C - Control
Rating Type				%	%	%
Rating Unit Rating Date			08/09/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Early (April 10) Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	0.955 lb ai/a 0.75 lb ai/a	PRE A	A	3.3 cde
2	Early (April 10) Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.43 lb ai/a 0.75 lb ai/a	PRE A	A	0.0 e
3	Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE A	A	7.0 abc
4	Early (April 10) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE A	A	9.0 a
5	Early (April 10) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE A	A	8.0 ab
6	Early (April 10) 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 B	B	0.0 e
7	Late (May 1) Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	0.955 lb ai/a 0.75 lb ai/a	PRE A	A	55.0 b
8	Late (May 1) Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.43 lb ai/a 0.75 lb ai/a	PRE A	A	85.0 a
9	Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.0815 lb ai/a 0.75 lb ai/a	PRE A	A	92.5 a
10	Late (May 1) Zidua.....pyroxasulfone Atrazine 4L	4.17 SC 4 L	0.122 lb ai/a 0.75 lb ai/a	PRE A	A	87.5 a
11	Late (May 1) Harness.....acetochlor Atrazine 4L	7 E 4 L	1.31 lb ai/a 0.75 lb ai/a	PRE A	A	50.0 b
					10.7 a	6.7 ab
						63.3 e

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=2,8,16,26

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

Means followed by same letter or symbol as not significant.  
Mean separations are based on the complete error term.

Mean comparisons are based on the Tukey HSD test.

Missing data estimates are included in columns:Yates=2,8,16,26

## University of Delaware

Pest Code		C	ZEAMS	C	ZEAMS	DIGSA L.crbgrs	PANDI F.panicm
Pest Name			Sweet corn Stunting		Sweet corn Stunting	C -	C -
Crop Type, Code							
Crop Name							
Rating Type						Control	Control
Rating Unit			%		%	%	%
Rating Date			05/09/18		05/26/18	05/26/18	05/26/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
12	Late (May 1) Untreated Check						
	Callisto.....mesotrione	4 SC	0.0625 lb ai/a	5WAP	B		
	Crop Oil Concentrate	100 L	1.17 % v/v	5WAP	B		
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	5WAP	B		
LSD P=.05				2.75	7.51	6.42	11.39
Standard Deviation				1.51	4.07	3.53	6.26
CV				33.21	127.07	4.52	8.13
Replicate F				1.262	0.697	1.664	0.260
Replicate Prob(F)				0.3245	0.5232	0.2378	0.7764
Treatment F				21.126	1.156	355.629	110.727
Treatment Prob(F)				0.0001	0.3993	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=2,8,16,26

## University of Delaware

Pest Code		DIGSA L.crbgrs	PANDI F.panicm								
Pest Name											
Crop Type, Code	C ZEAMS	C -	C -	C ZEAMS							
Crop Name	Sweet corn			Sweet corn							
Rating Type	Stunting	Control	Control	Stunting							
Rating Unit	%	%	%	%							
Rating Date	06/04/18	06/04/18	06/04/18	06/14/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
12	Late (May 1) Untreated Check										0.0 f
	Callisto.....mesotrione	4 SC	0.0625 lb ai/a	5WAP	B						
	Crop Oil Concentrate	100 L	1.17 % v/v	5WAP	B						
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	5WAP	B						
LSD P=.05				7.94		7.45		11.05		4.28	
Standard Deviation				4.37		4.09		6.08		2.50	
CV				142.86		5.74		8.05		43.01	
Replicate F				0.878		5.743		1.780		1.350	
Replicate Prob(F)				0.4455		0.0218		0.2181		0.2831	
Treatment F				1.815		231.369		117.197		9.506	
Treatment Prob(F)				0.1975		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=2,8,16,26

## University of Delaware

Pest Code Pest Name	DIGSA L.crbgrs	PANDI F.panicm		DIGSA L.crbgrs
Crop Type, Code Crop Name Rating Type	C - Control	C - Control	C ZEAMS Sweet corn Stunting	C - Control
Rating Unit Rating Date	% 06/14/18	% 06/14/18	% 07/05/18	% 07/05/18
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code
12 Late (May 1) Untreated Check				
Callisto.....mesotrione	4 SC	0.0625 lb ai/a	5WAP	B
Crop Oil Concentrate	100 L	1.17 % v/v	5WAP	B
30% Urea Ammonium Nitrate	100 L	2.5 % v/v	5WAP	B
LSD P=.05		13.89	23.40	11.50
Standard Deviation		7.64	12.86	6.32
CV		12.39	19.57	109.45
Replicate F		3.714	0.359	2.110
Replicate Prob(F)		0.0622	0.7070	0.1720
Treatment F		52.229	21.630	3.543
Treatment Prob(F)		0.0001	0.0001	189.973
				0.0420
				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=2,8,16,26

## University of Delaware

Pest Code Pest Name	PANDI F.panicm	AMAPA PalmerAm	DIGSA L.crbgrs	PANDI F.panicm
Crop Type, Code Crop Name Rating Type	C - Control	C - Control	C - Control	C - Control
Rating Unit Rating Date	% 07/05/18	% 07/05/18	% 08/09/18	% 08/09/18
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code
12 Late (May 1) 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 B 5WAP B 5WAP B	
LSD P=.05 Standard Deviation CV		13.13 7.21 11.32	11.07 6.08 8.22	8.45 4.64 9.2
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		4.740 0.0357 61.026 0.0001	3.355 0.0767 114.365 0.0001	4.495 0.0405 108.753 0.0001
				24.84 13.45 29.78 4.599 0.0421 11.028 0.0013

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=2,8,16,26

## University of Delaware

Pest Code Pest Name	AMAPA PalmerAm	C ZEAMS Sweet corn Stunt 2 wks	C ZEAMS Sweet corn Stunt 4 wks	DIGSA L.crbgrs
Crop Type, Code Crop Name Rating Type	C - Control	%	%	C - Control
Rating Unit Rating Date	08/09/18			%
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code
12 Late (May 1) Untreated Check				
Callisto.....mesotrione	4 SC	0.0625 lb ai/a	5WAP B	
Crop Oil Concentrate	100 L	1.17 % v/v	5WAP B	
30% Urea Ammonium Nitrate	100 L	2.5 % v/v	5WAP B	
LSD P=.05		22.01	3.69	8.92
Standard Deviation		8.56	2.17	5.24
CV		13.89	41.32	116.4
Replicate F		0.114	0.336	0.787
Replicate Prob(F)		0.7497	0.7182	0.4690
Treatment F		33.523	10.396	2.861
Treatment Prob(F)		0.0008	0.0001	0.0199
				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=2,8,16,26

## University of Delaware

Pest Code	PANDI F.panicm	DIGSA L.crbgrs	PANDI F.panicm	DIGSA L.crbgrs	PANDI F.panicm		
Pest Name	C - Control %	C - Control %	C - Control %	C - Control %	C - Control %		
Crop Type, Code							
Crop Name							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
12	Late (May 1) Untreated Check	4 SC	0.0625 lb ai/a	5WAP B			0.0 g
	Callisto.....mesotrione	100 L	1.17 % v/v	5WAP B			
	Crop Oil Concentrate	100 L	2.5 % v/v	5WAP B			
	30% Urea Ammonium Nitrate						
LSD P=.05		11.50	7.45	11.05	10.76	22.54	
Standard Deviation		6.75	4.09	6.08	6.32	13.19	
CV		9.6	5.74	8.05	11.27	23.87	
Replicate F		3.483	5.743	1.780	6.679	2.922	
Replicate Prob(F)		0.0504	0.0218	0.2181	0.0060	0.0783	
Treatment F		78.040	231.369	117.197	63.925	16.568	
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 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=2,8,16,26

ImpactZ Programs in Roundup Ready / Liberty Link Sweet Corn

Trial ID: SCRN3-18

Location: Field #18

Trial Year: 2018

Protocol ID: SCRN3-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 03/01/18

Completion Date: 09/30/18

**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

Variety: Remedy

Attributes: LL/RR

Planting Date: 05/09/18

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: 72 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 05/15/18

**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: CHEAL Chenopodium album

Common Name: Common lambsquarters

Pest 4 Type: W Code: DIGSA Digitaria sanguinalis

Common Name: large crabgrass

**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 18A

% Sand: 81

% OM: 1.0

Texture: LS

loamy sand

% Silt: 12

pH: 6.5

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

% Clay: 7

CEC: 3.5

Fert. Level: G

good

Soil Drainage: G

good

**Application Description**

	A	B
Application Date	05/09/18	06/05/18
Appl. Stop Time	12:30 PM	10:30 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	2-4" wds
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	70 F	74 F
% Relative Humidity Start, Stop	44	49
Wind Velocity+Dir. Start	3 mph NE	4 mph SW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	70 F	83 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	0	5

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	ZEAMS BCOR	ZEAMS BCOR
Stage Scale Used		DESC
Stage Majority, Percent		V5
Height Average		7 in
Height Minimum, Maximum		4 11

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100
Height Average		1 in
Density Average		25 m2
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		1-3 lf 70
Stage Minimum, Percent		cot 10
Stage Maximum, Percent		4-lf 20
Height Average		2 in
Height Minimum, Maximum		1 3
Density Average		6 m2
Pest 3 Code, Type, Scale	CHEAL W	CHEAL W
Stage Majority, Percent		1-lf 60
Stage Minimum, Percent		cot 20
Stage Maximum, Percent		2-lf 20
Height Average		0.3 in
Height Minimum, Maximum		0.2 0.5
Density Average		5 m2
Pest 4 Code, Type, Scale	DIGSA W	DIGSA W
Stage Majority, Percent		1-lf 70
Stage Minimum, Percent		cot 15
Stage Maximum, Percent		2-lf 15
Height Average		0.7 in
Height Minimum, Maximum		0.5 1
Density Average		40 m2

**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
Boom Length	6.7 ft	6.7 ft
Boom Height	18 in	28 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMAIR	COMAIR

Date	Notes
06/07/18	Common ragweed sporadic throughout. Found in plots 107, 108, 201, 204, 205, 207, 208, 303, and 304

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

05/23/18: Sweet corn stand looks good, no corn injury observed from Dual treatments.

06/06/18: Excessive rainfall early in the season resulted in poor stand development making it difficult to distinguish herbicide injury.

08/09/18: No grass control with any treatment resulted in interspecific competition with Palmer amaranth and other broadleaf weeds.

## ImpactZ Programs in Roundup Ready / Liberty Link Sweet Corn

Trial ID: SCRN3-18

Location: Field #18

Trial Year: 2018

Protocol ID: SCRN3-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code	Pest Name		IPOSS morngly	DIGSA L.crbgrs					
Crop Type, Code	Crop Name	C ZEAMS Swt.Corn Injury %	C - Control %	C - Control %	C ZEAMS Swt.Corn Stunting %				
Rating Type	Rating Unit	05/25/18	05/25/18	05/25/18	06/06/18				
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit				
					Appl Timing				
					Appl Code				
1	Untreated Check			0.0 a	0.0 a	0.0 b	0.0 c		
2	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	1.19 lb ai/a 0.356 lb ai/a 0.0217 0.334 1 % v/v 1.02 % w/v	PRE 2-4"wds B	A	0.0 a	0.0 a	100.0 a	48.3 ab
3	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 4.5 AS 100 L 100 D	1.19 lb ai/a 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v	PRE 2-4"wds B	A	0.0 a	0.0 a	100.0 a	63.3 ab
4	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 2.34 SL 100 D	1.19 lb ai/a 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v	PRE 2-4"wds B	A	0.0 a	0.0 a	100.0 a	38.3 b
5	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	1.19 lb ai/a 0.094 lb ai/a 0.334 lb ai/a 0.25 % v/v	PRE 2-4"wds B	A	0.0 a	0.0 a	100.0 a	48.3 ab
6	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	1.19 lb ai/a 0.71 lb ai/a 0.0433 0.667 1 % v/v 1.02 % w/v	PRE 2-4"wds B	A	0.0 a	0.0 a	100.0 a	38.3 b
7	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	1.19 lb ai/a 0.188 lb ai/a 0.334 lb ai/a 0.25 % v/v	PRE 2-4"wds B	A	0.0 a	0.0 a	100.0 a	38.3 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.  
Could not calculate LSD (% mean diff) for columns 1,2,3,6 because error mean square = 0.

Pest Code	Pest Name		AMAPA PalmerAm	IPOSS mornglry	SOLCA Horsenetl	CYPES Y.nutsge			
Crop Type, Code	Crop Name		C -	C -	C -	C -			
Rating Type	Rating Unit	Control %	Control %	Control %	Control %	Control %			
Rating Date		06/06/18	06/06/18	06/06/18	06/06/18	06/06/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code			
1	Untreated Check								
2	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	1.19 lb ai/a 0.356 lb ai/a 0.0217 0.334 1 % v/v 1.02 % w/v	PRE 2-4" wds B	A	90.0 a	0.0 a	0.0 c	97.0 a
3	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 4.5 AS 100 L 100 D	1.19 lb ai/a 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v	PRE 2-4" wds B	A	25.0 bc	0.0 a	0.0 c	97.7 a
4	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 2.34 SL 100 D	1.19 lb ai/a 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v	PRE 2-4" wds B	A	45.0 abc	0.0 a	3.3 c	98.7 a
5	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	1.19 lb ai/a 0.094 lb ai/a 0.334 lb ai/a 0.25 % v/v	PRE 2-4" wds B	A	48.3 abc	0.0 a	33.3 bc	99.0 a
6	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	1.19 lb ai/a 0.71 lb ai/a 0.0433 0.667 1 % v/v 1.02 % w/v	PRE 2-4" wds B	A	66.7 ab	0.0 a	100.0 a	97.7 a
7	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	1.19 lb ai/a 0.188 lb ai/a 0.334 lb ai/a 0.25 % v/v	PRE 2-4" wds B	A	55.0 ab	0.0 a	66.7 ab	99.0 a

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Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.  
Could not calculate LSD (% mean diff) for columns 1,2,3,6 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	SETFA G.foxtl C -	C Control % 06/06/18	ZEAMS Swt.Corn Stunting % 06/18/18	AMAPA PalmerAm C -	IPOSS morngly C -	Control % 06/18/18	Control % 06/18/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code						
1	Untreated Check							0.0 b	0.0 a	0.0 c	0.0 b		
2	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	1.19 lb ai/a 0.356 lb ai/a 0.0217 0.334 1 % v/v 1.02 % w/v	PRE 2-4"wds B	A		67.7 a	5.0 a		100.0 a	96.0 a		
3	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 4.5 AS 100 L 100 D	1.19 lb ai/a 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v	PRE 2-4"wds B	A		76.0 a	8.3 a		98.7 b	90.0 a		
4	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Liberty 280.....glufosinate Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 2.34 SL 100 D	1.19 lb ai/a 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v	PRE 2-4"wds B	A		80.0 a	6.7 a		100.0 a	63.3 a		
5	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	1.19 lb ai/a 0.094 lb ai/a 0.334 lb ai/a 0.25 % v/v	PRE 2-4"wds B	A		68.3 a	8.3 a		100.0 a	70.0 a		
6	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	1.19 lb ai/a 0.71 lb ai/a 0.0433 0.667 1 % v/v 1.02 % w/v	PRE 2-4"wds B	A		71.7 a	3.3 a		100.0 a	97.7 a		
7	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	1.19 lb ai/a 0.188 lb ai/a 0.334 lb ai/a 0.25 % v/v	PRE 2-4"wds B	A		68.3 a	3.3 a		100.0 a	96.7 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.  
Could not calculate LSD (% mean diff) for columns 1,2,3,6 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	DIGSA L.crbgrs C -	SETFA G.foxtl C -	AMAPA PalmerAm C -	IPOSS mornglry C -
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check						0.0 c	0.0 c	0.0 c	0.0 a
2	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	E SC 0.356 lb ai/a 0.0217 0.334 1 % v/v 1.02 % w/v	1.19 lb ai/a 2-4" wds B	PRE 2-4" wds B	A	98.3 a	97.3 a	83.3 a	16.7 a
3	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 4.5 AS 100 L 100 D	E SC 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v	1.19 lb ai/a 2-4" wds B	PRE 2-4" wds B	A	97.7 a	100.0 a	48.3 b	30.0 a
4	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 2.34 SL 100 D	E SC 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v	1.19 lb ai/a 2-4" wds B	PRE 2-4" wds B	A	97.0 ab	98.3 a	48.3 b	20.0 a
5	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	E SC 0.094 lb ai/a 0.334 lb ai/a 0.25 % v/v	1.19 lb ai/a 2-4" wds B	PRE 2-4" wds B	A	96.7 ab	87.0 b	66.7 ab	60.0 a
6	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	E SC 0.71 lb ai/a 0.0433 0.667 1 % v/v 1.02 % w/v	1.19 lb ai/a 2-4" wds B	PRE 2-4" wds B	A	96.3 ab	100.0 a	73.3 ab	50.0 a
7	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	E SC 0.188 lb ai/a 0.334 lb ai/a 0.25 % v/v	1.19 lb ai/a 2-4" wds B	PRE 2-4" wds B	A	97.0 ab	90.3 b	80.0 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.  
Could not calculate LSD (% mean diff) for columns 1,2,3,6 because error mean square = 0.

Pest Code					SETFA
Pest Name					G.foxtl
Crop Type, Code					C -
Crop Name					
Rating Type					Control
Rating Unit					%
Rating Date					07/02/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code
1	Untreated Check				0.0 d
2	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	E SC 0.356 lb ai/a 0.0217 0.334 1 % v/v 1.02 % w/v	1.19 lb ai/a 2-4" wds B 2-4" wds B	PRE A 2-4" wds B 2-4" wds B
3	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Roundup PowerMax..glyphosate Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 4.5 AS 100 L 100 D	E SC 0.266 lb ai/a 0.0162 0.25 1.13 lb ae/a 0.5 % v/v 1.02 % w/v	1.19 lb ai/a 2-4" wds B 2-4" wds B 2-4" wds B	PRE A 2-4" wds B 2-4" wds B
4	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 2.34 SL 100 D	E SC 0.266 lb ai/a 0.0162 0.25 0.402 lb ai/a 1.02 % w/v	1.19 lb ai/a 2-4" wds B 2-4" wds B	PRE A 2-4" wds B 2-4" wds B
5	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	E SC 0.094 lb ai/a 0.334 lb ai/a 0.25 % v/v	1.19 lb ai/a 2-4" wds B 2-4" wds B 2-4" wds B	PRE A 2-4" wds B 2-4" wds B
6	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 100 L 100 D	E SC 0.71 lb ai/a 0.0433 0.667 1 % v/v 1.02 % w/v	1.19 lb ai/a 2-4" wds B 2-4" wds B	PRE A 2-4" wds B 2-4" wds B
7	Dual II Magnum..s-metolachlor Callisto.....mesotrione Atrazine 4L Nonionic Surfactant	7.64 E 4 SC 4 L 100 L	E SC 0.188 lb ai/a 0.334 lb ai/a 0.25 % v/v	1.19 lb ai/a 2-4" wds B 2-4" wds B 2-4" wds B	PRE A 2-4" wds B 2-4" 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.  
Could not calculate LSD (% mean diff) for columns 1,2,3,6 because error mean square = 0.

Pest Code Pest Name		IPOSS morngly	DIGSA L.crbgrs	
Crop Type, Code Crop Name	C ZEAMS Swt.Corn	C -	C -	C ZEAMS Swt.Corn
Rating Type	Injury %	Control %	Control %	Stunting %
Rating Unit				
Rating Date	05/25/18	05/25/18	05/25/18	06/06/18
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
8 Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A
ImpactZ Premix	4.26 SC	0.266 lb ai/a	2-4" wds	B
----topramezone	0.26	0.0162		
----atrazine	4	0.25		
Atrazine 4L	4 L	0.5 lb ai/a	2-4" wds	B
Methylated Seed Oil	100 L	0.5 % v/v	2-4" wds	B
Dry Ammonium Sulfate	100 D	1.02 % w/v	2-4" wds	B
LSD P=.05				27.52
Standard Deviation		0.00	0.00	15.72
CV		0.0	0.0	36.8
Replicate F		0.000	0.000	0.000
Replicate Prob(F)		1.0000	1.0000	1.0000
Treatment F		0.000	0.000	0.000
Treatment Prob(F)		1.0000	1.0000	0.0047

Means followed by same letter 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 1,2,3,6 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA	IPOSS	SOLCA	CYPES						
Pest Name		PalmerAm	mornglry	Horsenetl	Y.nutsge						
Crop Type, Code		C -	C -	C -	C -						
Crop Name		Control	Control	Control	Control						
Rating Type		%	%	%	%						
Rating Unit		06/06/18	06/06/18	06/06/18	06/06/18						
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
8	Dual II Magnum..s-metolachlor ImpactZ Premix ----topramezone ----atrazine Atrazine 4L Methylated Seed Oil Dry Ammonium Sulfate	7.64 E 4.26 SC 0.26 4 4 L 100 L 100 D	E SC 0.266 lb ai/a 0.0162 0.25 0.5 lb ai/a 0.5 % v/v 1.02 % w/v	1.19 lb ai/a 0.266 lb ai/a 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B 2-4"wds B	PRE 2-4"wds B	A	73.3 ab	0.0 a	66.7 ab	99.0 a	
LSD P=.05							49.62	.	55.66	2.44	
Standard Deviation							28.34	0.00	31.78	1.40	
CV							56.21	0.0	94.17	1.62	
Replicate F							3.523	0.000	2.933	4.817	
Replicate Prob(F)							0.0576	1.0000	0.0863	0.0256	
Treatment F							2.988	0.000	4.624	1862.019	
Treatment Prob(F)							0.0386	1.0000	0.0072	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 1,2,3,6 because error mean square = 0.

Pest Code		SETFA		AMAPA	IPOSS											
Pest Name	G.foxtl	C	ZEAMS	PalmerAm	morngly											
Crop Type, Code	C -		Swt.Corn	C -	C -											
Crop Name		Control	Stunting	Control	Control											
Rating Type	%	06/06/18	%	06/18/18	06/18/18											
Rating Unit																
Rating Date																
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code									
8	Dual II Magnum..s-metolachlor	7.64	E	1.19	lb ai/a	PRE	A	71.7	a	5.0	a	100.0	a	94.3	a	
	ImpactZ Premix	4.26	SC	0.266	lb ai/a	2-4"	wds	B								
	----topramezone	0.26		0.0162												
	----atrazine		4	0.25												
	Atrazine 4L		4 L	0.5	lb ai/a	2-4"	wds	B								
	Methylated Seed Oil	100	L	0.5	% v/v	2-4"	wds	B								
	Dry Ammonium Sulfate	100	D	1.02	% w/v	2-4"	wds	B								
LSD P=.05								16.43		12.89		0.71		44.78		
Standard Deviation								9.38		7.36		0.41		25.57		
CV								14.9		147.2		0.47		33.64		
Replicate F								18.980		0.231		1.000		0.528		
Replicate Prob(F)								0.0001		0.7969		0.3927		0.6008		
Treatment F								22.661		0.440		22418.288		5.113		
Treatment Prob(F)								0.0001		0.8612		0.0001		0.0047		

Means followed by same letter 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 1,2,3,6 because error mean square = 0.

## University of Delaware

Pest Code		DIGSA	SETFA	AMAPA	IPOSS						
Pest Name	L.crbgrs	G.foxtl	PalmerAm	morngly							
Crop Type, Code	C -	C -	C -	C -							
Crop Name											
Rating Type		Control	Control	Control	Control						
Rating Unit	%	%	%	%	%						
Rating Date	06/18/18	06/18/18	07/02/18	07/02/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
8	Dual II Magnum..s-metolachlor ImpactZ Premix	7.64 E 4.26 SC 0.26	1.19 lb ai/a 0.266 lb ai/a 0.0162	PRE 2-4" wds B	A			66.7 b	97.3 a	88.3 a	23.3 a
	----topramezone										
	----atrazine		4	0.25							
	Atrazine 4L		4 L	0.5 lb ai/a	2-4" wds B						
	Methylated Seed Oil	100 L		0.5 % v/v	2-4" wds B						
	Dry Ammonium Sulfate	100 D		1.02 % w/v	2-4" wds B						
LSD P=.05						30.75	4.04	30.05	52.34		
Standard Deviation						17.56	2.31	17.16	29.89		
CV						21.62	2.75	28.11	95.65		
Replicate F						1.019	1.697	2.593	3.036		
Replicate Prob(F)						0.3861	0.2188	0.1102	0.0803		
Treatment F						11.588	657.876	8.489	1.396		
Treatment Prob(F)						0.0001	0.0001	0.0004	0.2814		

Means followed by same letter 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 1,2,3,6 because error mean square = 0.

## University of Delaware

Pest Code		SETFA						
Pest Name		G.foxtl						
Crop Type, Code		C -						
Crop Name								
Rating Type		Control						
Rating Unit		%						
Rating Date		07/02/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
8	Dual II Magnum..s-metolachlor	7.64	E	1.19 lb	ai/a	PRE	A	82.7 ab
	ImpactZ Premix	4.26	SC	0.266 lb	ai/a	2-4" wds	B	
	----topramezone	0.26		0.0162				
	----atrazine		4	0.25				
	Atrazine 4L		4 L	0.5 lb	ai/a	2-4" wds	B	
	Methylated Seed Oil	100	L	0.5 %	v/v	2-4" wds	B	
	Dry Ammonium Sulfate	100	D	1.02 %	w/v	2-4" wds	B	
LSD P=.05								8.87
Standard Deviation								5.06
CV								7.17
Replicate F								0.122
Replicate Prob(F)								0.8862
Treatment F								101.137
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.  
Could not calculate LSD (% mean diff) for columns 1,2,3,6 because error mean square = 0.

**Evaluation of POST Grain Sorghum Herbicides**

Trial ID: Milo1-18      Location: Field #18      Trial Year: 2018  
Protocol ID: Milo1-18      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Initiation Date: 03/01/18  
Completion Date: 10/27/18

**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	Variety: DKS37-07
Planting Date: 06/27/18	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: 80 F	Seed Bed: MEDIUM medium
Emergence Date: 07/01/18	Soil Moisture: NORMAL normal, adequate
Harvest Date: 10/17/18	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

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
Common Name: Morning glory

**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)

## Trial Initiation Comments:

Total preemergence application of Dual II Magnum 1.25 pt/A on 6-28-18.

**Soil Description**

Description Name: Field 18A	% Sand: 81	% OM: 1.0	Texture: LS	loamy sand
	% Silt: 12	pH: 6.5	Soil Name: Rosedale	loamy sand, 0-2% slopes
	% Clay: 7	CEC: 4.9	Fert. Level: G	good
Soil Drainage: G				
	good			

**Application Description**

A	
Application Date	08/03/18
Appl. Stop Time	09:15 AM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	82 F
% Relative Humidity Start, Stop	80
Wind Velocity+Dir. Start	2 mph S
Wet Leaves (Y/N)	Y yes
Soil Temperature	82 F
Soil Moisture	NORMAL
% Cloud Cover	40

**Crop Stage At Each Application**

A	
Crop 1 Code, BBCH Scale	SORVU BGRM
Stage Scale Used	DESC
Stage Majority, Percent	V11-12 100
Height Average	30 in

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	AMAPA W
Stage Majority, Percent	veg 100
Height Average	20 in
Height Minimum, Maximum	8 28
Density Average	2 PLOT
Pest 2 Code, Type, Scale	IPOSS W
Stage Majority, Percent	run 100
Height Average	24 in
Height Minimum, Maximum	15 30
Density Average	1 m2

**Application Equipment**

A	
Appl. Equipment	Tractor
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	48 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

07/11/18: Good stand of sorghum, no issues with Dual II Mag application

10/16/18: Note Untreated check was sprayed late with Huskie yield loss maybe due in part to herbicide injury.  
Milo stand was reduced in row 3, due to tire damage when POST treatments were applied. Plots impacted were: 110, 105, 208, 209, 210, 301, 303, 310

Evaluation of POST Grain Sorghum Herbicides									
Trial ID: Milo1-18		Location: Field #18		Trial Year: 2018					
Protocol ID: Milo1-18		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact:									
Pest Code				C SORVU					
Pest Name				Grain sorghum	C SORVU	AMAPA			
Crop Type, Code				Grain sorghum	Grain sorghum	Palmer amaranth			
Crop Name						C -			
Rating Type				Leaf burn	moisture				
Rating Unit				%	%	Control			
Rating Date				08/06/18	08/06/18	%			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
1	Untreated Check				0.0 c	0.0 b			
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	lb ai/a	POST A	7.0 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	lb ai/a	POST A	9.7 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	lb ai/a	POST A	11.3 a			
5	Atrazine 4L Buctril 2EC.....bromoxynil	4 L 2 EC	0.5 lb ai/a 0.25 lb ai/a	lb ai/a	POST A	9.7 ab			
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	lb ai/a	POST A	0.0 c			
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	0.0 c			
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	lb ai/a	POST A	0.0 c			
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	2.3 c			
						8.7 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=3

Pest Code						
Pest Name						
Crop Type, Code						
Crop Name						
Rating Type						
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	lb ai/a	POST A	
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	lb ai/a	POST A	
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	lb ai/a	POST A	
5	Atrazine 4L Buctril 2EC.....bromoxynil	4 L 2 EC	0.5 lb ai/a 0.25 lb ai/a	lb ai/a	POST A	
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	lb ai/a	POST A	
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	
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	lb ai/a	POST A	
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	

Means followed by same letter 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

Pest Code					AMAPA
Pest Name					Palmer amaranth
Crop Type, Code					C -
Crop Name					
Rating Type					Control
Rating Unit					%
Rating Date					10/16/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing
10	Facet L.....quinclorac	1.5 L	0.375 lb	ae/a	POST A
	DiFlexx.....dicamba	4 L	0.28 lb	ai/a	POST A
	Crop Oil Concentrate	100 L	1 %	v/v	POST A
	30% Urea Ammonium Nitrate	100 L	2.5 %	v/v	POST A
LSD P=.05				3.48	3.88
Standard Deviation				2.03	2.26
CV				50.71	26.89
Replicate F				4.447	0.078
Replicate Prob(F)				0.0269	0.9249
Treatment F				16.994	5.977
Treatment Prob(F)				0.0001	0.0007
					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

## University of Delaware

Pest Code		C SORVU					
Pest Name		Grain sorghum					
Crop Type, Code							
Crop Name							
Rating Type		Yield					
Rating Unit		Bu/A					
Rating Date		10/17/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
10	Facet L.....quinclorac	1.5 L	0.375 lb ae/a	POST	A		
	DiFlexx.....dicamba	4 L	0.28 lb ai/a	POST	A		
	Crop Oil Concentrate	100 L	1 % v/v	POST	A		
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	POST	A		
LSD P=.05							5.34
Standard Deviation							3.11
CV							4.13
Replicate F							4.089
Replicate Prob(F)							0.0344
Treatment F							1.877
Treatment Prob(F)							0.1222

Means followed by same letter 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

**Evaluating PRE Weed Control for Grain Sorghum**

Trial ID: Milo3-18

Location: Field #18

Trial Year: 2018

Protocol ID: Milo3-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 03/01/18

Completion Date: 10/27/18

**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

Variety: DKS37-07

Planting Date: 06/27/18

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

Seed Bed: MEDIUM medium

Soil Temperature: 80 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 07/01/18

Harvest Equipment: Plot combine

Harvest Date: 10/17/18

Harvested Width: 6.25 FT

% Standard Moisture: 14.0

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>

Tillage Type: CONTIL conventional-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 18A

% Sand: 81 % OM: 1.0 Texture: LS loamy sand

% Silt: 12 pH: 6.5 Soil Name: Rosedale loamy sand, 0-2% slopes

% Clay: 7 CEC: 4.9 Fert. Level: G good

Soil Drainage: G good

**Application Description**

		A
Application Date	06/28/18	
Appl. Stop Time	10:00 AM	
Application Method	SPRAY	
Application Timing	PRE	
Application Placement	BROADC	
Applied By	Johnson	
Air Temperature Start, Stop	84 F	
% Relative Humidity Start, Stop	70	
Wind Velocity+Dir. Start	3 mph SW	
Wet Leaves (Y/N)	N no	
Soil Temperature	84 F	
Soil Moisture	NORMAL	
% Cloud Cover	60	

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	SORVU BGRM

**Application Equipment**

		A
Appl. Equipment	Tractor	
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	18 in	
Ground Speed	3 mph	
Carrier	WATER	
Application Amount	20 gal/ac	
Propellant	COMAIR	

**SE Definitions**

	1.
Crop Type, Code	C

Trial Comments

## Evaluating PRE Weed Control for Grain Sorghum

Trial ID: Milo3-18

Location: Field #18

Trial Year: 2018

Protocol ID: Milo3-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code					
Pest Name					
Crop Type, Code					
Crop Name					
Rating Type					
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1	Untreated Check				0.0 d
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.67 SC 2.49 0.25 0.93	2.48 lb ai/a 1.68 0.169 0.63	PRE A	6.3 c
3	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Bicep II Magnum Premix ----s-metolachlor ----atrazine	3.67 SC 2.49 0.25 0.93 5.5 L 2.4 3.1	1.48 lb ai/a 1 0.101 0.375 1.1 lb ai/a 0.48 0.62	PRE A	9.7 b
4	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Bicep II Magnum Premix ----s-metolachlor ----atrazine	3.67 SC 2.49 0.25 0.93 5.5 L 2.4 3.1	0.99 lb ai/a 0.67 0.0674 0.25 1.65 lb ai/a 0.72 0.93	PRE A	0.0 d
5	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 0.625 lb ai/a	PRE A	9.0 b
6	Bicep II Magnum Premix ----s-metolachlor ----atrazine	5.5 L 2.4 3.1	2.75 lb ai/a 1.2 1.55	PRE A	8.0 bc
7	Zidua.....pyroxasulfone Atrazine 4L	85 WG 4 L	0.106 lb ai/a 0.75 lb ai/a	PRE A	13.0 a
8	Dual II Magnum..s-metolachlor	7.64 E	1.2 lb ai/a	PRE A	0.0 d
9	Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.2 lb ai/a 0.75 lb ai/a	PRE A	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=2

Pest Code Pest Name		AMAPA Palmer amaranth	IPOSS Morning glory	DIGSA large crabgrass						
Crop Type, Code Crop Name		C -	C -	C -						
Rating Type		Control %	Control %	Control %						
Rating Unit		08/06/18	08/06/18	08/06/18						
Rating Date										
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	3.67	SC	2.48	lb ai/a	PRE	A	100.0 a	60.0 a	100.0 a
	----s-metolachlor	2.49		1.68						
	----mesotrione	0.25		0.169						
	----atrazine	0.93		0.63						
3	Lumax EZ Premix	3.67	SC	1.48	lb ai/a	PRE	A	100.0 a	60.0 a	100.0 a
	----s-metolachlor	2.49		1						
	----mesotrione	0.25		0.101						
	----atrazine	0.93		0.375						
	Bicep II Magnum Premix	5.5	L	1.1	lb ai/a	PRE	A			
	----s-metolachlor	2.4		0.48						
	----atrazine	3.1		0.62						
4	Lumax EZ Premix	3.67	SC	0.99	lb ai/a	PRE	A	100.0 a	53.3 a	100.0 a
	----s-metolachlor	2.49		0.67						
	----mesotrione	0.25		0.0674						
	----atrazine	0.93		0.25						
	Bicep II Magnum Premix	5.5	L	1.65	lb ai/a	PRE	A			
	----s-metolachlor	2.4		0.72						
	----atrazine	3.1		0.93						
5	Lumax EZ Premix	3.67	SC	2.48	lb ai/a	PRE	A	100.0 a	63.3 a	100.0 a
	----s-metolachlor	2.49		1.68						
	----mesotrione	0.25		0.169						
	----atrazine	0.93		0.63						
	Atrazine 4L	4	L	0.625	lb ai/a	PRE	A			
6	Bicep II Magnum Premix	5.5	L	2.75	lb ai/a	PRE	A	100.0 a	56.7 a	100.0 a
	----s-metolachlor	2.4		1.2						
	----atrazine	3.1		1.55						
7	Zidua.....pyroxasulfone	85	WG	0.106	lb ai/a	PRE	A	100.0 a	53.3 a	100.0 a
	Atrazine 4L	4	L	0.75	lb ai/a	PRE	A			
8	Dual II Magnum..s-metolachlor	7.64	E	1.2	lb ai/a	PRE	A	83.3 b	31.7 b	100.0 a
9	Dual II Magnum..s-metolachlor	7.64	E	1.2	lb ai/a	PRE	A	100.0 a	31.7 b	90.0 b
	Atrazine 4L	4	L	0.75	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.

Missing data estimates are included in columns:Yates=2

Pest Code						
Pest Name						
Crop Type, Code						
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Untreated Check					
2	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine	3.67 2.49 0.25 0.93	SC 1.68 0.169 0.63	2.48 lb ai/a 1 0.169 0.63	PRE A	89.3 a
3	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Bicep II Magnum Premix ----s-metolachlor ----atrazine	3.67 2.49 0.25 0.93 5.5 L 2.4 3.1	SC 1 0.101 0.375 1.1 lb ai/a 0.48 0.62	1.48 lb ai/a A	81.0 bc	89.0 a
4	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Bicep II Magnum Premix ----s-metolachlor ----atrazine	3.67 2.49 0.25 0.93 5.5 L 2.4 3.1	SC 0.67 0.0674 0.25 0.93 1.65 lb ai/a 0.72 0.93	0.99 lb ai/a A	78.9 bc	
5	Lumax EZ Premix ----s-metolachlor ----mesotrione ----atrazine Atrazine 4L	3.67 2.49 0.25 0.93 4 L	SC 1.68 0.169 0.63 0.625 lb ai/a	2.48 lb ai/a A	86.3 ab	
6	Bicep II Magnum Premix ----s-metolachlor ----atrazine	5.5 L 2.4 3.1	5.5 L 1.2 1.55	2.75 lb ai/a A	82.2 abc	
7	Zidua.....pyroxasulfone Atrazine 4L	85 WG 4 L	0.106 lb ai/a 0.75 lb ai/a	0.75 lb ai/a PRE A	83.1 abc	
8	Dual II Magnum..s-metolachlor	7.64 E	1.2 lb ai/a	PRE A	79.4 bc	
9	Dual II Magnum..s-metolachlor Atrazine 4L	7.64 E 4 L	1.2 lb ai/a 0.75 lb ai/a	PRE A	76.6 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=2

## University of Delaware

Pest Code		C SORVU	C SORVU						
Pest Name		Grain sorghum	Grain sorghum						
Crop Type, Code									
Crop Name									
Rating Type		Stunting	Stunting						
Rating Unit		%	%						
Rating Date		07/11/18	08/06/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
10	Acuron Premix	3.44	ZC	2.15	lb ai/a	PRE	A	9.7 b	10.4 ab
----	atrazine		1	0.625					
----	bicyclopyrone	0.06		0.0375					
----	mesotrione	0.24		0.15					
----	s-metolachlor	2.14		1.34					
LSD P=.05					2.66			5.11	
Standard Deviation					1.55			2.97	
CV					27.81			83.08	
Replicate F					4.771			3.719	
Replicate Prob(F)					0.0217			0.0457	
Treatment F					32.150			8.008	
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

## University of Delaware

Pest Code Pest Name	AMAPA Palmer amaranth	IPOSS Morning glory	DIGSA large crabgrass			
Crop Type, Code Crop Name	C -	C -	C -			
Rating Type	Control	Control	Control			
Rating Unit	%	%	%			
Rating Date	08/06/18	08/06/18	08/06/18			
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code			
10 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	100.0 a	60.0 a	100.0 a
LSD P=.05 Standard Deviation CV				8.29 4.83 5.47	14.83 8.64 18.39	9.40 5.48 6.15
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				1.000 0.3874 127.381 0.0001	1.037 0.3747 16.178 0.0001	1.000 0.3874 98.778 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

Pest Code						C SORVU
Pest Name						Grain sorghum
Crop Type, Code						
Crop Name						
Rating Type						Yield
Rating Unit						Bu/A
Rating Date						10/17/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
10	Acuron Premix	3.44	ZC 1	2.15 lb ai/a	PRE	A
	----atrazine			0.625		
	----bicyclopyrone	0.06		0.0375		
	----mesotrione	0.24		0.15		
	----s-metolachlor	2.14		1.34		
LSD P=.05						7.53
Standard Deviation						4.39
CV						5.3
Replicate F						0.702
Replicate Prob(F)						0.5085
Treatment F						2.800
Treatment Prob(F)						0.0301

Means followed by same letter 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

Comparison of Sorghum and Soybeans for Palmer Amaranth Control  
 Trial ID: Milo4-18 Location: Field# 10 Trial Year: 2018  
 Protocol ID: Milo4-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 11/24/18

**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	Variety: DKS37-07	Planting Date: 06/27/18	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: 80 F	Seed Bed: MEDTRA	medium/trashy
		Emergence Date: 07/01/18	Soil Moisture: NORMAL	normal, adequate
		% Standard Moisture: 14.0	Harvest Equipment: Plot combine	
			Harvested Width: 6.25 ft	
			Harvested Length: 20 ft	
Crop 2: C GLXMA Glycine max	Soybean			
		Variety: S43XS27		
		Attributes: Xtend		
		Planting Date: 06/27/18	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: 80 F	Seed Bed: MEDTRA	medium/trashy
		Emergence Date: 07/02/18	Soil Moisture: NORMAL	normal, adequate
		Harvest Date: 11/21/18	Harvest Equipment: Plot combine	
			Harvested Width: 6.25 FT	
		% Standard Moisture: 13.0	Harvested Length: 20 FT	

**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

**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: SPLPLO Split-Plot

**Soil Description**

Description Name: Field 10  
 % Sand: 79 % OM: 1.6 Texture: SL sandy loam  
 % Silt: 10 pH: 6.3 Soil Name: Hurlokk sandy loam, 0-2% slopes  
 % Clay: 11 CEC: 5.0 Fert. Level: G good  
 Soil Drainage: F fair

**Application Description**

	A	B
Application Date	06/28/18	07/27/18
Appl. Stop Time	10:00 AM	11:40 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	4WAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	84 F	88 F
% Relative Humidity Start, Stop	70	65
Wind Velocity+Dir. Start	3 mph SW	1 mph SW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	84 F	88 F
Soil Moisture	NORMAL	WET
% Cloud Cover	60	30

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	SORVU BGRM	SORVU BGRM
Stage Scale Used		DESC
Stage Majority, Percent		V7 50
Stage Minimum, Percent		V6 20
Stage Maximum, Percent		V8 30
Height Average		12 in
Height Minimum, Maximum		8 15
Crop 2 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC
Stage Majority, Percent		V4-5 100
Height Average		10 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100
Height Average		15 in
Height Minimum, Maximum		10 18
Density Average		2 plot
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		run 100
Height Average		18 in
Height Minimum, Maximum		12 24
Density Average		3 m2

**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
Boom Length	6.7 ft	6.7 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

**SE Definitions**

	1.
Crop Type, Code	C

Trial Comments

Comparison of Sorghum and Soybeans for Palmer Amaranth Control  
 Trial ID: Milo4-18 Location: Field# 10 Trial Year: 2018  
 Protocol ID: Milo4-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	Pest Name	Crop Type, Code		C -	AMAPA PalmerAm C -	AMAPA PalmerAm C -	AMAPA PalmerAm C -
Crop Name			Srghm/Soy				
Rating Type			Stunting %		Control %	Control %	Control %
Rating Unit				07/10/18	08/03/18	09/14/18	10/10/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Sorghum Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A		0.0 c
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	10.7 a	86.7 b
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	10.3 a	100.0 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	0.0 c	93.7 ab
5	Sorghum Dual II Magnum..s-metolachlor Atrazine 4L Huskie Premix ----pyrasulfotole ----bromoxynil Nonionic Surfactant	7.64 E 4 L 2.05 EC 0.3 1.75 100 L	1.19 lb ai/a 1 lb ai/a 0.208 lb ai/a 0.0304 0.178	PRE PRE 4 WAP B	A	11.3 a	100.0 a
6	Sorghum Untreated Check					0.0 c	0.0 d
7	Soybean DT/RR Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE	A	0.0 c	86.6 b
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	6.3 b	66.7 c
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	0.0 c	85.4 b
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	0.0 c	91.7 ab
11	Soybean DT/RR Dual II Magnum..s-metolachlor Metribuzin.....metribuzin Reflex.....fomesafen Nonionic Surfactant	7.64 E 75 DF 2 L 100 L	1.19 lb ai/a 0.188 lb ai/a 0.375 lb ai/a 0.25 % v/v	PRE PRE 4 WAP B 4 WAP B	A A	6.3 b	91.7 ab
							86.7 ab
							90.7 ab

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=1,2,3,4,10,11

Pest Code	Pest Name	Crop Type, Code	C SORVU	C GLXMA	C -
Crop Name		GrnSrghm	Soybean	Srghm/Soy	
Rating Type			Yield Bu/A	Yield Bu/A	Yield Bu/A
Rating Unit					
Rating Date			10/17/18	11/21/18	
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
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 Nonionic Surfactant	7.64 E 4 L 2.05 EC 0.3 1.75 100 L	1.19 lb ai/a 1 lb ai/a 0.208 lb ai/a 0.0304 0.178 0.25 % v/v	PRE PRE 4 WAP B	A A A
6	Sorghum Untreated Check				75.2 a
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 Nonionic Surfactant	7.64 E 75 DF 2 L 100 L	1.19 lb ai/a 0.188 lb ai/a 0.375 lb ai/a 0.25 % v/v	PRE PRE 4 WAP B 4 WAP B	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=1,2,3,4,10,11

## University of Delaware

Pest Code		C -	AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm
Pest Name	Srghm/Soy	C -	C -	C -	C -
Crop Type, Code	Stunting %	Control %	Control %	Control %	Control %
Crop Name	07/10/18	08/03/18	09/14/18	10/10/18	
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
12 Soybean DT/RR Untreated Check					
LSD P=.05		3.46	12.92	19.09	14.89
Standard Deviation		2.02	7.53	11.08	8.71
CV		53.95	10.33	19.11	12.96
Replicate F		1.975	0.518	0.390	0.313
Replicate Prob(F)		0.1663	0.6045	0.6832	0.7348
Treatment F		17.354	72.999	30.979	44.780
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=1,2,3,4,10,11

Pest Code		C SORVU	C GLXMA	C -
Pest Name		GrnSrghm	Soybean	Srghm/Soy
Crop Type, Code		Yield Bu/A 10/17/18	Yield Bu/A 11/21/18	Yield Bu/A
Crop Name				
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing Appl Code
12 Soybean DT/RR Untreated Check				
LSD P=.05		15.25	8.78	11.83
Standard Deviation		8.38	4.75	6.92
CV		10.26	14.07	11.97
Replicate F		0.298	4.092	1.226
Replicate Prob(F)		0.7485	0.0545	0.3155
Treatment F		0.710	1.591	39.776
Treatment Prob(F)		0.6293	0.2566	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=1,2,3,4,10,11

Comparison of Sorghum and Soybeans for Palmer Amaranth Control  
 Trial ID: Milo4-18 Location: Field# 10 Trial Year: 2018  
 Protocol ID: Milo4-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	Pest Name		AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm
Crop Type, Code		C -	C -	C -	C -
Crop Name		Srghm/Soy			
Rating Type		Stunting %	Control %	Control %	Control %
Rating Unit		07/10/18	08/03/18	09/14/18	10/10/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing
	TABLE OF R MEANS				
Replicate 1			4.0		56.7
Replicate 2			2.8		57.0
Replicate 3			4.4		60.3
	TABLE OF A (Crop) MEANS				
1	Sorghum			5.4 a	66.1 a
2	Soybean DT/RR			2.1 b	49.9 b
LSD P=.05			1.36		7.64
Standard Deviation			1.97		10.95
CV			52.43		8.71
	12.96				18.89
	TABLE OF B (Herbicide Program) MEANS				
1	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	0.0 c
2	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	8.5 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	5.2 b
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	0.0 c
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	8.8 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	Nonionic Surfactant	100 L	0.25 % v/v	4 WAP B	
6	Untreated Check			0.0 c	0.0 d
LSD P=.05			2.36		13.23
Standard Deviation			1.97		10.95
CV			52.43		8.71
	12.96				18.89
	TABLE OF A (Crop) B (Herbicide Program) MEANS				
1	Sorghum			0.0 c	.
1	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	39.5 a
2	Soybean DT/RR				69.5 a
1	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	0.0 c
1	Sorghum			86.6 a	31.2 a
2	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	10.7 a
2	Atrazine 4L	4 L	1 lb ai/a	PRE A	
2	Soybean DT/RR			86.7 a	80.0 a
2	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	6.3 b
2	Atrazine 4L	4 L	1 lb ai/a	PRE A	
2	Dual II Magnum..s-metolachlor	7.64 E	1.19 lb ai/a	PRE A	43.3 a
2	Atrazine 4L	4 L	1 lb ai/a	PRE A	60.0 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 SORVU	C GLXMA	C -
Pest Name		GrnSrgm	Soybean	Srgm/Soy
Crop Type, Code				
Crop Name				
Rating Type		Yield	Yield	Yield
Rating Unit	Bu/A	Bu/A	Bu/A	
Rating Date	10/17/18	11/21/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate
				Appl Unit
				Appl Timing
				Code
<b>TABLE OF R MEANS</b>				
Replicate 1				55.4
Replicate 2				58.2
Replicate 3				59.8
<b>TABLE OF A (Crop) MEANS</b>				
1 Sorghum				81.7 a
2 Soybean DT/RR				33.9 b
LSD P=.05				4.81
Standard Deviation				6.94
CV				12.01
<b>TABLE OF B (Herbicide Program) MEANS</b>				
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 Nonionic Surfactant	100 L	0.25 % v/v	4 WAP	B
6 Untreated Check				54.3 a
LSD P=.05				8.33
Standard Deviation				6.94
CV				12.01
<b>TABLE OF A (Crop) B (Herbicide Program) MEANS</b>				
1 Sorghum				84.9 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				81.0 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
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	Pest Name			AMAPA PalmerAm	AMAPA PalmerAm	AMAPA PalmerAm	
Crop Type, Code			C -	C -	C -	C -	
Crop Name			Srghm/Soy				
Rating Type			Stunting %	Control %	Control %	Control %	
Rating Unit			07/10/18	08/03/18	09/14/18	10/10/18	
Trt No.	Treatment 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						
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	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	Nonionic Surfactant		100 L	0.25 % v/v	4 WAP	B	
1	Sorghum						
6	Untreated Check						
0.0 c	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	
2	Soybean DT/RR						
6	Untreated Check						
0.0 c	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	0.0 a	
LSD P=.05				3.34	12.92	18.72	14.79
Standard Deviation				1.97	7.53	10.95	8.71
CV				52.43	10.33	18.89	12.96

Means followed by same letter 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	Pest Name	Crop Type, Code	C SORVU	C GLXMA	C -
Crop Name		GrnSrghm	Soybean	Srghm/Soy	
Rating Type			Yield	Yield	Yield
Rating Unit			Bu/A	Bu/A	Bu/A
Rating Date			10/17/18	11/21/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
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	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	Nonionic Surfactant	100 L	0.25 % v/v	4 WAP	B
1	Sorghum				
6	Untreated Check				
2	Soybean DT/RR				
6	Untreated Check				
LSD P=.05			15.25	8.78	11.79
Standard Deviation			8.38	4.75	6.94
CV			10.26	14.07	12.01

Means followed by same letter 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 Srghm/Soy Stunting % 07/10/18 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	34	878.750000				
R	2	16.166667	8.083333	2.091	0.1485	
A	1	96.694444	96.694444	25.017	0.0001	1.4
B	5	555.583333	111.116667	28.749	0.0001	2.4
AB	5	129.138889	25.827778	6.682	0.0007	3.3
ERROR	21	81.166667	3.865079			

Randomized Complete Block (RCB) AOV For AMAPA PalmerAm C Control % 08/03/18 Missing factor A1 B1 levels prevents analyzing column 2 as Split-Plot 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	30	42490.360513			
Replicate	2	58.734141	29.367070	0.518	0.6045
Treatment	10	41410.531970	4141.053197	72.999	0.0001
ERROR	18	1021.094403	56.727467		

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Control % 09/14/18 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	32	44216.275761				
R	2	95.691126	47.845563	0.399	0.6765	
A	1	2345.714358	2345.714358	19.558	0.0003	7.6
B	5	38286.197821	7657.239564	63.845	0.0001	13.2
AB	5	1209.902614	241.980523	2.018	0.1221	18.7
ERROR	19	2278.769841	119.935255			

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Control % 10/10/18 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	34	39031.057851				
R	2	47.542700	23.771350	0.313	0.7343	
A	1	936.730946	936.730946	12.348	0.0021	6.0
B	5	35923.553719	7184.710744	94.712	0.0001	10.5
AB	5	530.200184	106.040037	1.398	0.2655	14.8
ERROR	21	1593.030303	75.858586			

Randomized Complete Block (RCB) AOV For C SORVU GrnSrghm Yield Bu/A 10/17/18 Missing factor A levels prevents analyzing column 7 as Split-Plot design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	17	994.015541			
Replicate	2	41.907988	20.953994	0.298	0.7485
Treatment	5	249.567333	49.913467	0.710	0.6293
ERROR	10	702.540219	70.254022		

Randomized Complete Block (RCB) AOV For C GLXMA Soybean Yield Bu/A 11/21/18 Missing factor A levels prevents analyzing column 10 as Split-Plot design; Missing values in column 10 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	16	567.485519			
Replicate	2	184.760807	92.380404	4.092	0.0545
Treatment	5	179.545401	35.909080	1.591	0.2566
ERROR	9	203.179310	22.575479		

FACTORIAL/POOLED ERROR AOV For C Srghm/Soy Yield Bu/A 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	22091.099849				
R	2	117.508369	58.754185	1.219	0.3155	
A	1	20533.588255	20533.588255	426.120	0.0001	4.8
B	5	183.140124	36.628025	0.760	0.5885	8.3
AB	5	244.928232	48.985646	1.017	0.4329	11.8
ERROR	21	1011.934868	48.187375			

Means followed by same letter 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: Cover1-18

Location: REC Fld #32

Trial Year: 2018

Protocol ID: Cover1-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Initiation Date: 09/01/17 Planned Completion Date: 11/30/18

**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

Variety: VNS

Planting Date: 10/10/17

Planting Rate: 120 LB/A

Depth: 0.75 in

Row Spacing: 7 in

Planting Method: DRILLE drilled

Soil Temperature: 83 F

Planting Equipment: FE Field Equipment

Emergence Date: 10/15/17

Seed Bed: MEDTRA medium/trashy

Crop 2: C GLXMA Glycine max Soybean

Variety: S43XS27

Attributes: Xtend

Planting Rate: 180000 S/A

Planting Date: 06/08/18

Depth: 1 in

Rows per Plot: 7

Planting Method: PLANTD planted

Row Spacing: 15 in

Planting Equipment: FE Field Equipment

Soil Temperature: 81 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 06/14/18

Soil Moisture: ABONOR above normal, excessive

**Site and Design**

Treated Plot Width: 10 FT

Treated Plot Length: 25 FT

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

Treatments: 21

Replications: 3

Study Design: FACTOR Factorial

**Field Prep./Maintenance:**

Total preemergence application of Roundup PowerMax 1 qt/A + Valor SX 2 oz/A + Metribuzin 75WG 4 oz/A + UAN 2.5% v/v on 06-08-18.

**Soil Description**

Description Name: Field 32

% Sand: 81

% OM: 1.5

Texture: LS

loamy sand

% Silt: 10

pH: 6.5

Soil Name: Hammonton

loamy sand, 0-2% slopes

% Clay: 9

CEC: 5.2

Fert. Level: G

good

Soil Drainage: F

fair

**Application Description**

	A	B	C
Application Date	04/18/18	05/01/18	05/15/18
Appl. Stop Time	10:30 AM	10:00 AM	09:00 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	Jointing	Boot	Heading
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Air Temperature Start, Stop	48 F	70 F	74 F
% Relative Humidity Start, Stop	46	25	82
Wind Velocity+Dir. Start	2 mph W	2 mph W	4 mph SW
Wet Leaves (Y/N)	Y yes	Y yes	Y yes
Soil Temperature	48 F	70 F	74 F
Soil Moisture	NORMAL	NORMAL	WET
% Cloud Cover	10	0	80

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	SECCE BCER	SECCE BCER	SECCE BCER
Stage Scale Used	DESC	DESC	DESC
Stage Majority, Percent	Jointing 100	Boot 100	Heading 100
Stage Minimum, Percent	3-nodes 50		
Stage Maximum, Percent	4-nodes 50		
Height Average	9 in	20 in	28 in
Height Minimum, Maximum	8 10	16 24	24 32
Crop 2 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used	BBCH	BBCH	

**Application Equipment**

	A	B	C
Appl. Equipment	Backpack	Backpack	Tractor
Equipment Type	SPRBAC	SPRBAC	TRMOSP
Operation Pressure	31 psi	31 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	18 in	18 in	20 in
Boom Length	9 ft	9 ft	10 ft
Boom Height	26 in	40 in	48 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	COMCO2	COMCO2	COMAIR

Context	Date	By	Notes
STATUS	02/26/19	Mark VanGessel	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

Burndown for Cereal Rye

Trial ID: Cover1-18

Location: REC Fld #32

Trial Year: 2018

Protocol ID: Cover1-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**Trial Comments**

06/18/18: All rye is dead, including the untreated checks that were "planted green". Broadleaf summer annual weeds were 100% control; annual grasses occasionally a plant with some green tissue; primrose control is only fair, lots of necrotic leaves but lower leaves and stem with some green tissue. Otherwise, weed control was excellent.

07/03/18: All rye is dead, no regrowth. The soybean stand is poor due to wet soil at planting and deer feeding.

Burndown for Cereal Rye Trial ID: Cover1-18 Protocol ID: Cover1-18	Location: REC Fld #32 Investigator: Mark VanGessel Study Director: Sponsor Contact:	Trial Year: 2018								
Crop Type, Code		C SECCE	C SECCE							
Crop Name	Rye Dead %	Rye Dead %	Rye Dead %							
Rating Type	05/03/18	05/09/18	05/24/18							
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Gramoxone SL....paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Jointing	2 SL 100 L	0.75 lb ai/a 0.25 % v/v	Jointing Jointing	A	A		89.3 c	85.0 e	72.3 g
2	Gramoxone SL....paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Boot	2 SL 100 L	0.75 lb ai/a 0.25 % v/v	Boot Boot	B	B		70.0 d	90.7 b	87.3 ef
3	Gramoxone SL....paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Head Emergence	2 SL 100 L	0.75 lb ai/a 0.25 % v/v	Heading Heading	C	C				95.7 abc
4	Gramoxone SL....paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Jointing	2 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Jointing Jointing Jointing	A	A		91.3 bc	90.0 b	73.3 g
5	Gramoxone SL....paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Boot	2 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Boot Boot Boot	B	B		72.7 d	88.0 b-e	88.7 def
6	Gramoxone SL....paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Head Emergence	2 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Heading Heading Heading	C	C				95.7 abc
7	Gramoxone SL....paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Jointing	2 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Jointing Jointing Jointing	A	A		89.3 c	85.3 de	73.3 g
8	Gramoxone SL....paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Boot	2 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Boot Boot Boot	B	B		61.7 e	88.7 bcd	93.0 bcd
9	Gramoxone SL....paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Head Emergence	2 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Heading Heading Heading	C	C				97.0 ab
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 Jointing	A	A		95.3 ab	99.0 a	99.7 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 Boot	B	B		11.7 h	86.0 cde	96.3 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.

Crop Type, Code Crop Name Rating Type Rating Unit Rating Date		C SECCE Rye NDVI rdng 05/24/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Gramoxone SL....paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Jointing	2 SL 100 L	0.75 lb ai/a 0.25 % v/v	Jointing Jointing	A A		0.260 b	
2	Gramoxone SL....paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Boot	2 SL 100 L	0.75 lb ai/a 0.25 % v/v	Boot Boot	B B		0.170 e-i	
3	Gramoxone SL....paraquat Nonionic Surfactant No Added Herbicide Cereal stage - Head Emergence	2 SL 100 L	0.75 lb ai/a 0.25 % v/v	Heading Heading	C C		0.133 jk	
4	Gramoxone SL....paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Jointing	2 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Jointing Jointing Jointing	A A A		0.230 c	
5	Gramoxone SL....paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Boot	2 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Boot Boot Boot	B B B		0.163 ghi	
6	Gramoxone SL....paraquat Nonionic Surfactant Valor SX.....flumioxazin Cereal stage - Head Emergence	2 SL 100 L 51 WG	0.75 lb ai/a 0.25 % v/v 0.096 lb ai/a	Heading Heading Heading	C C C		0.130 k	
7	Gramoxone SL....paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Jointing	2 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Jointing Jointing Jointing	A A A		0.233 c	
8	Gramoxone SL....paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Boot	2 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Boot Boot Boot	B B B		0.173 e-h	
9	Gramoxone SL....paraquat Nonionic Surfactant Atrazine 4L Cereal stage - Head Emergence	2 SL 100 L 4 L	0.75 lb ai/a 0.25 % v/v 1.5 lb ai/a	Heading Heading Heading	C C C		0.150 h-k	
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 Jointing	A A		0.193 de	
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 Boot	B B		0.170 e-i	

Means followed by same letter 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

						C SECCE	C SECCE	C SECCE
						Rye Dead % 05/03/18	Rye Dead % 05/09/18	Rye Dead % 05/24/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit 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	Heading C Heading C				91.0 cde
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 Jointing A Jointing A		96.3 a	98.3 a	99.3 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 Boot Boot	B B B	18.3 g	88.3 b-e	97.0 ab
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	Heading C Heading C Heading C				96.3 ab
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 Jointing A Jointing A		90.3 c	98.3 a	99.7 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 Boot Boot	B B B	13.3 h	73.3 f	97.7 ab
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	Heading C Heading C Heading C				85.0 f
19	Cereal stage - Boot Gramoxone SL....paraquat Metribuzin.....metribuzin Nonionic Surfactant	2 SL 75 DF 100 L	0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	Boot Boot Boot	B B B	56.7 f	89.3 bc	94.3 bc
20	Cereal stage - Head Emergence Gramoxone SL....paraquat Metribuzin.....metribuzin Nonionic Surfactant	2 SL 75 DF 100 L	0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	Heading C Heading C Heading C				95.7 abc
21	Untreated Check				0.0 i	0.0 g	0.0 h	
LSD P=.05					4.63	3.34	4.72	
Standard Deviation					2.76	1.99	2.86	
CV					4.51	2.4	3.29	
Replicate F					1.054	0.294	0.642	
Replicate Prob(F)					0.3630	0.7474	0.5317	
Treatment F					493.956	463.710	173.255	
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

Crop Type, Code Crop Name Rating Type Rating Unit Rating Date		C SECCE Rye NDVI rdng 05/24/18				
Trt No.	Treatment Name	Form Conc Type Rate	Rate 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	Heading C Heading C		0.157 g-j
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 Jointing A Jointing A		0.190 def
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 Boot Boot	B B B	0.167 f-i
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	Heading C Heading C Heading C		0.163 ghi
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 Jointing A Jointing A		0.200 d
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 Boot Boot	B B B	0.177 d-g
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	Heading C Heading C Heading C		0.160 ghi
19	Cereal stage - Boot Gramoxone SL....paraquat Metribuzin.....metribuzin Nonionic Surfactant	2 SL 75 DF 100 L	0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	Boot Boot Boot	B B B	0.180 d-g
20	Cereal stage - Head Emergence Gramoxone SL....paraquat Metribuzin.....metribuzin Nonionic Surfactant	2 SL 75 DF 100 L	0.75 lb ai/a 0.188 lb ai/a 0.25 % v/v	Heading C Heading C Heading C		0.147 ijk
21	Untreated Check					0.350 a
LSD P=.05 Standard Deviation CV						0.0246 0.0149 8.02
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)						2.715 0.0784 33.370 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.

**Spring Termination of Oilseed Rape as Cover Crop**

Trial ID: Cover2-18

Location: Fld #30

Trial Year: 2017

Protocol ID: Cover2-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 08/01/17

Completion Date: 07/04/18

**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 BRSNW Brassica napus Winter rape

Variety: Dwarf Essex

Planting Date: 10/10/17

Planting Rate: 8 lb/A

Depth: 0.2 in

Row Spacing: 7 in

Planting Method: DRILLE drilled

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 83 F Soil Moisture: NORMAL normal, adequate

Emergence Date: 10/15/17

**Site and Design**

Treated Plot Width: 7 FT

Site Type: FIELD field

Treated Plot Length: 20 FT

Treated Plot Area: 140 FT<sup>2</sup> Treatments: 52 Tillage Type: NOTILL no-till

Replications: 3 Study Design: FACTOR Factorial

**Soil Description**

Description Name: Field 30

% Sand: 83

% OM: 1.1 Texture: LS

loamy sand

% Silt: 8

pH: 5.5

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

% Clay: 9

CEC: 2.7

Fert. Level: G good

Soil Drainage: G good

**Application Description**

	A	B
Application Date	04/11/18	04/26/18
Appl. Stop Time	12:05 PM	11:50 AM
Interval to Prev. Appl.		15 DAYS
Application Method	SPRAY	SPRAY
Application Timing	E_Spring	L_Spring
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	50 F	62 F
% Relative Humidity Start, Stop	35	53
Wind Velocity+Dir. Start	1 mph N	4 mph W
Wet Leaves (Y/N)	N no	Y yes
Soil Temperature	50 F	62 F
Soil Moisture	NORMAL	WET
% Cloud Cover	35	25

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	BRSNW BRAP	BRSNW BRAP
Stage Scale Used	DESC	DESC
Stage Majority, Percent	EaBolt 60	Flower 70
Stage Minimum, Percent	rosette 40	EaFlwr 30
Stage Maximum, Percent	EaBolt 60	Flower 70
Height Average	5 in	16 in
Height Minimum, Maximum	3 6	8 26

**Application Equipment**

	A	B
Appl. Equipment	Backpack	Backpack
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	22 in	40 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2

**SE Definitions**

	1.
Crop Type, Code	C

## Trial Comments

05/03/18: Trt 20: rapeseed leaves were noticeably white, but only a little biomass reduction was observed; lots of regrowth. Ratings are % control (i.e. % terminated).

## Spring Termination of Oilseed Rape as Cover Crop

Trial ID: Cover2-18

Location: Fld #30

Trial Year: 2017

Protocol ID: Cover2-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code	C BRSNW WntrRape Control % 04/23/18	C BRSNW WntrRape Control % 05/03/18	C BRSNW WntrRape Control % 05/11/18			
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt Treatment No. Name	Form Conc Rate	Form Type Rate	Rate Unit Appl Timing Appl Code			
1 2,4-D ester Prior to Corn Planting	3.8 L	0.475 lb ae/a	E_Spring A	36.7 i	73.3 i	75.0 hi
2 2,4-D ester Prior to Soybean Planting	3.8 L	0.475 lb ae/a	L_Spring B		55.0 nop	70.0 ijk
3 2,4-D ester Prior to Corn Planting	3.8 L	0.95 lb ae/a	E_Spring A	46.7 h	63.3 kl	76.0 hi
4 2,4-D ester Prior to Soybean Planting	3.8 L	0.95 lb ae/a	L_Spring B		53.3 op	53.3 nop
5 Banvel.....dicamba Nonionic Surfactant Prior to Corn Planting	4 L 100 L	0.25 lb ai/a 0.25 % v/v	E_Spring A E_Spring A	25.0 j	28.3 uv	30.0 st
6 Banvel.....dicamba Nonionic Surfactant Prior to Soybean Planting	4 L 100 L	0.25 lb ai/a 0.25 % v/v	L_Spring B L_Spring B		23.3 v	26.7 t
7 Banvel.....dicamba Nonionic Surfactant Prior to Corn Planting	4 L 100 L	0.5 lb ai/a 0.25 % v/v	E_Spring A E_Spring A	33.3 i	45.0 rs	43.3 qr
8 Banvel.....dicamba Nonionic Surfactant Prior to Soybean Planting	4 L 100 L	0.5 lb ai/a 0.25 % v/v	L_Spring B L_Spring B		28.3 uv	43.3 qr
9 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	50 SG 33 17 100 L 100 L	0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A	40.0 hi	56.7 mno	50.0 opq
10 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	50 SG 33 17 100 L 100 L	0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B		36.7 t	36.7 rs
11 Roundup PowerMax..glyphosate Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	E_Spring A E_Spring A	60.0 d-g	80.3 gh	86.0 fg
12 Roundup PowerMax..glyphosate Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	L_Spring B L_Spring B		51.7 opq	56.7 mno
13 Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	2.85 SC 100 L 100 L	0.0334 lb ai/a 1 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A	58.3 efg	63.3 kl	46.7 pq

Means followed by same letter 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=6

Crop Type, Code		C BRSNW WntrRape Control % 05/21/18	C BRSNW WntrRape Control % 05/28/18	C BRSNW WntrRape DryWght g/0.25m2 05/04/18
Crop Name				
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Rate	Form Type Rate	Rate Unit Appl Timing	Appl Code
1 2,4-D ester Prior to Corn Planting	3.8 L	0.475 lb ae/a	E_Spring A	2.0440 f
2 2,4-D ester Prior to Soybean Planting	3.8 L	0.475 lb ae/a	L_Spring B	95.7 a
3 2,4-D ester Prior to Corn Planting	3.8 L	0.95 lb ae/a	E_Spring A	2.1570 ef
4 2,4-D ester Prior to Soybean Planting	3.8 L	0.95 lb ae/a	L_Spring B	85.0 bc
5 Banvel.....dicamba Nonionic Surfactant Prior to Corn Planting	4 L 100 L	0.25 lb ai/a 0.25 % v/v	E_Spring A E_Spring A	22.7093 c
6 Banvel.....dicamba Nonionic Surfactant Prior to Soybean Planting	4 L 100 L	0.25 lb ai/a 0.25 % v/v	L_Spring B L_Spring B	36.7 i
7 Banvel.....dicamba Nonionic Surfactant Prior to Corn Planting	4 L 100 L	0.5 lb ai/a 0.25 % v/v	E_Spring A E_Spring A	24.5460 bc
8 Banvel.....dicamba Nonionic Surfactant Prior to Soybean Planting	4 L 100 L	0.5 lb ai/a 0.25 % v/v	L_Spring B L_Spring B	33.3 i
9 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	50 SG 33 17 100 L 100 L	0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A	12.0017 c-f
10 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	50 SG 33 17 100 L 100 L	0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B	61.7 fg
11 Roundup PowerMax..glyphosate Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	E_Spring A E_Spring A	70.0 de
12 Roundup PowerMax..glyphosate Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 100 D	1.13 lb ae/a 1.02 % w/v	L_Spring B L_Spring B	76.7 de
13 Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	2.85 SC 100 L 100 L	0.0334 lb ai/a 1 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A	75.0 bcd
				3.4353 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.  
Missing data estimates are included in columns:Average=6

Crop Type, Code Crop Name Rating Type Rating Unit Rating Date		C BRSNW WntrRape DryWght g/0.25m <sup>2</sup> 05/29/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	2,4-D ester Prior to Corn Planting	3.8 L		0.475 lb ae/a	E	Spring A		
2	2,4-D ester Prior to Soybean Planting	3.8 L		0.475 lb ae/a	L	Spring B	2.3200 e	
3	2,4-D ester Prior to Corn Planting	3.8 L		0.95 lb ae/a	E	Spring A		
4	2,4-D ester Prior to Soybean Planting	3.8 L		0.95 lb ae/a	L	Spring B	9.2473 de	
5	Banvel.....dicamba Nonionic Surfactant Prior to Corn Planting	4 L 100 L		0.25 lb ai/a 0.25 % v/v	E	Spring A E_Spring A		
6	Banvel.....dicamba Nonionic Surfactant Prior to Soybean Planting	4 L 100 L		0.25 lb ai/a 0.25 % v/v	L	Spring B L_Spring B	24.7577 cd	
7	Banvel.....dicamba Nonionic Surfactant Prior to Corn Planting	4 L 100 L		0.5 lb ai/a 0.25 % v/v	E	Spring A E_Spring A		
8	Banvel.....dicamba Nonionic Surfactant Prior to Soybean Planting	4 L 100 L		0.5 lb ai/a 0.25 % v/v	L	Spring B L_Spring B	21.0407 cde	
9	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	50 SG 33 17 100 L 100 L		0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	E	Spring A E_Spring A E_Spring A		
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	50 SG 33 17 100 L 100 L		0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	L	Spring B L_Spring B L_Spring B	9.5527 de	
11	Roundup PowerMax..glyphosate Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 100 D		1.13 lb ae/a 1.02 % w/v	E	Spring A E_Spring A		
12	Roundup PowerMax..glyphosate Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 100 D		1.13 lb ae/a 1.02 % w/v	L	Spring B L_Spring B	11.0743 cde	
13	Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	2.85 SC 100 L 100 L		0.0334 lb ai/a 1 % v/v 2.34 % v/v	E	Spring A E_Spring A E_Spring 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=6

## University of Delaware

Crop Type, Code						C BRSNW	C BRSNW	C BRSNW
						WntrRape Control %	WntrRape Control %	WntrRape Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code		
14	Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	2.85 SC 100 L 100 L	0.0334 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a 1 % v/v L_Spring B	L_Spring B L_Spring B L_Spring B		65.0 jkl	60.0 lmn
15	Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a 1 % v/v E_Spring A	E_Spring A E_Spring A E_Spring A	46.7 h	61.7 klm	51.7 op
16	Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a 1 % v/v L_Spring B	L_Spring B L_Spring B L_Spring B		63.3 kl	56.7 mno
17	Gramoxone SL....paraquat Crop Oil Concentrate Prior to Corn Planting	2 SL 100 L	0.75 lb ai/a 1.17 % v/v	lb ai/a 1.17 % v/v	E_Spring A E_Spring A	72.7 bc	81.0 fgh	65.0 kl
18	Gramoxone SL....paraquat Crop Oil Concentrate Prior to Soybean Planting	2 SL 100 L	0.75 lb ai/a 1.17 % v/v	lb ai/a 1.17 % v/v	L_Spring B L_Spring B		53.3 op	53.3 nop
19	Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4 SC 100 L 100 L	0.094 lb ai/a 1.17 % v/v 2.34 % v/v	lb ai/a 1.17 % v/v E_Spring A	E_Spring A E_Spring A E_Spring A	25.0 j	46.7 qrs	43.3 qr
20	Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4 SC 100 L 100 L	0.094 lb ai/a 1.17 % v/v 2.34 % v/v	lb ai/a 1.17 % v/v L_Spring B	L_Spring B L_Spring B L_Spring B		33.3 tu	36.7 rs
21	Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Corn Planting	2.34 SL 100 D	0.79 lb ai/a 1.02 % w/v	lb ai/a 1.02 % w/v	E_Spring A E_Spring A	56.7 fg	70.0 ij	50.0 opq
22	Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Soybean Planting	2.34 SL 100 D	0.79 lb ai/a 1.02 % w/v	lb ai/a 1.02 % w/v	L_Spring B L_Spring B		50.0 pqr	46.7 pq
23	Roundup PowerMax..glyphosate 2,4-D ester Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 3.8 L 100 D	1.13 lb ae/a 0.475 lb ae/a 1.02 % w/v	lb ae/a 0.475 lb ae/a E_Spring A	E_Spring A E_Spring A E_Spring A	63.3 def	96.3 ab	99.0 a
24	Roundup PowerMax..glyphosate 2,4-D ester Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 3.8 L 100 D	1.13 lb ae/a 0.475 lb ae/a 1.02 % w/v	lb ae/a 0.475 lb ae/a L_Spring B	L_Spring B L_Spring B L_Spring B		55.0 nop	77.7 h
25	Roundup PowerMax..glyphosate Banvel.....dicamba Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 4 L 100 D	1.13 lb ae/a 0.25 lb ai/a 1.02 % w/v	lb ae/a 0.25 lb ai/a E_Spring A	E_Spring A E_Spring A E_Spring A	66.0 cde	89.3 cde	87.7 ef
26	Roundup PowerMax..glyphosate Banvel.....dicamba Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 4 L 100 D	1.13 lb ae/a 0.25 lb ai/a 1.02 % w/v	lb ae/a 0.25 lb ai/a L_Spring B	L_Spring B L_Spring B L_Spring B		43.3 s	63.3 klm

Means followed by same letter 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=6

## University of Delaware

Crop Type, Code			C BRSNW	C BRSNW	C BRSNW
Crop Name			WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2
Rating Type			05/21/18	05/28/18	05/04/18
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code
14 Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	2.85 SC 100 L 100 L	0.0334 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a	L_Spring B L_Spring B L_Spring B	56.7 g
15 Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a	E_Spring A E_Spring A E_Spring A	46.7 h
16 Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a	L_Spring B L_Spring B L_Spring B	4.0973 def
17 Gramoxone SL....paraquat Crop Oil Concentrate Prior to Corn Planting	2 SL 100 L	0.75 lb ai/a 1.17 % v/v	lb ai/a	E_Spring A E_Spring A	60.0 fg
18 Gramoxone SL....paraquat Crop Oil Concentrate Prior to Soybean Planting	2 SL 100 L	0.75 lb ai/a 1.17 % v/v	lb ai/a	L_Spring B L_Spring B	53.3 gh
19 Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4 SC 100 L 100 L	0.094 lb ai/a 1.17 % v/v 2.34 % v/v	lb ai/a	E_Spring A E_Spring A E_Spring A	18.3640 cd
20 Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4 SC 100 L 100 L	0.094 lb ai/a 1.17 % v/v 2.34 % v/v	lb ai/a	L_Spring B L_Spring B L_Spring B	45.0 h
21 Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Corn Planting	2.34 SL 100 D	0.79 lb ai/a 1.02 % w/v	lb ai/a	E_Spring A E_Spring A	43.3 hi
22 Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Soybean Planting	2.34 SL 100 D	0.79 lb ai/a 1.02 % w/v	lb ai/a	L_Spring B L_Spring B	6.7317 def
23 Roundup PowerMax..glyphosate 2,4-D ester Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 3.8 L 100 D	1.13 lb ae/a 0.475 lb ae/a 1.02 % w/v	lb ae/a	E_Spring A E_Spring A E_Spring A	26.7 j
24 Roundup PowerMax..glyphosate 2,4-D ester Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 3.8 L 100 D	1.13 lb ae/a 0.475 lb ae/a 1.02 % w/v	lb ae/a	L_Spring B L_Spring B L_Spring B	1.9703 f
25 Roundup PowerMax..glyphosate Banvel.....dicamba Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 4 L 100 D	1.13 lb ae/a 0.25 lb ai/a 1.02 % w/v	lb ae/a	E_Spring A E_Spring A E_Spring A	93.7 a
26 Roundup PowerMax..glyphosate Banvel.....dicamba Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 4 L 100 D	1.13 lb ae/a 0.25 lb ai/a 1.02 % w/v	lb ae/a	L_Spring B L_Spring B L_Spring B	99.7 a
					0.4583 f
					82.0 bcd
					76.7 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:Average=6

## University of Delaware

Crop Type, Code Crop Name Rating Type Rating Unit Rating Date		C BRSNW WntrRape DryWght g/0.25m2 05/29/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
14	Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	2.85 SC 100 L 100 L	0.0334 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a 1 % v/v 2.34 % v/v	L	Spring B Spring B Spring B		6.7937 de
15	Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a 1 % v/v 2.34 % v/v	E	Spring A Spring A Spring A		
16	Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	2.85 SC 100 L 100 L	0.0445 lb ai/a 1 % v/v 2.34 % v/v	lb ai/a 1 % v/v 2.34 % v/v	L	Spring B Spring B Spring B		10.5547 de
17	Gramoxone SL....paraquat Crop Oil Concentrate Prior to Corn Planting	2 SL 100 L		0.75 lb ai/a 1.17 % v/v	E	Spring A Spring A		
18	Gramoxone SL....paraquat Crop Oil Concentrate Prior to Soybean Planting	2 SL 100 L		0.75 lb ai/a 1.17 % v/v	L	Spring B Spring B		9.6203 de
19	Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4 SC 100 L 100 L		0.094 lb ai/a 1.17 % v/v 2.34 % v/v	E	Spring A Spring A Spring A		
20	Callisto.....mesotrione Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4 SC 100 L 100 L		0.094 lb ai/a 1.17 % v/v 2.34 % v/v	L	Spring B Spring B Spring B		20.9027 cde
21	Liberty 280.....glufosinate Dry Ammonium Sulfate Prior to Corn Planting	2.34 SL 100 D		0.79 lb ai/a 1.02 % w/v	E	Spring A Spring A		
22	Liberty 280.....glufosinate Dry Ammonium Sulfate Prior to Soybean Planting	2.34 SL 100 D		0.79 lb ai/a 1.02 % w/v	L	Spring B Spring B		19.2453 cde
23	Roundup PowerMax..glyphosate 2,4-D ester Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 3.8 L 100 D		1.13 lb ae/a 0.475 lb ae/a 1.02 % w/v	E	Spring A Spring A Spring A		
24	Roundup PowerMax..glyphosate 2,4-D ester Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 3.8 L 100 D		1.13 lb ae/a 0.475 lb ae/a 1.02 % w/v	L	Spring B Spring B Spring B		6.4473 de
25	Roundup PowerMax..glyphosate Banvel.....dicamba Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 4 L 100 D		1.13 lb ae/a 0.25 lb ai/a 1.02 % w/v	E	Spring A Spring A Spring A		
26	Roundup PowerMax..glyphosate Banvel.....dicamba Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 4 L 100 D		1.13 lb ae/a 0.25 lb ai/a 1.02 % w/v	L	Spring B Spring B Spring B		5.5170 de

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Missing data estimates are included in columns:Average=6

## University of Delaware

Crop Type, Code		C BRSNW	C BRSNW	C BRSNW						
Crop Name		WntrRape Control %	WntrRape Control %	WntrRape Control %						
Rating Type		04/23/18	05/03/18	05/11/18						
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
27	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 100 L 100 L	AS SG 0.0165 0.0085 1.13 lb ae/a 0.025 lb ai/a	1.13 lb ae/a 0.025 lb ai/a	E_Spring A E_Spring A		63.3 def	86.7 efg	95.0 a-d	
28	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 100 L 100 L	AS SG 0.0165 0.0085 1.17 % v/v 2.34 % v/v	1.13 lb ae/a 0.025 lb ai/a	L_Spring B L_Spring B		53.3 op	50.0 opq		
29	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 3.8 L 100 L 100 L	AS SG 0.0165 0.0085 3.8 L 1.17 % v/v 2.34 % v/v	1.13 lb ae/a 0.025 lb ai/a 0.475 lb ae/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A		55.0 g	90.0 b-e	94.3 a-e	
30	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 3.8 L 100 L 100 L	AS SG 0.0165 0.0085 3.8 L 1.17 % v/v 2.34 % v/v	1.13 lb ae/a 0.025 lb ai/a 0.475 lb ae/a 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B		46.7 qrs	61.7 lm		
31	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Banvel.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 4 L 100 L 100 L	AS SG 0.0165 0.0085 4 L 1.17 % v/v 2.34 % v/v	1.13 lb ae/a 0.025 lb ai/a 0.25 lb ai/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A		66.7 cd	87.3 def	91.7 b-f	
32	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Banvel.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 4 L 100 L 100 L	AS SG 0.0165 0.0085 4 L 1.17 % v/v 2.34 % v/v	1.13 lb ae/a 0.025 lb ai/a 0.25 lb ai/a 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B		43.3 s	56.7 mno		
33	Gramoxone SL....paraquat 2,4-D ester Crop Oil Concentrate Prior to Corn Planting	2 SL 3.8 L 100 L	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	E_Spring A E_Spring A E_Spring A		76.7 ab	86.0 efg	88.7 def	

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Missing data estimates are included in columns:Average=6

## University of Delaware

Crop Type, Code							C BRSNW	C BRSNW	C BRSNW
							WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
27	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A					0.0893 f
28	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B		81.7 bcd	72.7 cde		
29	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 3.8 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.475 lb ae/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A					0.0000 f
30	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 3.8 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.475 lb ae/a 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B		96.3 a	99.7 a		
31	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Banvel.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 4 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.25 lb ai/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A					0.0000 f
32	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Banvel.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 4 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.25 lb ai/a 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B		70.7 e	69.3 de		
33	Gramoxone SL....paraquat 2,4-D ester Crop Oil Concentrate Prior to Corn Planting	2 SL 3.8 L 100 L	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	E_Spring A E_Spring A E_Spring A					0.0000 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:Average=6

## University of Delaware

Crop Type, Code Crop Name Rating Type Rating Unit Rating Date		C BRSNW WntrRape DryWght g/0.25m2 05/29/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
27	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 100 L 100 L	AS SG 33 17 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	lb ae/a lb ai/a lb lb % v/v % v/v	E_Spring A E_Spring A E_Spring A E_Spring A	
28	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 100 L 100 L	AS SG 33 17 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	lb ae/a lb ai/a lb lb % v/v % v/v	L_Spring B L_Spring B L_Spring B L_Spring B	8.1017 de
29	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 3.8 L 100 L 100 L	AS SG 33 17 3.8 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.475 lb ae/a 1.17 % v/v 2.34 % v/v	lb ae/a lb ai/a lb lb lb ae/a % v/v % v/v	E_Spring A E_Spring A E_Spring A E_Spring A	
30	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 3.8 L 100 L 100 L	AS SG 33 17 3.8 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.475 lb ae/a 1.17 % v/v 2.34 % v/v	lb ae/a lb ai/a lb lb lb ae/a % v/v % v/v	L_Spring B L_Spring B L_Spring B L_Spring B	9.7357 de
31	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Banvel.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 50 SG 33 17 4 L 100 L 100 L	AS SG 33 17 4 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.25 lb ai/a 1.17 % v/v 2.34 % v/v	lb ae/a lb ai/a lb lb lb ai/a % v/v % v/v	E_Spring A E_Spring A E_Spring A E_Spring A	
32	Roundup PowerMax..glyphosate Harmony Extra SG Premix ----thifensulfuron ----tribenuron Banvel.....dicamba Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 50 SG 33 17 4 L 100 L 100 L	AS SG 33 17 4 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.25 lb ai/a 1.17 % v/v 2.34 % v/v	lb ae/a lb ai/a lb lb lb ai/a % v/v % v/v	L_Spring B L_Spring B L_Spring B L_Spring B	5.5493 de
33	Gramoxone SL....paraquat 2,4-D ester Crop Oil Concentrate Prior to Corn Planting	2 SL 3.8 L 100 L	SL L L	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	lb ai/a lb ae/a % v/v	E_Spring A E_Spring A E_Spring 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=6

## University of Delaware

Crop Type, Code		C BRSNW	C BRSNW	C BRSNW						
Crop Name		WntrRape Control %	WntrRape Control %	WntrRape Control %						
Rating Type		04/23/18	05/03/18	05/11/18						
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
34	Gramoxone SL....paraquat 2,4-D ester Crop Oil Concentrate Prior to Soybean Planting	2 SL 3.8 L 100 L	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	L_Spring B L_Spring B L_Spring B			75.3 hi	73.3 hij	
35	Roundup PowerMax..glyphosate Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 2.34 SL 100 D	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	E_Spring A E_Spring A E_Spring A		56.7 fg	82.3 fg	74.3 hi	
36	Roundup PowerMax..glyphosate Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 2.34 SL 100 D	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	L_Spring B L_Spring B L_Spring B			60.0 lmn	56.7 mno	
37	Roundup PowerMax..glyphosate Liberty 280....glufosinate 2,4-D ester Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 2.34 SL 3.8 L 100 D	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	E_Spring A E_Spring A E_Spring A E_Spring A		67.7 cd	96.3 ab	98.0 ab	
38	Roundup PowerMax..glyphosate Liberty 280....glufosinate 2,4-D ester Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 2.34 SL 3.8 L 100 D	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	L_Spring B L_Spring B L_Spring B L_Spring B			50.0 pqr	61.7 lm	
39	Gramoxone SL....paraquat Callisto.....mesotrione Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	2 SL 4 SC 4 L 100 L 100 L	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A		82.0 a	97.3 a	99.0 a	
40	Gramoxone SL....paraquat Callisto.....mesotrione Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	2 SL 4 SC 4 L 100 L 100 L	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B L_Spring B			53.3 op	79.3 gh	
41	Gramoxone SL....paraquat Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	2 SL 50 SG 33 17 100 L 100 L	0.75 lb ai/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	0.75 lb ai/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A		78.3 ab	85.3 efg	86.7 f	
42	Gramoxone SL....paraquat Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	2 SL 50 SG 33 17 100 L 100 L	0.75 lb ai/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	0.75 lb ai/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B L_Spring B			56.7 mno	56.7 mno	

Means followed by same letter 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=6

## University of Delaware

Crop Type, Code			C BRSNW	C BRSNW	C BRSNW		
Crop Name			WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2		
Rating Type			05/21/18	05/28/18	05/04/18		
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code		
34	Gramoxone SL....paraquat 2,4-D ester Crop Oil Concentrate Prior to Soybean Planting	2 SL 3.8 L 100 L	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	L_Spring B L_Spring B L_Spring B	96.0 a	97.3 a	
35	Roundup PowerMax..glyphosate Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 2.34 SL 100 D	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	E_Spring A E_Spring A E_Spring A			3.1717 def
36	Roundup PowerMax..glyphosate Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 2.34 SL 100 D	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	L_Spring B L_Spring B L_Spring B	63.3 f	58.3 fg	
37	Roundup PowerMax..glyphosate Liberty 280....glufosinate 2,4-D ester Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 2.34 SL 3.8 L 100 D	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	E_Spring A E_Spring A E_Spring A E_Spring A			0.0000 f
38	Roundup PowerMax..glyphosate Liberty 280....glufosinate 2,4-D ester Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 2.34 SL 3.8 L 100 D	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	L_Spring B L_Spring B L_Spring B L_Spring B	95.0 a	84.7 b	
39	Gramoxone SL....paraquat Callisto.....mesotrione Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	2 SL 4 SC 4 L 100 L 100 L	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A			0.0000 f
40	Gramoxone SL....paraquat Callisto.....mesotrione Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	2 SL 4 SC 4 L 100 L 100 L	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B L_Spring B	87.0 b	74.0 cd	
41	Gramoxone SL....paraquat Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	2 SL 50 SG 33 17 100 L 100 L	0.75 lb ai/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A   E_Spring A E_Spring A			0.7350 f
42	Gramoxone SL....paraquat Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	2 SL 50 SG 33 17 100 L 100 L	0.75 lb ai/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	L_Spring B L_Spring B   L_Spring B L_Spring B	79.7 cd	63.3 efg	

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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=6

## University of Delaware

Crop Type, Code Crop Name Rating Type Rating Unit Rating Date		C BRSNW WntrRape DryWght g/0.25m2 05/29/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code	
34	Gramoxone SL....paraquat 2,4-D ester Crop Oil Concentrate Prior to Soybean Planting	2 SL 3.8 L 100 L	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	lb ai/a lb ae/a %	L	Spring B Spring B Spring B		2.4513 e
35	Roundup PowerMax..glyphosate Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 2.34 SL 100 D	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	lb ae/a lb ai/a %	E	Spring A Spring A Spring A		
36	Roundup PowerMax..glyphosate Liberty 280....glufosinate Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 2.34 SL 100 D	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	lb ae/a lb ai/a %	L	Spring B Spring B Spring B		7.8747 de
37	Roundup PowerMax..glyphosate Liberty 280....glufosinate 2,4-D ester Dry Ammonium Sulfate Prior to Corn Planting	4.5 AS 2.34 SL 3.8 L 100 D	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	lb ae/a lb ai/a lb ae/a %	E	Spring A Spring A Spring A Spring A		
38	Roundup PowerMax..glyphosate Liberty 280....glufosinate 2,4-D ester Dry Ammonium Sulfate Prior to Soybean Planting	4.5 AS 2.34 SL 3.8 L 100 D	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	lb ae/a lb ai/a lb ae/a %	L	Spring B Spring B Spring B Spring B		3.5720 e
39	Gramoxone SL....paraquat Callisto.....mesotrione Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	2 SL 4 SC 4 L 100 L 100 L	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	lb ai/a lb ai/a lb ai/a %	E	Spring A Spring A Spring A Spring A Spring A		
40	Gramoxone SL....paraquat Callisto.....mesotrione Atrazine 4L Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	2 SL 4 SC 4 L 100 L 100 L	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	lb ai/a lb ai/a lb ai/a %	L	Spring B Spring B Spring B Spring B Spring B		4.3990 e
41	Gramoxone SL....paraquat Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Corn Planting	2 SL 50 SG 33 17 100 L 100 L	0.75 lb ai/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	lb ai/a lb ai/a lb ai/a lb ai/a %	E	Spring A Spring A Spring A Spring A Spring A		
42	Gramoxone SL....paraquat Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate 30% Urea Ammonium Nitrate Prior to Soybean Planting	2 SL 50 SG 33 17 100 L 100 L	0.75 lb ai/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	lb ai/a lb ai/a lb ai/a lb ai/a %	L	Spring B Spring B Spring B Spring B Spring B		3.4913 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:Average=6

## University of Delaware

Crop Type, Code		C BRSNW	C BRSNW	C BRSNW		
Crop Name		WntrRape Control %	WntrRape Control %	WntrRape Control %		
Rating Type		04/23/18	05/03/18	05/11/18		
Rating Unit						
Rating Date						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code		
43 Roundup PowerMax..glyphosate Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 1 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A	66.7 cd	93.3 a-d	90.3 c-f
44 Roundup PowerMax..glyphosate Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 1 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B		66.7 jk	77.7 h
45 Roundup PowerMax..glyphosate Sharpen.....saflufenacil 2,4-D ester Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 3.8 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.475 lb ae/a 1 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A	66.7 cd	97.0 a	99.0 a
46 Roundup PowerMax..glyphosate Sharpen.....saflufenacil 2,4-D ester Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 3.8 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.475 lb ae/a 1 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B		60.0 lmn	78.7 h
47 Roundup PowerMax..glyphosate Sharpen.....saflufenacil Banvel.....dicamba Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 4 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.25 lb ai/a 1 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A	71.7 bc	95.7 abc	95.7 abc
48 Roundup PowerMax..glyphosate Sharpen.....saflufenacil Banvel.....dicamba Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 4 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.25 lb ai/a 1 % v/v 2.34 % v/v	L_Spring B L_Spring B L_Spring B L_Spring B		61.7 klm	66.7 jkl
49 Untreated Check 1			0.0 k	0.0 w	0.0 u	
50 Untreated Check 2			0.0 k	0.0 w	0.0 u	
51 Untreated Check 3			0.0 k	0.0 w	0.0 u	
52 Untreated Check 4			0.0 k	0.0 w	0.0 u	
LSD P=.05			8.09	6.41	6.80	
Standard Deviation			4.94	3.96	4.20	
CV			10.02	6.66	6.78	
Replicate F			1.318	8.369	6.986	
Replicate Prob(F)			0.2762	0.0004	0.0014	
Treatment F			79.050	131.121	120.272	
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=6

## University of Delaware

Crop Type, Code		C BRSNW	C BRSNW	C BRSNW
Crop Name		WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2
Rating Type				05/04/18
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code
43 Roundup PowerMax..glyphosate Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 1 % v/v 2.34 % v/v		E_Spring A E_Spring A E_Spring A E_Spring A
44 Roundup PowerMax..glyphosate Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 1 % v/v 2.34 % v/v		L_Spring B L_Spring B L_Spring B L_Spring B
45 Roundup PowerMax..glyphosate Sharpen.....saflufenacil 2,4-D ester Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 3.8 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.475 lb ae/a 1 % v/v 2.34 % v/v		E_Spring A E_Spring A E_Spring A E_Spring A
46 Roundup PowerMax..glyphosate Sharpen.....saflufenacil 2,4-D ester Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 3.8 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.475 lb ae/a 1 % v/v 2.34 % v/v		L_Spring B L_Spring B L_Spring B L_Spring B
47 Roundup PowerMax..glyphosate Sharpen.....saflufenacil Banvel.....dicamba Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 4 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.25 lb ai/a 1 % v/v 2.34 % v/v		E_Spring A E_Spring A E_Spring A E_Spring A
48 Roundup PowerMax..glyphosate Sharpen.....saflufenacil Banvel.....dicamba Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 4 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.25 lb ai/a 1 % v/v 2.34 % v/v		L_Spring B L_Spring B L_Spring B L_Spring B
49 Untreated Check 1			0.0 j	0.0 k
50 Untreated Check 2			0.0 j	0.0 k
51 Untreated Check 3			0.0 j	0.0 k
52 Untreated Check 4			0.0 j	0.0 k
LSD P=.05		6.51	10.18	15.87286
Standard Deviation		3.98	6.22	9.68338
CV		6.26	10.45	91.31
Replicate F		6.106	1.620	1.451
Replicate Prob(F)		0.0041	0.2073	0.2439
Treatment F		201.065	84.309	11.038
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=6

## University of Delaware

Crop Type, Code Crop Name Rating Type Rating Unit Rating Date		C BRSNW WntrRape DryWght g/0.25m2 05/29/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
43	Roundup PowerMax..glyphosate Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 1 % v/v 2.34 % v/v		E_Spring A E_Spring A E_Spring A E_Spring A		
44	Roundup PowerMax..glyphosate Sharpen.....saflufenacil Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 1 % v/v 2.34 % v/v		L_Spring B L_Spring B L_Spring B L_Spring B		3.5090 e
45	Roundup PowerMax..glyphosate Sharpen.....saflufenacil 2,4-D ester Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 3.8 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.475 lb ae/a 1 % v/v 2.34 % v/v		E_Spring A E_Spring A E_Spring A E_Spring A		
46	Roundup PowerMax..glyphosate Sharpen.....saflufenacil 2,4-D ester Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 3.8 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.475 lb ae/a 1 % v/v 2.34 % v/v		L_Spring B L_Spring B L_Spring B L_Spring B		2.4907 e
47	Roundup PowerMax..glyphosate Sharpen.....saflufenacil Banvel.....dicamba Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Corn Planting	4.5 AS 2.85 SC 4 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.25 lb ai/a 1 % v/v 2.34 % v/v		E_Spring A E_Spring A E_Spring A E_Spring A		
48	Roundup PowerMax..glyphosate Sharpen.....saflufenacil Banvel.....dicamba Methylated Seed Oil 30% Urea Ammonium Nitrate Prior to Soybean Planting	4.5 AS 2.85 SC 4 L 100 L 100 L	1.13 lb ae/a 0.0445 lb ai/a 0.25 lb ai/a 1 % v/v 2.34 % v/v		L_Spring B L_Spring B L_Spring B L_Spring B		3.0177 e
49	Untreated Check 1						17.3253 cde
50	Untreated Check 2						30.3333 c
51	Untreated Check 3						56.6667 b
52	Untreated Check 4						106.6667 a
LSD P=.05 Standard Deviation CV							19.55618 11.94652 79.22
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)							3.644 0.0328 9.547 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=6

## Spring Termination of Oilseed Rape as Cover Crop

Trial ID: Cover2-18

Location: Fld #30

Trial Year: 2017

Protocol ID: Cover2-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code	C BRSNW WntrRape Control % 04/23/18	C BRSNW WntrRape Control % 05/03/18	C BRSNW WntrRape Control % 05/11/18				
Trt Treatment No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code		
<b>TABLE OF R MEANS</b>							
Replicate 1						65.7	67.9
Replicate 2						65.0	68.0
Replicate 3						62.5	65.1
<b>TABLE OF A (Herbicides) MEANS</b>							
1 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A			64.2 hij	72.5 g
2 2,4-D ester	3.8 L	0.95 lb ae/a	E_Spring A			58.3 k	64.7 h
3 Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A			25.8 n	28.3 m
3 Nonionic Surfactant	100 L	0.25 % v/v	E_Spring A				
4 Banvel.....dicamba	4 L	0.5 lb ai/a	E_Spring A			36.7 m	43.3 l
4 Nonionic Surfactant	100 L	0.25 % v/v	E_Spring A				
5 Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A			46.7 i	43.3 l
5 ----thifensulfuron	33	0.0165					
5 ----tribenuron	17	0.0085					
5 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
5 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A				
6 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A			66.0 ghi	71.3 g
6 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A				
7 Sharpen.....saflufenacil	2.85 SC	0.0334 lb ai/a	E_Spring A			64.2 hij	53.3 j
7 Methylated Seed Oil	100 L	1 % v/v	E_Spring A				
7 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A				
8 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A			62.5 ijk	54.2 j
8 Methylated Seed Oil	100 L	1 % v/v	E_Spring A				
8 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A				
9 Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A			67.2 e-i	59.2 i
9 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
10 Callisto.....mesotrione	4 SC	0.094 lb ai/a	E_Spring A			40.0 m	40.0 l
10 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
10 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A				
11 Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A			60.0 jk	48.3 k
11 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A				
12 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A			75.7 bc	88.3 ab
12 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A				
12 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A				
13 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A			66.3 f-i	75.5 efg
13 Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A				
13 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A				
14 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A			70.0 d-g	72.5 g
14 Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A				
14 ----thifensulfuron	33	0.0165					
14 ----tribenuron	17	0.0085					
14 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
14 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring 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.

Crop Type, Code		C BRSNW WntrRape Control % 05/21/18	C BRSNW WntrRape Control % 05/28/18	C BRSNW WntrRape DryWght g/0.25m2 05/04/18
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				
TABLE OF A (Herbicides) MEANS				
1 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A	
2 2,4-D ester	3.8 L	0.95 lb ae/a	E_Spring A	
3 Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A	
3 Nonionic Surfactant	100 L	0.25 % v/v	E_Spring A	
4 Banvel.....dicamba	4 L	0.5 lb ai/a	E_Spring A	
4 Nonionic Surfactant	100 L	0.25 % v/v	E_Spring A	
5 Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A	
5 ----thifensulfuron	33	0.0165		
5 ----tribenuron	17	0.0085		
5 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
5 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
6 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
6 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
7 Sharpen.....saflufenacil	2.85 SC	0.0334 lb ai/a	E_Spring A	
7 Methylated Seed Oil	100 L	1 % v/v	E_Spring A	
7 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
8 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A	
8 Methylated Seed Oil	100 L	1 % v/v	E_Spring A	
8 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
9 Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A	
9 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
10 Callisto.....mesotrione	4 SC	0.094 lb ai/a	E_Spring A	
10 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
10 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
11 Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A	
11 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
12 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
12 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A	
12 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
13 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
13 Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A	
13 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
14 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
14 Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A	
14 ----thifensulfuron	33	0.0165		
14 ----tribenuron	17	0.0085		
14 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
14 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring 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.

Crop Type, Code							C BRSNW
Crop Name							WntrRape
Rating Type							DryWght
Rating Unit							g/0.25m <sup>2</sup>
Rating Date							05/29/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
TABLE OF R MEANS							
Replicate 1							
Replicate 2							
Replicate 3							
TABLE OF A (Herbicides) MEANS							
1 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A				
2 2,4-D ester	3.8 L	0.95 lb ae/a	E_Spring A				
3 Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A				
3 Nonionic Surfactant	100 L	0.25 % v/v	E_Spring A				
4 Banvel.....dicamba	4 L	0.5 lb ai/a	E_Spring A				
4 Nonionic Surfactant	100 L	0.25 % v/v	E_Spring A				
5 Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A				
5 ----thifensulfuron	33	0.0165					
5 ----tribenuron	17	0.0085					
5 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
5 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A				
6 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				
6 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A				
7 Sharpen.....saflufenacil	2.85 SC	0.0334 lb ai/a	E_Spring A				
7 Methylated Seed Oil	100 L	1 % v/v	E_Spring A				
7 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A				
8 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A				
8 Methylated Seed Oil	100 L	1 % v/v	E_Spring A				
8 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A				
9 Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A				
9 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
10 Callisto.....mesotrione	4 SC	0.094 lb ai/a	E_Spring A				
10 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
10 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A				
11 Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A				
11 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A				
12 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				
12 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A				
12 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A				
13 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				
13 Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A				
13 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A				
14 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				
14 Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A				
14 ----thifensulfuron	33	0.0165					
14 ----tribenuron	17	0.0085					
14 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
14 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring 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 Type, Code							C BRSNW	C BRSNW	C BRSNW
							WntrRape Control %	WntrRape Control %	WntrRape Control %
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
							04/23/18	05/03/18	05/11/18
15	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				68.3 e-h	78.0 def
15	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A					
15	----thifensulfuron	33	0.0165						
15	----tribenuron	17	0.0085						
15	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A					
15	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
15	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
16	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				65.3 ghi	74.2 fg
16	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A					
16	----thifensulfuron	33	0.0165						
16	----tribenuron	17	0.0085						
16	Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A					
16	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
16	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
17	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A				80.7 a	81.0 cd
17	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A					
17	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
18	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				71.2 cde	65.5 h
18	Liberty 280.....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A					
18	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A					
19	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				73.2 cd	79.8 cde
19	Liberty 280.....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A					
19	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A					
19	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A					
20	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A				75.3 bc	89.2 a
20	Callisto.....mesotrione	4 SC	0.094 lb ai/a	E_Spring A					
20	Atrazine 4L	4 L	0.5 lb ai/a	E_Spring A					
20	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
20	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
21	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A				71.0 c-f	71.7 g
21	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A					
21	----thifensulfuron	33	0.0165						
21	----tribenuron	17	0.0085						
21	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
21	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
22	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				80.0 ab	84.0 bc
22	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A					
22	Methylated Seed Oil	100 L	1 % v/v	E_Spring A					
22	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
23	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				78.5 ab	88.8 ab
23	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A					
23	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A					
23	Methylated Seed Oil	100 L	1 % v/v	E_Spring A					
23	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
24	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A				78.7 ab	81.2 cd
24	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A					
24	Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A					
24	Methylated Seed Oil	100 L	1 % v/v	E_Spring A					
24	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
LSD P=.05							4.70	4.98	
Standard Deviation							4.10	4.35	
CV							6.36	6.49	

Means followed by same letter 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 BRSNW	C BRSNW	C BRSNW	
						WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code	05/21/18	05/28/18	05/04/18
15	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A					
15	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A					
15	----thifensulfuron	33	0.0165						
15	----tribenuron	17	0.0085						
15	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A					
15	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
15	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
16	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A					
16	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A					
16	----thifensulfuron	33	0.0165						
16	----tribenuron	17	0.0085						
16	Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A					
16	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
16	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
17	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A					
17	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A					
17	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
18	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A					
18	Liberty 280.....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A					
18	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A					
19	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A					
19	Liberty 280.....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A					
19	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A					
19	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A					
20	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A					
20	Callisto.....mesotrione	4 SC	0.094 lb ai/a	E_Spring A					
20	Atrazine 4L	4 L	0.5 lb ai/a	E_Spring A					
20	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
20	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
21	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A					
21	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A					
21	----thifensulfuron	33	0.0165						
21	----tribenuron	17	0.0085						
21	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A					
21	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
22	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A					
22	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A					
22	Methylated Seed Oil	100 L	1 % v/v	E_Spring A					
22	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
23	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A					
23	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A					
23	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A					
23	Methylated Seed Oil	100 L	1 % v/v	E_Spring A					
23	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
24	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A					
24	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A					
24	Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A					
24	Methylated Seed Oil	100 L	1 % v/v	E_Spring A					
24	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A					
LSD P=.05 Standard Deviation CV									

Means followed by same letter 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 Crop Name Rating Type Rating Unit Rating Date		C BRSNW WntrRape DryWght g/0.25m <sup>2</sup> 05/29/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
15	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E	Spring A		
15	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E	Spring A		
15	----thifensulfuron	33	0.0165				
15	----tribenuron	17	0.0085				
15	2,4-D ester	3.8 L	0.475 lb ae/a	E	Spring A		
15	Crop Oil Concentrate	100 L	1.17 % v/v	E	Spring A		
15	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E	Spring A		
16	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E	Spring A		
16	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E	Spring A		
16	----thifensulfuron	33	0.0165				
16	----tribenuron	17	0.0085				
16	Banvel.....dicamba	4 L	0.25 lb ai/a	E	Spring A		
16	Crop Oil Concentrate	100 L	1.17 % v/v	E	Spring A		
16	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E	Spring A		
17	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E	Spring A		
17	2,4-D ester	3.8 L	0.475 lb ae/a	E	Spring A		
17	Crop Oil Concentrate	100 L	1.17 % v/v	E	Spring A		
18	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E	Spring A		
18	Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E	Spring A		
18	Dry Ammonium Sulfate	100 D	1.02 % w/v	E	Spring A		
19	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E	Spring A		
19	Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E	Spring A		
19	2,4-D ester	3.8 L	0.475 lb ae/a	E	Spring A		
19	Dry Ammonium Sulfate	100 D	1.02 % w/v	E	Spring A		
20	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E	Spring A		
20	Callisto.....mesotrione	4 SC	0.094 lb ai/a	E	Spring A		
20	Atrazine 4L	4 L	0.5 lb ai/a	E	Spring A		
20	Crop Oil Concentrate	100 L	1.17 % v/v	E	Spring A		
20	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E	Spring A		
21	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E	Spring A		
21	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E	Spring A		
21	----thifensulfuron	33	0.0165				
21	----tribenuron	17	0.0085				
21	Crop Oil Concentrate	100 L	1.17 % v/v	E	Spring A		
21	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E	Spring A		
22	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E	Spring A		
22	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E	Spring A		
22	Methylated Seed Oil	100 L	1 % v/v	E	Spring A		
22	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E	Spring A		
23	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E	Spring A		
23	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E	Spring A		
23	2,4-D ester	3.8 L	0.475 lb ae/a	E	Spring A		
23	Methylated Seed Oil	100 L	1 % v/v	E	Spring A		
23	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E	Spring A		
24	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E	Spring A		
24	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E	Spring A		
24	Banvel.....dicamba	4 L	0.25 lb ai/a	E	Spring A		
24	Methylated Seed Oil	100 L	1 % v/v	E	Spring A		
24	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E	Spring A		
LSD P=.05							
Standard Deviation							
CV							

Means followed by same letter 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 BRSNW	C BRSNW	C BRSNW
Crop Name		WntrRape Control %	WntrRape Control %	WntrRape Control %
Rating Type		04/23/18	05/03/18	05/11/18
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing
				Appl Code
TABLE OF B (Application Timing) MEANS				
1 Prior to Corn Planting				77.2 a
2 Prior to Soybean Planting				51.6 b
LSD P=.05				1.36
Standard Deviation				4.10
CV				6.36
TABLE OF A (Herbicides) B (Application Timing) MEANS				
1 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A	36.7 a
1 Prior to Corn Planting				73.3 i
2 2,4-D ester	3.8 L	0.95 lb ae/a	E_Spring A	46.7 a
1 Prior to Corn Planting				63.3 kl
3 Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A	25.0 a
3 Nonionic Surfactant	100 L	0.25 % v/v	E_Spring A	
1 Prior to Corn Planting				28.3 uv
4 Banvel.....dicamba	4 L	0.5 lb ai/a	E_Spring A	33.3 a
4 Nonionic Surfactant	100 L	0.25 % v/v	E_Spring A	
1 Prior to Corn Planting				45.0 rs
5 Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A	40.0 a
5 ----thifensulfuron	33	0.0165		56.7 mno
5 ----tribenuron	17	0.0085		50.0 nop
5 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
5 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
1 Prior to Corn Planting				
6 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	60.0 a
6 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
1 Prior to Corn Planting				80.3 gh
7 Sharpen.....saflufenacil	2.85 SC	0.0334 lb ai/a	E_Spring A	58.3 a
7 Methylated Seed Oil	100 L	1 % v/v	E_Spring A	
7 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
1 Prior to Corn Planting				63.3 kl
8 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A	46.7 a
8 Methylated Seed Oil	100 L	1 % v/v	E_Spring A	
8 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
1 Prior to Corn Planting				61.7 klm
9 Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A	72.7 a
9 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
1 Prior to Corn Planting				81.0 fgh
10 Callisto.....mesotrione	4 SC	0.094 lb ai/a	E_Spring A	25.0 a
10 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
10 30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
1 Prior to Corn Planting				43.3 pq
11 Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A	56.7 a
11 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
1 Prior to Corn Planting				70.0 ij
12 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	63.3 a
12 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A	
12 Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
1 Prior to Corn Planting				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

Crop Type, Code						C BRSNW	C BRSNW	C BRSNW
						WntrRape Control % 05/21/18	WntrRape Control % 05/28/18	WntrRape DryWght g/0.25m2 05/04/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code		
<b>TABLE OF B (Application Timing) MEANS</b>								
1	Prior to Corn Planting							
2	Prior to Soybean Planting							
LSD P=.05								
Standard Deviation								
CV								
<b>TABLE OF A (Herbicides) B (Application Timing) MEANS</b>								
1	2,4-D ester	3.8 L		0.475 lb ae/a	E_Spring A	.	.	2.0440 a
1	Prior to Corn Planting							
2	2,4-D ester	3.8 L		0.95 lb ae/a	E_Spring A	.	.	2.1570 a
1	Prior to Corn Planting							
3	Banvel.....dicamba	4 L		0.25 lb ai/a	E_Spring A	.	.	22.7093 a
3	Nonionic Surfactant	100 L		0.25 % v/v	E_Spring A			
1	Prior to Corn Planting							
4	Banvel.....dicamba	4 L		0.5 lb ai/a	E_Spring A	.	.	24.5460 a
4	Nonionic Surfactant	100 L		0.25 % v/v	E_Spring A			
1	Prior to Corn Planting							
5	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E_Spring A	.	.	12.0017 a
5	----thifensulfuron	33		0.0165				
5	----tribenuron	17		0.0085				
5	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A			
5	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A			
1	Prior to Corn Planting							
6	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A	.	.	0.6717 a
6	Dry Ammonium Sulfate	100 D		1.02 % w/v	E_Spring A			
1	Prior to Corn Planting							
7	Sharpen.....saflufenacil	2.85 SC		0.0334 lb ai/a	E_Spring A	.	.	3.4353 a
7	Methylated Seed Oil	100 L		1 % v/v	E_Spring A			
7	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A			
1	Prior to Corn Planting							
8	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E_Spring A	.	.	4.0973 a
8	Methylated Seed Oil	100 L		1 % v/v	E_Spring A			
8	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A			
1	Prior to Corn Planting							
9	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E_Spring A	.	.	3.4650 a
9	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A			
1	Prior to Corn Planting							
10	Callisto.....mesotrione	4 SC		0.094 lb ai/a	E_Spring A	.	.	18.3640 a
10	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A			
10	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A			
1	Prior to Corn Planting							
11	Liberty 280....glufosinate	2.34 SL		0.79 lb ai/a	E_Spring A	.	.	6.7317 a
11	Dry Ammonium Sulfate	100 D		1.02 % w/v	E_Spring A			
1	Prior to Corn Planting							
12	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A	.	.	1.9703 a
12	2,4-D ester	3.8 L		0.475 lb ae/a	E_Spring A			
12	Dry Ammonium Sulfate	100 D		1.02 % w/v	E_Spring A			
1	Prior to Corn Planting							

Means followed by same letter 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 BRSNW					
Crop Name		WntrRape					
Rating Type		DryWght					
Rating Unit		g/0.25m <sup>2</sup>					
Rating Date		05/29/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
TABLE OF B (Application Timing) MEANS							
1 Prior to Corn Planting							
2 Prior to Soybean Planting							
LSD P=.05							
Standard Deviation							
CV							
TABLE OF A (Herbicides) B (Application Timing) MEANS							
1 2,4-D ester		3.8 L		0.475 lb ae/a	E_Spring A	.	
1 Prior to Corn Planting							
2 2,4-D ester		3.8 L		0.95 lb ae/a	E_Spring A	.	
1 Prior to Corn Planting							
3 Banvel.....dicamba		4 L		0.25 lb ai/a	E_Spring A	.	
3 Nonionic Surfactant		100 L		0.25 % v/v	E_Spring A	.	
1 Prior to Corn Planting							
4 Banvel.....dicamba		4 L		0.5 lb ai/a	E_Spring A	.	
4 Nonionic Surfactant		100 L		0.25 % v/v	E_Spring A	.	
1 Prior to Corn Planting							
5 Harmony Extra SG Premix		50 SG		0.025 lb ai/a	E_Spring A	.	
5 ----thifensulfuron		33		0.0165			
5 ----tribenuron		17		0.0085			
5 Crop Oil Concentrate		100 L		1.17 % v/v	E_Spring A	.	
5 30% Urea Ammonium Nitrate		100 L		2.34 % v/v	E_Spring A	.	
1 Prior to Corn Planting							
6 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	E_Spring A	.	
6 Dry Ammonium Sulfate		100 D		1.02 % w/v	E_Spring A	.	
1 Prior to Corn Planting							
7 Sharpen.....saflufenacil		2.85 SC		0.0334 lb ai/a	E_Spring A	.	
7 Methylated Seed Oil		100 L		1 % v/v	E_Spring A	.	
7 30% Urea Ammonium Nitrate		100 L		2.34 % v/v	E_Spring A	.	
1 Prior to Corn Planting							
8 Sharpen.....saflufenacil		2.85 SC		0.0445 lb ai/a	E_Spring A	.	
8 Methylated Seed Oil		100 L		1 % v/v	E_Spring A	.	
8 30% Urea Ammonium Nitrate		100 L		2.34 % v/v	E_Spring A	.	
1 Prior to Corn Planting							
9 Gramoxone SL....paraquat		2 SL		0.75 lb ai/a	E_Spring A	.	
9 Crop Oil Concentrate		100 L		1.17 % v/v	E_Spring A	.	
1 Prior to Corn Planting							
10 Callisto.....mesotrione		4 SC		0.094 lb ai/a	E_Spring A	.	
10 Crop Oil Concentrate		100 L		1.17 % v/v	E_Spring A	.	
10 30% Urea Ammonium Nitrate		100 L		2.34 % v/v	E_Spring A	.	
1 Prior to Corn Planting							
11 Liberty 280.....glufosinate		2.34 SL		0.79 lb ai/a	E_Spring A	.	
11 Dry Ammonium Sulfate		100 D		1.02 % w/v	E_Spring A	.	
1 Prior to Corn Planting							
12 Roundup PowerMax..glyphosate		4.5 AS		1.13 lb ae/a	E_Spring A	.	
12 2,4-D ester		3.8 L		0.475 lb ae/a	E_Spring A	.	
12 Dry Ammonium Sulfate		100 D		1.02 % w/v	E_Spring A	.	
1 Prior to Corn Planting							

Means followed by same letter 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 BRSNW	C BRSNW	C BRSNW						
Crop Name		WntrRape Control %	WntrRape Control %	WntrRape Control %						
Rating Type		04/23/18	05/03/18	05/11/18						
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
13	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		66.0 a	89.3 cde	87.7 de
	Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A				
13	Dry Ammonium Sulfate	100 D		1.02 % w/v	E	Spring A				
	1 Prior to Corn Planting									
14	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		63.3 a	86.7 efg	95.0 abc
	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A				
14	----thifensulfuron	33		0.0165						
14	----tribenuron	17		0.0085						
14	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A				
14	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A				
	1 Prior to Corn Planting									
15	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		55.0 a	90.0 b-e	94.3 a-d
	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A				
15	----thifensulfuron	33		0.0165						
15	----tribenuron	17		0.0085						
15	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A				
15	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A				
15	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A				
	1 Prior to Corn Planting									
16	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		66.7 a	87.3 def	91.7 b-e
	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A				
16	----thifensulfuron	33		0.0165						
16	----tribenuron	17		0.0085						
16	Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A				
16	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A				
16	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A				
	1 Prior to Corn Planting									
17	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A		76.7 a	86.0 efg	88.7 cde
17	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A				
17	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A				
	1 Prior to Corn Planting									
18	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		56.7 a	82.3 fg	74.3 gh
	Liberty 280....glufosinate	2.34 SL		0.79 lb ai/a	E	Spring A				
18	Dry Ammonium Sulfate	100 D		1.02 % w/v	E	Spring A				
	1 Prior to Corn Planting									
19	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		67.7 a	96.3 ab	98.0 ab
	Liberty 280....glufosinate	2.34 SL		0.79 lb ai/a	E	Spring A				
19	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A				
19	Dry Ammonium Sulfate	100 D		1.02 % w/v	E	Spring A				
	1 Prior to Corn Planting									
20	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A		82.0 a	97.3 a	99.0 a
20	Callisto.....mesotrione	4 SC		0.094 lb ai/a	E	Spring A				
20	Atrazine 4L	4 L		0.5 lb ai/a	E	Spring A				
20	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A				
20	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A				
	1 Prior to Corn Planting									
21	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A		78.3 a	85.3 efg	86.7 e
	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A				
21	----thifensulfuron	33		0.0165						
21	----tribenuron	17		0.0085						
21	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A				
21	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A				
	1 Prior to Corn Planting									

Means followed by same letter 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 BRSNW	C BRSNW	C BRSNW
Crop Name			WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2
Rating Type			05/21/18	05/28/18	05/04/18
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code
13	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A
13	Banvel.....dicamba	4 L		0.25 lb ai/a	E_Spring A
13	Dry Ammonium Sulfate	100 D		1.02 % w/v	E_Spring A
	1 Prior to Corn Planting				
14	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A
14	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E_Spring A
14	----thifensulfuron	33		0.0165	
14	----tribenuron	17		0.0085	
14	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A
14	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A
	1 Prior to Corn Planting				
15	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A
15	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E_Spring A
15	----thifensulfuron	33		0.0165	
15	----tribenuron	17		0.0085	
15	2,4-D ester	3.8 L		0.475 lb ae/a	E_Spring A
15	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A
15	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A
	1 Prior to Corn Planting				
16	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A
16	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E_Spring A
16	----thifensulfuron	33		0.0165	
16	----tribenuron	17		0.0085	
16	Banvel.....dicamba	4 L		0.25 lb ai/a	E_Spring A
16	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A
16	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A
	1 Prior to Corn Planting				
17	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E_Spring A
17	2,4-D ester	3.8 L		0.475 lb ae/a	E_Spring A
17	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A
	1 Prior to Corn Planting				
18	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A
18	Liberty 280....glufosinate	2.34 SL		0.79 lb ai/a	E_Spring A
18	Dry Ammonium Sulfate	100 D		1.02 % w/v	E_Spring A
	1 Prior to Corn Planting				
19	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A
19	Liberty 280....glufosinate	2.34 SL		0.79 lb ai/a	E_Spring A
19	2,4-D ester	3.8 L		0.475 lb ae/a	E_Spring A
19	Dry Ammonium Sulfate	100 D		1.02 % w/v	E_Spring A
	1 Prior to Corn Planting				
20	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E_Spring A
20	Callisto.....mesotrione	4 SC		0.094 lb ai/a	E_Spring A
20	Atrazine 4L	4 L		0.5 lb ai/a	E_Spring A
20	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A
20	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A
	1 Prior to Corn Planting				
21	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E_Spring A
21	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E_Spring A
21	----thifensulfuron	33		0.0165	
21	----tribenuron	17		0.0085	
21	Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A
21	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E_Spring A
	1 Prior to Corn Planting				

Means followed by same letter 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 BRSNW
Crop Name							WntrRape
Rating Type							DryWght
Rating Unit							g/0.25m <sup>2</sup>
Rating Date							05/29/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
13	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
13	Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A	.
13	Dry Ammonium Sulfate	100 D		1.02 % w/v	E	Spring A	.
13	1 Prior to Corn Planting						
14	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
14	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A	.
14	----thifensulfuron	33		0.0165			.
14	----tribenuron	17		0.0085			.
14	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
14	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
14	1 Prior to Corn Planting						
15	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
15	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A	.
15	----thifensulfuron	33		0.0165			.
15	----tribenuron	17		0.0085			.
15	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A	.
15	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
15	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
15	1 Prior to Corn Planting						
16	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
16	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A	.
16	----thifensulfuron	33		0.0165			.
16	----tribenuron	17		0.0085			.
16	Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A	.
16	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
16	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
16	1 Prior to Corn Planting						
17	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A	.
17	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A	.
17	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
17	1 Prior to Corn Planting						
18	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
18	Liberty 280....glufosinate	2.34 SL		0.79 lb ai/a	E	Spring A	.
18	Dry Ammonium Sulfate	100 D		1.02 % w/v	E	Spring A	.
18	1 Prior to Corn Planting						
19	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
19	Liberty 280....glufosinate	2.34 SL		0.79 lb ai/a	E	Spring A	.
19	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A	.
19	Dry Ammonium Sulfate	100 D		1.02 % w/v	E	Spring A	.
19	1 Prior to Corn Planting						
20	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A	.
20	Callisto.....mesotrione	4 SC		0.094 lb ai/a	E	Spring A	.
20	Atrazine 4L	4 L		0.5 lb ai/a	E	Spring A	.
20	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
20	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
20	1 Prior to Corn Planting						
21	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A	.
21	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A	.
21	----thifensulfuron	33		0.0165			.
21	----tribenuron	17		0.0085			.
21	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
21	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
21	1 Prior to Corn Planting						

Means followed by same letter 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 BRSNW	C BRSNW	C BRSNW						
Crop Name	WntrRape Control %	WntrRape Control %	WntrRape Control %						
Rating Type	04/23/18	05/03/18	05/11/18						
Rating Unit									
Rating Date									
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
22 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		66.7 a	93.3 a-d	90.3 cde
22 Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A				
22 Methylated Seed Oil	100 L		1 % v/v	E	Spring A				
22 30% Urea Ammonium Nitrate 1 Prior to Corn Planting	100 L		2.34 % v/v	E	Spring A				
23 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		66.7 a	97.0 a	99.0 a
23 Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A				
23 2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A				
23 Methylated Seed Oil	100 L		1 % v/v	E	Spring A				
23 30% Urea Ammonium Nitrate 1 Prior to Corn Planting	100 L		2.34 % v/v	E	Spring A				
24 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		71.7 a	95.7 abc	95.7 abc
24 Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A				
24 Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A				
24 Methylated Seed Oil	100 L		1 % v/v	E	Spring A				
24 30% Urea Ammonium Nitrate 1 Prior to Corn Planting	100 L		2.34 % v/v	E	Spring A				
1 2,4-D ester 2 Prior to Soybean Planting	3.8 L		0.475 lb ae/a	E	Spring A		.	55.0 nop	70.0 hij
2 2,4-D ester 2 Prior to Soybean Planting	3.8 L		0.95 lb ae/a	E	Spring A		.	53.3 op	53.3 mno
3 Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A		.	23.3 v	26.7 s
3 Nonionic Surfactant 2 Prior to Soybean Planting	100 L		0.25 % v/v	E	Spring A				
4 Banvel.....dicamba	4 L		0.5 lb ai/a	E	Spring A		.	28.3 uv	43.3 pq
4 Nonionic Surfactant 2 Prior to Soybean Planting	100 L		0.25 % v/v	E	Spring A				
5 Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A		.	36.7 t	36.7 qr
5 ----thifensulfuron	33		0.0165						
5 ----tribenuron	17		0.0085						
5 Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A				
5 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L		2.34 % v/v	E	Spring A				
6 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A		.	51.7 opq	56.7 lmn
6 Dry Ammonium Sulfate 2 Prior to Soybean Planting	100 D		1.02 % w/v	E	Spring A				
7 Sharpen.....saflufenacil	2.85 SC		0.0334 lb ai/a	E	Spring A		.	65.0 jkl	60.0 klm
7 Methylated Seed Oil	100 L		1 % v/v	E	Spring A				
7 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L		2.34 % v/v	E	Spring A				
8 Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A		.	63.3 kl	56.7 lmn
8 Methylated Seed Oil	100 L		1 % v/v	E	Spring A				
8 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L		2.34 % v/v	E	Spring A				
9 Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A		.	53.3 op	53.3 mno
9 Crop Oil Concentrate 2 Prior to Soybean Planting	100 L		1.17 % v/v	E	Spring A				
10 Callisto.....mesotrione	4 SC		0.094 lb ai/a	E	Spring A		.	33.3 tu	36.7 qr
10 Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A				
10 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L		2.34 % v/v	E	Spring 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 Type, Code			C BRSNW	C BRSNW	C BRSNW
Crop Name			WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2
Rating Type			05/21/18	05/28/18	05/04/18
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code
22 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A	
22 Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E_Spring A	
22 Methylated Seed Oil	100 L		1 % v/v	E_Spring A	
22 30% Urea Ammonium Nitrate 1 Prior to Corn Planting	100 L		2.34 % v/v	E_Spring A	
23 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A	
23 Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E_Spring A	
23 2,4-D ester	3.8 L		0.475 lb ae/a	E_Spring A	
23 Methylated Seed Oil	100 L		1 % v/v	E_Spring A	
23 30% Urea Ammonium Nitrate 1 Prior to Corn Planting	100 L		2.34 % v/v	E_Spring A	
24 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A	
24 Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E_Spring A	
24 Banvel.....dicamba	4 L		0.25 lb ai/a	E_Spring A	
24 Methylated Seed Oil	100 L		1 % v/v	E_Spring A	
24 30% Urea Ammonium Nitrate 1 Prior to Corn Planting	100 L		2.34 % v/v	E_Spring A	
1 2,4-D ester	3.8 L		0.475 lb ae/a	E_Spring A	95.7 a
2 Prior to Soybean Planting					99.3 a
2 2,4-D ester	3.8 L		0.95 lb ae/a	E_Spring A	85.0 a
2 Prior to Soybean Planting					97.7 a
3 Banvel.....dicamba	4 L		0.25 lb ai/a	E_Spring A	36.7 a
3 Nonionic Surfactant	100 L		0.25 % v/v	E_Spring A	33.3 a
2 Prior to Soybean Planting					
4 Banvel.....dicamba	4 L		0.5 lb ai/a	E_Spring A	33.3 a
4 Nonionic Surfactant	100 L		0.25 % v/v	E_Spring A	23.3 a
2 Prior to Soybean Planting					
5 Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E_Spring A	61.7 a
5 ----thifensulfuron	33		0.0165		70.0 a
5 ----tribenuron	17		0.0085		
5 Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A	
5 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L		2.34 % v/v	E_Spring A	
6 Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E_Spring A	76.7 a
6 Dry Ammonium Sulfate	100 D		1.02 % w/v	E_Spring A	75.0 a
2 Prior to Soybean Planting					
7 Sharpen.....saflufenacil	2.85 SC		0.0334 lb ai/a	E_Spring A	56.7 a
7 Methylated Seed Oil	100 L		1 % v/v	E_Spring A	46.7 a
7 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L		2.34 % v/v	E_Spring A	
8 Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E_Spring A	60.0 a
8 Methylated Seed Oil	100 L		1 % v/v	E_Spring A	53.3 a
8 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L		2.34 % v/v	E_Spring A	
9 Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E_Spring A	60.0 a
9 Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A	53.3 a
2 Prior to Soybean Planting					
10 Callisto.....mesotrione	4 SC		0.094 lb ai/a	E_Spring A	45.0 a
10 Crop Oil Concentrate	100 L		1.17 % v/v	E_Spring A	43.3 a
10 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L		2.34 % v/v	E_Spring 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 Type, Code Crop Name Rating Type Rating Unit Rating Date		C BRSNW WntrRape DryWght g/0.25m <sup>2</sup> 05/29/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
22	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
22	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A	.
22	Methylated Seed Oil	100 L		1 % v/v	E	Spring A	.
22	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
	1 Prior to Corn Planting						
23	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
23	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A	.
23	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A	.
23	Methylated Seed Oil	100 L		1 % v/v	E	Spring A	.
23	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
	1 Prior to Corn Planting						
24	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	.
24	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A	.
24	Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A	.
24	Methylated Seed Oil	100 L		1 % v/v	E	Spring A	.
24	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
	1 Prior to Corn Planting						
1	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A	2.3200 a
2	Prior to Soybean Planting						
2	2,4-D ester	3.8 L		0.95 lb ae/a	E	Spring A	9.2473 a
3	Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A	24.7577 a
3	Nonionic Surfactant	100 L		0.25 % v/v	E	Spring A	.
2	Prior to Soybean Planting						
4	Banvel.....dicamba	4 L		0.5 lb ai/a	E	Spring A	21.0407 a
4	Nonionic Surfactant	100 L		0.25 % v/v	E	Spring A	.
2	Prior to Soybean Planting						
5	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A	9.5527 a
5	----thifensulfuron	33		0.0165			.
5	----tribenuron	17		0.0085			.
5	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
5	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
2	Prior to Soybean Planting						
6	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	11.0743 a
6	Dry Ammonium Sulfate	100 D		1.02 % w/v	E	Spring A	.
2	Prior to Soybean Planting						
7	Sharpen.....saflufenacil	2.85 SC		0.0334 lb ai/a	E	Spring A	6.7937 a
7	Methylated Seed Oil	100 L		1 % v/v	E	Spring A	.
7	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
2	Prior to Soybean Planting						
8	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A	10.5547 a
8	Methylated Seed Oil	100 L		1 % v/v	E	Spring A	.
8	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
2	Prior to Soybean Planting						
9	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A	9.6203 a
9	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
2	Prior to Soybean Planting						
10	Callisto.....mesotrione	4 SC		0.094 lb ai/a	E	Spring A	20.9027 a
10	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	.
10	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	.
2	Prior to Soybean Planting						

Means followed by same letter 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 BRSNW	C BRSNW	C BRSNW
Crop Name	WntrRape Control %	WntrRape Control %	WntrRape Control %
Rating Type	04/23/18	05/03/18	05/11/18
Rating Unit			
Rating Date			
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code
11 Liberty 280.....glufosinate 11 Dry Ammonium Sulfate 2 Prior to Soybean Planting	2.34 SL 100 D	0.79 lb ai/a 1.02 % w/v	E_Spring A E_Spring A
12 Roundup PowerMax..glyphosate 12 2,4-D ester 12 Dry Ammonium Sulfate 2 Prior to Soybean Planting	4.5 AS 3.8 L 100 D	1.13 lb ae/a 0.475 lb ae/a 1.02 % w/v	E_Spring A E_Spring A E_Spring A
13 Roundup PowerMax..glyphosate 13 Banvel.....dicamba 13 Dry Ammonium Sulfate 2 Prior to Soybean Planting	4.5 AS 4 L 100 D	1.13 lb ae/a 0.25 lb ai/a 1.02 % w/v	E_Spring A E_Spring A E_Spring A
14 Roundup PowerMax..glyphosate 14 Harmony Extra SG Premix 14 ----thifensulfuron 14 ----tribenuron 14 Crop Oil Concentrate 14 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	4.5 AS 50 SG 33 17 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A
15 Roundup PowerMax..glyphosate 15 Harmony Extra SG Premix 15 ----thifensulfuron 15 ----tribenuron 15 2,4-D ester 15 Crop Oil Concentrate 15 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	4.5 AS 50 SG 33 17 3.8 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.475 lb ae/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A
16 Roundup PowerMax..glyphosate 16 Harmony Extra SG Premix 16 ----thifensulfuron 16 ----tribenuron 16 Banvel.....dicamba 16 Crop Oil Concentrate 16 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	4.5 AS 50 SG 33 17 4 L 100 L 100 L	1.13 lb ae/a 0.025 lb ai/a 0.0165 0.0085 0.25 lb ai/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A E_Spring A
17 Gramoxone SL....paraquat 17 2,4-D ester 17 Crop Oil Concentrate 2 Prior to Soybean Planting	2 SL 3.8 L 100 L	0.75 lb ai/a 0.475 lb ae/a 1.17 % v/v	E_Spring A E_Spring A E_Spring A
18 Roundup PowerMax..glyphosate 18 Liberty 280.....glufosinate 18 Dry Ammonium Sulfate 2 Prior to Soybean Planting	4.5 AS 2.34 SL 100 D	1.13 lb ae/a 0.79 lb ai/a 1.02 % w/v	E_Spring A E_Spring A E_Spring A
19 Roundup PowerMax..glyphosate 19 Liberty 280.....glufosinate 19 2,4-D ester 19 Dry Ammonium Sulfate 2 Prior to Soybean Planting	4.5 AS 2.34 SL 3.8 L 100 D	1.13 lb ae/a 0.79 lb ai/a 0.475 lb ae/a 1.02 % w/v	E_Spring A E_Spring A E_Spring A E_Spring A
20 Gramoxone SL....paraquat 20 Callisto.....mesotrione 20 Atrazine 4L 20 Crop Oil Concentrate 20 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	2 SL 4 SC 4 L 100 L 100 L	0.75 lb ai/a 0.094 lb ai/a 0.5 lb ai/a 1.17 % v/v 2.34 % v/v	E_Spring A E_Spring A E_Spring A E_Spring A E_Spring 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 Type, Code			C BRSNW	C BRSNW	C BRSNW
Crop Name			WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2
Rating Type			05/21/18	05/28/18	05/04/18
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code
11	Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A	
11	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
2	Prior to Soybean Planting				
12	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
12	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A	
12	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
2	Prior to Soybean Planting				
13	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
13	Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A	
13	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
2	Prior to Soybean Planting				
14	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
14	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A	
14	----thifensulfuron	33	0.0165		
14	----tribenuron	17	0.0085		
14	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
14	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
2	Prior to Soybean Planting				
15	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
15	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A	
15	----thifensulfuron	33	0.0165		
15	----tribenuron	17	0.0085		
15	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A	
15	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
15	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
2	Prior to Soybean Planting				
16	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
16	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A	
16	----thifensulfuron	33	0.0165		
16	----tribenuron	17	0.0085		
16	Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A	
16	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
16	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
2	Prior to Soybean Planting				
17	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A	
17	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A	
17	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
2	Prior to Soybean Planting				
18	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
18	Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A	
18	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
2	Prior to Soybean Planting				
19	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A	
19	Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	E_Spring A	
19	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A	
19	Dry Ammonium Sulfate	100 D	1.02 % w/v	E_Spring A	
2	Prior to Soybean Planting				
20	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A	
20	Callisto.....mesotrione	4 SC	0.094 lb ai/a	E_Spring A	
20	Atrazine 4L	4 L	0.5 lb ai/a	E_Spring A	
20	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A	
20	30% Urea Ammonium Nitrate	100 L	2.34 % v/v	E_Spring A	
2	Prior to Soybean Planting				

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

## University of Delaware

Crop Type, Code						C BRSNW	
Crop Name						WntrRape	
Rating Type						DryWght	
Rating Unit						g/0.25m <sup>2</sup>	
Rating Date						05/29/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
11	Liberty 280....glufosinate	2.34	SL	0.79	lb ai/a	E_Spring A	19.2453 a
11	Dry Ammonium Sulfate	100	D	1.02	% w/v	E_Spring A	
2	Prior to Soybean Planting						
12	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	E_Spring A	6.4473 a
12	2,4-D ester	3.8	L	0.475	lb ae/a	E_Spring A	
12	Dry Ammonium Sulfate	100	D	1.02	% w/v	E_Spring A	
2	Prior to Soybean Planting						
13	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	E_Spring A	5.5170 a
13	Banvel.....dicamba	4	L	0.25	lb ai/a	E_Spring A	
13	Dry Ammonium Sulfate	100	D	1.02	% w/v	E_Spring A	
2	Prior to Soybean Planting						
14	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	E_Spring A	8.1017 a
14	Harmony Extra SG Premix	50	SG	0.025	lb ai/a	E_Spring A	
14	----thifensulfuron	33		0.0165			
14	----tribenuron	17		0.0085			
14	Crop Oil Concentrate	100	L	1.17	% v/v	E_Spring A	
14	30% Urea Ammonium Nitrate	100	L	2.34	% v/v	E_Spring A	
2	Prior to Soybean Planting						
15	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	E_Spring A	9.7357 a
15	Harmony Extra SG Premix	50	SG	0.025	lb ai/a	E_Spring A	
15	----thifensulfuron	33		0.0165			
15	----tribenuron	17		0.0085			
15	2,4-D ester	3.8	L	0.475	lb ae/a	E_Spring A	
15	Crop Oil Concentrate	100	L	1.17	% v/v	E_Spring A	
15	30% Urea Ammonium Nitrate	100	L	2.34	% v/v	E_Spring A	
2	Prior to Soybean Planting						
16	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	E_Spring A	5.5493 a
16	Harmony Extra SG Premix	50	SG	0.025	lb ai/a	E_Spring A	
16	----thifensulfuron	33		0.0165			
16	----tribenuron	17		0.0085			
16	Banvel.....dicamba	4	L	0.25	lb ai/a	E_Spring A	
16	Crop Oil Concentrate	100	L	1.17	% v/v	E_Spring A	
16	30% Urea Ammonium Nitrate	100	L	2.34	% v/v	E_Spring A	
2	Prior to Soybean Planting						
17	Gramoxone SL....paraquat	2	SL	0.75	lb ai/a	E_Spring A	2.4513 a
17	2,4-D ester	3.8	L	0.475	lb ae/a	E_Spring A	
17	Crop Oil Concentrate	100	L	1.17	% v/v	E_Spring A	
2	Prior to Soybean Planting						
18	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	E_Spring A	7.8747 a
18	Liberty 280....glufosinate	2.34	SL	0.79	lb ai/a	E_Spring A	
18	Dry Ammonium Sulfate	100	D	1.02	% w/v	E_Spring A	
2	Prior to Soybean Planting						
19	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	E_Spring A	3.5720 a
19	Liberty 280....glufosinate	2.34	SL	0.79	lb ai/a	E_Spring A	
19	2,4-D ester	3.8	L	0.475	lb ae/a	E_Spring A	
19	Dry Ammonium Sulfate	100	D	1.02	% w/v	E_Spring A	
2	Prior to Soybean Planting						
20	Gramoxone SL....paraquat	2	SL	0.75	lb ai/a	E_Spring A	4.3990 a
20	Callisto.....mesotrione	4	SC	0.094	lb ai/a	E_Spring A	
20	Atrazine 4L	4	L	0.5	lb ai/a	E_Spring A	
20	Crop Oil Concentrate	100	L	1.17	% v/v	E_Spring A	
20	30% Urea Ammonium Nitrate	100	L	2.34	% v/v	E_Spring A	
2	Prior to Soybean Planting						

Means followed by same letter 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 BRSNW	C BRSNW	C BRSNW						
Crop Name	WntrRape Control %	WntrRape Control %	WntrRape Control %						
Rating Type	04/23/18	05/03/18	05/11/18						
Rating Unit									
Rating Date									
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
21 Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A		.		56.7 mno	56.7 lmn	
21 Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A						
21 ----thifensulfuron	33	0.0165							
21 ----tribenuron	17	0.0085							
21 Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A						
21 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L	2.34 % v/v	E_Spring A						
22 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A		.		66.7 jk	77.7 g	
22 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A						
22 Methylated Seed Oil	100 L	1 % v/v	E_Spring A						
22 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L	2.34 % v/v	E_Spring A						
23 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A		.		60.0 lmn	78.7 g	
23 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A						
23 2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A						
23 Methylated Seed Oil	100 L	1 % v/v	E_Spring A						
23 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L	2.34 % v/v	E_Spring A						
24 Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A		.		61.7 klm	66.7 ijk	
24 Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A						
24 Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A						
24 Methylated Seed Oil	100 L	1 % v/v	E_Spring A						
24 30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L	2.34 % v/v	E_Spring A						
LSD P=.05					8.09		6.64		7.05
Standard Deviation					4.94		4.10		4.35
CV					8.58		6.36		6.49

Means followed by same letter 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 BRSNW	C BRSNW	C BRSNW
						WntrRape Control %	WntrRape Control %	WntrRape DryWght g/0.25m2
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing			
21	Gramoxone SL....paraquat	2 SL	0.75 lb ai/a	E_Spring A		79.7 a	63.3 a	.
21	Harmony Extra SG Premix	50 SG	0.025 lb ai/a	E_Spring A				
21	----thifensulfuron	33	0.0165					
21	----tribenuron	17	0.0085					
21	Crop Oil Concentrate	100 L	1.17 % v/v	E_Spring A				
21	30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L	2.34 % v/v	E_Spring A				
22	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A		85.0 a	68.3 a	.
22	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A				
22	Methylated Seed Oil	100 L	1 % v/v	E_Spring A				
22	30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L	2.34 % v/v	E_Spring A				
23	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A		98.0 a	99.0 a	.
23	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A				
23	2,4-D ester	3.8 L	0.475 lb ae/a	E_Spring A				
23	Methylated Seed Oil	100 L	1 % v/v	E_Spring A				
23	30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L	2.34 % v/v	E_Spring A				
24	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	E_Spring A		97.3 a	81.7 a	.
24	Sharpen.....saflufenacil	2.85 SC	0.0445 lb ai/a	E_Spring A				
24	Banvel.....dicamba	4 L	0.25 lb ai/a	E_Spring A				
24	Methylated Seed Oil	100 L	1 % v/v	E_Spring A				
24	30% Urea Ammonium Nitrate 2 Prior to Soybean Planting	100 L	2.34 % v/v	E_Spring A				
LSD P=.05						6.51	10.18	15.87286
Standard Deviation						3.98	6.22	9.68338
CV						5.36	8.95	217.91496

Means followed by same letter 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 Crop Name Rating Type Rating Unit Rating Date		C BRSNW WntrRape DryWght g/0.25m <sup>2</sup> 05/29/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
21	Gramoxone SL....paraquat	2 SL		0.75 lb ai/a	E	Spring A	
21	Harmony Extra SG Premix	50 SG		0.025 lb ai/a	E	Spring A	
21	----thifensulfuron	33		0.0165			
21	----tribenuron	17		0.0085			
21	Crop Oil Concentrate	100 L		1.17 % v/v	E	Spring A	
21	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	
2	Prior to Soybean Planting						
22	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	
22	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A	
22	Methylated Seed Oil	100 L		1 % v/v	E	Spring A	
22	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	
2	Prior to Soybean Planting						
23	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	
23	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A	
23	2,4-D ester	3.8 L		0.475 lb ae/a	E	Spring A	
23	Methylated Seed Oil	100 L		1 % v/v	E	Spring A	
23	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	
2	Prior to Soybean Planting						
24	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	E	Spring A	
24	Sharpen.....saflufenacil	2.85 SC		0.0445 lb ai/a	E	Spring A	
24	Banvel.....dicamba	4 L		0.25 lb ai/a	E	Spring A	
24	Methylated Seed Oil	100 L		1 % v/v	E	Spring A	
24	30% Urea Ammonium Nitrate	100 L		2.34 % v/v	E	Spring A	
2	Prior to Soybean Planting						
LSD P=.05							19.55618
Standard Deviation							11.94652
CV							135.71349

Means followed by same letter 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 BRSNW WntrRape Control % 04/23/18 Missing factor B levels prevents analyzing column 1 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	83	53514.988095			
Replicate	2	64.380952	32.190476	1.318	0.2762
Treatment	27	52131.654762	1930.802028	79.050	0.0001
ERROR	54	1318.952381	24.425044		

FACTORIAL/POOLED ERROR AOV For C BRSNW WntrRape Control % 05/03/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	143	60744.638889				
R	2	284.263889	142.131944	8.472	0.0004	
A	23	27665.305556	1202.839372	71.694	0.0001	4.7
B	1	23562.250000	23562.250000	1404.410	0.0001	1.4
AB	23	7655.750000	332.858696	19.840	0.0001	6.6
ERROR	94	1577.069444	16.777335			

FACTORIAL/POOLED ERROR AOV For C BRSNW WntrRape Control % 05/11/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	143	60310.993056				
R	2	266.513889	133.256944	7.055	0.0014	
A	23	40395.159722	1756.311292	92.985	0.0001	5.0
B	1	10833.340278	10833.340278	573.552	0.0001	1.4
AB	23	7040.493056	306.108394	16.206	0.0001	7.0
ERROR	94	1775.486111	18.888150			

Randomized Complete Block (RCB) AOV For C BRSNW WntrRape Control % 05/21/18 Missing factor B levels prevents analyzing column 4 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	83	86918.702381			
Replicate	2	193.166667	96.583333	6.106	0.0041
Treatment	27	85871.369048	3180.421076	201.065	0.0001
ERROR	54	854.166667	15.817901		

Randomized Complete Block (RCB) AOV For C BRSNW WntrRape Control % 05/28/18 Missing factor B levels prevents analyzing column 5 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	83	90232.952381			
Replicate	2	125.309524	62.654762	1.620	0.2073
Treatment	27	88019.619048	3259.985891	84.309	0.0001
ERROR	54	2088.023810	38.667108		

Randomized Complete Block (RCB) AOV For C BRSNW WntrRape DryWght g/0.25m2 05/04/18 Missing factor B levels prevents analyzing column 6 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	80	32999.651514			
Replicate	2	272.099452	136.049726	1.451	0.2439
Treatment	27	27945.388526	1035.014390	11.038	0.0001
ERROR	51	4782.163536	93.767912		

Randomized Complete Block (RCB) AOV For C BRSNW WntrRape DryWght g/0.25m2 05/29/18 Missing factor B levels prevents analyzing column 7 as Factorial design

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	83	45533.795341			
Replicate	2	1040.174765	520.087383	3.644	0.0328
Treatment	27	36786.778286	1362.473270	9.547	0.0001
ERROR	54	7706.842290	142.719302		

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

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

**Cereal Rye Management for Weed Control**

Trial ID: Cover8-18      Location: REC Fld #34      Trial Year: 2016  
 Protocol ID: Cover8-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

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

Variety: VNS

Planting Date: 10/20/17	Planting Rate: 120 LB/A
Rows per Plot: 16	Planting Method: DRILLE drilled
Row Spacing: 7 IN	Planting Equipment: FE Field Equipment
Emergence Date: 10/27/17	

**Site and Design**

Treated Plot Width: 6 FT	Site Type: FIELD field
Treated Plot Length: 20 FT	
Treated Plot Area: 120 FT <sup>2</sup>	Tillage Type: NOTILL no-till
Treatments: 9	Study Design: SPLPLO Split-Plot
Replications: 3	

**Soil Description**

Description Name: Field 34			
% Sand: 79	% OM: 1.6	Texture: SL	sandy loam
% Silt: 10	pH: 6.7	Soil Name: Hammonton loamy sand, 0-2% slopes	
% Clay: 11	CEC: 6.1	Fert. Level: G	good
Soil Drainage: F	fair		

**Application Description**

	A	B	C
Application Date	10/20/17	10/23/17	03/09/18
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	Preplant	Fall	EaSpring
Application Placement	BROADC	BROADC	BROADC

**Application Equipment**

	A	B	C
Appl. Equipment	Bckpck6Nozl	Bckpck6Nozl	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	9 ft	9 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
Propellant	COMCO2	COMCO2	COMCO2

### Trial Comments

10/23/17: Nitrogen was applied by hand over the plots receiving fall N applications

05/01/18: Not much observed difference between 40 or 60 lbs N. Spring N is much more responsive than fall N.

05/23/18: cover crop biomass taken.

05/29/18: Weeds density and growth was similar for all plots with no fall glyphosate treatment.

Cereal Rye Management for Weed Control					
Trial ID: Cover8-18		Location: REC Fld #34		Trial Year: 2016	
Protocol ID: Cover8-18		Investigator: Mark VanGessel			
Study Director:					
Sponsor Contact:					
Crop Type, Code				C SECCE	
Crop Name				Rye	
Rating Type				DryWght	
Rating Unit				g/0.5m <sup>2</sup>	
Rating Date				05/23/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
1	Glyphosate Pre-Plant	4.5 AS	1.13 lb ae/a	Preplant	A
	Roundup PowerMax..glyphosate				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	Preplant	A
	30% Urea Ammonium Nitrate	3.25 L	40 lb ai/a	EaSpring	C
2	Glyphosate Pre-Plant	4.5 AS	1.13 lb ae/a	Preplant	A
	Roundup PowerMax..glyphosate				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	Preplant	A
	30% Urea Ammonium Nitrate	3.25 L	60 lb ai/a	EaSpring	C
3	Glyphosate Pre-Plant	4.5 AS	1.13 lb ae/a	Preplant	A
	Roundup PowerMax..glyphosate				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	Preplant	A
	No Nitrogen				
4	Untreated Check				210.7 a
	30% Urea Ammonium Nitrate	3.25 L	40 lb ai/a	EaSpring	C
5	Untreated Check				237.3 a
	30% Urea Ammonium Nitrate	3.25 L	60 lb ai/a	EaSpring	C
6	Untreated Check				169.0 a
	No Nitrogen				
7	Glyphosate Pre-Plant				214.7
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Preplant	A
	Dry Ammonium Sulfate	100 D	1.02 % w/v	Preplant	A
	30% Urea Ammonium Nitrate	3.25 L	40 lb ai/a	Fall	B
8	Glyphosate Pre-Plant				223.0
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	Preplant	A
	Dry Ammonium Sulfate	100 D	1.02 % w/v	Preplant	A
	30% Urea Ammonium Nitrate	3.25 L	60 lb ai/a	Fall	B
9	No Fall Glyphosate				222.0
	30% Urea Ammonium Nitrate	3.25 L	60 lb ai/a	Fall	B
LSD P=.05					95.26
Comp. Trt. LSD					85.99
Standard Deviation					50.60
CV					22.32
Replicate F					3.868
Replicate Prob(F)					0.0668
Treatment F					2.049
Treatment Prob(F)					0.1651

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.

Cereal Rye Management for Weed Control Trial ID: Cover8-18      Location: REC Fld #34      Trial Year: 2016 Protocol ID: Cover8-18      Investigator: Mark VanGessel Study Director: Sponsor Contact:					
Crop Type, Code Crop Name Rating Type Rating Unit Rating Date					
C SECCE Rye DryWght g/0.5m <sup>2</sup> 05/23/18					
Trt Treatment No. Name      Form Form      Rate Appl Appl Conc Type Rate Unit      Timing Code					
TABLE OF R MEANS					
Replicate 1      273.5					
Replicate 2      217.7					
Replicate 3      199.0					
TABLE OF A (Glyphosate PP) MEANS					
1 Glyphosate Pre-Plant      254.4 a					
1 Roundup PowerMax..glyphosate      4.5 AS 1 Dry Ammonium Sulfate      100 D      1.13 lb ae/a Preplant A 1.02 % w/v Preplant A					
2 Untreated Check      205.7 a					
LSD P=.05      55.02					
Standard Deviation      52.38					
CV      22.77					
TABLE OF B (Nitrogen) MEANS					
1 30% Urea Ammonium Nitrate      3.25 L      40 lb ai/a EaSpring C      243.5 ab					
2 30% Urea Ammonium Nitrate      3.25 L      60 lb ai/a EaSpring C      270.2 a					
3 No Nitrogen      176.5 b					
LSD P=.05      67.39					
Standard Deviation      52.38					
CV      22.77					
TABLE OF A (Glyphosate PP) B (Nitrogen) MEANS					
1 Glyphosate Pre-Plant      276.3 a					
1 Roundup PowerMax..glyphosate      4.5 AS      1.13 lb ae/a Preplant A 1 Dry Ammonium Sulfate      100 D      1.02 % w/v Preplant A 1 30% Urea Ammonium Nitrate      3.25 L      40 lb ai/a EaSpring C					
2 Untreated Check      210.7 a					
1 30% Urea Ammonium Nitrate      3.25 L      40 lb ai/a EaSpring C					
1 Glyphosate Pre-Plant      303.0 a					
1 Roundup PowerMax..glyphosate      4.5 AS      1.13 lb ae/a Preplant A 1 Dry Ammonium Sulfate      100 D      1.02 % w/v Preplant A 2 30% Urea Ammonium Nitrate      3.25 L      60 lb ai/a EaSpring C					
2 Untreated Check      237.3 a					
2 30% Urea Ammonium Nitrate      3.25 L      60 lb ai/a EaSpring C					
1 Glyphosate Pre-Plant      184.0 a					
1 Roundup PowerMax..glyphosate      4.5 AS      1.13 lb ae/a Preplant A 1 Dry Ammonium Sulfate      100 D      1.02 % w/v Preplant A 3 No Nitrogen					
2 Untreated Check      169.0 a					
3 No Nitrogen					
LSD P=.05      95.30					
Standard Deviation      52.38					
CV      22.77					

Means followed by same letter 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 SECCE Rye DryWght g/0.5m <sup>2</sup> 05/23/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	17	86692.944444				
R	2	18032.111111	9016.055556	3.286	0.0800	
A	1	10706.722222	10706.722222	3.902	0.0765	55.0
B	2	27947.111111	13973.555556	5.092	0.0298	67.4
AB	2	2567.111111	1283.555556	0.468	0.6394	95.3
ERROR	10	27439.888889	2743.988889			

Means followed by same letter 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: Cover9a-18      Location: Field #34      Trial Year: 2017  
 Protocol ID: Cover9-18      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: 01/16/20

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: 01/16/20

Variety: VNS

Planting Date: 09/21/17

Rows per Plot: 16

Row Spacing: 7 IN

Emergence Date: 09/27/17

Planting Method: DRILLE drilled

Planting Equipment: FE Field Equipment

**Site and Design**

Treated Plot Width: 5 FT

Treated Plot Length: 20 FT

Treated Plot Area: 100 FT<sup>2</sup> Treatments: 8

Replications: 4

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 34

% Sand: 79	% OM: 1.6	Texture: SL	sandy loam
% Silt: 10	pH: 6.7	Soil Name: Hammonton loamy sand, 0-2% slopes	
% Clay: 11	CEC: 6.1	Fert. Level: G	good
Soil Drainage: F		fair	

## Trial Comments

05/01/18: Rep 1 and 2 look good, but reps 3 and 4 all the cover crops are smaller and less vigorous

Treatment 4 (rye 55 lb and crimson clover 15 lbs) looks to be the best ratio.

05/29/18: Site had no nitrogen applied or any left from previous crop. Biomass production looks simliar for both rates of rye alone. Almost complete ground cover with all mixes of rye and crimson clover.

80:10 had thin plants of crimson clover, but good ground cover

55:15 best mix of crimson clover and rye

30:20 looks similar to 55:15 but not as much rye biomass

20:10 and 20:5 both look similar not much difference

06/01/18: cover crop biomass taken. 5 treatments only.

## Comparison of Cover Crop Seeding Rate and Ratio

Trial ID: Cover9a-18

Location: Field #34

Trial Year: 2017

Protocol ID: Cover9-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code Description Rating Type Rating Unit Rating Date	C - CovrCrop Canopeo	C SECCE Rye Dry Wght g/0.5m <sup>2</sup> 06/01/18	C TRFIN CrmsnClvr Dry Wght g/0.5m <sup>2</sup> 06/01/18
Trt Treatment No. Name			
1 Cereal Rye 112 lbs/A	28.485 cd	170.5 a	
2 Cereal Rye 80 lbs/A	27.340 d	151.3 a	
3 Cereal Rye 80 lbs/A Crimson Clover 10 lbs/A	37.133 bcd	140.0 a	88.8 a
4 Cereal Rye 55 lbs/A Crimson Clover 15 lbs/A	43.285 abc	119.8 a	93.3 a
5 Cereal Rye 30 lbs/A Crimson Clover 20 lbs/A	51.520 ab	104.0 a	152.8 a
6 Crimson Clover 20 lbs/A Tillage Radish 10 lbs/A	53.193 a		
7 Crimson Clover 20 lbs/A Tillage Radish 5 lbs/A	56.693 a		
8 Cereal Rye 80 lbs/A Tillage Radish 5 lbs/A	27.888 d		
LSD P=.05	15.2955	82.44	116.50
Standard Deviation	10.4015	53.51	67.33
CV	25.56	39.03	60.34
Replicate F	19.288	12.575	2.369
Replicate Prob(F)	0.0001	0.0005	0.1697
Treatment F	5.494	0.950	1.126
Treatment Prob(F)	0.0011	0.4688	0.3844

Means followed by same letter 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: Cover10a-18      Location: Field #34      Trial Year: 2017  
Protocol ID: Cover10-18      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

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](mailto:mjv@udel.edu)

Country: USA United States

**Cooperator/Landowner****Other Contacts****Soil Description**

Description Name: Field 34

% Sand: 79	% OM: 1.6	Texture: SL	sandy loam
% Silt: 10	pH: 6.7	Soil Name: Hammonton loamy sand, 0-2% slopes	
% Clay: 11	CEC: 6.1	Fert. Level: G	good
Soil Drainage: F	fair		

**Trial Comments**

Cover crop plant dates: 09/21/17, 10/20/17, and mid-Nov 2017.

05/01/18: No vetch in November planted plots. Winter peas only legume to establish in Nov. but not much biomass yet. Oct. crimson clover + winter peas look to be more robust than hairy vetch. Reps 3&4 heavy deer feeding/ poorer stands.

05/29/18: September planting: higher biomass with high rate of Austrian winter peas and hairy vetch. Not as much of a difference between seeding rates with crimson clover. October planting: not much of a difference in legume biomass between seeding rates for all three species. November planting: almost no growth of crimson clover; higher seeding rate of hairy vetch look better than lower rate.

Cover Crop Legume Selection for Different Planting Dates			
Trial ID: Cover10a-18	Location: Field #34	Trial Year: 2017	
Protocol ID: Cover10-18	Investigator: Mark VanGessel		
Study Director:			
Sponsor Contact:			
Crop Name Rating Type	CovrCrop Canapeo		
Trt Treatment No. Name			
1 Plant September Rye+Austrian Winter Peas Low Seeding Rates 60 lbs rye + low legume rate	40.585 b-e		
2 Plant September Rye+Austrian Winter Peas High Seeding Rates 30 lbs rye + high legume rate	51.573 ab		
3 Plant September Rye+Crimson Clover Low Seeding Rates 60 lbs rye + low legume rate	50.300 abc		
4 Plant September Rye+Crimson Clover High Seeding Rates 30 lbs rye + high legume rate	57.470 a		
5 Plant September Rye+Hairy Vetch Low Seeding Rates 60 lbs rye + low legume rate	40.275 b-e		
6 Plant September Rye+Hairy Vetch High Seeding Rates 30 lbs rye + high legume rate	35.723 b-f		
7 Plant October Rye+Austrian Winter Peas Low Seeding Rates 60 lbs rye + low legume rate	29.748 d-h		
8 Plant October Rye+Austrian Winter Peas High Seeding Rates 30 lbs rye + high legume rate	29.148 d-i		
9 Plant October Rye+Crimson Clover Low Seeding Rates 60 lbs rye + low legume rate	38.700 b-e		
10 Plant October Rye+Crimson Clover High Seeding Rates 30 lbs rye + high legume rate	44.870 a-d		
11 Plant October Rye+Hairy Vetch Low Seeding Rates 60 lbs rye + low legume rate	34.745 c-g		
12 Plant October Rye+Hairy Vetch High Seeding Rates 30 lbs rye + high legume rate	28.065 e-i		

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:Average=1

Crop Name	CovrCrop
Rating Type	Canapeo
Trt Treatment No. Name	
13 Plant November Rye+Austrian Winter Peas Low Seeding Rates 60 lbs rye + low legume rate	13.130 ij
14 Plant November Rye+Austrian Winter Peas High Seeding Rates 30 lbs rye + high legume rate	16.287 hij
15 Plant November Rye+Crimson Clover Low Seeding Rates 60 lbs rye + low legume rate	19.915 f-j
16 Plant November Rye+Crimson Clover High Seeding Rates 30 lbs rye + high legume rate	17.913 hij
17 Plant November Rye+Hairy Vetch Low Seeding Rates 60 lbs rye + low legume rate	18.547 g-j
18 Plant November Rye+Hairy Vetch High Seeding Rates 30 lbs rye + high legume rate	11.013 j
LSD P=.05	16.2688
Standard Deviation	11.0297
CV	34.35
Replicate F	4.069
Replicate Prob(F)	0.0208
Treatment F	6.456
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.

Missing data estimates are included in columns:Average=1

## Cover Crop Legume Selection for Different Planting Dates

Trial ID: Cover10a-18

Location: Field #34

Trial Year: 2017

Protocol ID: Cover10-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Name	CovrCrop
Rating Type	Canapeo
Trt Treatment No. Name	
TABLE OF R MEANS	
Replicate 1	34.562
Replicate 2	38.318
Replicate 3	27.281
Replicate 4	28.284
TABLE OF A (Planting Dates) MEANS	
1 Plant September	45.988 a
2 Plant October	34.213 b
3 Plant November	16.134 c
LSD P=.05	7.7704
Standard Deviation	13.3560
CV	41.5928
TABLE OF B (Legume Species) MEANS	
1 Rye+Austrian Winter Peas	30.078 b
2 Rye+Crimson Clover	38.195 a
3 Rye+Hairy Vetch	28.061 b
LSD P=.05	7.7704
Standard Deviation	13.3560
CV	41.5928
TABLE OF C (Seeding Rates) MEANS	
1 Low Seeding Rates	31.772 a
1 60 lbs rye + low legume rate	
2 High Seeding Rates	32.451 a
2 30 lbs rye + high legume rate	
LSD P=.05	6.3445
Standard Deviation	13.3560
CV	41.5928
TABLE OF A (Planting Dates) B (Legume Species) MEANS	
1 Plant September	46.079 a
1 Rye+Austrian Winter Peas	
2 Plant October	29.448 a
1 Rye+Austrian Winter Peas	
3 Plant November	14.708 a
1 Rye+Austrian Winter Peas	
1 Plant September	53.885 a
2 Rye+Crimson Clover	
2 Plant October	41.785 a
2 Rye+Crimson Clover	
3 Plant November	18.914 a
2 Rye+Crimson Clover	
1 Plant September	37.999 a
3 Rye+Hairy Vetch	
2 Plant October	31.405 a
3 Rye+Hairy Vetch	
3 Plant November	14.780 a
3 Rye+Hairy Vetch	

Means followed by same letter 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	CovrCrop
Rating Type	Canapeo
Trt Treatment No. Name	
LSD P=.05	13.4587
Standard Deviation	13.3560
CV	41.5928
TABLE OF A (Planting Dates) C (Seeding Rates) MEANS	
1 Plant September	43.720 a
1 Low Seeding Rates	
1 60 lbs rye + low legume rate	
2 Plant October	34.398 a
1 Low Seeding Rates	
1 60 lbs rye + low legume rate	
3 Plant November	17.197 a
1 Low Seeding Rates	
1 60 lbs rye + low legume rate	
1 Plant September	48.255 a
2 High Seeding Rates	
2 30 lbs rye + high legume rate	
2 Plant October	34.028 a
2 High Seeding Rates	
2 30 lbs rye + high legume rate	
3 Plant November	15.071 a
2 High Seeding Rates	
2 30 lbs rye + high legume rate	
LSD P=.05	10.9890
Standard Deviation	13.3560
CV	41.5928
TABLE OF B (Legume Species) C (Seeding Rates) MEANS	
1 Rye+Austrian Winter Peas	27.821 a
1 Low Seeding Rates	
1 60 lbs rye + low legume rate	
2 Rye+Crimson Clover	36.305 a
1 Low Seeding Rates	
1 60 lbs rye + low legume rate	
3 Rye+Hairy Vetch	31.189 a
1 Low Seeding Rates	
1 60 lbs rye + low legume rate	
1 Rye+Austrian Winter Peas	32.336 a
2 High Seeding Rates	
2 30 lbs rye + high legume rate	
2 Rye+Crimson Clover	40.084 a
2 High Seeding Rates	
2 30 lbs rye + high legume rate	
3 Rye+Hairy Vetch	24.934 a
2 High Seeding Rates	
2 30 lbs rye + high legume rate	
LSD P=.05	10.9890
Standard Deviation	13.3560
CV	41.5928
TABLE OF A (Planting Dates) B (Legume Species) C (Seeding Rates) MEANS	
1 Plant September	40.585 a
1 Rye+Austrian Winter Peas	
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	CovrCrop
Rating Type	Canapeo
Trt Treatment No. Name	
2 Plant October 1 Rye+Austrian Winter Peas 1 Low Seeding Rates 1 60 lbs rye + low legume rate	29.748 a
3 Plant November 1 Rye+Austrian Winter Peas 1 Low Seeding Rates 1 60 lbs rye + low legume rate	13.130 a
1 Plant September 2 Rye+Crimson Clover 1 Low Seeding Rates 1 60 lbs rye + low legume rate	50.300 a
2 Plant October 2 Rye+Crimson Clover 1 Low Seeding Rates 1 60 lbs rye + low legume rate	38.700 a
3 Plant November 2 Rye+Crimson Clover 1 Low Seeding Rates 1 60 lbs rye + low legume rate	19.915 a
1 Plant September 3 Rye+Hairy Vetch 1 Low Seeding Rates 1 60 lbs rye + low legume rate	40.275 a
2 Plant October 3 Rye+Hairy Vetch 1 Low Seeding Rates 1 60 lbs rye + low legume rate	34.745 a
3 Plant November 3 Rye+Hairy Vetch 1 Low Seeding Rates 1 60 lbs rye + low legume rate	18.547 a
1 Plant September 1 Rye+Austrian Winter Peas 2 High Seeding Rates 2 30 lbs rye + high legume rate	51.573 a
2 Plant October 1 Rye+Austrian Winter Peas 2 High Seeding Rates 2 30 lbs rye + high legume rate	29.148 a
3 Plant November 1 Rye+Austrian Winter Peas 2 High Seeding Rates 2 30 lbs rye + high legume rate	16.287 a
1 Plant September 2 Rye+Crimson Clover 2 High Seeding Rates 2 30 lbs rye + high legume rate	57.470 a
2 Plant October 2 Rye+Crimson Clover 2 High Seeding Rates 2 30 lbs rye + high legume rate	44.870 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	CovrCrop
Rating Type	Canapeo
Trt Treatment No. Name	
3 Plant November 2 Rye+Crimson Clover 2 High Seeding Rates 2 30 lbs rye + high legume rate	17.913 a
1 Plant September 3 Rye+Hairy Vetch 2 High Seeding Rates 2 30 lbs rye + high legume rate	35.723 a
2 Plant October 3 Rye+Hairy Vetch 2 High Seeding Rates 2 30 lbs rye + high legume rate	28.065 a
3 Plant November 3 Rye+Hairy Vetch 2 High Seeding Rates 2 30 lbs rye + high legume rate	11.013 a
LSD P=.05	19.0334
Standard Deviation	13.3560
CV	41.5928

Means followed by same letter 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 CovrCrop Canapeo 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	64	22686.620989				
R	3	1485.090375	495.030125	2.775	0.0524	
A	2	10853.586178	5426.793089	30.422	0.0001	7.770
B	2	1381.066779	690.533389	3.871	0.0283	7.770
AB	4	424.726541	106.181635	0.595	0.6679	13.459
C	1	8.314136	8.314136	0.047	0.8301	6.344
AC	2	143.026705	71.513352	0.401	0.6721	10.989
BC	2	434.458367	217.229183	1.218	0.3057	10.989
ABC	4	107.466667	26.866667	0.151	0.9617	19.033
ERROR	44	7848.885242	178.383755			

Means followed by same letter 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: Cover11a-18      Location: Field #34      Trial Year: 2017  
 Protocol ID: Cover11-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Crop Name Rating Type	Cover Crop Canapeo
Trt Treatment No. Name	
1 Annual Ryegrass	12.040 cde
2 Winter Barley	9.910 de
3 Cereal Rye	27.473 b
4 Winter Wheat	25.605 b
5 Triticale	
6 Crimson Clover	51.960 a
7 Hairy Vetch	22.550 bc
8 Kale	11.213 cde
9 Spring Oats	4.895 e
10 Austrian Winter Peas	49.165 a
11 Winter Rape	9.015 de
12 Forage Radish	9.770 de
13 Forage Turnip	20.018 bcd
LSD P=.05	11.9486
Standard Deviation	8.3056
CV	39.3
Replicate F	0.871
Replicate Prob(F)	0.4658
Treatment F	13.949
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.

**Comparison of Various Cover Crop Species**

Trial ID: Cover11b-18 Location: Marl Pit Rd Trial Year: 2017  
Protocol ID: Cover11-18 Investigator: Mark VanGessel  
Project ID: Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Trial Status: E established

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**

Variety: Varieties not recorded

Attributes: All cover crops planted same day

Planting Date: 09/22/17

Rows per Plot: 16

Row Spacing: 7 IN

Emergence Date: 09/28/17

Planting Method: DRILLE drilled

Planting Equipment: FE Field Equipment

**Site and Design**

Treated Plot Width: 5 FT

Site Type: FIELD field

Treated Plot Length: 20 FT

Treated Plot Area: 100 FT<sup>2</sup>

Tillage Type: NOTILL no-till

Treatments: 13

Study Design: RACOBL Randomized Complete Block (RCB)

Replications: 3

**Trial Comments**

## Comparison of Various Cover Crop Species

Trial ID: Cover11b-18 Location: Marl Pit Rd Trial Year: 2017  
 Protocol ID: Cover11-18 Investigator: Mark VanGessel  
 Project ID: Study Director:  
 Sponsor Contact:

Crop Name Rating Type	Cover Crop Canopeo
Trt Treatment No. Name	
1 Annual Ryegrass	77.867 abc
2 Winter Barley	74.657 bcd
3 Cereal Rye	79.860 abc
4 Winter Wheat	77.667 abc
5 Triticale	
6 Crimson Clover	83.100 ab
7 Hairy Vetch	91.800 a
8 Kale	50.840 e
9 Spring Oats	10.637 f
10 Austrian Winter Peas	60.090 de
11 Winter Rape	65.927 cd
12 Forage Radish	11.610 f
13 Forage Turnip	73.650 bcd
LSD P=.05	14.6823
Standard Deviation	8.6707
CV	13.73
Replicate F	1.108
Replicate Prob(F)	0.3478
Treatment F	28.116
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.

**Early-Season Weed Control in No-Till Winter Wheat**

Trial ID: SG1-18

Location: Field #28

Trial Year: 2017

Protocol ID: SG1-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 08/01/17

Completion Date: 06/30/18

**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

Variety: Shirley

Planting Date: 10/17/17

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: 60 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 10/25/17

Soil Moisture: NORMAL normal, adequate

Harvest Date: 07/03/18

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

**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: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

## Trial Initiation Comments:

Study area was turbo-tilled two times on 10-05-17 prior to planting.

## Field Prep./Maintenance:

Broadcast preplant burndown application Gramoxone 2SL 2 qt/A + NIS on 10-09-17.

**Soil Description**

Description Name: Field 28

% Sand: 81

Texture: SL

sandy loam

% Silt: 2

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

% Clay: 17

Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	10/10/17	10/18/17	10/23/17
Appl. Stop Time	01:30 PM	10:30 AM	11:55 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	7DPP	PRE	Spike
Application Placement	BROADC	BROADC	BROADC
Applied By	VanGessl	VanGessl	VanGessl
Air Temperature Start, Stop	82 F	58 F	74 F
% Relative Humidity Start, Stop	67	70	70
Wind Velocity+Dir. Start	1 mph NE	2 mph W	6 mph SE
Wet Leaves (Y/N)	N no	Y yes	Y yes
Soil Temperature	82 F	58 F	73 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	35	10	100

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER	TRZAW BCER
Stage Scale Used			DESC
Stage Majority, Percent			spike 100
Height Average			1.5 in

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	LAMAM W	LAMAM W	LAMAM W
Stage Majority, Percent			cot 100
Height Average			0.2 in
Density Average			10 m2

**Application Equipment**

	A	B	C
Appl. Equipment	Backpack	Backpack	Backpack
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	9 ft	9 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
Propellant	COMCO2	COMCO2	COMCO2

**SE Definitions**

	1.
Crop Type, Code	C

**Early-Season Weed Control in No-Till Winter Wheat**

Trial ID: SG1-18

Location: Field #28

Trial Year: 2017

Protocol ID: SG1-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**Trial Comments**

10/10/17: Large amounts of residue in plots from corn and fall panicum residue. All residue dead.

10/23/17: Approx. 25% of wheat emerged. Very trashy, ~80% ground cover from residue.

04/18/18: Lots of crop/weed residue in plots 108, 309 that interfered with control. Poor control of both henbit and jagged chickweed in 108,205 and 309. Only treatment with crop injury was trt 8 - stand loss in the plots.

05/07/18: Stunting in plots 109, 204.

Early-Season Weed Control in No-Till Winter Wheat						
Trial ID: SG1-18	Location: Field #28	Trial Year: 2017				
Protocol ID: SG1-18	Investigator: Mark VanGessel					
Study Director:						
Sponsor Contact:						
Pest Code		HLOUM	LAMAM			
Pest Name	JagChkwrd	Henbit				
Crop Type, Code	C -	C -	C	TRZAW		
Crop Name						
Rating Type		Control	Control			
Rating Unit	%	%	%			
Rating Date	04/18/18	04/18/18	05/07/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Untreated Check					
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
2	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	7 DPP	A	
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	7 DPP	A	
3	Sharpen.....saflufenacil	2.85 SC	0.067 lb ai/a	PRE	B	
	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
	Methylated Seed Oil	100 L	1 % v/v	PRE	B	
4	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
	Zidua.....pyroxasulfone	4.17 SC	0.053 lb ai/a	Spike	C	
5	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
	Zidua.....pyroxasulfone	4.17 SC	0.08 lb ai/a	Spike	C	
6	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
	Anthem Flex Premix	4 SE	0.084 lb ai/a	Spike	C	
	----pyroxasulfone	3.733	0.0784			
	----carfentrazone	0.267	0.0056			
7	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
	Axiom Premix	68 WG	0.17 lb ai/a	Spike	C	
	----flufenacet	54	0.135			
	----metribuzin	14	0.035			
	Nonionic Surfactant	100 L	0.25 % v/v	Spike	C	
8	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
	Axiom Premix	68 WG	0.255 lb ai/a	Spike	C	
	----flufenacet	54	0.202			
	----metribuzin	14	0.0525			
	Nonionic Surfactant	100 L	0.25 % v/v	Spike	C	
9	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
	Anthem Flex Premix	4 SE	0.084 lb ai/a	Spike	C	
	----pyroxasulfone	3.733	0.0784			
	----carfentrazone	0.267	0.0056			
	Nonionic Surfactant	100 L	0.25 % v/v	Spike	C	
10	Roundup WeatherMax..glyphosate	4.5 AS	0.77 lb ae/a	PRE	B	
	Zidua.....pyroxasulfone	4.17 SC	0.053 lb ai/a	Spike	C	
	Metribuzin.....metribuzin	75 DF	0.0525 lb ai/a	Spike	C	
LSD P=.05				16.91	21.56	4.45
Standard Deviation				9.77	11.85	2.60
CV				22.89	19.21	80.32
Replicate F				1.083	0.687	0.835
Replicate Prob(F)				0.3622	0.5251	0.4499
Treatment F				8.679	23.188	19.814
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=1,2

Pest Code		HLOUM							
Pest Name	JagChkwrd	C - C	TRZAW						
Crop Type, Code									
Crop Name									
Rating Type									
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 f	33.7 bcd
	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B		
2	Valor SX.....flumioxazin	51 WG		0.064 lb	ai/a	7 DPP	A	26.7 de	27.7 de
	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	7 DPP	A		
3	Sharpen.....saflufenacil	2.85 SC		0.067 lb	ai/a	PRE	B	23.3 e	33.4 bcd
	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B		
	Methylated Seed Oil	100 L		1 %	v/v	PRE	B		
4	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B	36.7 cd	32.8 bcd
	Zidua.....pyroxasulfone	4.17 SC		0.053 lb	ai/a	Spike	C		
5	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B	56.7 a	41.6 a
	Zidua.....pyroxasulfone	4.17 SC		0.08 lb	ai/a	Spike	C		
6	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B	63.3 a	29.7 cde
	Anthem Flex Premix	4 SE		0.084 lb	ai/a	Spike	C		
	----pyroxasulfone	3.733		0.0784					
	----carfentrazone	0.267		0.0056					
7	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B	43.3 bc	36.4 ab
	Axiom Premix	68 WG		0.17 lb	ai/a	Spike	C		
	----flufenacet	54		0.135					
	----metribuzin	14		0.035					
	Nonionic Surfactant	100 L		0.25 %	v/v	Spike	C		
8	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B	43.3 bc	23.9 e
	Axiom Premix	68 WG		0.255 lb	ai/a	Spike	C		
	----flufenacet	54		0.202					
	----metribuzin	14		0.0525					
	Nonionic Surfactant	100 L		0.25 %	v/v	Spike	C		
9	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B	53.3 ab	35.0 bc
	Anthem Flex Premix	4 SE		0.084 lb	ai/a	Spike	C		
	----pyroxasulfone	3.733		0.0784					
	----carfentrazone	0.267		0.0056					
	Nonionic Surfactant	100 L		0.25 %	v/v	Spike	C		
10	Roundup WeatherMax..glyphosate	4.5 AS		0.77 lb	ae/a	PRE	B	40.0 c	33.3 bcd
	Zidua.....pyroxasulfone	4.17 SC		0.053 lb	ai/a	Spike	C		
	Metribuzin.....metribuzin	75 DF		0.0525 lb	ai/a	Spike	C		
LSD P=.05								10.75	6.00
Standard Deviation								6.27	3.50
CV								16.2	10.69
Replicate F								0.340	45.189
Replicate Prob(F)								0.7165	0.0001
Treatment F								26.075	5.736
Treatment Prob(F)								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.  
Missing data estimates are included in columns:Average=1,2

## Postemergence Weed Control for Winter Wheat

Trial ID: SG2-18

Location: Field #30

Trial Year: 2018

Protocol ID: SG2-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 08/01/17

Completion Date: 07/04/18

**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 BBCH Scale: BCER

Variety: Shirley

Planting Date: 10/17/17

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: 60 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 10/25/17

Soil Moisture: NORMAL normal, adequate

Harvest Date: 07/03/18

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

**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)

## Trial Initiation Comments:

Study area was turbo-tilled two times on 10-05-17 prior to planting.

**Soil Description**

Description Name: Field 30

% Sand: 83

Texture: LS

loamy sand

% Silt: 8

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

% Clay: 9

Soil Drainage: G good

**Application Description**

	A	B
Application Date	11/21/17	04/12/18
Appl. Stop Time	04:45 PM	09:40 AM
Application Method	SPRAY	SPRAY
Application Timing	3-lvs	Spring
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	57 F	58 F
% Relative Humidity Start, Stop	56	53
Wind Velocity+Dir. Start	4 mph S	2 mph SW
Wet Leaves (Y/N)	N no	Y yes
Soil Temperature	57 F	58 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	80	60

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER
Stage Scale Used	DESC	DESC
Stage Majority, Percent	3-leaf 100	jointing 100
Stage Minimum, Percent		2-nodes 50
Stage Maximum, Percent		3-nodes 50
Height Average	4 in	7 in
Height Minimum, Maximum		5 8

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	LAMAM W	LAMAM W
Stage Majority, Percent	veg 100	seed 100
Height Average	0.4 in	4 in
Height Minimum, Maximum	0.3 0.5	
Density Average	15 m2	8 m2
Pest 2 Code, Type, Scale	HLOUM W	HLOUM W
Stage Majority, Percent	2-leaf 60	Flowr 60
Stage Minimum, Percent	cot 15	Flowr 60
Stage Maximum, Percent	4-leaf 25	Seed 40
Height Average	0.8 in	7 in
Density Average	40 m2	10 m2

**Application Equipment**

	A	B
Appl. Equipment	Backpack	Backpack
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	18 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

04/18/18: No crop injury observed from treatments. Poor on knawel trts 3,4,11.

05/05/18: Height of wheat is variable not quite due to treatments but due to plant residue from last fall.

Postemergence Weed Control for Winter Wheat									
Trial ID: SG2-18		Location: Field #30		Trial Year: 2018					
Protocol ID: SG2-18		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact:									
Pest Code					HLOUM	LAMAM	HLOUM		
Pest Name					JagChkwrd	Henbit	JagChkwrd		
Crop Type, Code					C -	C - C	TRZAW		
Crop Name							W.Wheat		
Rating Type					Control %	Control %	Stunting %		
Rating Unit					04/18/18	04/18/18	05/05/18		
Rating Date							Control %		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check					0.0 f	0.0 b		
2	Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B	40.0 cd	67.5 b	0.0 b		
	----thifensulfuron	33	0.0154				28.3 cd		
	----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	50.0 b	60.0 bc	0.0 b		
	----thifensulfuron	33	0.0185				35.0 c		
	----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	40.0 cd	41.5 d	0.0 b		
	----thifensulfuron	33	0.0154				33.3 c		
	----tribenuron	17	0.00796						
	Starane Ultra...fluoxypyr	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	33.3 de	36.7 d	0.0 b		
	----thifensulfuron	33	0.0154				81.7 a		
	----tribenuron	17	0.00796						
	Glory.....metribuzin	75 DF	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	43.3 bc	95.0 a		
	Nonionic Surfactant	100 L	0.5 % v/v	3-lvs	A		0.0 b		
	30% Urea Ammonium Nitrate	100 L	1.25 % v/v	3-lvs	A		35.0 c		
7	PowerFlex HL....pyroxasulam	13.1 WG	0.0164 lb ai/a	3-lvs	A	63.3 a	100.0 a		
	Nonionic Surfactant	100 L	0.25 % v/v	3-lvs	A		0.0 b		
	30% Urea Ammonium Nitrate	100 L	1.25 % v/v	3-lvs	A		63.3 b		
8	Huskie Premix	2.05 EC	0.176 lb ai/a	Spring B	30.0 e	26.5 e	0.0 b		
	----pyrasulfotole	0.3	0.0258				71.7 b		
	----bromoxynil	1.75	0.15						
	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	0.24 lb ai/a	Spring B	36.7 cde	56.7 c	0.0 b		
	----pyrasulfotole	0.3	0.035				71.7 b		
	----bromoxynil	1.75	0.205						
	Nonionic Surfactant	100 L	0.25 % v/v	Spring B					
	30% Urea Ammonium Nitrate	100 L	1.25 % 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.

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

Pest Code						C TRZAW W.Wheat Yield Bu/A 07/03/18	
Pest Name							
Crop Type, Code							
Crop Name							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code	
1	Untreated Check						25.6 a
2	Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring B			22.2 a
	----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			23.5 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			22.9 a
	----thifensulfuron	33	0.0154				
	----tribenuron	17	0.00796				
	Starane Ultra...fluoroxypr	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			22.6 a
	----thifensulfuron	33	0.0154				
	----tribenuron	17	0.00796				
	Glory.....metribuzin	75 DF	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		24.8 a
	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....pyroxsulam	13.1 WG	0.0164 lb ai/a	3-lvs	A		24.9 a
	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	0.176 lb ai/a	Spring B			25.2 a
	----pyrasulfotole	0.3	0.0258				
	----bromoxynil	1.75	0.15				
	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	0.24 lb ai/a	Spring B			22.4 a
	----pyrasulfotole	0.3	0.035				
	----bromoxynil	1.75	0.205				
	Nonionic Surfactant	100 L	0.25 % v/v	Spring B			
	30% Urea Ammonium Nitrate	100 L	1.25 % 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.  
Missing data estimates are included in columns:Yates=2,3

## University of Delaware

Pest Code Pest Name		HLOUM JagChkwrd	LAMAM Henbit	C TRZAW	HLOUM JagChkwrd						
Crop Type, Code		C -	C -		C -						
Crop Name				W.Wheat Stunting %							
Rating Type		Control %	Control %		Control %						
Rating Unit		04/18/18	04/18/18	05/05/18	05/05/18						
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
10	Huskie Premix	2.05	EC	0.176	lb ai/a	Spring	B	50.0 b	56.7 c	8.0 a	85.0 a
	----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				
11	Quelex Premix	20	WG	0.0094	lb ai/a	Spring	B	36.7 cde	61.5 bc	2.3 b	30.0 cd
	----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				
12	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring	B	40.0 cd	95.0 a	9.0 a	21.7 d
	----bicyclopyrone	0.31		0.0387							
	----bromoxynil	1.46		0.182							
	Coact+ Sodium Bicarbonate	2.67	SL	0.067	lb ai/a	Spring	B				
	Crop Oil Concentrate	100	L	1	% v/v	Spring	B				
	30% Urea Ammonium Nitrate	100	L	1.25	% v/v	Spring	B				
LSD P=.05				9.28	9.13	2.40	8.52				
Standard Deviation				5.48	5.30	1.41	5.03				
CV				14.2	9.13	87.72	10.85				
Replicate F				4.529	4.029	0.681	7.105				
Replicate Prob(F)				0.0225	0.0370	0.5167	0.0042				
Treatment F				22.681	94.053	16.289	87.132				
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

## University of Delaware

Pest Code				C	TRZAW	
Pest Name						
Crop Type, Code						
Crop Name					W.Wheat	
Rating Type					Yield	
Rating Unit					Bu/A	
Rating Date					07/03/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	
				Timing	Appl Code	
10	Huskie Premix	2.05	EC	0.176 lb ai/a	Spring B	17.4 a
	----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	
11	Quelex Premix	20	WG	0.0094 lb ai/a	Spring B	19.9 a
	----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	
12	Talinor Premix	1.77	EC	0.221 lb ai/a	Spring B	23.1 a
	----bicyclopyrone	0.31		0.0387		
	----bromoxynil	1.46		0.182		
	Coact+ Sodium Bicarbonate	2.67	SL	0.067 lb ai/a	Spring B	
	Crop Oil Concentrate	100	L	1 % v/v	Spring B	
	30% Urea Ammonium Nitrate	100	L	1.25 % v/v	Spring B	
LSD P=.05				7.56		
Standard Deviation				4.46		
CV				19.5		
Replicate F				21.997		
Replicate Prob(F)				0.0001		
Treatment F				0.828		
Treatment Prob(F)				0.6152		

Means followed by same letter 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

**Effect of Annual Ryegrass Removal on Winter Wheat Yields**

Trial ID: SG3-18

Location: Field #14

Trial Year: 2018

Protocol ID: SG3-18

Investigator: Mark VanGessel

Study Director: Charlie Cahoon

Sponsor Contact:

**General Trial Information**

Study Director: Charlie Cahoon

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 08/01/17

Completion Date: 06/30/18

**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: Charlie Cahoon

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: 10/17/17	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: 60 F	Seed Bed: MEDIUM	medium
Emergence Date: 10/23/17	Soil Moisture: NORMAL	normal, adequate
Harvest Date: 06/27/18	Harvest Equipment: Plot combine	
% Standard Moisture: 13.5	Harvested Width: 7 FT	
	Harvested Length: 24 FT	

**Pest Description**

Pest 1 Type: W Code: LOLMG Lolium multiflorum gaudini

Common Name: Annual ryegrass

Attributes: Purchased seed

Artificial Population: X

Establishment Date: 10/17/17

Establishment Rate: 20 lb/A

Establishment Method/Description: Hand spinner spreader

**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: REDTIL reduced-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

Trial Initiation Comments:

Study area was turbo-tilled three times on 10-05-17 prior to planting.

**Soil Description**

Description Name: Field 14-C  
 % Sand: 79 % OM: 1.5 Texture: LS loamy sand  
 % Silt: 14 pH: 6.7 Soil Name: Klej loamy sand, 0-2% slopes  
 % Clay: 7 CEC: 4.8 Fert. Level: E excellent  
 Soil Drainage: G good

**Application Description**

	A	B	C	D	E	F
Application Date	10/23/17	11/03/17	11/15/17	11/30/17	12/19/17	02/01/18
Appl. Stop Time	11:00 AM	02:45 PM	03:30 PM	02:40 PM	01:15 PM	03:30 PM
Interval to Prev. Appl.		11 DAYS	12 DAYS	15 DAYS	19 DAYS	44 DAYS
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	Spike	2 WAP	4 WAP	6 WAP	8 WAP	14 WAP
Application Placement	BROADC	BROADC	BROADC	BROADC	BROADC	BROADC
Applied By	VanGessl	Johnson	Johnson	Johnson	Johnson	Johnson
Air Temperature Start, Stop	74 F	76 F	53 F	59 F	58 F	36 F
% Relative Humidity Start, Stop	70	59	80	54	59	64
Wind Velocity+Dir. Start	6 mph SE	2 mph SW	3 mph NE	2 mph SE	5 mph SW	4 mph SW
Wet Leaves (Y/N)	N no	N no	Y yes	N no	N no	N no
Soil Temperature	72 F	76 F	52 F	59 F	58 F	35 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	80	15	50	10	10	85

	G	H	I	J	K	L
Application Date	02/08/18	02/21/18	03/09/18	03/19/18	04/11/18	11/30/17
Appl. Stop Time	03:10 PM	04:30 PM	08:40 AM	02:00 PM	10:00 AM	02:40 AM
Interval to Prev. Appl.	7 DAYS	13 DAYS	16 DAYS	10 DAYS	23 DAYS	15 DAYS
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	16 WAP	18 WAP	20 WAP	22 WAP	24 WAP	5 WAP bc1-15
Application Placement	BROADC	BROADC	BROADC	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson	Johnson	Johnson	Johnson
Air Temperature Start, Stop	36 F	75 F	37 F	51 F	48 F	59 F
% Relative Humidity Start, Stop	43	67	47	48	38	54
Wind Velocity+Dir. Start	2 mph W	4 mph SW	5 mph W	1 mph E	1 mph N	2 mph SE
Wet Leaves (Y/N)	N no	N no	N no	N no	Y yes	N no
Soil Temperature	36 F	75 F	36 F	51 F	48 F	59 F
Soil Moisture	WET	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	5	15	0	90	10	10

**Crop Stage At Each Application**

	A	B	C	D	E
Crop 1 Code, BBCH Scale	TRZAW BCER				
Stage Scale Used	DESC	DESC	DESC	DESC	DESC
Stage Majority, Percent	Spike 100	2-leaf 100	3-leaf 90	3-leaf 55	3-tilr 70
Stage Minimum, Percent			4-leaf 10	3-leaf 55	2-tilr 15
Stage Maximum, Percent				1-tilr 45	4-tilr 15
Height Average	0.3 in	2.7 in	4 in	4 in	4 in
Height Minimum, Maximum		2.5 3	3 4	3 4	3 4

	F	G	H	I	J	
Crop 1 Code, BBCH Scale	TRZAW	BCER	TRZAW	BCER	TRZAW	BCER
Stage Scale Used	DESC	DESC	DESC	DESC	DESC	
Stage Majority, Percent	3-tilr 70	3-tilr 70	3-tilr 80	3-tilr 75	4-tilr 70	
Stage Minimum, Percent	2-tilr 15	2-tilr 15	2-tilr 5	2-tilr 5	3-tilr 20	
Stage Maximum, Percent	4-tilr 15	4-tilr 15	4-tilr 15	4-tilr 20	5-tilr 10	
Height Average	4 in	4 in	4 in	4 in	5 in	
Height Minimum, Maximum	3 4	3 4	3 4	3 4	3 7	

	K	L
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER
Stage Scale Used	DESC	DESC
Stage Majority, Percent	4-tilr 80	3-leaf 55
Stage Minimum, Percent	4-tilr 80	3-leaf 55
Stage Maximum, Percent	5-tilr 20	1-tilr 45
Height Average	7.5 in	4 in
Height Minimum, Maximum	7 8	

## Pest Stage At Each Application

	H	I	J	K	L
Pest 1 Code, Type, Scale	LOLMG W	LOLMG W	LOLMG W	LOLMG W	LOLMG W
Stage Majority, Percent	3-4tlr 80	3-4tlr 80	3-4tlr 80	6-7tlr 60	
Stage Minimum, Percent	1-2tlr 10	1-2tlr 10	1-2tlr 10	5-tilr 15	
Stage Maximum, Percent	5-tilr 10	5-tilr 10	5-tilr 10	8-tilr 25	
Height Average	4 in	4 in	4 in	5 in	
Height Minimum, Maximum	3 4	3 4	3 5	4 8	
Density Average	80 m <sup>2</sup>	80 m <sup>2</sup>	80 m <sup>2</sup>	80 m <sup>2</sup>	

## **Application Equipment**

	H	I	J	K	L
Appl. Equipment	Backpack	Backpack	Backpack	Backpack	Backpack
Equipment Type	SPRBAC	SPRBAC	SPRBAC	SPRBAC	SPRBAC
Operation Pressure	31 psi				
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002	11002	11002
Nozzle Spacing	18 in				
Boom Length	9 ft				
Boom Height	20 in	20 in	25 in	26 in	20 in
Ground Speed	3 mph				
Carrier	WATER	WATER	WATER	WATER	WATER
Application Amount	20 gal/ac				
Propellant	COMCO2	COMCO2	COMCO2	COMCO2	COMCO2

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

10/23/17: Approx. 50% wheat emerged.

04/18/18: Excellent control of henbit and jagged chickweed with all treatments except Osprey Xtra, Harmony Extra + MCPA. Henbit & jagged Rep 1 0-60%, rep 2 70-80% rep 3 60-70%.

05/02/18: Trt 16 - poor on jagged chickweed control.

06/19/18: No stunting or injury observed in any plot. Ryegrass control based on plants and seedheads visible in (or above) the wheat canopy

## Effect of Annual Ryegrass Removal on Winter Wheat Yields

Trial ID: SG3-18

Location: Field #14

Trial Year: 2018

Protocol ID: SG3-18

Investigator: Mark VanGessel

Study Director: Charlie Cahoon

Sponsor Contact:

Pest Code	Pest Name	Crop Type, Code	LOLMG A.reygrs C -	C TRZAW	C TRZAW
Crop Name	Rating Type	Rating Unit	Count #/0.25m2	W.wheat Stunting %	W.wheat Stunting %
Rating Date			11/29/17	10/07/17	04/18/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
1	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A
2	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E
3	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E
4	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	8 WAP	E
5	Removal 2 WAP			2 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	2 WAP	B
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	2 WAP	B
6	Removal 4 WAP			4 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	4 WAP	C
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	4 WAP	C
7	Removal 6 WAP			6 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	6 WAP	D
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	6 WAP	D
8	Removal 8 WAP			8 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	8 WAP	E
9	Removal 14 WAP			14 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	14 WAP	F
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	14 WAP	F
10	Removal 16 WAP			16 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	16 WAP	G
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	16 WAP	G
11	Removal 18 WAP			18 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	18 WAP	H
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	18 WAP	H
12	Removal 20 WAP			20 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	20 WAP	I
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	20 WAP	I
13	Removal 22 WAP			22 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	22 WAP	J
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	22 WAP	J
14	Removal 24 WAP			24 WAP	
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	24 WAP	K
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	24 WAP	K
15	Untreated Check				
	Harmony Extra SG Premix	50 SG	0.9 oz wt/a	5 WAPbc1-15 L	
	----thifensulfuron	33	0.594		
	----tribenuron	17	0.306		
	MCPA Ester 4	3.7 EC	16 fl oz/a	5 WAPbc1-15 L	
	Nonionic Surfactant	100 L	1 qt/100 gal	5 WAPbc1-15 L	

Means followed by same letter 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	Pest Name	Crop Type, Code	LOLMG A.ryegr C -	C TRZAW	LOLMG A.ryegr C -	
Crop Name	Rating Type	Rating Unit	Control % 04/18/18	W.wheat Stunting % 05/05/18	Control % 05/05/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Timing	Appl Code
1	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A	84.3 bc
2	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E	95.0 a
3	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A	99.0 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E	0.0 e
4	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A	99.0 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E	4.0 b-e
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	8 WAP	E	99.0 a
5	Removal 2 WAP			2 WAP		100.0 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	2 WAP	B	0.0 e
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	2 WAP	B	100.0 a
6	Removal 4 WAP			4 WAP		100.0 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	4 WAP	C	2.3 de
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	4 WAP	C	100.0 a
7	Removal 6 WAP			6 WAP		98.3 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	6 WAP	D	2.3 de
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	6 WAP	D	99.7 a
8	Removal 8 WAP			8 WAP		98.0 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E	2.3 de
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	8 WAP	E	98.0 a
9	Removal 14 WAP			14 WAP		99.0 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	14 WAP	F	7.0 bc
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	14 WAP	F	88.3 de
10	Removal 16 WAP			16 WAP		95.3 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	16 WAP	G	8.0 b
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	16 WAP	G	92.7 c
11	Removal 18 WAP			18 WAP		89.0 b
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	18 WAP	H	4.7 bcd
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	18 WAP	H	94.0 bc
12	Removal 20 WAP			20 WAP		94.7 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	20 WAP	I	5.7 bcd
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	20 WAP	I	90.7 cd
13	Removal 22 WAP			22 WAP		82.7 c
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	22 WAP	J	2.3 de
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	22 WAP	J	94.0 bc
14	Removal 24 WAP			24 WAP		56.7 d
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	24 WAP	K	15.7 a
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	24 WAP	K	79.3 f
15	Untreated Check					
	Harmony Extra SG Premix	50 SG	0.9 oz wt/a	5 WAPbc1-15 L		0.0 e
	----thifensulfuron	33	0.594			
	----tribenuron	17	0.306			
	MCPA Ester 4	3.7 EC	16 fl oz/a	5 WAPbc1-15 L		
	Nonionic Surfactant	100 L	1 qt/100 gal	5 WAPbc1-15 L		

Means followed by same letter 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				LOLMG		
Pest Name			A.ryegr	C	C	TRZAW
Crop Type, Code				-		
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing
1	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A	86.3 c
2	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E	99.7 a
3	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A	100.0 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E	61.5 ab
4	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	Spike	A	100.0 a
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E	54.7 bcd
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	8 WAP	E	
5	Removal 2 WAP			2 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	2 WAP	B	100.0 a
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	2 WAP	B	62.5 a
6	Removal 4 WAP			4 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	4 WAP	C	98.7 ab
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	4 WAP	C	52.8 cd
7	Removal 6 WAP			6 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	6 WAP	D	95.7 b
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	6 WAP	D	59.3 abc
8	Removal 8 WAP			8 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	8 WAP	E	98.3 ab
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	8 WAP	E	53.8 cd
9	Removal 14 WAP			14 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	14 WAP	F	100.0 a
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	14 WAP	F	58.3 abc
10	Removal 16 WAP			16 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	16 WAP	G	96.7 ab
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	16 WAP	G	58.4 abc
11	Removal 18 WAP			18 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	18 WAP	H	99.7 a
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	18 WAP	H	58.3 abc
12	Removal 20 WAP			20 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	20 WAP	I	99.7 a
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	20 WAP	I	58.4 abc
13	Removal 22 WAP			22 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	22 WAP	J	95.7 b
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	22 WAP	J	53.9 cd
14	Removal 24 WAP			24 WAP		
	Axial XL.....pinoxaden	0.42 L	16.4 fl oz/a	24 WAP	K	100.0 a
	Zidua SC.....pyroxasulfone	4.17 SC	1.75 fl oz/a	24 WAP	K	49.5 d
15	Untreated Check					
	Harmony Extra SG Premix	50 SG	0.9 oz wt/a	5 WAPbc1-15 L		
	----thifensulfuron	33	0.594			
	----tribenuron	17	0.306			
	MCPA Ester 4	3.7 EC	16 fl oz/a	5 WAPbc1-15 L		
	Nonionic Surfactant	100 L	1 qt/100 gal	5 WAPbc1-15 L		

Means followed by same letter 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		LOLMG	C	TRZAW	C	TRZAW					
Pest Name	A.reygrs										
Crop Type, Code	C -										
Crop Name											
Rating Type		Count		W.wheat		W.wheat					
Rating Unit		#/0.25m2		Stunting %		Stunting %					
Rating Date			11/29/17	10/07/17	04/18/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code				
16	Osprey Xtra Premix	6	WG	0.0178	lb ai/a	6	WAP	D	28.7	a	0.0 d
	----mesosulfuron	4.5		0.0133							
	----thienencarbazone	1.5		0.00445							
	Nonionic Surfactant	100	L	0.5	% v/v	6	WAP	D			
	30% Urea Ammonium Nitrate	100	L	2.5	% v/v	6	WAP	D			
LSD P=.05							4.21		3.31		5.11
Standard Deviation							1.86		1.66		3.06
CV							10.99		14.11		122.57
Replicate F							0.032		0.273		2.642
Replicate Prob(F)							0.9685		0.7703		0.0877
Treatment F							166.484		11.182		2.333
Treatment Prob(F)							0.0001		0.0072		0.0235

Means followed by same letter 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		LOLMG		LOLMG							
Pest Name	A.ryegrss	C	TRZAW	A.ryegrss							
Crop Type, Code	C	-	-	C							
Crop Name			W.wheat								
Rating Type		Control	Stunting	Control							
Rating Unit	%	04/18/18	%	05/05/18							
Rating Date		05/05/18		05/05/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
16	Osprey Xtra Premix	6	WG	0.0178	lb ai/a	6	WAP	D	94.7 a	3.3 cde	97.0 ab
	----mesosulfuron	4.5		0.0133							
	----thienicarbazone	1.5		0.00445							
	Nonionic Surfactant	100	L	0.5 %	v/v	6	WAP	D			
	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v	6	WAP	D			
LSD P=.05									5.54	4.24	3.88
Standard Deviation									3.32	2.54	2.32
CV									3.84	68.57	2.63
Replicate F									0.680	3.097	2.143
Replicate Prob(F)									0.5141	0.0599	0.1349
Treatment F									177.072	7.547	329.865
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		LOLMG							
Pest Name		A.ryegr							
Crop Type, Code		C -	C TRZAW						
Crop Name			W.wheat						
Rating Type		Control	Yield						
Rating Unit		%	Bu/A						
Rating Date		06/19/18	06/27/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
16	Osprey Xtra Premix	6	WG	0.0178	lb ai/a	6	WAP	D	100.0 a
	----mesosulfuron	4.5		0.0133					
	----thienecarbazone	1.5		0.00445					
	Nonionic Surfactant	100	L	0.5 %	v/v	6	WAP	D	
	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v	6	WAP	D	
LSD P=.05								3.61	7.28
Standard Deviation								2.17	4.37
CV								2.36	7.8
Replicate F								3.959	17.085
Replicate Prob(F)								0.0298	0.0001
Treatment F								391.505	7.338
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.

**New Herbicide Evaluation for Small Grains**

Trial ID: SG5-18      Location: Field #14      Trial Year: 2018  
Protocol ID: SG5-18      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Trial Status: E established  
Initiation Date: 08/01/17  
Completion Date: 11/30/18

**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	Variety: Shirley	Planting Date: 10/17/17	Depth: 0.75 in	Planting Rate: 120 lb/A
				Planting Method: DRILLE drilled
				Planting Equipment: FE Field Equipment
				Seed Bed: MEDIUM medium
				Soil Moisture: NORMAL normal, adequate
		Soil Temperature: 60 F	Emergence Date: 10/23/17	Harvest Equipment: Plot combine
			Harvest Date: 06/27/18	Harvested Width: 7 FT
		% Standard Moisture: 13.5		Harvested Length: 24 FT
Crop 2: C GLXMA Glycine max	Variety: S42LL63	Attributes: Liberty Link	Planting Date: 07/03/18	Planting Rate: 180000 S/A
			Depth: 1 in	Planting Method: PLANTD planted
			Rows per Plot: 7	Planting Equipment: FE Field Equipment
			Row Spacing: 15 in	Seed Bed: MEDTRA medium/trashy
				Soil Moisture: NORMAL normal, adequate
		Soil Temperature: 93 F	Emergence Date: 07/09/18	Harvest Equipment: Plot combine
			Harvest Date: 11/29/18	Harvested Width: 6.25 FT
		% Standard Moisture: 13		Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: LAMAM Lamium amplexicaule  
Common Name: Henbit

Pest 2 Type: W Code: ARBTH Arabidopsis thaliana  
Common Name: Mouse-ear cress

Pest 3 Type: W Code: HLOUM Holostium umbellatum  
Common Name: Jagged chickweed

**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: REDTIL reduced-till  
 Replications: 3      Study Design: FACTOR Factorial

## Trial Initiation Comments:

Study area was turbo-tilled three times on 10-05-17 prior to planting.

**Soil Description**

Description Name: Field 14-C  
 % Sand: 79      % OM: 1.5      Texture: LS      loamy sand  
 % Silt: 14      pH: 6.7      Soil Name: Klej loamy sand, 0-2% slopes  
 % Clay: 7      CEC: 4.8      Fert. Level: E      excellent  
 Soil Drainage: G      good

**Application Description**

	A
Application Date	03/29/18
Appl. Stop Time	12:30 PM
Application Method	SPRAY
Application Timing	Spring
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	71 F
% Relative Humidity Start, Stop	63
Wind Velocity+Dir. Start	2 mph SW
Wet Leaves (Y/N)	Y yes
Soil Temperature	71 F
Soil Moisture	NORMAL
% Cloud Cover	40

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	TRZAW BCER
Stage Scale Used	DESC
Stage Majority, Percent	tillered 100
Height Average	6.5 in
Height Minimum, Maximum	6 7
Crop 2 Code, BBCH Scale	GLXMA BSOY

**Pest Stage At Each Application**

A	
Pest 1 Code, Type, Scale	LAMAM W
Stage Majority, Percent	Flower 100
Height Average	3 in
Height Minimum, Maximum	3 4
Density Average	100 m2
Pest 2 Code, Type, Scale	ARBTH W
Stage Majority, Percent	Flower 60
Stage Minimum, Percent	Flower 60
Stage Maximum, Percent	Seed 40
Height Average	4 in
Density Average	30 m2
Pest 3 Code, Type, Scale	HLOUM W
Stage Majority, Percent	Flower 100
Height Average	4 in
Density Average	15 m2

**Application Equipment**

A	
Appl. Equipment	Backpack
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	12/03/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

04/24/18: No chlorosis observed. Trts 3,6,9,10 good-excellent on mouseear cress. Trts 1,2,4,5,7,8,11 were weak on mouseear cress.

07/16/18: No soybean injury observed

08/06/18: Heavy deer feeding in Rep 3.

New Herbicide Evaluation for Small Grains						
Trial ID: SG5-18		Location: Field #14		Trial Year: 2018		
Protocol ID: SG5-18		Investigator: Mark VanGessel				
Study Director:			Sponsor Contact:			
Pest Code			C	TRZAW	C	TRZAW
Pest Name						
Crop Type, Code						
Crop Name				W.Wheat	W.Wheat	W.Wheat
Rating Type				Chlrosis	Stunting	Chlrosis
Rating Unit				%	%	%
Rating Date				04/12/18	04/12/18	04/19/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing Code
1	Huskie Premix	2.05	EC	0.24	lb ai/a	Spring A
	----pyrasulfotole	0.3		0.035		
	----bromoxynil	1.75		0.205		
	Dry Ammonium Sulfate	100	D	0.3	% w/v	Spring A
	No Tankmix Partner					
2	Huskie Premix	2.05	EC	0.24	lb ai/a	Spring A
	----pyrasulfotole	0.3		0.035		
	----bromoxynil	1.75		0.205		
	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Spring A
	----thifensulfuron	33		0.0154		
	----tribenuron	17		0.00796		
	Nonionic Surfactant	100	L	0.25	% v/v	Spring A
	30% Urea Ammonium Nitrate	100	L	2.5	% v/v	Spring A
3	Huskie Premix	2.05	EC	0.24	lb ai/a	Spring A
	----pyrasulfotole	0.3		0.035		
	----bromoxynil	1.75		0.205		
	Dry Ammonium Sulfate	100	D	0.3	% w/v	Spring A
	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring A
	Nonionic Surfactant	100	L	0.25	% v/v	Spring A
4	Quelex Premix	20	WG	0.0094	lb ai/a	Spring A
	----florasulam	10		0.0047		
	----halauxifen	10		0.0047		
	Nonionic Surfactant	100	L	0.25	% v/v	Spring A
	No Tankmix Partner					
5	Quelex Premix	20	WG	0.0094	lb ai/a	Spring A
	----florasulam	10		0.0047		
	----halauxifen	10		0.0047		
	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Spring A
	----thifensulfuron	33		0.0154		
	----tribenuron	17		0.00796		
	Nonionic Surfactant	100	L	0.25	% v/v	Spring A
	30% Urea Ammonium Nitrate	100	L	2.5	% v/v	Spring A
6	Quelex Premix	20	WG	0.0094	lb ai/a	Spring A
	----florasulam	10		0.0047		
	----halauxifen	10		0.0047		
	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring A
	Nonionic Surfactant	100	L	0.25	% v/v	Spring A
7	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring A
	----bicyclopyrone	0.31		0.0387		
	----bromoxynil	1.46		0.182		
	Coact+ Sodium Bicarbonate	2.67	SL	0.067	lb ai/a	Spring A
	Crop Oil Concentrate	100	L	1	% v/v	Spring A
	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:Average=7

Pest Code Pest Name Crop Type, Code		C TRZAW	C TRZAW	HLOUM Jagged chickwe> C -
Crop Name Rating Type Rating Unit Rating Date		W.Wheat Stunting %	W.Wheat Stunting %	Control %
Trt No. Treatment Name	Form Conc Type Rate	Appl Unit 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 A	8.3 b 4.7 b 73.3 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 A	0.0 d 0.0 b 66.7 bc
3 Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Glory.....metribuzin Nonionic Surfactant	2.05 EC 0.3 1.75 100 D 75 DF 100 L	0.24 lb ai/a 0.035 0.205 0.3 % w/v 0.188 lb ai/a 0.25 % v/v	Spring A	0.0 d 2.3 b 90.0 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 A	1.7 cd 1.7 b 46.7 fg
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 A	0.0 d 0.0 b 63.3 cd
6 Quelex Premix ----florasulam ----halauxifen Glory.....metribuzin Nonionic Surfactant	20 WG 10 10 75 DF 100 L	0.0094 lb ai/a 0.0047 0.0047 0.188 lb ai/a 0.25 % v/v	Spring A	0.0 d 0.0 b 89.3 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 A	6.0 bc 5.7 b 58.3 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:Average=7

Pest Code Pest Name Crop Type, Code	LAMAM Henbit C -	C TRZAW	HLOUM Jagged chickwe> C -
Crop Name Rating Type Rating Unit Rating Date	Control % 04/24/18	W.Wheat Stunting % 05/02/18	Control % 05/02/18
Trt No. Treatment Name	Form Conc Form Type Rate Rate	Appl 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 Spring A 0.035 0.205 0.3 % w/v Spring A	2.3 cde 71.7 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 Spring A 0.035 0.205 0.0234 lb ai/a Spring A 0.0154 0.00796 0.25 % v/v Spring A 2.5 % v/v Spring A	0.0 e 73.3 b
3 Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Glory.....metribuzin Nonionic Surfactant	2.05 EC 0.3 1.75 100 D 75 DF 100 L	0.24 lb ai/a Spring A 0.035 0.205 0.3 % w/v Spring A 0.188 lb ai/a Spring A 0.25 % v/v Spring A	0.0 e 97.0 a
4 Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant No Tankmix Partner	20 WG 10 10 100 L	0.0094 lb ai/a Spring A 0.0047 0.0047 0.25 % v/v Spring A	70.0 a 2.3 cde 61.7 c
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 Spring A 0.0047 0.0047 0.0234 lb ai/a Spring A 0.0154 0.00796 0.25 % v/v Spring A 2.5 % v/v Spring A	5.7 bcd 75.0 b
6 Quelex Premix ----florasulam ----halauxifen Glory.....metribuzin Nonionic Surfactant	20 WG 10 10 75 DF 100 L	0.0094 lb ai/a Spring A 0.0047 0.0047 0.188 lb ai/a Spring A 0.25 % v/v Spring A	1.7 de 95.3 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 Spring A 0.0387 0.182 0.067 lb ai/a Spring A 1 % v/v Spring A	69.0 a 10.3 b 56.7 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=7

Pest Code Pest Name Crop Type, Code		C TRZAW	C TRZAW						
Crop Name Rating Type Rating Unit Rating Date		W.Wheat Stunting % 06/19/18	W.Wheat Yield Bu/A 06/27/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate No Tankmix Partner	2.05 0.3 1.75 100 D	EC 0.3 1.75 0.3 % w/v	0.24 0.035 0.205 Spring A	lb ai/a	Spring A		0.0 b	53.2 a
2	Huskie Premix ----pyrasulfotole ----bromoxynil Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	2.05 0.3 1.75 50 SG 33 17 100 L 100 L	EC 0.3 1.75 0.0234 lb ai/a 0.0154 0.00796 0.25 % v/v 2.5 % v/v	0.24 0.035 0.205 lb ai/a Spring A	lb ai/a	Spring A		0.0 b	58.9 a
3	Huskie Premix ----pyrasulfotole ----bromoxynil Dry Ammonium Sulfate Glory.....metribuzin Nonionic Surfactant	2.05 0.3 1.75 100 D 75 DF 100 L	EC 0.3 1.75 0.3 % w/v 0.188 lb ai/a 0.25 % v/v	0.24 0.035 0.205 Spring A Spring A	lb ai/a	Spring A		0.0 b	53.9 a
4	Quelex Premix ----florasulam ----halauxifen Nonionic Surfactant No Tankmix Partner	20 10 10 100 L	WG 10 10 0.0094 lb ai/a	0.0094 0.0047 0.0047 Spring A	lb ai/a	Spring A		0.0 b	58.6 a
5	Quelex Premix ----florasulam ----halauxifen Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	20 10 10 50 SG 33 17 100 L 100 L	WG 10 10 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	0.0094 0.0047 0.0047 lb ai/a Spring A	lb ai/a	Spring A		0.0 b	59.2 a
6	Quelex Premix ----florasulam ----halauxifen Glory.....metribuzin Nonionic Surfactant	20 10 10 75 DF 100 L	WG 10 10 0.0094 lb ai/a 0.0047 0.0047 0.188 lb ai/a 0.25 % v/v	0.0094 0.0047 0.0047 lb ai/a Spring A	lb ai/a	Spring A		2.3 b	63.5 a
7	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate No Tankmix Partner	1.77 0.31 1.46 2.67 SL 100 L	EC 0.31 1.46 0.067 lb ai/a 1 % v/v	0.221 0.0387 0.182 lb ai/a Spring A	lb ai/a	Spring A		0.0 b	57.0 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=7

## University of Delaware

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	C TRZAW		
Crop Name	Rating Type	Rating Unit	W.Wheat Chlrosis %	W.Wheat Stunting %	W.Wheat Chlrosis %		
Rating Date			04/12/18	04/12/18	04/19/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code		
8	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17	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	Spring A	9.0 b         	18.0 b         	0.0 b         
9	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Glory.....metribuzin Nonionic Surfactant	1.77 EC 0.31 1.46 2.67 SL 75 DF 100 L	0.221 lb ai/a 0.0387 0.182 0.067 lb ai/a 0.188 lb ai/a 0.25 % v/v	Spring A         	3.3 c         	9.7 c         	0.0 b         
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Glory.....metribuzin 30% Urea Ammonium Nitrate Nonionic Surfactant	50 SG 33 17 75 DF 100 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.188 lb ai/a 2.5 % v/v 0.25 % v/v	Spring A         	9.7 b         	11.3 c         	0.0 b         
11	Osprey Xtra Premix ----mesosulfuron ----thienencarbazone Nonionic Surfactant 30% Urea Ammonium Nitrate	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 A         	18.3 a         	53.3 a         	5.7 a         
12	Untreated Check			0.0 c	0.0 e	0.0 b	
LSD P=.05				5.02	6.65	3.33	
Standard Deviation				2.97	3.93	1.96	
CV				76.28	43.23	294.55	
Replicate F				0.439	0.632	0.065	
Replicate Prob(F)				0.6504	0.5407	0.9374	
Treatment F				11.303	43.932	2.279	
Treatment Prob(F)				0.0001	0.0001	0.0482	

Means followed by same letter 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=7

## University of Delaware

Pest Code		C TRZAW	C TRZAW	HLOUM						
Pest Name				Jagged chickwe>						
Crop Type, Code				C -						
Crop Name										
Rating Type		W.Wheat	W.Wheat							
Rating Unit		Stunting	Stunting	Control						
Rating Date		%	%	%						
04/19/18	04/24/18	04/24/18	04/24/18							
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	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17	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					5.0 bcd	2.3 b	53.3 ef
9	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Glory.....metribuzin Nonionic Surfactant	1.77 EC 0.31 1.46 2.67 SL 75 DF 100 L	0.221 lb ai/a 0.0387 0.182 0.067 lb ai/a 0.188 lb ai/a 0.25 % v/v					0.0 d	4.0 b	89.0 a
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Glory.....metribuzin 30% Urea Ammonium Nitrate Nonionic Surfactant	50 SG 33 17 75 DF 100 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.188 lb ai/a 2.5 % v/v 0.25 % v/v					0.0 d	5.7 b	86.7 a
11	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate	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					18.7 a	16.7 a	40.0 g
12	Untreated Check				3.3 bcd			0.0 b		0.0 h
LSD P=.05					5.71			6.36		7.84
Standard Deviation					3.37			3.76		4.63
CV					94.17			104.84		7.34
Replicate F					2.554			0.785		0.553
Replicate Prob(F)					0.1006			0.4684		0.5828
Treatment F					8.112			4.625		97.439
Treatment Prob(F)					0.0001			0.0011		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=7

## University of Delaware

Pest Code Pest Name Crop Type, Code	LAMAM Henbit C - C	TRZAW	HLOUM Jagged chickwe> C -		
Crop Name Rating Type Rating Unit Rating Date	Control % 04/24/18	W.Wheat Stunting % 05/02/18	Control % 05/02/18		
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing			
8 Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17	0.221 lb ai/a Spring A 0.0387 0.182 0.067 lb ai/a Spring A 1 % v/v Spring A 0.0234 lb ai/a Spring A 0.0154 0.00796	63.3 a         	7.3 bc         	60.0 c         
9 Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Glory.....metribuzin Nonionic Surfactant	1.77 EC 0.31 1.46 2.67 SL 75 DF 100 L	0.221 lb ai/a Spring A 0.0387 0.182 0.067 lb ai/a Spring A 0.188 lb ai/a Spring A 0.25 % v/v Spring A	      	2.3 cde      	97.0 a      
10 Harmony Extra SG Premix ----thifensulfuron ----tribenuron Glory.....metribuzin 30% Urea Ammonium Nitrate Nonionic Surfactant	50 SG 33 17 75 DF 100 L 100 L	0.0234 lb ai/a Spring A 0.0154 0.00796 0.188 lb ai/a Spring A 2.5 % v/v Spring A 0.25 % v/v Spring A	      	1.7 de      	96.3 a      
11 Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate	6 WG 4.5 1.5 100 L 100 L	0.0178 lb ai/a Spring A 0.0133 0.00445 0.5 % v/v Spring A 2.5 % v/v Spring A	60.0 a     	17.3 a     	43.3 d     
12 Untreated Check		0.0 b	0.0 e	0.0 e	
LSD P=.05 Standard Deviation CV		22.20 8.54 16.28	5.07 2.99 70.47	5.74 3.39 4.92	
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		0.067 0.9368 36.056 0.0072	1.598 0.2249 9.068 0.0001	0.763 0.4782 208.061 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=7

## University of Delaware

Pest Code		C TRZAW	C TRZAW						
Pest Name									
Crop Type, Code									
Crop Name									
Rating Type									
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Crop Oil Concentrate Harmony Extra SG Premix ----thifensulfuron ----tribenuron	1.77 EC 0.31 1.46 2.67 SL 100 L 50 SG 33 17	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					0.0 b	59.6 a
9	Talinor Premix ----bicyclopyrone ----bromoxynil Coact+ Sodium Bicarbonate Glory.....metribuzin Nonionic Surfactant	1.77 EC 0.31 1.46 2.67 SL 75 DF 100 L	0.221 lb ai/a 0.0387 0.182 0.067 lb ai/a 0.188 lb ai/a 0.25 % v/v					0.0 b	54.1 a
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Glory.....metribuzin 30% Urea Ammonium Nitrate Nonionic Surfactant	50 SG 33 17 75 DF 100 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.188 lb ai/a 2.5 % v/v 0.25 % v/v					0.0 b	52.6 a
11	Osprey Xtra Premix ----mesosulfuron ----thien carbazole Nonionic Surfactant 30% Urea Ammonium Nitrate	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					7.3 a	53.5 a
12	Untreated Check							0.0 b	57.4 a
LSD P=.05								3.62	8.52
Standard Deviation								2.13	5.03
CV								265.03	8.86
Replicate F								1.652	16.901
Replicate Prob(F)								0.2147	0.0001
Treatment F								3.078	1.341
Treatment Prob(F)								0.0119	0.2678

Means followed by same letter 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=7

New Herbicide Evaluation for Small Grains			
Trial ID: SG5-18	Location: Field #14	Trial Year: 2018	
Protocol ID: SG5-18	Investigator: Mark VanGessel		
Study Director:			
Sponsor Contact:			

Pest Code		C	TRZAW	C	TRZAW	C	TRZAW
Pest Name							
Crop Type, Code							
Crop Name							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Huskie Premix	2.05	EC	0.24	lb ai/a	Spring	A
1	----pyrasulfotole	0.3		0.035			
1	----bromoxynil	1.75		0.205			
1	Dry Ammonium Sulfate	100	D	0.3	% w/v	Spring	A
2	Quelex Premix	20	WG	0.0094	lb ai/a	Spring	A
2	----florasulam	10		0.0047			
2	----halauxifen	10		0.0047			
2	Nonionic Surfactant	100	L	0.25	% v/v	Spring	A
3	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring	A
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	A
3	Crop Oil Concentrate	100	L	1	% v/v	Spring	A
LSD P=.05				3.20	4.02	1.35	
Standard Deviation				3.20	4.02	1.35	
CV				154.22	81.65	519.62	
TABLE OF B (Tankmix Partners) MEANS							
1 No Tankmix Partner				1.6 a	3.2 a	0.8 a	
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Spring	A
2	----thifensulfuron	33		0.0154			
2	----tribenuron	17		0.00796			
2	Nonionic Surfactant	100	L	0.25	% v/v	Spring	A
2	30% Urea Ammonium Nitrate	100	L	2.5	% v/v	Spring	A
3	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring	A
3	Nonionic Surfactant	100	L	0.25	% v/v	Spring	A
LSD P=.05				3.20	4.02	1.35	
Standard Deviation				3.20	4.02	1.35	
CV				154.22	81.65	519.62	
TABLE OF A (Main Herbicide) B (Tankmix Partners) MEANS							
1	Huskie Premix	2.05	EC	0.24	lb ai/a	Spring	A
1	----pyrasulfotole	0.3		0.035			
1	----bromoxynil	1.75		0.205			
1	Dry Ammonium Sulfate	100	D	0.3	% w/v	Spring	A
1	No Tankmix Partner						
2	Quelex Premix	20	WG	0.0094	lb ai/a	Spring	A
2	----florasulam	10		0.0047			
2	----halauxifen	10		0.0047			
2	Nonionic Surfactant	100	L	0.25	% v/v	Spring	A
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		C	TRZAW	C	TRZAW	HLOUM
Pest Name						Jagged chickwe>
Crop Type, Code						C -
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
						Code
<b>TABLE OF R MEANS</b>						
Replicate 1				3.3	3.2	70.2
Replicate 2				3.1	2.1	69.2
Replicate 3				0.6	1.6	70.6
<b>TABLE OF A (Main Herbicide) MEANS</b>						
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring A	2.8 a	2.3 a	76.7 a
1 ----pyrasulfotole	0.3	0.035				
1 ----bromoxynil	1.75	0.205				
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring A			
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	0.6 a	0.6 a	66.4 b
2 ----florasulam	10	0.0047				
2 ----halauxifen	10	0.0047				
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A			
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring A	3.7 a	4.0 a	66.9 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 A			
3 Crop Oil Concentrate	100 L	1 % v/v	Spring A			
LSD P=.05				3.50	3.95	5.12
Standard Deviation				3.50	3.96	5.12
CV				150.17	172.27	7.32
<b>TABLE OF B (Tankmix Partners) MEANS</b>						
1 No Tankmix Partner				5.3 a	4.0 a	59.4 b
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring A	1.7 b	0.8 a	61.1 b
2 ----thifensulfuron	33	0.0154				
2 ----tribenuron	17	0.00796				
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A			
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring A			
3 Glory.....metribuzin	75 DF	0.188 lb ai/a	Spring A	0.0 b	2.1 a	89.4 a
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring A			
LSD P=.05				3.50	3.95	5.12
Standard Deviation				3.50	3.96	5.12
CV				150.17	172.27	7.32
<b>TABLE OF A (Main Herbicide) B (Tankmix Partners) MEANS</b>						
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring A	8.3 a	4.7 a	73.3 b
1 ----pyrasulfotole	0.3	0.035				
1 ----bromoxynil	1.75	0.205				
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring A			
1 No Tankmix Partner						
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	1.7 a	1.7 a	46.7 e
2 ----florasulam	10	0.0047				
2 ----halauxifen	10	0.0047				
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A			
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		LAMAM		HLOUM
Pest Name		Henbit		Jagged chickwe>
Crop Type, Code		C -	C TRZAW	C -
Crop Name				
Rating Type				
Rating Unit				
Rating Date		Control %		Control %
	04/24/18	W.Wheat Stunting %	05/02/18	05/02/18
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
TABLE OF R MEANS				
Replicate 1				3.2 75.7
Replicate 2				4.8 75.9
Replicate 3				2.7 77.7
TABLE OF A (Main Herbicide) MEANS				
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring A	
1 ----pyrasulfotole	0.3	0.035		0.8 b 80.7 a
1 ----bromoxynil	1.75	0.205		
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring A	
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	
2 ----florasulam	10	0.0047		3.2 b 77.3 a
2 ----halauxifen	10	0.0047		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A	
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring A	
3 ----bicyclopyrone	0.31	0.0387		6.7 a 71.2 b
3 ----bromoxynil	1.46	0.182		
3 Coact+ Sodium Bicarbonate	2.67 SL	0.067 lb ai/a	Spring A	
3 Crop Oil Concentrate	100 L	1 % v/v	Spring A	
LSD P=.05				3.31 3.35
Standard Deviation				3.31 3.35
CV				93.04 4.39
TABLE OF B (Tankmix Partners) MEANS				
1 No Tankmix Partner				5.0 a 63.3 c
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring A	
2 ----thifensulfuron	33	0.0154		4.3 a 69.4 b
2 ----tribenuron	17	0.00796		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A	
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring A	
3 Glory.....metribuzin	75 DF	0.188 lb ai/a	Spring A	
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring A	1.3 a 96.4 a
LSD P=.05				3.31 3.35
Standard Deviation				3.31 3.35
CV				93.04 4.39
TABLE OF A (Main Herbicide) B (Tankmix Partners) MEANS				
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring A	
1 ----pyrasulfotole	0.3	0.035		. 2.3 a 71.7 b
1 ----bromoxynil	1.75	0.205		
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring A	
1 No Tankmix Partner				
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	70.0 a 61.7 c
2 ----florasulam	10	0.0047		
2 ----halauxifen	10	0.0047		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A	
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			C TRZAW	C TRZAW
Pest Name				
Crop Type, Code				
Crop Name			W.Wheat	W.Wheat
Rating Type			Stunting	Yield
Rating Unit			%	Bu/A
Rating Date			06/19/18	06/27/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate
				Appl Unit
				Appl Timing
				Code
<b>TABLE OF R MEANS</b>				
Replicate 1				
			0.8	54.1
Replicate 2				
			0.0	53.7
Replicate 3				
			0.0	64.9
<b>TABLE OF A (Main Herbicide) MEANS</b>				
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring A	
1 ----pyrasulfotole	0.3	0.035		
1 ----bromoxynil	1.75	0.205		
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring A	
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	
2 ----florasulam	10	0.0047		
2 ----halauxifen	10	0.0047		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A	
3 Talinor Premix	1.77 EC	0.221 lb ai/a	Spring A	
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 A	
3 Crop Oil Concentrate	100 L	1 % v/v	Spring A	
LSD P=.05			1.35	5.10
Standard Deviation			1.35	5.10
CV			519.62	8.86
<b>TABLE OF B (Tankmix Partners) MEANS</b>				
1 No Tankmix Partner				
			0.0 a	56.3 a
2 Harmony Extra SG Premix	50 SG	0.0234 lb ai/a	Spring A	
2 ----thifensulfuron	33	0.0154		
2 ----tribenuron	17	0.00796		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A	
2 30% Urea Ammonium Nitrate	100 L	2.5 % v/v	Spring A	
3 Glory.....metribuzin	75 DF	0.188 lb ai/a	Spring A	
3 Nonionic Surfactant	100 L	0.25 % v/v	Spring A	
LSD P=.05			1.35	5.10
Standard Deviation			1.35	5.10
CV			519.62	8.86
<b>TABLE OF A (Main Herbicide) B (Tankmix Partners) MEANS</b>				
1 Huskie Premix	2.05 EC	0.24 lb ai/a	Spring A	
1 ----pyrasulfotole	0.3	0.035		
1 ----bromoxynil	1.75	0.205		
1 Dry Ammonium Sulfate	100 D	0.3 % w/v	Spring A	
1 No Tankmix Partner				
2 Quelex Premix	20 WG	0.0094 lb ai/a	Spring A	
2 ----florasulam	10	0.0047		
2 ----halauxifen	10	0.0047		
2 Nonionic Surfactant	100 L	0.25 % v/v	Spring A	
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.

## University of Delaware

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	C TRZAW
Crop Name	Rating Type	Rating Unit	W.Wheat Chlrosis %	W.Wheat Stunting %	W.Wheat Chlrosis %
Rating Date			04/12/18	04/12/18	04/19/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
3	Talinor Premix	1.77	EC	0.221	lb ai/a Spring A
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 A
3	Crop Oil Concentrate	100	L	1 %	v/v Spring A
1	No Tankmix Partner				
1	Huskie Premix	2.05	EC	0.24	lb ai/a Spring A
1	----pyrasulfotole	0.3		0.035	
1	----bromoxynil	1.75		0.205	
1	Dry Ammonium Sulfate	100	D	0.3 %	w/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
2	Quelex Premix	20	WG	0.0094	lb ai/a Spring A
2	----florasulam	10		0.0047	
2	----halauxifen	10		0.0047	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
3	Talinor Premix	1.77	EC	0.221	lb ai/a Spring A
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 A
3	Crop Oil Concentrate	100	L	1 %	v/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
1	Huskie Premix	2.05	EC	0.24	lb ai/a Spring A
1	----pyrasulfotole	0.3		0.035	
1	----bromoxynil	1.75		0.205	
1	Dry Ammonium Sulfate	100	D	0.3 %	w/v Spring A
3	Glory.....metribuzin	75	DF	0.188	lb ai/a Spring A
3	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	Quelex Premix	20	WG	0.0094	lb ai/a Spring A
2	----florasulam	10		0.0047	
2	----halauxifen	10		0.0047	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
3	Glory.....metribuzin	75	DF	0.188	lb ai/a Spring A
3	Nonionic Surfactant	100	L	0.25 %	v/v Spring 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	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	HLOUM Jagged chickwe> C -
Crop Name	Rating Type	Rating Unit	W.Wheat Stunting %	W.Wheat Stunting %	Control %
Rating Date			04/19/18	04/24/18	04/24/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
3	Talinor Premix	1.77	EC	0.221	lb ai/a Spring A
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 A
3	Crop Oil Concentrate	100	L	1 %	v/v Spring A
1	No Tankmix Partner				
1	Huskie Premix	2.05	EC	0.24	lb ai/a Spring A
1	----pyrasulfotole	0.3		0.035	
1	----bromoxynil	1.75		0.205	
1	Dry Ammonium Sulfate	100	D	0.3 %	w/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
2	Quelex Premix	20	WG	0.0094	lb ai/a Spring A
2	----florasulam	10		0.0047	
2	----halauxifen	10		0.0047	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
3	Talinor Premix	1.77	EC	0.221	lb ai/a Spring A
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 A
3	Crop Oil Concentrate	100	L	1 %	v/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
1	Huskie Premix	2.05	EC	0.24	lb ai/a Spring A
1	----pyrasulfotole	0.3		0.035	
1	----bromoxynil	1.75		0.205	
1	Dry Ammonium Sulfate	100	D	0.3 %	w/v Spring A
3	Glory.....metribuzin	75	DF	0.188	lb ai/a Spring A
3	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	Quelex Premix	20	WG	0.0094	lb ai/a Spring A
2	----florasulam	10		0.0047	
2	----halauxifen	10		0.0047	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
3	Glory.....metribuzin	75	DF	0.188	lb ai/a Spring A
3	Nonionic Surfactant	100	L	0.25 %	v/v Spring 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	Pest Name	Crop Type, Code	LAMAM Henbit C - C	TRZAW	HLOUM Jagged chickwe> C -
Crop Name	Rating Type	Rating Unit	Control %	W.Wheat Stunting %	Control %
Rating Date			04/24/18	05/02/18	05/02/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
3	Talinor Premix	1.77	EC	0.221	lb ai/a Spring A
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 A
3	Crop Oil Concentrate	100	L	1 %	v/v Spring A
1	No Tankmix Partner				
1	Huskie Premix	2.05	EC	0.24	lb ai/a Spring A
1	----pyrasulfotole	0.3		0.035	
1	----bromoxynil	1.75		0.205	
1	Dry Ammonium Sulfate	100	D	0.3 %	w/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
2	Quelex Premix	20	WG	0.0094	lb ai/a Spring A
2	----florasulam	10		0.0047	
2	----halauxifen	10		0.0047	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
3	Talinor Premix	1.77	EC	0.221	lb ai/a Spring A
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 A
3	Crop Oil Concentrate	100	L	1 %	v/v Spring A
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a Spring A
2	----thifensulfuron	33		0.0154	
2	----tribenuron	17		0.00796	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v Spring A
1	Huskie Premix	2.05	EC	0.24	lb ai/a Spring A
1	----pyrasulfotole	0.3		0.035	
1	----bromoxynil	1.75		0.205	
1	Dry Ammonium Sulfate	100	D	0.3 %	w/v Spring A
3	Glory.....metribuzin	75	DF	0.188	lb ai/a Spring A
3	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
2	Quelex Premix	20	WG	0.0094	lb ai/a Spring A
2	----florasulam	10		0.0047	
2	----halauxifen	10		0.0047	
2	Nonionic Surfactant	100	L	0.25 %	v/v Spring A
3	Glory.....metribuzin	75	DF	0.188	lb ai/a Spring A
3	Nonionic Surfactant	100	L	0.25 %	v/v Spring 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 TRZAW	C TRZAW						
Pest Name									
Crop Type, Code									
Crop Name									
Rating Type									
Rating Unit									
Rating Date		W.Wheat Stunting % 06/19/18	W.Wheat Yield Bu/A 06/27/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
3	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring	A	0.0 a	57.0 a
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	A		
3	Crop Oil Concentrate	100	L	1 %	v/v	Spring	A		
1	No Tankmix Partner								
1	Huskie Premix	2.05	EC	0.24	lb ai/a	Spring	A	0.0 a	58.9 a
1	----pyrasulfotole	0.3		0.035					
1	----bromoxynil	1.75		0.205					
1	Dry Ammonium Sulfate	100	D	0.3 %	w/v	Spring	A		
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Spring	A		
2	----thifensulfuron	33		0.0154					
2	----tribenuron	17		0.00796					
2	Nonionic Surfactant	100	L	0.25 %	v/v	Spring	A		
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v	Spring	A		
2	Quelex Premix	20	WG	0.0094	lb ai/a	Spring	A	0.0 a	59.2 a
2	----florasulam	10		0.0047					
2	----halauxifen	10		0.0047					
2	Nonionic Surfactant	100	L	0.25 %	v/v	Spring	A		
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Spring	A		
2	----thifensulfuron	33		0.0154					
2	----tribenuron	17		0.00796					
2	Nonionic Surfactant	100	L	0.25 %	v/v	Spring	A		
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v	Spring	A		
3	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring	A	0.0 a	59.6 a
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	A		
3	Crop Oil Concentrate	100	L	1 %	v/v	Spring	A		
2	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	Spring	A		
2	----thifensulfuron	33		0.0154					
2	----tribenuron	17		0.00796					
2	Nonionic Surfactant	100	L	0.25 %	v/v	Spring	A		
2	30% Urea Ammonium Nitrate	100	L	2.5 %	v/v	Spring	A		
1	Huskie Premix	2.05	EC	0.24	lb ai/a	Spring	A	0.0 a	53.9 a
1	----pyrasulfotole	0.3		0.035					
1	----bromoxynil	1.75		0.205					
1	Dry Ammonium Sulfate	100	D	0.3 %	w/v	Spring	A		
3	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring	A		
3	Nonionic Surfactant	100	L	0.25 %	v/v	Spring	A		
2	Quelex Premix	20	WG	0.0094	lb ai/a	Spring	A	2.3 a	63.5 a
2	----florasulam	10		0.0047					
2	----halauxifen	10		0.0047					
2	Nonionic Surfactant	100	L	0.25 %	v/v	Spring	A		
3	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring	A		
3	Nonionic Surfactant	100	L	0.25 %	v/v	Spring	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 TRZAW	C TRZAW	C TRZAW						
Pest Name										
Crop Type, Code										
Crop Name										
Rating Type										
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
3	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring	A	3.3 a	9.7 a	0.0 a
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	A			
3	Crop Oil Concentrate	100	L	1	% v/v	Spring	A			
3	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring	A			
3	Nonionic Surfactant	100	L	0.25	% v/v	Spring	A			
LSD P=.05					5.54		6.96		2.33	
Standard Deviation					3.20		4.02		1.35	
CV					154.22		81.65		519.62	

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		C TRZAW	C TRZAW	HLOUM									
Pest Name				Jagged chickwe>									
Crop Type, Code				C -									
Crop Name													
Rating Type													
Rating Unit													
Rating Date													
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code						
3	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring	A	0.0	a	4.0	a	89.0	a
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	A						
3	Crop Oil Concentrate	100	L	1	% v/v	Spring	A						
3	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring	A						
3	Nonionic Surfactant	100	L	0.25	% v/v	Spring	A						
LSD P=.05					6.06		6.85		8.87				
Standard Deviation					3.50		3.96		5.12				
CV					150.17		172.27		7.32				

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		LAMAM		HLOUM						
Pest Name		Henbit		Jagged chickwe>						
Crop Type, Code		C - C	TRZAW	C -						
Crop Name			W.Wheat							
Rating Type		Control	Stunting	Control						
Rating Unit		%	%	%						
Rating Date		04/24/18	05/02/18	05/02/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
3	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring	A	.	2.3 a	97.0 a
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	A			
3	Crop Oil Concentrate	100	L	1	% v/v	Spring	A			
3	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring	A			
3	Nonionic Surfactant	100	L	0.25	% v/v	Spring	A			
LSD P=.05					22.20		5.73		5.80	
Standard Deviation					8.54		3.31		3.35	
CV					12.67		93.04		4.39	

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		C TRZAW	C TRZAW						
Pest Name									
Crop Type, Code									
Crop Name									
Rating Type									
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
3	Talinor Premix	1.77	EC	0.221	lb ai/a	Spring	A	0.0 a	54.1 a
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	A		
3	Crop Oil Concentrate	100	L	1	% v/v	Spring	A		
3	Glory.....metribuzin	75	DF	0.188	lb ai/a	Spring	A		
3	Nonionic Surfactant	100	L	0.25	% v/v	Spring	A		
LSD P=.05					2.33		8.83		
Standard Deviation					1.35		5.10		
CV					519.62		8.86		

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 TRZAW W.Wheat Chlrosis % 04/12/18					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	26	405.851852			
R	2	8.296296	4.148148	0.405	0.6733
A	2	175.629630	87.814815	8.583	0.0029
B	2	11.629630	5.814815	0.568	0.5775
AB	4	46.592593	11.648148	1.138	0.3738
ERROR	16	163.703704	10.231481		5.5

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Stunting % 04/12/18					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	26	1105.851852			
R	2	0.518519	0.259259	0.016	0.9841
A	2	662.518519	331.259259	20.479	0.0001
B	2	96.074074	48.037037	2.970	0.0800
AB	4	87.925926	21.981481	1.359	0.2918
ERROR	16	258.814815	16.175926		7.0

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Chlrosis % 04/19/18					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	26	47.185185			
R	2	3.629630	1.814815	1.000	0.3897
A	2	3.629630	1.814815	1.000	0.3897
B	2	3.629630	1.814815	1.000	0.3897
AB	4	7.259259	1.814815	1.000	0.4362
ERROR	16	29.037037	1.814815		2.3

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Stunting % 04/19/18					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	26	492.000000			
R	2	42.888889	21.444444	1.747	0.2060
A	2	46.222222	23.111111	1.882	0.1844
B	2	134.000000	67.000000	5.457	0.0156
AB	4	72.444444	18.111111	1.475	0.2561
ERROR	16	196.444444	12.277778		6.1

FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Stunting % 04/24/18					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	26	371.629630			
R	2	12.962963	6.481481	0.414	0.6678
A	2	53.407407	26.703704	1.707	0.2129
B	2	47.185185	23.592593	1.508	0.2513
AB	4	7.703704	1.925926	0.123	0.9721
ERROR	16	250.370370	15.648148		6.8

FACTORIAL/POOLED ERROR AOV For HLOUM Jagged chickweed C Control % 04/24/18					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	26	6908.000000			
R	2	8.666667	4.333333	0.165	0.8493
A	2	600.888889	300.444444	11.446	0.0008
B	2	5116.666667	2558.333333	97.460	0.0001
AB	4	761.777778	190.444444	7.255	0.0016
ERROR	16	420.000000	26.250000		8.9

Randomized Complete Block (RCB) AOV For LAMAM Henbit C Control % 04/24/18 Analysis will skip factor level A1 for column 7 - all A1 treatments are missing; Missing factor A2 B2 levels prevents analyzing column 7 as Factorial design; Missing factor A2 B3 levels prevents analyzing column 7 as Factorial design; Missing factor A3 B3 levels prevents analyzing column 7 as Factorial design; Missing values in column 7 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F Prob(F)
Total	9	10753.733333		
Replicate	2	9.733333	4.866667	0.067
Treatment	4	10525.066667	2631.266667	36.056
ERROR	3	218.933333	72.977778	

Means followed by same letter 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 % 05/02/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	26	490.666667				
R	2	21.555556	10.777778	0.985	0.3951	
A	2	157.555556	78.777778	7.198	0.0059	3.3
B	2	68.666667	34.333333	3.137	0.0709	3.3
AB	4	67.777778	16.944444	1.548	0.2359	5.7
ERROR	16	175.111111	10.944444			

## FACTORIAL/POOLED ERROR AOV For HLOUM Jagged chickweed C Control % 05/02/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	26	6550.518519				
R	2	21.629630	10.814815	0.963	0.4028	
A	2	412.962963	206.481481	18.384	0.0001	3.3
B	2	5588.074074	2794.037037	248.768	0.0001	3.3
AB	4	348.148148	87.037037	7.749	0.0011	5.8
ERROR	16	179.703704	11.231481			

## FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Stunting % 06/19/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	26	47.185185				
R	2	3.629630	1.814815	1.000	0.3897	
A	2	3.629630	1.814815	1.000	0.3897	1.3
B	2	3.629630	1.814815	1.000	0.3897	1.3
AB	4	7.259259	1.814815	1.000	0.4362	2.3
ERROR	16	29.037037	1.814815			

## FACTORIAL/POOLED ERROR AOV For C TRZAW W.Wheat Yield Bu/A 06/27/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	26	1408.618001				
R	2	723.061417	361.530709	13.906	0.0003	
A	2	123.683155	61.841577	2.379	0.1246	5.1
B	2	41.529104	20.764552	0.799	0.4671	5.1
AB	4	104.377901	26.094475	1.004	0.4344	8.8
ERROR	16	415.966425	25.997902			

Means followed by same letter 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 Osprey Xtra for Winter Wheat**

Trial ID: SG8-18

Location: Field #30

Trial Year: 2018

Protocol ID: SG8-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Bayer

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 08/01/17

Completion Date: 07/04/18

**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 BBCH Scale: BCER

Variety: Shirley

Planting Date: 10/17/17

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: 60 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 10/25/17

Soil Moisture: NORMAL normal, adequate

Harvest Date: 07/03/18

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

**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: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

Trial Initiation Comments:

Study area was turbo-tilled two times on 10-05-17 prior to planting.

**Soil Description**

Description Name: Field 30

% Sand: 83

Texture: LS

loamy sand

% Silt: 8

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

% Clay: 9

Soil Drainage: G good

**Application Description**

	A
Application Date	11/21/17
Appl. Stop Time	04:45 PM
Application Method	SPRAY
Application Timing	3-lvs
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	57 F
% Relative Humidity Start, Stop	56
Wind Velocity+Dir. Start	4 mph S
Wet Leaves (Y/N)	N no
Soil Temperature	57 F
Soil Moisture	NORMAL
% Cloud Cover	80

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	TRZAW BCER
Stage Scale Used	DESC
Stage Majority, Percent	3-leaf 100
Height Average	4 in

**Pest Stage At Each Application**

	A
Pest 1 Code, Type, Scale	LAMAM W
Stage Majority, Percent	veg 100
Height Average	0.4 in
Height Minimum, Maximum	0.3 0.5
Density Average	15 m2
Pest 2 Code, Type, Scale	HLOUM W
Stage Majority, Percent	2-leaf 60
Stage Minimum, Percent	cot 15
Stage Maximum, Percent	4-leaf 25
Height Average	0.8 in
Density Average	40 m2

**Application Equipment**

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

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

04/18/18: Jagged chickweed was the only species consistent enough to rate.

Evaluation of Osprey Xtra for Winter Wheat							
Trial ID: SG8-18		Location: Field #30		Trial Year: 2018			
Protocol ID: SG8-18		Investigator: Mark VanGessel					
Study Director:							
Sponsor Contact: Bayer							
Pest Code				C TRZAW	HLOUM JagChkwd C -		
Pest Name							
Crop Type, Code							
Crop Name					W.wheat		
Rating Type					Stunting %		
Rating Unit					Control %		
Rating Date				04/18/18	04/18/18	W.wheat	
05/07/18					05/07/18	Control %	
05/07/18						Control %	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check						
2	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 3-lvs 3-lvs	A A A	2.3 a	26.7 c
3	Osprey.....mesosulfuron Axiom Premix ----flufenacet ----metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	4.5 WG 68 WG 54 14 100 L 100 L	0.0134 lb ai/a 0.255 lb ai/a 0.202 0.0525 0.5 % v/v 1.25 % v/v	3-lvs 3-lvs 3-lvs 3-lvs 3-lvs	A A A A	3.3 a	87.7 a
4	Osprey Xtra Premix ----mesosulfuron ----thiencarbazone Nonionic Surfactant 30% Urea Ammonium Nitrate	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	3-lvs 3-lvs 3-lvs 3-lvs	A A A A	0.0 a	70.0 b
5	Osprey Xtra Premix ----mesosulfuron ----thiencarbazone Huskie Premix ----pyrasulfotole ----bromoxynil Nonionic Surfactant 30% Urea Ammonium Nitrate	6 WG 4.5 1.5 2.05 EC 0.3 1.75 100 L 100 L	0.0178 lb ai/a 0.0133 0.00445 0.176 lb ai/a 0.0258 0.15 0.5 % v/v 2.5 % v/v	3-lvs 3-lvs 3-lvs 3-lvs 3-lvs 3-lvs	A A A A A A	0.0 a	89.3 a
6	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	3-lvs 3-lvs 3-lvs 3-lvs	A A A A	2.3 a	86.7 a
LSD P=.05					5.97	9.88	5.47
Standard Deviation					3.28	5.43	3.01
CV					246.09	9.05	4.17
Replicate F					1.130	0.397	0.485
Replicate Prob(F)					0.3610	0.6824	0.6297
Treatment F					0.632	145.276	9.429
Treatment Prob(F)					0.6806	0.0001	187.374
							0.0015
							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 Pest Name Crop Type, Code	C TRZAW						
Crop Name Rating Type Rating Unit Rating Date	W.wheat Yield Bu/A 07/03/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check						24.8 a
2	Osprey.....mesosulfuron Nonionic Surfactant 30% Urea Ammonium Nitrate	4.5 WG 100 L 100 L	WG 0.5 % v/v 1.25 % v/v	0.0134 lb ai/a 3-lvs 3-lvs	A A A		21.0 a
3	Osprey.....mesosulfuron Axiom Premix ----flufenacet ----metribuzin Nonionic Surfactant 30% Urea Ammonium Nitrate	4.5 WG 68 WG 54 14 100 L 100 L	WG 0.255 lb ai/a 3-lvs 0.202 0.0525 0.5 % v/v 3-lvs 1.25 % v/v	0.0134 lb ai/a 3-lvs 3-lvs	A A A A		22.1 a
4	Osprey Xtra Premix ----mesosulfuron ----thiencarbazone Nonionic Surfactant 30% Urea Ammonium Nitrate	6 WG 4.5 1.5 100 L 100 L	WG 0.0133 0.00445 0.5 % v/v 3-lvs 2.5 % v/v	0.0178 lb ai/a 3-lvs 3-lvs	A A A		25.1 a
5	Osprey Xtra Premix ----mesosulfuron ----thiencarbazone Huskie Premix ----pyrasulfotole ----bromoxynil Nonionic Surfactant 30% Urea Ammonium Nitrate	6 WG 4.5 1.5 2.05 EC 0.3 1.75 100 L 100 L	WG 0.0133 0.00445 0.176 lb ai/a 3-lvs 0.0258 0.15 0.5 % v/v 3-lvs 2.5 % v/v	0.0178 lb ai/a 3-lvs 3-lvs	A A A A		22.5 a
6	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Nonionic Surfactant 30% Urea Ammonium Nitrate	50 SG 33 17 100 L 100 L	SG 0.0154 0.00796 0.25 % v/v 3-lvs 1.25 % v/v	0.0234 lb ai/a 3-lvs 3-lvs	A A A		25.2 a
LSD P=.05 Standard Deviation CV							5.08 2.79 11.9
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)							15.662 0.0008 1.251 0.3556

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

Efficacy of Spring-applied Quelex, Tank-mixes, and Adjuvants on Winter Wheat  
 Trial ID: SG9-18 Location: Field #14 Trial Year: 2018  
 Protocol ID: SG9-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: DowDuPont

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 08/01/17  
 Completion Date: 11/30/18

**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	BBCH Scale: BCER
Variety: Shirley	
Planting Date: 10/17/17	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: 60 F	Seed Bed: MEDIUM medium
Emergence Date: 10/23/17	Soil Moisture: NORMAL normal, adequate
Harvest Date: 06/27/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.5	Harvested Width: 7 FT
	Harvested Length: 24 FT
Crop 2: C GLXMA Glycine max	BBCH Scale: BSOY
Variety: S42L63	
Attributes: Liberty Link	
Planting Date: 07/03/18	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: 93 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 07/09/18	Soil Moisture: NORMAL normal, adequate
Harvest Date: 11/29/18	Harvest Equipment: Plot combine
% Standard Moisture: 13	Harvested Width: 6.25 FT
	Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: LAMAM Lamium amplexicaule  
 Common Name: Henbit

Pest 2 Type: W Code: ARBTH Arabidopsis thaliana  
 Common Name: Mouse-ear cress

Pest 3 Type: W Code: HLOUM Holostium umbellatum  
 Common Name: Jagged chickweed

**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: REDTIL reduced-till  
 Replications: 3      Study Design: RACOBL Randomized Complete Block (RCB)

## Trial Initiation Comments:

Study area was turbo-tilled three times on 10-05-17 prior to planting.

**Soil Description**

Description Name: Field 14-C  
 % Sand: 79      % OM: 1.5      Texture: LS      loamy sand  
 % Silt: 14      pH: 6.7      Soil Name: Klej loamy sand, 0-2% slopes  
 % Clay: 7      CEC: 4.8      Fert. Level: E      excellent  
 Soil Drainage: G      good

**Application Description**

	A
Application Date	03/29/18
Appl. Stop Time	12:30 PM
Application Method	SPRAY
Application Timing	Spring
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	71 F
% Relative Humidity Start, Stop	63
Wind Velocity+Dir. Start	2 mph SW
Wet Leaves (Y/N)	Y yes
Soil Temperature	71 F
Soil Moisture	NORMAL
% Cloud Cover	40

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	TRZAW BCER
Stage Scale Used	DESC
Stage Majority, Percent	tillered 100
Height Average	6.5 in
Height Minimum, Maximum	6 7
Crop 2 Code, BBCH Scale	GLXMA BSOY

<b>Pest Stage At Each Application</b>	
	A
Pest 1 Code, Type, Scale	LAMAM W
Stage Majority, Percent	Flower 100
Height Average	3 in
Height Minimum, Maximum	3 4
Density Average	100 m2
Pest 2 Code, Type, Scale	ARBTH W
Stage Majority, Percent	Flower 60
Stage Minimum, Percent	Flower 60
Stage Maximum, Percent	Seed 40
Height Average	4 in
Density Average	30 m2
Pest 3 Code, Type, Scale	HLOUM W
Stage Majority, Percent	Flower 100
Height Average	4 in
Density Average	15 m2

<b>Application Equipment</b>	
	A
Appl. Equipment	Backpack
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	12/13/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

<b>SE Definitions</b>	
	1.
Crop Type, Code	C

Trial Comments	
07/16/18:	No stunting observed in double-cropped soybeans.
08/06/18:	No stunting observed in double-cropped soybeans (heavy deer feeding in Rep 3).

Efficacy of Spring-applied Quelex, Tank-mixes, and Adjuvants on Winter Wheat  
 Trial ID: SG9-18 Location: Field #14 Trial Year: 2018  
 Protocol ID: SG9-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: DowDuPont

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	C TRZAW
Crop Name	Rating Type	Rating Unit	W.wheat Chlrosis %	W.wheat Stunting %	W.wheat Chlrosis %
Rating Date			04/11/18	04/11/18	04/19/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
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	lb ai/a	Spring A
2	Quelex Premix ----florasulam ----halauxifen 30% Urea Ammonium Nitrate Nonionic Surfactant	20 WG 10 10 100 L 100 L	0.0094 lb ai/a 0.0047 0.0047 50 % v/v 0.25 % v/v	lb ai/a	Spring A
3	Quelex Premix ----florasulam ----halauxifen 2,4-D ester Crop Oil Concentrate	20 WG 10 10 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.312 lb ae/a 1 % v/v	lb ai/a	Spring A
4	Quelex Premix ----florasulam ----halauxifen 2,4-D ester Nonionic Surfactant	20 WG 10 10 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.312 lb ae/a 0.25 % v/v	lb ai/a	Spring A
5	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate	50 SG 33 17 100 L	0.0234 lb ai/a 0.0154 0.00796 1 % v/v	lb ai/a	Spring A
6	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate	50 SG 33 17 3.8 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.312 lb ae/a 1 % v/v	lb ai/a	Spring A
7	PowerFlex HL....pyroxslam Dry Ammonium Sulfate Crop Oil Concentrate	13.1 WG 100 D 100 L	0.0164 lb ai/a 0.9 % w/v 1 % v/v	lb ai/a	Spring A
8	PowerFlex HL....pyroxslam Quelex Premix ----florasulam ----halauxifen Dry Ammonium Sulfate Crop Oil Concentrate	13.1 WG 20 WG 10 10 100 D 100 L	0.0164 lb ai/a 0.0094 lb ai/a 0.0047 0.0047 0.9 % w/v 1 % v/v	lb ai/a	Spring A
9	Untreated Check			0.0 c	0.0 c
				0.0 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.

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	HLOUM JagChkwd C -	LAMAM Henbit C -		
Crop Name	Rating Type	Rating Unit	W.wheat Stunting %	W.wheat Stunting %	Control %	Control %		
Rating Date			04/19/18	05/02/18	05/02/18	05/02/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl 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	lb ai/a Spring A	0.0 d	0.0 c	66.7 c	
2	Quelex Premix ----florasulam ----halauxifen 30% Urea Ammonium Nitrate Nonionic Surfactant	20 WG 10 10 100 L 100 L	0.0094 lb ai/a 0.0047 0.0047 50 % v/v 0.25 % v/v	lb ai/a Spring A	0.0 d	0.0 c	75.7 bc	
3	Quelex Premix ----florasulam ----halauxifen 2,4-D ester Crop Oil Concentrate	20 WG 10 10 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.312 lb ae/a 1 % v/v	lb ai/a Spring A	0.0 d	2.3 c	74.0 bc	
4	Quelex Premix ----florasulam ----halauxifen 2,4-D ester Nonionic Surfactant	20 WG 10 10 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.312 lb ae/a 0.25 % v/v	lb ai/a Spring A	0.0 d	0.0 c	72.7 bc	
5	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate	50 SG 33 17 100 L	0.0234 lb ai/a 0.0154 0.00796 1 % v/v	lb ai/a Spring A	7.3 c	0.0 c	53.3 d	63.3 b
6	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate	50 SG 33 17 3.8 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.312 lb ae/a 1 % v/v	lb ai/a Spring A	0.0 d	2.3 c	74.3 bc	76.7 a
7	PowerFlex HL....pyroxslam Dry Ammonium Sulfate Crop Oil Concentrate	13.1 WG 100 D 100 L	0.0164 lb ai/a 0.9 % w/v 1 % v/v	lb ai/a Spring A	16.7 b	10.7 b	53.3 d	
8	PowerFlex HL....pyroxslam Quelex Premix ----florasulam ----halauxifen Dry Ammonium Sulfate Crop Oil Concentrate	13.1 WG 20 WG 10 10 100 D 100 L	0.0164 lb ai/a 0.0094 lb ai/a 0.0047 0.0047 0.9 % w/v 1 % v/v	lb ai/a Spring A	20.0 a	14.0 a	81.7 b	
9	Untreated Check				0.0 d	0.0 c	0.0 e	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.

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	C GLXMA
Crop Name	Rating Type	Rating Unit	W.wheat Stunting %	W.wheat Yield Bu/A	Soybean Yield Bu/A
Rating Date			06/19/18	06/27/18	11/29/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
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	lb ai/a Spring A	0.0 b 71.4 a 26.2 a
2	Quelex Premix ----florasulam ----halauxifen 30% Urea Ammonium Nitrate Nonionic Surfactant	20 WG 10 10 100 L 100 L	0.0094 lb ai/a 0.0047 0.0047 50 % v/v 0.25 % v/v	lb ai/a Spring A	0.0 b 77.0 a 36.8 a
3	Quelex Premix ----florasulam ----halauxifen 2,4-D ester Crop Oil Concentrate	20 WG 10 10 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.312 lb ae/a 1 % v/v	lb ai/a Spring A	0.0 b 70.1 a 29.2 a
4	Quelex Premix ----florasulam ----halauxifen 2,4-D ester Nonionic Surfactant	20 WG 10 10 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.312 lb ae/a 0.25 % v/v	lb ai/a Spring A	0.0 b 71.7 a 29.3 a
5	Harmony Extra SG Premix ----thifensulfuron ----tribenuron Crop Oil Concentrate	50 SG 33 17 100 L	0.0234 lb ai/a 0.0154 0.00796 1 % v/v	lb ai/a Spring A	0.0 b 68.4 a 26.5 a
6	Harmony Extra SG Premix ----thifensulfuron ----tribenuron 2,4-D ester Crop Oil Concentrate	50 SG 33 17 3.8 L 100 L	0.0234 lb ai/a 0.0154 0.00796 0.312 lb ae/a 1 % v/v	lb ai/a Spring A	0.0 b 69.8 a 31.5 a
7	PowerFlex HL....pyroxslam Dry Ammonium Sulfate Crop Oil Concentrate	13.1 WG 100 D 100 L	0.0164 lb ai/a 0.9 % w/v 1 % v/v	lb ai/a Spring A	9.0 a 67.2 a 20.7 a
8	PowerFlex HL....pyroxslam Quelex Premix ----florasulam ----halauxifen Dry Ammonium Sulfate Crop Oil Concentrate	13.1 WG 20 WG 10 10 100 D 100 L	0.0164 lb ai/a 0.0094 lb ai/a 0.0047 0.0047 0.9 % w/v 1 % v/v	lb ai/a Spring A	8.0 a 70.5 a 26.0 a
9	Untreated Check			0.0 b	71.0 a 32.6 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		C TRZAW	C TRZAW	C TRZAW						
Pest Name										
Crop Type, Code										
Crop Name		W.wheat		W.wheat						
Rating Type		Chlrosis		Chlrosis						
Rating Unit		%		%						
Rating Date		04/11/18		04/19/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
10	Harmony Extra SG Premix	50 SG		0.014	lb ai/a	Spring A		0.0 c	2.3 c	0.0 c
	----thifensulfuron	33		0.0092						
	----tribenuron	17		0.00476						
	Metribuzin.....metribuzin	75 DF		0.188	lb ai/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				
LSD P=.05				3.10			3.10	7.61		0.94
Standard Deviation				1.81			1.81	4.44		0.55
CV				34.96			34.96	47.02		36.51
Replicate F				3.565			3.565	3.300		1.000
Replicate Prob(F)				0.0496			0.0496	0.0601		0.3874
Treatment F				69.881			69.881	33.249		100.556
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		C TRZAW	C TRZAW	HLOUM JagChkwd C -	LAMAM Henbit C -
Pest Name					
Crop Type, Code					
Crop Name		W.wheat	W.wheat		
Rating Type		Stunting	Stunting		
Rating Unit		%	%		
Rating Date		04/19/18	05/02/18	Control % 05/02/18	Control % 05/02/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
				Appl Timing	Appl Code
10	Harmony Extra SG Premix	50 SG	0.014 lb ai/a	Spring A	
	----thifensulfuron	33	0.0092		
	----tribenuron	17	0.00476		
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/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	
LSD P=.05			2.76	3.10	10.98
Standard Deviation			1.61	1.81	6.40
CV			36.62	61.58	5.77
					12.37
Replicate F			0.116	2.339	0.559
Replicate Prob(F)			0.8915	0.1250	0.5815
Treatment F			69.067	23.968	49.623
Treatment Prob(F)			0.0001	0.0001	151.000
					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.

## University of Delaware

Pest Code		C TRZAW	C TRZAW	C GLXMA						
Pest Name										
Crop Type, Code										
Crop Name		W.wheat		Soybean						
Rating Type		Stunting		Yield						
Rating Unit		%	Bu/A	Bu/A						
Rating Date		06/19/18	06/27/18	11/29/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code			
10	Harmony Extra SG Premix	50	SG	0.014	lb ai/a	Spring	A	0.0 b	73.6 a	27.2 a
	----thifensulfuron	33		0.0092						
	----tribenuron	17		0.00476						
	Metribuzin.....metribuzin	75	DF	0.188	lb ai/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			
LSD P=.05					1.29		8.91		10.07	
Standard Deviation					0.75		5.19		5.87	
CV					44.28		7.31		20.52	
Replicate F					1.588		5.601		2.446	
Replicate Prob(F)					0.2316		0.0128		0.1149	
Treatment F					68.294		0.831		1.689	
Treatment Prob(F)					0.0001		0.5970		0.1644	

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

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

Quelex Efficacy Hard to Control Weeds in Winter Wheat  
 Trial ID: SG10-18 Location: Field #14 Trial Year: 2018  
 Protocol ID: SG10-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: DowDuPont

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 08/01/17  
 Completion Date: 11/30/18

**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	BBCH Scale: BCER
Variety: Shirley	
Planting Date: 10/17/17	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: 60 F	Seed Bed: MEDIUM medium
Emergence Date: 10/23/17	Soil Moisture: NORMAL normal, adequate
Harvest Date: 06/27/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.5	Harvested Width: 7 FT
	Harvested Length: 24 FT
Crop 2: C GLXMA Glycine max	Soybean BBCH Scale: BSOY
Variety: S42L63	
Attributes: Liberty Link	
Planting Date: 07/03/18	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: 93 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 07/09/18	Soil Moisture: NORMAL normal, adequate
Harvest Date: 11/29/18	Harvest Equipment: Plot combine
% Standard Moisture: 13	Harvested Width: 6.25 FT
	Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: HLOUM Holosteum umbellatum  
 Common Name: Jagged chickweed

Pest 2 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: 12      Tillage Type: REDTIL reduced-till  
 Replications: 3      Study Design: RACOBL Randomized Complete Block (RCB)

## Trial Initiation Comments:

Study area was turbo-tilled three times on 10-05-17 prior to planting.

**Soil Description**

Description Name: Field 14-C  
 % Sand: 79      % OM: 1.5      Texture: LS      loamy sand  
 % Silt: 14      pH: 6.7      Soil Name: Klej loamy sand, 0-2% slopes  
 % Clay: 7      CEC: 4.8      Fert. Level: E      excellent  
 Soil Drainage: G      good

**Application Description**

	A	B
Application Date	03/19/18	04/20/18
Appl. Stop Time	03:00 PM	08:40 AM
Application Method	SPRAY	SPRAY
Application Timing	EaSpring	LaSpring
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	45 F	43 F
% Relative Humidity Start, Stop	63	47
Wind Velocity+Dir. Start	4 mph E	6 mph NW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	45 F	43 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	100	5

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER
Stage Scale Used	DESC	DESC
Stage Majority, Percent	3-4tilr 70	3-4nodes 100
Stage Minimum, Percent	2-tilr 10	
Stage Maximum, Percent	5-tilr 20	
Height Average	6 in	13 in
Height Minimum, Maximum	4 7	12 14
Crop 2 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Stage Scale Used	BBCH	

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	HLOUM W	HLOUM W
Stage Majority, Percent	EaFlwr 100	seed 100
Height Average	3 in	5 in
Height Minimum, Maximum	3 4	4 6
Density Average	10 m <sup>2</sup>	10 m <sup>2</sup>
Pest 2 Code, Type, Scale	LAMAM W	LAMAM W
Stage Majority, Percent	EaFlwr 100	seed 80
Stage Minimum, Percent		LaFlwr 20
Stage Maximum, Percent		seed 80
Height Average	3 in	7 in
Height Minimum, Maximum	2 4	6 8
Density Average	25 m <sup>2</sup>	25 m <sup>2</sup>

**Application Equipment**

	A	B
Appl. Equipment	Backpack	Backpack
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	18 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	12/13/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

04/20/18: Wheat is Feekes stage 8.

05/01/18: Poor to no control on mouseearcress - trts 1,3. Poor to no control of common chickweed - trt 2.

06/19/18: Plants are thinner, appears to be a reduction in tillering, color of stems and heads is darker than rest of the treatments.

07/16/18: No injury observed in double-cropped soybeans

08/06/18: No injury observed in double-cropped soybeans (heavy deer feeding in rep 3)

Quelex Efficacy Hard to Control Weeds in Winter Wheat			
Trial ID: SG10-18	Location: Field #14	Trial Year: 2018	
Protocol ID: SG10-18	Investigator: Mark VanGessel		
Study Director:			
Sponsor Contact: DowDuPont			

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	C TRZAW
Crop Name			W.wheat	W.wheat	W.wheat
Rating Type			Stunting	Chlrosis	Stunting
Rating Unit			%	%	%
Rating Date			04/12/18	04/19/18	04/19/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing
1	Quelex Premix	20 WG	0.0094 lb ai/a	EaSpring A	
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	Crop Oil Concentrate	100 L	0.5 % v/v	EaSpring A	
2	Clarity.....dicamba Nonionic Surfactant	4 L	0.125 lb ai/a	EaSpring A	2.3 a
		100 L	0.25 % v/v	EaSpring A	4.0 a
3	Quelex Premix	20 WG	0.0094 lb ai/a	EaSpring A	6.3 a
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	2,4-D ester	3.8 L	0.374 lb ae/a	EaSpring A	
	Crop Oil Concentrate	100 L	0.5 % v/v	EaSpring A	
4	Quelex Premix	20 WG	0.0094 lb ai/a	EaSpring A	0.0 a
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	Clarity.....dicamba	4 L	0.125 lb ai/a	EaSpring A	
	Crop Oil Concentrate	100 L	0.5 % v/v	EaSpring A	
5	Quelex Premix	20 WG	0.0094 lb ai/a	EaSpring A	5.7 a
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	Starane Ultra...fluoroxypr	2.8 EC	0.105 lb ae/a	EaSpring A	
	Nonionic Surfactant	100 L	0.25 % v/v	EaSpring A	
6	Quelex Premix	20 WG	0.0094 lb ai/a	EaSpring A	4.7 a
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	Crop Oil Concentrate	100 L	0.5 % v/v	EaSpring A	
	Starane Ultra...fluoroxypr	2.8 EC	0.105 lb ae/a	LaSpring B	
	Nonionic Surfactant	100 L	0.25 % v/v	LaSpring B	
7	Quelex Premix	20 WG	0.0094 lb ai/a	EaSpring A	8.0 a
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	Crop Oil Concentrate	100 L	0.5 % v/v	EaSpring A	
	2,4-D ester	3.8 L	0.374 lb ae/a	LaSpring B	
	Crop Oil Concentrate	100 L	0.5 % v/v	LaSpring B	
8	Quelex Premix	20 WG	0.0094 lb ai/a	EaSpring A	4.7 a
	----florasulam	10	0.0047		
	----halauxifen	10	0.0047		
	Crop Oil Concentrate	100 L	0.5 % v/v	EaSpring A	
	Clarity.....dicamba	4 L	0.125 lb ai/a	LaSpring B	
	Crop Oil Concentrate	100 L	0.5 % v/v	LaSpring 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=7

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	HLOUM JagChkwd	LAMAM Henbit
Crop Name	Rating Type	Rating Unit	W.wheat Stunting %	W.wheat Stunting %	Control %	Control %
Rating Date			04/23/18	05/01/18	05/01/18	05/01/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl 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 0.5 % v/v	EaSpring A EaSpring A EaSpring A		0.0 a 53.3 d
2	Clarity.....dicamba Nonionic Surfactant	4 L 100 L	0.125 lb ai/a 0.25 % v/v	EaSpring A EaSpring A		0.0 a 23.3 e 53.3 b
3	Quelex Premix ----florasulam ----halauxifen 2,4-D ester Crop Oil Concentrate	20 WG 10 10 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.374 lb ae/a 0.5 % v/v	EaSpring A EaSpring A EaSpring A EaSpring A		0.0 a 81.3 a
4	Quelex Premix ----florasulam ----halauxifen Clarity.....dicamba Crop Oil Concentrate	20 WG 10 10 4 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.125 lb ai/a 0.5 % v/v	EaSpring A EaSpring A EaSpring A EaSpring A		4.0 a 61.7 bc
5	Quelex Premix ----florasulam ----halauxifen Starane Ultra...fluoroxypr Nonionic Surfactant	20 WG 10 10 2.8 EC 100 L	0.0094 lb ai/a 0.0047 0.0047 0.105 lb ae/a 0.25 % v/v	EaSpring A EaSpring A EaSpring A EaSpring A		4.7 a 68.3 b
6	Quelex Premix ----florasulam ----halauxifen Crop Oil Concentrate Starane Ultra...fluoroxypr Nonionic Surfactant	20 WG 10 10 100 L 2.8 EC 100 L	0.0094 lb ai/a 0.0047 0.0047 0.5 % v/v 0.105 lb ae/a 0.25 % v/v	EaSpring A LaSpring B LaSpring B	0.0 b 2.3 a	55.0 cd
7	Quelex Premix ----florasulam ----halauxifen Crop Oil Concentrate 2,4-D ester Crop Oil Concentrate	20 WG 10 10 100 L 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.5 % v/v 0.374 lb ae/a 0.5 % v/v	EaSpring A LaSpring B LaSpring B	0.0 b 1.7 a	56.7 cd
8	Quelex Premix ----florasulam ----halauxifen Crop Oil Concentrate Clarity.....dicamba Crop Oil Concentrate	20 WG 10 10 100 L 4 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.5 % v/v 0.125 lb ai/a 0.5 % v/v	EaSpring A LaSpring B LaSpring B	4.3 a 0.0 a	55.0 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:Average=7

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	C GLXMA		
Crop Name	Rating Type	Rating Unit	W.wheat Stunting %	W.wheat Yield Bu/A	Soybean Yield Bu/A		
Rating Date			06/19/18	06/27/18	11/29/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl 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 0.5 % v/v	EaSpring A	0.0 b	66.2 a	36.4 a
2	Clarity.....dicamba Nonionic Surfactant	4 L 100 L	0.125 lb ai/a 0.25 % v/v	EaSpring A EaSpring A	0.0 b	60.1 bc	33.9 a
3	Quelex Premix ----florasulam ----halauxifen 2,4-D ester Crop Oil Concentrate	20 WG 10 10 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.374 lb ae/a 0.5 % v/v	EaSpring A EaSpring A EaSpring A EaSpring A	0.0 b	62.9 abc	35.3 a
4	Quelex Premix ----florasulam ----halauxifen Clarity.....dicamba Crop Oil Concentrate	20 WG 10 10 4 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.125 lb ai/a 0.5 % v/v	EaSpring A EaSpring A EaSpring A EaSpring A	0.0 b	65.0 ab	35.1 a
5	Quelex Premix ----florasulam ----halauxifen Starane Ultra...fluoroxypr Nonionic Surfactant	20 WG 10 10 2.8 EC 100 L	0.0094 lb ai/a 0.0047 0.0047 0.105 lb ae/a 0.25 % v/v	EaSpring A EaSpring A EaSpring A EaSpring A	0.0 b	66.8 a	38.5 a
6	Quelex Premix ----florasulam ----halauxifen Crop Oil Concentrate Starane Ultra...fluoroxypr Nonionic Surfactant	20 WG 10 10 100 L 2.8 EC 100 L	0.0094 lb ai/a 0.0047 0.0047 0.5 % v/v 0.105 lb ae/a 0.25 % v/v	EaSpring A EaSpring A LaSpring B LaSpring B	1.7 b	63.6 abc	39.2 a
7	Quelex Premix ----florasulam ----halauxifen Crop Oil Concentrate 2,4-D ester Crop Oil Concentrate	20 WG 10 10 100 L 3.8 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.5 % v/v 0.374 lb ae/a 0.5 % v/v	EaSpring A EaSpring A LaSpring B LaSpring B	2.3 b	58.6 c	39.3 a
8	Quelex Premix ----florasulam ----halauxifen Crop Oil Concentrate Clarity.....dicamba Crop Oil Concentrate	20 WG 10 10 100 L 4 L 100 L	0.0094 lb ai/a 0.0047 0.0047 0.5 % v/v 0.125 lb ai/a 0.5 % v/v	EaSpring A EaSpring A LaSpring B LaSpring B	18.0 a	32.6 d	37.4 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:Average=7

## University of Delaware

Pest Code		C TRZAW	C TRZAW	C TRZAW						
Pest Name										
Crop Type, Code										
Crop Name		W.wheat	W.wheat	W.wheat						
Rating Type		Stunting	Chlrosis	Stunting						
Rating Unit		%	%	%						
Rating Date		04/12/18	04/19/18	04/19/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
9	Quelex Premix ----florasulam ----halauxifen	20 WG 10 10	WG 0.0047 0.0047	0.0094	lb ai/a	EaSpring A		1.7 a	0.0 a	0.0 a
	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	SG 0.0092 0.00476	0.014	lb ai/a	EaSpring A				
	Nonionic Surfactant	100 L	L	0.25 %	v/v	EaSpring A				
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	SG 0.0092 0.00476	0.014	lb ai/a	EaSpring A		8.0 a	2.3 a	0.0 a
	2,4-D ester Nonionic Surfactant	3.8 L 100 L	L	0.374	lb ae/a	EaSpring A				
11	Untreated Check							0.0 a	0.0 a	0.0 a
12	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	SG 0.0154 0.00796	0.0234	lb ai/a	EaSpring A		6.3 a	0.0 a	0.0 a
	Starane Ultra...fluoroxypr Nonionic Surfactant	2.8 EC 100 L	EC	0.12	lb ae/a	EaSpring A				
	30% Urea Ammonium Nitrate	100 L	L	0.25 %	v/v	EaSpring A				
		100 L	L	1.25 %	v/v	EaSpring A				
LSD P=.05					5.97		3.52	3.81		
Standard Deviation					3.53		2.08	2.25		
CV					81.91		439.92	404.52		
Replicate F					0.284		0.508	2.200		
Replicate Prob(F)					0.7557		0.6083	0.1346		
Treatment F					1.878		0.877	1.000		
Treatment Prob(F)					0.1003		0.5740	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.

Missing data estimates are included in columns:Average=7

## University of Delaware

Pest Code		C	TRZAW	C	TRZAW	HLOUM JagChkwd	LAMAM Henbit
Pest Name						C -	C -
Crop Type, Code							
Crop Name							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
9	Quelex Premix	20	WG	0.0094	lb ai/a	EaSpring A	
	----florasulam	10		0.0047			
	----halauxifen	10		0.0047			
10	Harmony Extra SG Premix	50	SG	0.014	lb ai/a	EaSpring A	
	----thifensulfuron	33		0.0092			
	----tribenuron	17		0.00476			
	Nonionic Surfactant	100	L	0.25	% v/v	EaSpring A	
11	Untreated Check						
12	Harmony Extra SG Premix	50	SG	0.0234	lb ai/a	EaSpring A	
	----thifensulfuron	33		0.0154			
	----tribenuron	17		0.00796			
	Starane Ultra...fluoroxypry	2.8	EC	0.12	lb ae/a	EaSpring A	
	Nonionic Surfactant	100	L	0.25	% v/v	EaSpring A	
	30% Urea Ammonium Nitrate	100	L	1.25	% v/v	EaSpring A	
LSD P=.05				1.51		4.44	8.00
Standard Deviation				0.67		2.62	4.72
CV				46.15		171.64	8.09
Replicate F				1.000		0.440	0.474
Replicate Prob(F)				0.4444		0.6494	0.6285
Treatment F				42.250		1.370	86.069
Treatment Prob(F)				0.0020		0.2542	0.0001
							15.52
							6.85
							11.25
							1.378
							0.3506
							131.022
							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=7

## University of Delaware

Pest Code	Pest Name	Crop Type, Code	C TRZAW	C TRZAW	C GLXMA			
Crop Name	Rating Type	Rating Unit	W.wheat Stunting %	W.wheat Yield Bu/A	Soybean Yield Bu/A			
Rating Date			06/19/18	06/27/18	11/29/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code			
9	Quelex Premix ----florasulam ----halauxifen	20 WG 10 10	lb ai/a	0.0094 0.0047 0.0047	EaSpring A	0.0 b	64.2 ab	36.0 a
	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	lb ai/a	0.014 0.0092 0.00476	EaSpring A			
	Nonionic Surfactant	100 L	v/v	0.25 %	EaSpring A			
10	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	lb ai/a	0.014 0.0092 0.00476	EaSpring A	0.0 b	62.6 abc	35.8 a
	2,4-D ester Nonionic Surfactant	3.8 L 100 L	lb ae/a	0.374	EaSpring A			
11	Untreated Check					0.0 b	63.2 abc	35.8 a
12	Harmony Extra SG Premix ----thifensulfuron ----tribenuron	50 SG 33 17	lb ai/a	0.0234 0.0154 0.00796	EaSpring A	0.0 b	62.9 abc	42.6 a
	Starane Ultra...fluoroxypr Nonionic Surfactant	2.8 EC 100 L	lb ae/a	0.12	EaSpring A			
	30% Urea Ammonium Nitrate	100 L	v/v	0.25 %	EaSpring A			
		100 L	v/v	1.25 %	EaSpring A			
LSD P=.05				2.67		5.03	9.05	
Standard Deviation				1.58		2.97	5.35	
CV				85.98		4.89	14.41	
Replicate F				0.134		7.656	9.005	
Replicate Prob(F)				0.8752		0.0030	0.0014	
Treatment F				32.037		28.415	0.612	
Treatment Prob(F)				0.0001		0.0001	0.7991	

Means followed by same letter 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=7

**Winter Wheat Response to PGR Herbicides**

Trial ID: SG12-18      Location: Field #14      Trial Year: 2018  
Protocol ID: SG12-18      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Initiation Date: 08/01/17  
Completion Date: 06/30/18

**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	BBCH Scale: BCER
Variety: Shirley	
Planting Date: 10/17/17	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: 60 F	Seed Bed: MEDIUM medium
Emergence Date: 10/23/17	Soil Moisture: NORMAL normal, adequate
Harvest Date: 06/27/18	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: 18      Tillage Type: REDTIL reduced-till  
Replications: 3      Study Design: FACTOR Factorial

## Trial Initiation Comments:

Study area was turbo-tilled three times prior to planting.

## Field Prep./Maintenance:

Broadcast postemergence application Axial XL 16.4 fl oz/A + Harmony Extra SG 0.9 oz wt/A + NIS on 11-30-17.

**Soil Description**

Description Name: Field 14-C  
% Sand: 79      Texture: LS      loamy sand  
% Silt: 14      Soil Name: Klej loamy sand, 0-2% slopes  
% Clay: 7  
Soil Drainage: G      good

**Application Description**

	A	B	C	D
Application Date	11/21/17	12/19/17	03/19/18	04/20/18
Appl. Stop Time	05:00 PM	01:00 PM	02:00 PM	08:20 AM
Interval to Prev. Appl.		28 DAYS	90 DAYS	32 DAYS
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	2-leaf	tiller	Spring	LaSpring
Application Placement	BROADC	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson	Johnson
Air Temperature Start, Stop	57 F	58 F	51 F	43 F
% Relative Humidity Start, Stop	56	59	48	47
Wind Velocity+Dir. Start	4 mph S	5 mph SW	1 mph E	4 mph NW
Wet Leaves (Y/N)	N no	N no	N no	N no
Soil Temperature	57 F	58 F	51 F	43 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	80	10	90	5

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	TRZAW BCER	TRZAW BCER	TRZAW BCER	TRZAW BCER
Stage Scale Used	DESC	DESC	DESC	DESC
Stage Majority, Percent	3-leaf 70	3-tilr 50	4-tilr 70	3-4nodes 100
Stage Minimum, Percent	2-leaf 10	2-tilr 30	3-tilr 20	
Stage Maximum, Percent	1-tilr 20	4-tilr 20	5-tilr 10	
Height Average	3 in	3.5 in	6 in	13 in
Height Minimum, Maximum		3 4	4 7	12 14

**Application Equipment**

	A	B	C	D
Appl. Equipment	Backpack	Backpack	Backpack	Backpack
Equipment Type	SPRBAC	SPRBAC	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002	11002
Nozzle Spacing	18 in	18 in	18 in	18 in
Boom Length	9 ft	9 ft	9 ft	9 ft
Boom Height	18 in	20 in	24 in	30 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

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

04/18/18: Plots 115,116,117,118, 202, 302, 305, 307 - wheat is shorter than other plots.

04/20/18: Wheat is Feekes Stae 8.

06/19/18: Wheat was stunted and stems and heads were darker than the rest of the other treatments.

## Winter Wheat Response to PGR Herbicides

Trial ID: SG12-18

Location: Field #14

Trial Year: 2018

Protocol ID: SG12-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	C TRZAW W.wheat Stunting % 04/18/18	C TRZAW W.wheat Stunting % 05/02/18	C TRZAW Winter wheat Stunting % 06/19/18	C TRZAW W.wheat Yield Bu/A 06/27/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	2,4-D amine 2-leaf wheat	3.8 L	0.475 lb ae/a	2-leaf	A		4.0 abc	1.7 a	0.0 b	52.4 ab
2	2,4-D amine Tillering	3.8 L	0.475 lb ae/a	Tiller	B		0.0 c	3.3 a	0.0 b	55.0 ab
3	2,4-D amine Spring	3.8 L	0.475 lb ae/a	Spring	C		0.0 c	2.3 a	0.0 b	56.4 ab
4	2,4-D amine Late Spring	3.8 L	0.475 lb ae/a	LaSprng	D			5.7 a	0.0 b	56.7 ab
5	2,4-D amine 2-leaf wheat	3.8 L	0.238 lb ae/a	2-leaf	A		2.3 bc	1.7 a	0.0 b	53.4 ab
6	2,4-D amine Tillering	3.8 L	0.238 lb ae/a	Tiller	B		2.3 bc	2.3 a	0.0 b	51.8 ab
7	2,4-D amine Spring	3.8 L	0.238 lb ae/a	Spring	C		2.3 bc	5.7 a	0.0 b	57.7 a
8	2,4-D amine Late Spring	3.8 L	0.238 lb ae/a	LaSprng	D			0.0 a	0.0 b	57.8 a
9	Clarity.....dicamba Nonionic Surfactant 2-leaf wheat	4 L 100 L	0.125 lb ai/a 0.25 % v/v	2-leaf 2-leaf	A A		0.0 c	4.7 a	0.0 b	50.1 ab
10	Clarity.....dicamba Nonionic Surfactant Tillering	4 L 100 L	0.125 lb ai/a 0.25 % v/v	Tiller Tiller	B B		4.7 ab	0.0 a	0.0 b	51.4 ab
11	Clarity.....dicamba Nonionic Surfactant Spring	4 L 100 L	0.125 lb ai/a 0.25 % v/v	Spring Spring	C C		8.0 a	4.7 a	0.0 b	51.9 ab
12	Clarity.....dicamba Nonionic Surfactant Late Spring	4 L 100 L	0.125 lb ai/a 0.25 % v/v	LaSprng LaSprng	D D			2.3 a	15.7 a	29.0 c
13	Starane Ultra...fluroxypyr 2-leaf wheat	2.8 EC	0.14 lb ae/a	2-leaf	A		1.7 bc	0.0 a	0.0 b	58.4 a
14	Starane Ultra...fluroxypyr Tillering	2.8 EC	0.14 lb ae/a	Tiller	B		0.0 c	2.3 a	0.0 b	54.5 ab
15	Starane Ultra...fluroxypyr Spring	2.8 EC	0.14 lb ae/a	Spring	C		2.3 bc	2.3 a	0.0 b	51.2 ab
16	Starane Ultra...fluroxypyr Late Spring	2.8 EC	0.14 lb ae/a	LaSprng	D			4.0 a	0.0 b	47.6 b
17	Untreated Check						0.0 c	0.0 a	0.0 b	51.0 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.

University of Delaware													
Pest Code						C	TRZAW	C	TRZAW	C	TRZAW	C	TRZAW
Pest Name							W.wheat		W.wheat		Winter wheat		W.wheat
Crop Type, Code							Stunting		Stunting		Stunting		Yield
Crop Name						%		%		%		Bu/A	
Rating Type						04/18/18		05/02/18		06/19/18		06/27/18	
Rating Unit													
Rating Date													
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Unit	Appl Timing	Appl Code						
18	Untreated Check					0.0	c	0.0	a	0.0	b	53.1	ab
LSD P=.05						4.48		5.88		0.45		9.33	
Standard Deviation						2.67		3.55		0.27		5.63	
CV						135.22		148.46		31.27		10.78	
Replicate F						1.844		1.285		1.000		0.121	
Replicate Prob(F)						0.1783		0.2897		0.3784		0.8861	
Treatment F						2.316		0.911		552.250		4.019	
Treatment Prob(F)						0.0331		0.5679		0.0001		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.

## Winter Wheat Response to PGR Herbicides

Trial ID: SG12-18

Location: Field #14

Trial Year: 2018

Protocol ID: SG12-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code		C TRZAW	C TRZAW	C TRZAW	C TRZAW
Pest Name		W.wheat	W.wheat	Winter wheat	W.wheat
Crop Type, Code		Stunting %	Stunting %	Stunting %	Yield Bu/A
Crop Name					
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			3.0	1.8	1.1
Replicate 2			1.0	2.4	0.9
Replicate 3			2.9	3.9	0.9
TABLE OF A (Herbicide) MEANS					
1 2,4-D amine	3.8 L	0.475 lb ae/a	2-leaf	A	1.3 a
2 2,4-D amine	3.8 L	0.238 lb ae/a	2-leaf	A	2.3 a
3 Clarity.....dicamba	4 L	0.125 lb ai/a	2-leaf	A	4.2 a
3 Nonionic Surfactant	100 L	0.25 % v/v	2-leaf	A	2.9 a
4 Starane Ultra...fluroxypyr	2.8 EC	0.14 lb ae/a	2-leaf	A	3.9 a
LSD P=.05			2.43	3.13	0.24
Standard Deviation			2.87	3.76	0.29
CV			124.50	139.82	5.41
TABLE OF B (Application Timing) MEANS					
1 2-leaf wheat			2.0 a	2.0 a	0.0 b
2 Tillering			1.8 a	2.0 a	0.0 b
3 Spring			3.2 a	3.8 a	0.0 b
4 Late Spring			.	3.0 a	3.9 a
LSD P=.05			2.43	3.13	0.24
Standard Deviation			2.87	3.76	0.29
CV			124.50	139.82	5.41
TABLE OF A (Herbicide) B (Application Timing) MEANS					
1 2,4-D amine	3.8 L	0.475 lb ae/a	2-leaf	A	4.0 a
1 2-leaf wheat					1.7 a
2 2,4-D amine	3.8 L	0.238 lb ae/a	2-leaf	A	2.3 a
1 2-leaf wheat					1.7 a
3 Clarity.....dicamba	4 L	0.125 lb ai/a	2-leaf	A	0.0 a
3 Nonionic Surfactant	100 L	0.25 % v/v	2-leaf	A	4.7 a
1 2-leaf wheat					0.0 b
4 Starane Ultra...fluroxypyr	2.8 EC	0.14 lb ae/a	2-leaf	A	1.7 a
1 2-leaf wheat					0.0 a
1 2,4-D amine	3.8 L	0.475 lb ae/a	2-leaf	A	0.0 a
2 Tillering					3.3 a
2 2,4-D amine	3.8 L	0.238 lb ae/a	2-leaf	A	2.3 a
2 Tillering					2.3 a
3 Clarity.....dicamba	4 L	0.125 lb ai/a	2-leaf	A	4.7 a
3 Nonionic Surfactant	100 L	0.25 % v/v	2-leaf	A	0.0 a
2 Tillering					0.0 b
4 Starane Ultra...fluroxypyr	2.8 EC	0.14 lb ae/a	2-leaf	A	0.0 a
2 Tillering					2.3 a
1 2,4-D amine	3.8 L	0.475 lb ae/a	2-leaf	A	0.0 a
3 Spring					2.3 a
					0.0 b
					56.4 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.

## University of Delaware

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	C TRZAW W.wheat Stunting % 04/18/18	C TRZAW W.wheat Stunting % 05/02/18	C TRZAW Winter wheat Stunting % 06/19/18	C TRZAW W.wheat Yield Bu/A 06/27/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing				
2	2,4-D amine	3.8 L	0.238 lb ae/a	2-leaf	A		2.3 a	5.7 a	0.0 b	57.7 a
3	Spring									
3	Clarity.....dicamba	4 L	0.125 lb ai/a	2-leaf	A		8.0 a	4.7 a	0.0 b	51.9 ab
3	Nonionic Surfactant	100 L	0.25 % v/v	2-leaf	A					
3	Spring									
4	Starane Ultra...fluroxypyr	2.8 EC	0.14 lb ae/a	2-leaf	A		2.3 a	2.3 a	0.0 b	51.2 ab
3	Spring									
1	2,4-D amine	3.8 L	0.475 lb ae/a	2-leaf	A		.	5.7 a	0.0 b	56.7 a
4	Late Spring									
2	2,4-D amine	3.8 L	0.238 lb ae/a	2-leaf	A		.	0.0 a	0.0 b	57.8 a
4	Late Spring									
3	Clarity.....dicamba	4 L	0.125 lb ai/a	2-leaf	A		.	2.3 a	15.7 a	29.0 c
3	Nonionic Surfactant	100 L	0.25 % v/v	2-leaf	A					
4	Late Spring									
4	Starane Ultra...fluroxypyr	2.8 EC	0.14 lb ae/a	2-leaf	A		.	4.0 a	0.0 b	47.6 b
4	Late Spring									
LSD P=.05							4.86	6.27	0.48	9.01
Standard Deviation							2.87	3.76	0.29	5.41
CV							124.50	139.82	29.48	10.35

Means followed by same letter 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 % 04/18/18 Analysis will skip factor level B4 for column 1 - all B4 treatments are missing

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	399.638889				
R	2	30.722222	15.361111	1.864	0.1787	
A	3	50.083333	16.694444	2.026	0.1396	2.4
B	2	13.722222	6.861111	0.833	0.4481	2.4
AB	6	123.833333	20.638889	2.505	0.0532	4.9
ERROR	22	181.277778	8.239899			

FACTORIAL/POOLED ERROR AOV For C TRZAW W.wheat Stunting % 05/02/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	616.312500				
R	2	36.375000	18.187500	1.288	0.2906	
A	3	8.562500	2.854167	0.202	0.8941	3.1
B	3	26.062500	8.687500	0.615	0.6105	3.1
AB	9	121.687500	13.520833	0.958	0.4928	6.3
ERROR	30	423.625000	14.120833			

FACTORIAL/POOLED ERROR AOV For C TRZAW Winter wheat Stunting % 06/19/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	692.979167				
R	2	0.166667	0.083333	1.000	0.3798	
A	3	138.062500	46.020833	552.250	0.0001	0.2
B	3	138.062500	46.020833	552.250	0.0001	0.2
AB	9	414.187500	46.020833	552.250	0.0001	0.5
ERROR	30	2.500000	0.083333			

FACTORIAL/POOLED ERROR AOV For C TRZAW W.wheat Yield Bu/A 06/27/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	3031.609223				
R	2	0.225860	0.112930	0.004	0.9961	
A	3	738.766447	246.255482	8.429	0.0003	4.5
B	3	322.882321	107.627440	3.684	0.0227	4.5
AB	9	1093.253183	121.472576	4.158	0.0015	9.0
ERROR	30	876.481412	29.216047			

Means followed by same letter 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: DSB1-18rev

Location: Field #10

Trial Year: 2018

Protocol ID: DSB1-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Delaware Soybean Board

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Initiation Date: 03/01/18

Completion Date: 11/24/18

**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

Variety: multiple

Planting Date: 06/18/18

Planting Rate: 180000 S/A

Depth: 1 in

Rows per Plot: 16

Planting Method: DRILLE drilled

Row Spacing: 7 in

Planting Equipment: CP Cone Planter

Soil Temperature: 89 F

Seed Bed: MEDTRA medium/trashy

Emergence Date: 06/24/18

Soil Moisture: NORMAL normal, adequate

Harvest Date: 11/21/18

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

**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

**Field Prep./Maintenance:**

Preemergence application of Outlook 12 oz/A was added to treatments 1-17, 19, 20, and applied on 6-18-18.

**Soil Description**

Description Name: Field 10

% Sand: 79

% OM: 1.6

Texture: SL

sandy loam

% Silt: 10

pH: 6.3

Soil Name: Hurlokk sandy loam, 0-2% slopes

% Clay: 11

CEC: 5.0

Fert. Level: G good

Soil Drainage: F

fair

<b>Application Description</b>		A	B	C	D
Application Date	06/18/18	07/19/18	07/20/18	07/27/18	
Appl. Stop Time	04:20 PM	09:35 AM	04:00 PM	11:10 AM	
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	
Application Timing	PRE	4WAP	16" Palmer	+7 days	
Application Placement	BROADC	BROADC	BROADC	BROADC	
Applied By	Johnson	Johnson	Johnson	Johnson	
Air Temperature Start, Stop	89 F	80 F	79 F	88 F	
% Relative Humidity Start, Stop	49	45	58	65	
Wind Velocity+Dir. Start	4 mph SW	1 mph NE	3 mph E	1 mph SW	
Wet Leaves (Y/N)	N no	N no	N no	N no	
Soil Temperature	89 F	80 F	79 F	88 F	
Soil Moisture	NORMAL	NORMAL	NORMAL	WET	
% Cloud Cover	15	30	20	30	

<b>Crop Stage At Each Application</b>		A	B	C	D
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY	
Stage Scale Used		DESC	DESC	DESC	
Stage Majority, Percent		V6 100	V6 100	Veg 60	
Stage Minimum, Percent				Veg 60	
Stage Maximum, Percent				EaFlowr 40	
Height Average		10 in	10 in	12 in	
Height Minimum, Maximum		9 10	9 10	10 14	

<b>Pest Stage At Each Application</b>		A	B	C	D
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W	AMAPA W	
Stage Majority, Percent		veg 100	veg 100	veg 100	
Height Average		14 in	14 in	12 in	
Height Minimum, Maximum		10 17	10 17	8 16	
Density Average		2 plot	3 plot	2 plot	

<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	AIR MIX	AIR MIX	AIR MIX	AIR MIX	
Nozzle Size	11002	11002	11002	11002	
Nozzle Spacing	20 in	20 in	20 in	20 in	
Boom Length	10 ft	6.7 ft	6.7 ft	6.7 ft	
Boom Height	20 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	COMAIR	COMAIR	COMAIR	COMAIR	

Context	Date	By	Notes
STATUS	11/28/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

Management of large Palmer amaranth plants in soybeans			
Trial ID: DSB1-18rev	Location: Field #10	Trial Year: 2018	
Protocol ID: DSB1-18	Investigator: Mark VanGessel		
Study Director:			
Sponsor Contact: Delaware Soybean Board			

Pest Code Crop Type, Code		C GLXMA	AMAPA C -	C GLXMA
Description	Soybean	PalmerAm	Soybean	
Rating Type	Stunting %	Control %	DelydMat	
Rating Unit	08/07/18	08/07/18	0=none	
Rating Date	10/10/18			
Trt No. Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing Appl Code
1 Single Application				
Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	0.0 e
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				
Enlist Duo Premix	3.34 SL	2 lb ae/a	16" Palmer C	0.0 e
----2,4-D choline	1.63	0.98		
----glyphosate	1.71	1.02		
3 Single Application				
Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C	0.0 e
Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C	
4 Single Application				
Reflex.....fomesafen	2 L	0.375 lb ai/a	16" Palmer C	0.0 e
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				
Flexstar GT Premix	3.3 L	1.86 lb ai/a	16" Palmer C	0.0 e
----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				
Sequential Application				
Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	0.0 e
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	
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				
Sequential Application				
Enlist Duo Premix	3.34 SL	2 lb ae/a	16" Palmer C	2.3 de
----2,4-D choline	1.63	0.98		
----glyphosate	1.71	1.02		
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: Average=2,16,17,18,19

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAM	AMAPA C - PalmerAM	AMAPA C - PalmerAM
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	
	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						
	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						
	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						
	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						
	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						
	Sequential Application						
	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	
	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						
	Sequential Application						
	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			
	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			

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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=2,16,17,18,19

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAM	AMAPA C - PalmerAM	AMAPA C - PalmerAM
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	
	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						
	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						
	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						
	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						
	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						
	Sequential Application						
	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	
	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						
	Sequential Application						
	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			
	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			

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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=2,16,17,18,19

Pest Code Crop Type, Code		C GLXMA	AMAPA C - Soybean	AMAPA C - PalmerAm					
Description			Yield Bu/A 11/21/18	Seed Ct #	Dry wt per plnt				
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				
	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								
	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								
	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								
	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								
	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								
	Sequential Application								
	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				
	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								
	Sequential Application								
	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						
	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:Average=2,16,17,18,19

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	AMAPA C - PalmerAm	AMAPA C - PalmerAm		
Rating Type	Rating Unit	Rating Date	Seed per female	ViablSd1 /50 sd	ViablSd2 /50 sd		
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	
	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						
	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						
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	16"	Palmer C	27353.3 a
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C	16.0 a
4	Single 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	
5	Single Application						
	Flexstar GT Premix	3.3 L		1.86 lb ai/a	16"	Palmer C	7562.0 a
	----fomesafen	0.66		0.372			29.0 a
	----glyphosate	2.64		1.49			45.50 a
	Dry Ammonium Sulfate	100 D		1.02 % w/v	16"	Palmer C	
6	1st Application						
	Sequential Application						
	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	
	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						
	Sequential Application						
	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			
	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: Average=2,16,17,18,19

Pest Code						AMAPA
Crop Type, Code						C -
Description						PalmerArm
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Code
1	Single Application					
	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					
	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					37.00 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					
	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					40.50 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					
	Sequential Application					
	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
	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					
	Sequential Application					
	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		
	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:Average=2,16,17,18,19

Pest Code	Crop Type, Code	C GLXMA	AMAPA C -	C GLXMA					
Description	Soybean	PalmerAm	Soybean						
Rating Type	Stunting %	Control %	DelydMat						
Rating Unit	08/07/18	08/07/18	0=none						
Rating Date	10/10/18								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code			
8	1st Application Sequential Application						0.0 e	99.0 a	0.67 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					
	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 Sequential Application						0.0 e	99.0 a	0.00 b
	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					
	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 Sequential Application						0.0 e	70.0 e	0.00 b
	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					
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ai/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						13.3 ab	98.3 ab	0.00 b
	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 ai/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						13.3 ab	85.0 c	0.00 b
	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: Average=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAM CtFemale #/plot 10/10/18	AMAPA C - PalmerAM Ct Male #/plot 10/10/18	AMAPA C - PalmerAM CtFemMal max 5 10/10/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code		
8	1st Application Sequential Application				0.0 d	0.0 a	0 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				
	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 Sequential Application				0.0 d	0.0 a	0 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				
	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 Sequential Application				2.0 b	0.7 a	3 b	
	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				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ai/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				0.0 d	0.0 a	0 d	
	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 ai/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				0.0 d	0.0 a	0 d	
	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: Average=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAM DryWght grams	AMAPA C - PalmerAM extrPlts #/plot	AMAPA C - PalmerAM Total Cnt #/plot
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
8	1st Application Sequential Application Liberty 280....glufosinate Dry Ammonium Sulfate Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D 2.34 SL 100 D	SL D SL D	0.585 lb ai/a 1.02 % w/v 0.585 lb ai/a 1.02 % w/v	16" Palmer C 16" Palmer C +7 days D +7 days D		0.0 c 0.0 b 0.0 e
9	1st Application Sequential Application Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	2 L 4.5 AS 100 L 100 D 4.5 AS 100 L 100 D	L AS L D AS L D	0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 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 +7 days D +7 days D +7 days D		0.0 c 0.0 b 0.0 e
10	1st Application Sequential Application Flexstar GT Premix ----fomesafen ----glyphosate Dry Ammonium Sulfate Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.3 L 0.66 2.64 100 D 4.5 AS 100 L 100 D	L L L D AS L D	1.86 lb ai/a 0.372 1.49 1.02 % w/v 1.13 lb ai/a 0.25 % v/v 1.02 % w/v	16" Palmer C 16" Palmer C +7 days D +7 days D +7 days D +7 days D	73.0 bc	0.3 b 3.0 b
11	1st Application Sequential + Cobra Engenia.....dicamba Cobra.....lactofen Roundup PowerMax..glyphosate Dry Ammonium Sulfate Crop Oil Concentrate Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5 SL 2 EC 4.5 AS 100 D 100 L 5 SL 4.5 AS 100 L 100 D	SL EC AS D L SL AS L D	0.5 lb ae/a 0.195 lb ai/a 1.13 lb ai/a 1.02 % w/v 4.7 qt/100 gal 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	+7 days D +7 days D +7 days D +7 days D +7 days D 16" Palmer C 16" Palmer C 16" Palmer C 16" Palmer C		0.0 c 0.0 b 0.0 e
12	1st Application Sequential + Cobra Enlist Duo Premix ----2,4-D choline ----glyphosate Cobra.....lactofen Crop Oil Concentrate Enlist Duo Premix ----2,4-D choline ----glyphosate	3.34 SL 1.63 1.71 2 EC 100 L 3.34 SL 1.63 1.71	SL L L EC L SL L L	2 lb ae/a 0.98 1.02 0.195 lb ai/a 4.7 qt/100 gal 2 lb ae/a 0.98 1.02	+7 days D +7 days D +7 days D +7 days D +7 days D 16" Palmer C		0.0 c 0.0 b 0.0 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.

Missing data estimates are included in columns:Average=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code		C	GLXMA	AMAPA C -	AMAPA C -
Description		Soybean	PalmerAm	PalmerAm	
Rating Type		Yield Bu/A 11/21/18	Seed Ct #	Dry wt per plnt	
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Timing	Appl Code
8 1st Application Sequential Application					
Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C		47.8 a-d
Dry Ammonium Sulfate	100 D	1.02 % w/v	16" Palmer C		
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 Sequential Application					47.7 a-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		
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 Sequential Application					48.8 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		
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ai/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					50.4 abc
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 ai/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					44.3 cde
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: Average=2,16,17,18,19

## University of Delaware

Pest Code	Crop Type, Code	Description	AMAPA C - PalmerAm	AMAPA C - PalmerAm	AMAPA C - PalmerAm				
Rating Type	Rating Unit	Rating Date	Seed per female	ViablSd1 /50 sd	ViablSd2 /50 sd				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
8	1st Application Sequential 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				
	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 Sequential 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				
	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 Sequential Application						9907.6 a	19.3 a	41.00 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				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ai/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 ai/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: Average=2,16,17,18,19

Pest Code Crop Type, Code Description		AMAPA C - PalmerAm					
Rating Type Rating Unit Rating Date		ViablSd3 /50 sd					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
8	1st Application Sequential Application Liberty 280....glufosinate Dry Ammonium Sulfate Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D 2.34 SL 100 D	SL D SL D	0.585 lb ai/a 1.02 % w/v 0.585 lb ai/a 1.02 % w/v	lb ai/a % w/v lb ai/a % w/v	16" Palmer C 16" Palmer C +7 days D +7 days D	
9	1st Application Sequential Application Reflex.....fomesafen Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	2 L 4.5 AS 100 L 100 D 4.5 AS 100 L 100 D	L AS L D AS L D	0.375 lb ai/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	lb ai/a lb ae/a % v/v % w/v lb ae/a % v/v % w/v	16" Palmer C 16" Palmer C 16" Palmer C 16" Palmer C +7 days D +7 days D +7 days D	
10	1st Application Sequential Application Flexstar GT Premix ----fomesafen ----glyphosate Dry Ammonium Sulfate Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	3.3 L 0.66 2.64 100 D 4.5 AS 100 L 100 D	L L L D AS L D	1.86 lb ai/a 0.372 1.49 1.02 % w/v 1.13 lb ai/a 0.25 % v/v 1.02 % w/v	lb ai/a lb ae/a % v/v % w/v lb ai/a % v/v % w/v	16" Palmer C +7 days D +7 days D 16" Palmer C +7 days D +7 days D +7 days D	27.67 a
11	1st Application Sequential + Cobra Engenia.....dicamba Cobra.....lactofen Roundup PowerMax..glyphosate Dry Ammonium Sulfate Crop Oil Concentrate Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant Dry Ammonium Sulfate	5 SL 2 EC 4.5 AS 100 D 100 L 5 SL 4.5 AS 100 L 100 D	SL EC AS D L SL AS L D	0.5 lb ae/a 0.195 lb ai/a 1.13 lb ai/a 1.02 % w/v 4.7 qt/100 gal 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v 1.02 % w/v	lb ae/a lb ai/a lb ai/a % w/v qt/100 gal lb ae/a lb ae/a % v/v % w/v	+7 days D +7 days D +7 days D +7 days D +7 days D 16" Palmer C 16" Palmer C 16" Palmer C 16" Palmer C	
12	1st Application Sequential + Cobra Enlist Duo Premix ----2,4-D choline ----glyphosate Cobra.....lactofen Crop Oil Concentrate Enlist Duo Premix ----2,4-D choline ----glyphosate	3.34 SL 1.63 1.71 2 EC 100 L 3.34 SL 1.63 1.71	SL L L EC L SL L L	2 lb ae/a 0.98 1.02 0.195 lb ai/a 4.7 qt/100 gal 2 lb ae/a 0.98 1.02	lb ae/a % w/v % w/v lb ai/a qt/100 gal lb ae/a % w/v % w/v	+7 days D +7 days D +7 days D +7 days D +7 days D 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:Average=2,16,17,18,19

## University of Delaware

Pest Code	Crop Type, Code		C GLXMA	AMAPA C -	C GLXMA					
Description		Soybean	PalmerAm		Soybean					
Rating Type			Stunting %	Control %	DelydMat					
Rating Unit			08/07/18	08/07/18	0=none					
Rating Date					10/10/18					
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 D EC L SL 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 C C	15.7 a	99.0 a	0.67 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	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	+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	15.0 a	80.0 cd	0.00 b	
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 1.49 1.02 % w/v	+7 days +7 days +7 days +7 days 16" Palmer C	D D D D C	11.7 ab	80.0 cd	0.00 b	
16	Untreated Check						0.0 e	0.0 f	0.00 b	
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	C C C	0.0 e	75.0 de	0.00 b	
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 L 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	0.0 e	93.3 b	0.00 b	
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 C C C	9.0 bc	100.0 a	0.00 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=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAM	AMAPA C - PalmerAM	AMAPA C - PalmerAM
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 D EC L SL 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 C C	0.0 d 0.0 a 0 d
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	+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	0.3 cd 0.0 a 0 d
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 0.66 2.64 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 C	1.0 bcd 1.7 a 3 b
16	Untreated Check					5.0 a	0.0 a 5 a
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	0.0 d 0.0 a 0 d	0.0 a 0 d
18	Authority Elite Premix ----sulfentrazone ----s-metolachlor Reflex.....fomesafen Roundup PowerMax..glyphosate	7 EC 0.7 6.3 2 L 4.5 AS	EC 0.7 6.3 L AS	1.64 lb ai/a 0.164 1.48 0.375 lb ai/a 1.13 lb ae/a	PRE A 4WAP B 4WAP B	0.3 cd 0.0 a 0 d	0.0 a 0 d
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 C C C	0.0 d 0.0 a 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: Average=2,16,17,18,19

## University of Delaware

Pest Code	Crop Type, Code		AMAPA C -	AMAPA C -	AMAPA C -
Description			PalmerAM	PalmerAM	PalmerAM
Rating Type			DryWght grams	extrPlts #/plot	Total Cnt #/plot
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing
13	1st Application Sequential + Cobra				
	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				
	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				
	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				
17	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	16" Palmer C	
	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
	----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
	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: Average=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	C GLXMA	AMAPA C -	AMAPA C -
					Soybean	PalmerAm	PalmerAm
					Yield Bu/A 11/21/18	Seed Ct #	Dry wt per plnt
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 D EC L SL 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 C C	36.9 e 0.0 b 0.00 d
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	+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	50.6 abc 4253.3 b 8.00 cd
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 1.49 1.02 % w/v	+7 days +7 days +7 days +7 days 16" Palmer C	D D D D C	44.9 b-e 4747.7 b 10.07 bcd
16	Untreated Check					45.9 bcd	192917.7 a 107.33 a
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	44.5 cde	0.0 b 0.00 d
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 L AS	1.64 lb ai/a 0.164 1.48 0.375 lb ai/a 1.13 lb ae/a	PRE A 4WAP B 4WAP B	52.1 abc	3631.0 b 13.33 bcd
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 L 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 C C C	47.9 a-d 0.0 b 0.00 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: Average=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm	AMAPA C - PalmerAm	AMAPA C - PalmerAm
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	D D D D C 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	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 C C C C	12760.0 a 29.0 a 21.00 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	D D D D C	4747.7 a 23.0 a 53.00 a
16 Untreated Check					38583.5 a	28.3 a 48.50 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		
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	B B	10893.0 a 37.0 a 66.00 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	D D D D C C 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=2,16,17,18,19

Pest Code					AMAPA C - PalmerAm	
Crop Type, Code						
Description						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit 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 D EC L SL 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 C 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 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	+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
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 1.49 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 C C C C
16	Untreated Check				32.50 a	
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	
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 L L 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
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 C C 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=2,16,17,18,19

## University of Delaware

Pest Code	C	GLXMA	AMAPA	C	GLXMA					
Crop Type, Code			C -							
Description		Soybean	PalmerAm		Soybean					
Rating Type		Stunting %	Control %		DelydMat					
Rating Unit					0=none					
Rating Date		08/07/18	08/07/18		10/10/18					
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	6.3 cd	75.0 de	0.00 b
	----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								4.40	5.21	0.265
Standard Deviation								2.66	3.09	0.160
CV								61.44	3.8	160.18
Replicate F								0.327	0.342	0.487
Replicate Prob(F)								0.7232	0.7136	0.6181
Treatment F								15.884	157.103	6.974
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=2,16,17,18,19

## University of Delaware

Pest Code		AMAPA C -	AMAPA C -	AMAPA C -						
Crop Type, Code		PalmerAM	PalmerAM	PalmerAM						
Description										
Rating Type		CtFemale	Ct Male	CtFemMal						
Rating Unit		#/plot	#/plot	max 5						
Rating Date		10/10/18	10/10/18	10/10/18						
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		0.3 cd	0.0 a	0 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							1.22	1.05	1.7	
Standard Deviation							0.74	0.63	1.0	
CV							126.53	223.95	120.48	
Replicate F							2.417	2.525	4.234	
Replicate Prob(F)							0.1028	0.0934	0.0219	
Treatment F							7.850	1.680	5.226	
Treatment Prob(F)							0.0001	0.0855	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=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAM DryWght grams	AMAPA C - PalmerAM extrPlts #/plot	AMAPA C - PalmerAM Total Cnt #/plot	
Trt No. 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	14.3 c	0.0 b	0.3 de
----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						111.50	1.20	2.08
Standard Deviation						67.46	0.73	1.26
CV						142.22	242.63	107.74
Replicate F						3.874	1.132	5.264
Replicate Prob(F)						0.0294	0.3329	0.0096
Treatment F						9.674	9.066	11.449
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=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	AMAPA C -	AMAPA C -
Description		Soybean	PalmerAm	PalmerAm
Rating Type		Yield Bu/A 11/21/18	Seed Ct #	Dry wt per plnt
Trt No. Name	Form Conc	Form Type	Rate Unit	Appl 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			8.12	42586.45
Standard Deviation			4.92	25764.52
CV			10.34	183.65
Replicate F			37.128	2.198
Replicate Prob(F)			0.0001	0.1249
Treatment F			2.047	8.401
Treatment Prob(F)			0.0297	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=2,16,17,18,19

## University of Delaware

Pest Code Crop Type, Code Description			AMAPA C - PalmerAm	AMAPA C - PalmerAm	AMAPA C - PalmerAm
Rating Type		Seed per female	ViablSd1 /50 sd	ViablSd2 /50 sd	
Rating Unit					
Rating Date					
Trt Treatment No. 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				40021.97	36.11
Standard Deviation				15402.21	13.90
CV				95.67	56.24
Replicate F				0.168	0.259
Replicate Prob(F)				0.8525	0.7874
Treatment F				1.646	0.854
Treatment Prob(F)				0.3690	0.6135
					0.037
					0.9645
					2.064
					0.2965

Means followed by same letter 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=2,16,17,18,19

Pest Code						AMAPA
Crop Type, Code						C -
Description						PalmerAm
Rating Type						
Rating Unit						
Rating Date						
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						38.326
Standard Deviation						14.750
CV						46.89
Replicate F						0.016
Replicate Prob(F)						0.9841
Treatment F						2.269
Treatment Prob(F)						0.2688

Means followed by same letter 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=2,16,17,18,19

## Management of large Palmer amaranth plants in soybeans

Trial ID: DSB1-18rev

Location: Field #10

Trial Year: 2018

Protocol ID: DSB1-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Delaware Soybean Board

Pest Code Crop Type, Code		C GLXMA	AMAPA C -	C GLXMA
Description	Soybean	PalmerAm	Soybean	
Rating Type	Stunting %	Control %	DelydMat	
Rating Unit	08/07/18	08/07/18	0=none	
Rating Date			10/10/18	
Trt No. Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing Appl Code
TABLE OF R MEANS				
Replicate 1			4.5	85.3 0.13
Replicate 2			5.0	86.0 0.10
Replicate 3			4.8	85.6 0.17
TABLE OF A (Application) MEANS				
1 Single Application			0.0 b	75.3 c 0.00 b
2 1st Application			0.5 b	93.1 a 0.27 a
2 Sequential Application				
3 1st Application			13.8 a	88.5 b 0.13 ab
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 ai/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			1.96	1.94 0.139
Standard Deviation			2.63	2.53 0.186
CV			55.23	2.95 139.354
TABLE OF B (Base herbicide) MEANS				
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	4.4 a 89.4 a 0.00 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	5.2 a 88.3 ab 0.22 b
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	5.2 a 89.3 ab 0.44 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	5.0 a 86.9 b 0.00 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	3.9 a 74.2 c 0.00 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			2.54	2.50 0.179
Standard Deviation			2.63	2.53 0.186
CV			55.23	2.95 139.354
TABLE OF A (Application) B (Base herbicide) 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		AMAPA C - PalmerAM	AMAPA C - PalmerAM	AMAPA C - PalmerAM
Description		CtFemale #/plot 10/10/18	Ct Male #/plot 10/10/18	Ct FemMal max 5 10/10/18
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code	
TABLE OF R MEANS				
Replicate 1		0.6	0.7	1
Replicate 2		0.1	0.1	0
Replicate 3		0.5	0.4	1
TABLE OF A (Application) MEANS				
1 Single Application		0.5 a	0.7 a	1 a
2 1st Application		0.4 a	0.1 a	1 a
2 Sequential Application				
3 1st Application		0.3 a	0.3 a	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 ai/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		0.62	0.54	0.9
Standard Deviation		0.83	0.72	1.2
CV		208.45	191.29	152.0
TABLE OF B (Base herbicide) MEANS				
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	0.0 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	0.0 b
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	0.4 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	0.1 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	1.4 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		0.81	0.70	1.1
Standard Deviation		0.83	0.72	1.2
CV		208.45	191.29	152.0
TABLE OF A (Application) B (Base herbicide) 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		AMAPA C - PalmerAM	AMAPA C - PalmerAM	AMAPA C - PalmerAM
Description		DryWght grams	extrPlts #/plot	Total Cnt #/plot
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		53.1	0.0	1.3
Replicate 2		4.9	0.0	0.1
Replicate 3		18.8	0.1	1.0
TABLE OF A (Application) MEANS				
1 Single Application		52.9 a	0.0 a	1.2 a
2 1st Application		14.6 a	0.1 a	0.6 a
2 Sequential Application				
3 1st Application		9.4 a	0.0 a	0.6 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 ai/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		46.48	0.11	0.94
Standard Deviation		62.13	0.15	1.26
CV		242.50	670.82	156.93
TABLE OF B (Base herbicide) MEANS				
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	16" Palmer C	2.6 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	3.0 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	50.4 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	12.0 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	60.1 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		60.00	0.14	1.21
Standard Deviation		62.13	0.15	1.26
CV		242.50	670.82	156.93
TABLE OF A (Application) B (Base herbicide) 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 GLXMA	AMAPA C -	AMAPA C -
Description	Soybean	PalmerAm	PalmerAm
Rating Type	Yield	Seed Ct	Dry wt
Rating Unit	Bu/A	#	per plnt
Rating Date	11/21/18		
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code
TABLE OF R MEANS			
Replicate 1		42.8	10473.5
Replicate 2		44.1	391.7
Replicate 3		55.6	4808.5
TABLE OF A (Application) MEANS			
1 Single Application		47.8 a	9310.7 a
2 1st Application		49.3 a	4562.8 a
2 Sequential Application			6.05 b
3 1st Application		45.4 a	1800.2 a
3 Sequential + Cobra			3.61 b
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 ai/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		3.61	12958.03
Standard Deviation		4.82	17324.20
CV		10.15	331.59
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		4.66	16728.74
Standard Deviation		4.82	17324.20
CV		10.15	331.59
TABLE OF A (Application) B (Base herbicide) 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	Description	Rating Type	Rating Unit	Rating Date	AMAPA C - PalmerAm	AMAPA C - PalmerAm	AMAPA C - PalmerAm
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit	Appl Timing	Appl Code	
TABLE OF R MEANS								
Replicate 1								
Replicate 2								
Replicate 3								
TABLE OF A (Application) MEANS								
1 Single Application								
2 1st Application								
2 Sequential Application								
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 ai/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								
Standard Deviation								
CV								
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								
Standard Deviation								
CV								
TABLE OF A (Application) B (Base herbicide) 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 Description Rating Type Rating Unit Rating Date	AMAPA C - PalmerAm ViablSd3 /50 sd
Trt Treatment No. Name	Form Form Conc Type Rate Rate Unit Appl Appl Timing Code
TABLE OF R MEANS Replicate 1	
Replicate 2	
Replicate 3	
TABLE OF A (Application) MEANS 1 Single Application	
2 1st Application 2 Sequential Application	
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 ai/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 Standard Deviation CV	
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 Standard Deviation CV	
TABLE OF A (Application) B (Base herbicide) 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

Pest Code Crop Type, Code		C GLXMA	AMAPA C - C GLXMA			
Description	Soybean	PalmerAm	Soybean			
Rating Type	Stunting %	Control %	DelydMat			
Rating Unit	08/07/18	08/07/18	0=none			
Rating Date	10/10/18					
Trt No. Treatment Name	Form Conc	Form Type Rate	Rate Unit Appl Timing Appl Code			
1 Single Application				0.0 a	70.0 d	0.00 b
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				0.0 a	100.0 a	0.00 b
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				13.3 a	98.3 a	0.00 b
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 ai/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				0.0 a	82.5 bc	0.00 b
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				2.3 a	97.3 a	0.67 a
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				13.3 a	85.0 b	0.00 b
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 ai/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				
1 Single Application				0.0 a	70.0 d	0.00 b
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				0.0 a	99.0 a	0.67 a
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			

Means followed by same letter 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 -	AMAPA C -
Description		PalmerAM	PalmerAM	PalmerAM	
Rating Type		CtFemale	Ct Male	CtFemMal	
Rating Unit		#/plot	#/plot	max 5	
Rating Date		10/10/18	10/10/18	10/10/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing
					Appl Code
1	Single 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
2	1st Application				
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
3	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ai/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	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 ai/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		
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	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

Means followed by same letter 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 C -	AMAPA C -	AMAPA C -
Crop Type, Code						PalmerAM	PalmerAM	PalmerAM
Description						DryWght grams	extrPlts #/plot	Total Cnt #/plot
Rating Type			Rate	Appl	Appl			
Rating Unit			Unit	Timing	Code			
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1	Single Application							
1	Engenia.....dicamba	5 SL	0.5 lb ae/a	16"	Palmer C		7.7 a	0.0 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	0.0 a
2	Sequential Application							0.0 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			
3	1st Application						0.0 a	0.0 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 ai/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						9.0 a	0.0 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						0.0 a	0.0 a
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						0.0 a	0.0 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 ai/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					
1	Single Application						151.3 a	0.0 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						0.0 a	0.0 a
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			

Means followed by same letter 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			Yield Bu/A 11/21/18	Seed Ct #	Dry wt per plnt
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1	Single 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
2	1st Application				
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
3	Cobra.....lactofen	2 EC	0.195 lb ai/a	+7 days	D
3	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ai/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	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 ai/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		
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	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

Means followed by same letter 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	AMAPA C - PalmerAm Seed per female	AMAPA C - PalmerAm ViablSd1 /50 sd	AMAPA C - PalmerAm ViablSd2 /50 sd
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit	Appl Timing	Appl Code	
1	Single 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		
2	1st Application							
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		
3	Cobra.....lactofen	2 EC		0.195 lb ai/a	+7 days	D		
3	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ai/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	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 ai/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				
1	Single Application							
3	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	16" Palmer C	27353.3 a	16.0 a	40.0 a
3	Dry Ammonium Sulfate	100 D		1.02 % w/v	16" Palmer C			
2	1st Application							
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			

Means followed by same letter 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 - PalmerAm ViablSd3 /50 sd
Crop Type, Code					
Description					
Rating Type					
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code
1	Single 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
2	1st Application				
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
3	Cobra.....lactofen	2 EC		0.195 lb ai/a	+7 days D
3	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ai/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	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 ai/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	
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	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

Means followed by same letter 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 -	C GLXMA						
Description		Soybean	PalmerAm	Soybean						
Rating Type		Stunting %	Control %	DelydMat 0=none						
Rating Unit		08/07/18	08/07/18	10/10/18						
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
3	1st Application							15.7 a	99.0 a	0.67 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 ai/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							0.0 a	81.7 bc	0.00 b
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							0.0 a	99.0 a	0.00 b
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							15.0 a	80.0 c	0.00 b
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 ai/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						
1	Single Application							0.0 a	72.5 d	0.00 b
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							0.0 a	70.0 d	0.00 b
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						

Means followed by same letter 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 -	AMAPA C -						
Description	PalmerAM	PalmerAM	PalmerAM							
Rating Type	CtFemale	Ct Male	CtFemMal							
Rating Unit	#/plot	#/plot	max 5							
Rating Date	10/10/18	10/10/18	10/10/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
3	1st Application Sequential + Cobra							0.0 a	0.0 a	0 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 ai/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							0.0 a	0.7 a	1 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							0.0 a	0.0 a	0 a
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							0.3 a	0.0 a	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 ai/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						
1	Single Application							1.3 a	1.0 a	2 a
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							2.0 a	0.7 a	3 a
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						

Means followed by same letter 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	AMAPA C - PalmerAM DryWght grams	AMAPA C - PalmerAM extrPlts #/plot	AMAPA C - PalmerAM Total Cnt #/plot
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
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 ai/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	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 ai/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		
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						
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		

Means followed by same letter 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		Yield Bu/A	Seed Ct #	Dry wt per plnt
Rating Unit		11/21/18		
Rating Date				
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Unit	Appl Timing	Appl Code
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 ai/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 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 ai/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	
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				
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	

Means followed by same letter 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	AMAPA C - PalmerAm Seed per female	AMAPA C - PalmerAm ViablSd1 /50 sd	AMAPA C - PalmerAm ViablSd2 /50 sd
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit	Appl Timing	Appl Code	
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 ai/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	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						12760.0 a	29.0 a
3	Sequential + Cobra							21.0 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 ai/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		
1	Single Application						7562.0 a	29.0 a
5	Flexstar GT Premix	3.3 L		1.86 lb ai/a		16" Palmer C		45.5 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						9907.6 a	19.3 a
2	Sequential Application							41.0 a
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		

Means followed by same letter 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		AMAPA C - PalmerAm ViablSd3 /50 sd					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
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 ai/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	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						7.0 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 ai/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		
1	Single Application						40.5 a
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						27.7 a
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		

Means followed by same letter 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 - C GLXMA							
Description		Soybean	PalmerAm							
Rating Type		Stunting %	Control %							
Rating Unit			DelydMat							
Rating Date	08/07/18	08/07/18	0=none 10/10/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
3	1st Application							11.7 a	80.0 c	0.00 b
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 ai/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								4.39	4.34	0.311
Standard Deviation								2.63	2.53	0.186
CV								55.23	2.95	139.354

Means followed by same letter 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 C -	AMAPA C -	AMAPA C -						
Crop Type, Code		PalmerAM	PalmerAM	PalmerAM						
Description										
Rating Type		CtFemale	Ct Male	CtFemMal						
Rating Unit		#/plot	#/plot	max 5						
Rating Date		10/10/18	10/10/18	10/10/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
3	1st Application							1.0 a	1.7 a	3 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 ai/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								1.39	1.21	2.0
Standard Deviation								0.83	0.72	1.2
CV								208.45	191.29	152.0

Means followed by same letter 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 -	AMAPA C -
Description		PalmerAM	PalmerAM	PalmerAM
Rating Type	DryWght			
Rating Unit	grams	extrPlts	#/plot	Total Cnt
Rating Date		#/plot		
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Unit	Appl Timing	Appl Code
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 ai/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		103.92	0.25	2.10
Standard Deviation		62.13	0.15	1.26
CV		242.50	670.82	156.93

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		C GLXMA	AMAPA C -	AMAPA C -						
Description		Soybean	PalmerAm	PalmerAm						
Rating Type		Yield Bu/A	Seed Ct #	Dry wt per plnt						
Rating Unit		11/21/18								
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
3	1st Application							44.9 a	4747.7 a	10.07 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 ai/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							8.06	28975.03	22.843	
Standard Deviation							4.82	17324.20	13.658	
CV							10.15	331.59	140.419	

Means followed by same letter 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	AMAPA C - PalmerAm Seed per female	AMAPA C - PalmerAm ViablSd1 /50 sd	AMAPA C - PalmerAm ViablSd2 /50 sd
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit	Appl Timing	Appl Code	
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 ai/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						40021.97	36.11	40.13
Standard Deviation						15402.21	13.90	15.44
CV						123.55	59.72	38.51

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						AMAPA
Crop Type, Code						C -
Description						PalmerAm
Rating Type						ViablSd3
Rating Unit						/50 sd
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
3	1st Application					38.0 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 ai/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						38.33
Standard Deviation						14.75
CV						49.11

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.

## FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Stunting % 08/07/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	2080.311111				
R	2	2.177778	1.088889	0.158	0.8547	
A	2	1842.177778	921.088889	133.522	0.0001	2.0
B	4	12.088889	3.022222	0.438	0.7800	2.5
AB	8	30.711111	3.838889	0.556	0.8037	4.4
ERROR	28	193.155556	6.898413			

## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Control % 08/07/18 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	34	6226.077778				
R	2	4.044444	2.022222	0.317	0.7326	
A	2	2540.577778	1270.288889	198.905	0.0001	1.9
B	4	1514.411111	378.602778	59.282	0.0001	2.5
AB	8	2052.088889	256.511111	40.165	0.0001	4.3
ERROR	18	114.955556	6.386420			

## FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean DelydMat 0=none 10/10/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	4.200000				
R	2	0.033333	0.016667	0.483	0.6221	
A	2	0.533333	0.266667	7.724	0.0021	0.14
B	4	1.422222	0.355556	10.299	0.0001	0.18
AB	8	1.244444	0.155556	4.506	0.0013	0.31
ERROR	28	0.966667	0.034524			

## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAM CtFemale #/plot 10/10/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	40.800000				
R	2	2.533333	1.266667	1.822	0.1804	
A	2	0.533333	0.266667	0.384	0.6850	0.6
B	4	13.466667	3.366667	4.842	0.0043	0.8
AB	8	4.800000	0.600000	0.863	0.5581	1.4
ERROR	28	19.466667	0.695238			

## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAM Ct Male #/plot 10/10/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	28.577778				
R	2	2.711111	1.355556	2.596	0.0924	
A	2	2.177778	1.088889	2.085	0.1432	0.5
B	4	6.355556	1.588889	3.043	0.0335	0.7
AB	8	2.711111	0.338889	0.649	0.7304	1.2
ERROR	28	14.622222	0.522222			

## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAM CtFemMal max 5 10/10/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	99.777778				
R	2	10.177778	5.088889	3.639	0.0394	
A	2	4.044444	2.022222	1.446	0.2525	1
B	4	38.222222	9.555556	6.833	0.0006	1
AB	8	8.177778	1.022222	0.731	0.6634	2
ERROR	28	39.155556	1.398413			

## FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAM DryWght grams

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	44	203256.577778				
R	2	18471.511111	9235.755556	2.392	0.1099	
A	2	16903.644444	8451.822222	2.189	0.1308	46.5
B	4	27315.244444	6828.811111	1.769	0.1632	60.0
AB	8	32465.688889	4058.211111	1.051	0.4235	103.9
ERROR	28	108100.488889	3860.731746			

Means followed by same letter 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 extrPlts #/plot					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	44	0.977778			
R	2	0.044444	0.022222	1.000	0.3806
A	2	0.044444	0.022222	1.000	0.3806
B	4	0.088889	0.022222	1.000	0.4241
AB	8	0.177778	0.022222	1.000	0.4578
ERROR	28	0.622222	0.022222		0.2

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAM Total Cnt #/plot					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	44	109.200000			
R	2	10.533333	5.266667	3.341	0.0500
A	2	3.600000	1.800000	1.142	0.3336
B	4	41.866667	10.466667	6.640	0.0007
AB	8	9.066667	1.133333	0.719	0.6732
ERROR	28	44.133333	1.576190		2.1

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield Bu/A 11/21/18					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	44	2967.852672			
R	2	1477.711869	738.855934	31.781	0.0001
A	2	113.539870	56.769935	2.442	0.1053
B	4	494.910814	123.727703	5.322	0.0026
AB	8	230.729860	28.841233	1.241	0.3130
ERROR	28	650.960259	23.248581		8.1

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Seed Ct #					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	44	13920189172.977800			
R	2	766224858.177778	383112429.088889	1.276	0.2948
A	2	432914703.244444	216457351.622222	0.721	0.4950
B	4	1536990934.533330	384247733.633333	1.280	0.3013
AB	8	2780476141.200000	347559517.650000	1.158	0.3579
ERROR	28	8403582535.822220	300127947.707937		28975.0

FACTORIAL/POOLED ERROR AOV For AMAPA C PalmerAm Dry wt per plnt					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	44	13343.308000			
R	2	1809.281333	904.640667	4.849	0.0155
A	2	2202.369333	1101.184667	5.903	0.0073
B	4	1834.648000	458.662000	2.459	0.0686
AB	8	2273.777333	284.222167	1.524	0.1938
ERROR	28	5223.232000	186.544000		22.84

Randomized Complete Block (RCB) AOV For AMAPA C PalmerAm Seed per female Analysis will skip factor level B1 for column 16 - all B1 treatments are missing; Analysis will skip factor level B2 for column 16 - all B2 treatments are missing; Missing factor A2 B3 levels prevents analyzing column 16 as Factorial design; Missing factor A3 B3 levels prevents analyzing column 16 as Factorial design; Missing factor A1 B4 levels prevents analyzing column 16 as Factorial design; Missing factor A2 B4 levels prevents analyzing column 16 as Factorial design; Missing values in column 16 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F Prob(F)
Total	12	3525540114.327710		
Replicate	2	79865786.993695	39932893.496848	0.168
Treatment	7	2733990267.002760	390570038.143252	1.646
ERROR	3	711684060.331250	237228020.110417	0.3690

Randomized Complete Block (RCB) AOV For AMAPA C PalmerAm ViablSd1 /50 sd Analysis will skip factor level B1 for column 17 - all B1 treatments are missing; Analysis will skip factor level B2 for column 17 - all B2 treatments are missing; Missing factor A2 B3 levels prevents analyzing column 17 as Factorial design; Missing factor A3 B3 levels prevents analyzing column 17 as Factorial design; Missing factor A1 B4 levels prevents analyzing column 17 as Factorial design; Missing factor A2 B4 levels prevents analyzing column 17 as Factorial design; Missing values in column 17 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F Prob(F)
Total	12	1832.958333		
Replicate	2	100.083333	50.041667	0.259
Treatment	7	1153.625000	164.803571	0.854
ERROR	3	579.250000	193.083333	0.6135

Means followed by same letter 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 AMAPA C PalmerAm ViablSd2 /50 sd Analysis will skip factor level B1 for column 18 - all B1 treatments are missing; Analysis will skip factor level B2 for column 18 - all B2 treatments are missing; Missing factor A2 B3 levels prevents analyzing column 18 as Factorial design; Missing factor A3 B3 levels prevents analyzing column 18 as Factorial design; Missing factor A1 B4 levels prevents analyzing column 18 as Factorial design; Missing factor A2 B4 levels prevents analyzing column 18 as Factorial design; Missing values in column 18 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	12	4178.500000			
Replicate	2	17.437500	8.718750	0.037	0.9645
Treatment	7	3445.500000	492.214286	2.064	0.2965
ERROR	3	715.562500	238.520833		

Randomized Complete Block (RCB) AOV For AMAPA C PalmerAm ViablSd3 /50 sd Analysis will skip factor level B1 for column 19 - all B1 treatments are missing; Analysis will skip factor level B2 for column 19 - all B2 treatments are missing; Missing factor A2 B3 levels prevents analyzing column 19 as Factorial design; Missing factor A3 B3 levels prevents analyzing column 19 as Factorial design; Missing factor A1 B4 levels prevents analyzing column 19 as Factorial design; Missing factor A2 B4 levels prevents analyzing column 19 as Factorial design; Missing values in column 19 results in unbalanced data, Least Squares Analysis is preferred

Source	DF	Sum of Squares	Mean Square	F	Prob(F)
Total	12	4115.458333			
Replicate	2	7.020833	3.510417	0.016	0.9841
Treatment	7	3455.791667	493.684524	2.269	0.2688
ERROR	3	652.645833	217.548611		

Non-AMS water conditioners for Roundup PowerMax and Engenia  
 Trial ID: Soy1-18 Location: Field #7 Trial Year: 2018  
 Protocol ID: Soy1-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Winfield

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 12/01/18

**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

Variety: S43XS27

Attributes: Xtend

Planting Date: 05/31/18

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: 82 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 06/04/18

Harvest Date: 11/30/18

Harvest Equipment: Plot combine

Harvested Width: 6.25 FT

% Standard Moisture: 13.0

Harvested Length: 25 FT

**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: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass

**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 7

% Sand: 79 % OM: 2.1 Texture: LS loamy sand

% Silt: 13 pH: 6.2 Soil Name: Rockawalkin loamy sand, 0-2% slopes

% Clay: 8 CEC: 5.6 Fert. Level: G good

Soil Drainage: G good

**Application Description**

	A
Application Date	07/03/18
Appl. Stop Time	11:55 AM
Application Method	SPRAY
Application Timing	2-4"wds
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	90 F
% Relative Humidity Start, Stop	64
Wind Velocity+Dir. Start	1 mph S
Wet Leaves (Y/N)	Y yes
Soil Temperature	90 F
Soil Moisture	DRY
% Cloud Cover	80

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY
Stage Scale Used	DESC
Stage Majority, Percent	V4 100
Height Average	8 in

**Pest Stage At Each Application**

	A
Pest 1 Code, Type, Scale	AMAPA W
Stage Majority, Percent	Veg 70
Stage Minimum, Percent	veg 70
Stage Maximum, Percent	EaFlwr 30
Height Average	12 in
Height Minimum, Maximum	8 25
Density Average	3 plot
Pest 2 Code, Type, Scale	IPOSS W
Stage Majority, Percent	run 100
Height Average	15 in
Height Minimum, Maximum	12 18
Density Average	1 m2
Pest 3 Code, Type, Scale	DIGSA W
Stage Majority, Percent	veg 100
Height Average	8 in
Height Minimum, Maximum	5 10
Density Average	5 m2

**Application Equipment**

	A
Appl. Equipment	Backpack
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	6 ft
Boom Height	36 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	12/12/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

07/07/18: No soybean injury observed.

07/12/18: No soybean injury observed.

08/09/18: Weed control ratings were based on weeds observed at soybean canopy or above; no attempt was made to move the soybean canopy and observed injury or low growing weeds.

Non-AMS water conditioners for Roundup PowerMax and Engenia  
 Trial ID: Soy1-18 Location: Field #7 Trial Year: 2018  
 Protocol ID: Soy1-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Winfield

Pest Code	Pest Name	Crop Type, Code	AMAPA PalmerAm C -	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -			
Crop Name	Rating Type	Rating Unit	Control %	Control %	Control %	Control %			
		Rating Date	07/19/18	07/19/18	07/19/18	08/09/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code			
1	Roundup PowerMax..glyphosate Engenia.....dicamba On Target	4.5 AS 5 SL 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v	2-4"wds A 2-4"wds A 2-4"wds A	92.0 a	97.0 ab	100.0 a	99.0 a
2	Roundup PowerMax..glyphosate Engenia.....dicamba On Target Class Act Ridion	4.5 AS 5 SL 100 L 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.5 % v/v	2-4"wds A 2-4"wds A 2-4"wds A 2-4"wds A	87.7 a	97.7 a	100.0 a	98.0 a
3	Roundup PowerMax..glyphosate Engenia.....dicamba On Target Class Act Ridion	4.5 AS 5 SL 100 L 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	2-4"wds A 2-4"wds A 2-4"wds A 2-4"wds A	95.3 a	97.3 ab	100.0 a	99.0 a
4	Roundup PowerMax..glyphosate Engenia.....dicamba On Target AG18047	4.5 AS 5 SL 100 L 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.5 % v/v	2-4"wds A 2-4"wds A 2-4"wds A 2-4"wds A	92.7 a	97.3 ab	100.0 a	97.7 a
5	Roundup PowerMax..glyphosate Engenia.....dicamba On Target AG18047	4.5 AS 5 SL 100 L 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	2-4"wds A 2-4"wds A 2-4"wds A 2-4"wds A	95.7 a	98.7 a	100.0 a	96.0 a
6	Roundup PowerMax..glyphosate Engenia.....dicamba No adjuvant	4.5 AS 5 SL	AS	0.77 lb ae/a 0.5 lb ae/a	2-4"wds A 2-4"wds A	89.0 a	97.0 ab	99.3 a	98.3 a
7	Roundup PowerMax..glyphosate Engenia.....dicamba On Target	4.5 AS 5 SL 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v	2-4"wds A 2-4"wds A 2-4"wds A	90.7 a	92.0 bcd	96.3 b	96.0 a
8	Roundup PowerMax..glyphosate Engenia.....dicamba On Target Class Act Ridion	4.5 AS 5 SL 100 L 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 0.5 % v/v	2-4"wds A 2-4"wds A 2-4"wds A 2-4"wds A	83.8 a	94.0 abc	96.3 b	98.3 a
9	Roundup PowerMax..glyphosate Engenia.....dicamba On Target Class Act Ridion	4.5 AS 5 SL 100 L 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 1 % v/v	2-4"wds A 2-4"wds A 2-4"wds A 2-4"wds A	86.4 a	92.0 bcd	96.3 b	94.0 a
10	Roundup PowerMax..glyphosate Engenia.....dicamba On Target AG18047	4.5 AS 5 SL 100 L 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 0.5 % v/v	2-4"wds A 2-4"wds A 2-4"wds A 2-4"wds A	85.4 a	91.3 cd	96.7 b	98.3 a
11	Roundup PowerMax..glyphosate Engenia.....dicamba On Target AG18047	4.5 AS 5 SL 100 L 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 1 % v/v	2-4"wds A 2-4"wds A 2-4"wds A 2-4"wds A	87.0 a	93.7 a-d	96.7 b	97.3 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

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

Pest Code	Pest Name	Crop Type, Code	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	C GLXMA			
Crop Name	Rating Type	Rating Unit	Control %	Control %	Control %	Soybean Yield Bu/A			
			08/09/18	08/09/18	10/24/18	11/30/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
1	Roundup PowerMax..glyphosate Engenia.....dicamba On Target	4.5 AS 5 SL 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	99.0 a	98.7 a	36.9 a
2	Roundup PowerMax..glyphosate Engenia.....dicamba On Target Class Act Ridion	4.5 AS 5 SL 100 L 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	99.0 a	95.7 a	31.1 a
3	Roundup PowerMax..glyphosate Engenia.....dicamba On Target Class Act Ridion	4.5 AS 5 SL 100 L 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	98.7 a	99.0 a	32.6 a
4	Roundup PowerMax..glyphosate Engenia.....dicamba On Target AG18047	4.5 AS 5 SL 100 L 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	98.7 a	97.3 a	36.0 a
5	Roundup PowerMax..glyphosate Engenia.....dicamba On Target AG18047	4.5 AS 5 SL 100 L 100 L	AS	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	98.7 a	98.0 a	34.6 a
6	Roundup PowerMax..glyphosate Engenia.....dicamba No adjuvant	4.5 AS 5 SL	AS	0.77 lb ae/a 0.5 lb ae/a	2-4" wds A 2-4" wds A	99.0 a	99.0 a	98.3 a	36.8 a
7	Roundup PowerMax..glyphosate Engenia.....dicamba On Target	4.5 AS 5 SL 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	98.3 a	97.3 a	32.0 a
8	Roundup PowerMax..glyphosate Engenia.....dicamba On Target Class Act Ridion	4.5 AS 5 SL 100 L 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	99.0 a	97.3 a	35.4 a
9	Roundup PowerMax..glyphosate Engenia.....dicamba On Target Class Act Ridion	4.5 AS 5 SL 100 L 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	98.3 a	93.3 a	31.0 a
10	Roundup PowerMax..glyphosate Engenia.....dicamba On Target AG18047	4.5 AS 5 SL 100 L 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	99.0 a	98.7 a	33.2 a
11	Roundup PowerMax..glyphosate Engenia.....dicamba On Target AG18047	4.5 AS 5 SL 100 L 100 L	AS	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	99.0 a	95.7 a	97.3 a	32.6 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.

Missing data estimates are included in columns: Yates=1

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

## University of Delaware

Pest Code	AMAPA PalmerAm	IPOSS mornglry	DIGSA L.crbgrs	AMAPA PalmerAm
Crop Name	C -	C -	C -	C -
Rating Type	Control %	Control %	Control %	Control %
Rating Unit				
Rating Date	07/19/18	07/19/18	07/19/18	08/09/18
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code
12 Roundup PowerMax..glyphosate Engenia.....dicamba No adjvant	4.5 AS 5 SL	0.387 lb ae/a 0.25 lb ae/a	2-4"wds A 2-4"wds A	88.4 a
LSD P=.05		9.84	5.38	2.41
Standard Deviation		5.71	3.18	1.42
CV		6.38	3.36	1.45
Replicate F		1.486	1.000	2.315
Replicate Prob(F)		0.2543	0.3840	0.1223
Treatment F		1.334	3.156	7.870
Treatment Prob(F)		0.2872	0.0105	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

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

## University of Delaware

Pest Code		IPOSS mornlry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	C GLXMA
Crop Name		Control %	Control %	Control %	Soybean Yield Bu/A
Rating Type		08/09/18	08/09/18	10/24/18	11/30/18
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
12 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4" wds	A	
Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4" wds	A	
No adjvant					
LSD P=.05		.	2.56	4.84	7.68
Standard Deviation		0.00	1.51	2.86	4.54
CV		0.0	1.53	2.94	13.39
Replicate F		0.000	0.814	1.267	0.047
Replicate Prob(F)		1.0000	0.4558	0.3015	0.9538
Treatment F		0.000	1.152	0.973	0.639
Treatment Prob(F)		1.0000	0.3715	0.4971	0.7768

Means followed by same letter 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

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

Non-AMS water conditioners for Roundup PowerMax and Engenia  
 Trial ID: Soy1-18 Location: Field #7 Trial Year: 2018  
 Protocol ID: Soy1-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Winfield

Pest Code	AMAPA PalmerAm C -	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -
Crop Name	Control %	Control %	Control %	Control %
Crop Type, Code	07/19/18	07/19/18	07/19/18	08/09/18
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit
TABLE OF R MEANS				
Replicate 1			90.2	94.8
Replicate 2			91.1	95.6
Replicate 3			87.2	93.8
TABLE OF A (Herbicide Rate) MEANS				
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	92.1 a
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	86.9 b
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A	
LSD P=.05			4.02	2.20
Standard Deviation			5.71	3.18
CV			6.38	3.36
TABLE OF B (Adjuvant Combo) MEANS				
1 On Target	100 L	0.5 % v/v	2-4"wds A	91.3 a
2 On Target	100 L	0.5 % v/v	2-4"wds A	85.8 a
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A	
3 On Target	100 L	0.5 % v/v	2-4"wds A	90.8 a
3 Class Act Ridion	100 L	1 % v/v	2-4"wds A	
4 On Target	100 L	0.5 % v/v	2-4"wds A	89.0 a
4 AG18047	100 L	0.5 % v/v	2-4"wds A	
5 On Target	100 L	0.5 % v/v	2-4"wds A	91.3 a
5 AG18047	100 L	1 % v/v	2-4"wds A	
6 No adjuvant			88.7 a	92.7 a
LSD P=.05			6.96	3.81
Standard Deviation			5.71	3.18
CV			6.38	3.36
TABLE OF A (Herbicide Rate) B (Adjuvant Combo) MEANS				
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	92.0 a
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A	
1 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	90.7 a
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A	
1 On Target	100 L	0.5 % v/v	2-4"wds A	
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	87.7 a
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A	
2 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	83.8 a
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A	
2 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds 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 Pest Name Crop Type, Code	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	C GLXMA
Crop Name Rating Type Rating Unit Rating Date	Control % 08/09/18	Control % 08/09/18	Control % 10/24/18	Soybean Yield Bu/A 11/30/18
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code	
TABLE OF R MEANS				
Replicate 1		99.0	98.1	97.6
Replicate 2		99.0	98.8	96.2
Replicate 3		99.0	98.7	97.9
TABLE OF A (Herbicide Rate) MEANS				
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A	
LSD P=.05		.	1.05	1.98
Standard Deviation		0.00	1.51	2.86
CV		0.00	1.53	2.94
13.39				3.14
TABLE OF B (Adjuvant Combo) MEANS				
1 On Target	100 L	0.5 % v/v	2-4"wds A	
2 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A	
3 On Target	100 L	0.5 % v/v	2-4"wds A	
3 Class Act Ridion	100 L	1 % v/v	2-4"wds A	
4 On Target	100 L	0.5 % v/v	2-4"wds A	
4 AG18047	100 L	0.5 % v/v	2-4"wds A	
5 On Target	100 L	0.5 % v/v	2-4"wds A	
5 AG18047	100 L	1 % v/v	2-4"wds A	
6 No adjuvant			99.0 a	98.0 a
34.4 a			98.7 a	34.7 a
LSD P=.05		.	1.05	3.14
Standard Deviation		0.00	1.51	2.86
CV		0.00	1.53	2.94
13.39				4.54
TABLE OF A (Herbicide Rate) B (Adjuvant Combo) MEANS				
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A	
1 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A	
1 On Target	100 L	0.5 % v/v	2-4"wds A	
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A	
2 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A	
2 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A	
31.1 a			99.0 a	95.7 a
35.4 a			99.0 a	97.3 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	Pest Name	Crop Type, Code	AMAPA PalmerAm C -	IPOSS morngly C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -
Crop Name	Rating Type	Rating Unit	Control %	Control %	Control %	Control %
			07/19/18	07/19/18	07/19/18	08/09/18
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A			
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A			
3 On Target	100 L	0.5 % v/v	2-4"wds A			
3 Class Act Ridion	100 L	1 % v/v	2-4"wds A			
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A			
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A			
3 On Target	100 L	0.5 % v/v	2-4"wds A			
3 Class Act Ridion	100 L	1 % v/v	2-4"wds A			
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A			
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A			
4 On Target	100 L	0.5 % v/v	2-4"wds A			
4 AG18047	100 L	0.5 % v/v	2-4"wds A			
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A			
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A			
4 On Target	100 L	0.5 % v/v	2-4"wds A			
4 AG18047	100 L	0.5 % v/v	2-4"wds A			
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A			
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A			
5 On Target	100 L	0.5 % v/v	2-4"wds A			
5 AG18047	100 L	1 % v/v	2-4"wds A			
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A			
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A			
5 On Target	100 L	0.5 % v/v	2-4"wds A			
5 AG18047	100 L	1 % v/v	2-4"wds A			
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A			
1 Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"wds A			
6 No adjuvant						
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A			
2 Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"wds A			
6 No adjuvant						
LSD P=.05				9.84	5.38	2.41
Standard Deviation				5.71	3.18	1.42
CV				6.38	3.36	1.45
						4.55
						2.69
						2.76

Means followed by same letter 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 mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	C GLXMA						
Crop Name		Control %	Control %	Control %	Soybean Yield Bu/A						
Rating Type		08/09/18	08/09/18	10/24/18	11/30/18						
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"	wds A			99.0 a	98.7 a	99.0 a	32.6 a
1	Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"	wds A						
3	On Target	100 L	0.5 % v/v	2-4"	wds A						
3	Class Act Ridion	100 L	1 % v/v	2-4"	wds A						
2	Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"	wds A			99.0 a	98.3 a	93.3 a	31.0 a
2	Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"	wds A						
3	On Target	100 L	0.5 % v/v	2-4"	wds A						
3	Class Act Ridion	100 L	1 % v/v	2-4"	wds A						
1	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"	wds A			99.0 a	98.7 a	97.3 a	36.0 a
1	Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"	wds A						
4	On Target	100 L	0.5 % v/v	2-4"	wds A						
4	AG18047	100 L	0.5 % v/v	2-4"	wds A						
2	Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"	wds A			99.0 a	99.0 a	98.7 a	33.2 a
2	Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"	wds A						
4	On Target	100 L	0.5 % v/v	2-4"	wds A						
4	AG18047	100 L	0.5 % v/v	2-4"	wds A						
1	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"	wds A			99.0 a	98.7 a	98.0 a	34.6 a
1	Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"	wds A						
5	On Target	100 L	0.5 % v/v	2-4"	wds A						
5	AG18047	100 L	1 % v/v	2-4"	wds A						
2	Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"	wds A			99.0 a	95.7 a	97.3 a	32.6 a
2	Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"	wds A						
5	On Target	100 L	0.5 % v/v	2-4"	wds A						
5	AG18047	100 L	1 % v/v	2-4"	wds A						
1	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"	wds A			99.0 a	99.0 a	98.3 a	36.8 a
1	Engenia.....dicamba	5 SL	0.5 lb ae/a	2-4"	wds A						
6	No adjuvant										
2	Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"	wds A			99.0 a	99.0 a	95.7 a	34.3 a
2	Engenia.....dicamba	5 SL	0.25 lb ae/a	2-4"	wds A						
6	No adjuvant										
LSD P=.05								.	2.56	4.84	7.68
Standard Deviation								0.00	1.51	2.86	4.54
CV								0.00	1.53	2.94	13.39

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.

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Control % 07/19/18 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	30	1131.279453				
R	2	97.018137	48.509068	1.486	0.2543	
A	1	236.009818	236.009818	7.229	0.0155	4.0
B	5	140.639984	28.127997	0.862	0.5265	7.0
AB	5	102.563421	20.512684	0.628	0.6807	9.8
ERROR	17	555.048093	32.649888			

FACTORIAL/POOLED ERROR AOV For IPOSS morngly C Control % 07/19/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	593.638889				
R	2	20.222222	10.111111	1.000	0.3840	
A	1	283.361111	283.361111	28.025	0.0001	2.2
B	5	46.472222	9.294444	0.919	0.4870	3.8
AB	5	21.138889	4.227778	0.418	0.8310	5.4
ERROR	22	222.444444	10.111111			

FACTORIAL/POOLED ERROR AOV For DIGSA L.crbgrs C Control % 07/19/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	229.555556				
R	2	9.388889	4.694444	2.315	0.1223	
A	1	144.000000	144.000000	71.014	0.0001	1.0
B	5	21.555556	4.311111	2.126	0.1003	1.7
AB	5	10.000000	2.000000	0.986	0.4484	2.4
ERROR	22	44.611111	2.027778			

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Control % 08/09/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	264.000000				
R	2	28.166667	14.083333	1.947	0.1666	
A	1	16.000000	16.000000	2.212	0.1512	1.9
B	5	14.000000	2.800000	0.387	0.8523	3.2
AB	5	46.666667	9.333333	1.290	0.3039	4.6
ERROR	22	159.166667	7.234848			

FACTORIAL/POOLED ERROR AOV For IPOSS morngly C Control % 08/09/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	0.000000				
R	2	0.000000	0.000000	0.000	1.0000	
A	1	0.000000	0.000000	0.000	1.0000	.
B	5	0.000000	0.000000	0.000	1.0000	.
AB	5	0.000000	0.000000	0.000	1.0000	.
ERROR	22	0.000000	0.000000			

FACTORIAL/POOLED ERROR AOV For DIGSA L.crbgrs C Control % 08/09/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	82.972222				
R	2	3.722222	1.861111	0.814	0.4558	
A	1	3.361111	3.361111	1.471	0.2381	1.0
B	5	14.472222	2.894444	1.267	0.3133	1.8
AB	5	11.138889	2.227778	0.975	0.4548	2.6
ERROR	22	50.277778	2.285354			

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Control % 10/24/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	288.222222				
R	2	20.722222	10.361111	1.267	0.3015	
A	1	13.444444	13.444444	1.644	0.2132	2.0
B	5	18.555556	3.711111	0.454	0.8061	3.4
AB	5	55.555556	11.111111	1.358	0.2778	4.8
ERROR	22	179.944444	8.179293			

Means followed by same letter 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 11/30/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	599.266427				
R	2	1.950979	0.975490	0.047	0.9538	
A	1	22.945401	22.945401	1.115	0.3024	3.1
B	5	51.222326	10.244465	0.498	0.7744	5.4
AB	5	70.529023	14.105805	0.686	0.6393	7.7
ERROR	22	452.618697	20.573577			

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

Non-AMS water conditioners for Roundup PowerMax and Xtendimax  
 Trial ID: Soy2-18 Location: Field #7 Trial Year: 2018  
 Protocol ID: Soy2-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Winfield

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 12/01/18

**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

Variety: S43XS27

Attributes: Xtend

Planting Date: 05/31/18

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: 82 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 06/04/18

Harvest Date: 11/30/18

Harvest Equipment: Plot combine

Harvested Width: 6.25 FT

% Standard Moisture: 13.0

Harvested Length: 25 FT

**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: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass

**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 7

% Sand: 79 % OM: 2.1 Texture: LS loamy sand

% Silt: 13 pH: 6.2 Soil Name: Rockawalkin loamy sand, 0-2% slopes

% Clay: 8 CEC: 5.6 Fert. Level: G good

Soil Drainage: G good

**Application Description**

	A
Application Date	07/03/18
Appl. Stop Time	11:55 AM
Application Method	SPRAY
Application Timing	2-4"wds
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	90 F
% Relative Humidity Start, Stop	64
Wind Velocity+Dir. Start	1 mph S
Wet Leaves (Y/N)	Y yes
Soil Temperature	90 F
Soil Moisture	DRY
% Cloud Cover	80

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY
Stage Scale Used	DESC
Stage Majority, Percent	V4 100
Height Average	8 in

**Pest Stage At Each Application**

	A
Pest 1 Code, Type, Scale	AMAPA W
Stage Majority, Percent	Veg 70
Stage Minimum, Percent	veg 70
Stage Maximum, Percent	EaFlwr 30
Height Average	12 in
Height Minimum, Maximum	8 25
Density Average	3 plot
Pest 2 Code, Type, Scale	IPOSS W
Stage Majority, Percent	run 100
Height Average	15 in
Height Minimum, Maximum	12 18
Density Average	1 m2
Pest 3 Code, Type, Scale	DIGSA W
Stage Majority, Percent	veg 100
Height Average	8 in
Height Minimum, Maximum	5 10
Density Average	5 m2

**Application Equipment**

	A
Appl. Equipment	Backpack
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIR MIX
Nozzle Size	11002
Nozzle Spacing	18 in
Boom Length	6 ft
Boom Height	36 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMCO2

Context	Date	By	Notes
STATUS	12/12/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

07/07/18: No soybean injury observed.

07/12/18: No soybean injury observed.

08/09/18: Weed control ratings were based on weeds observed at soybean canopy or above; no attempt was made to move the soybean canopy and observed injury or low growing weeds.

10/24/18: All plots are virtually weed-free (98% + control).

Non-AMS water conditioners for Roundup PowerMax and Xtendimax  
 Trial ID: Soy2-18 Location: Field #7 Trial Year: 2018  
 Protocol ID: Soy2-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Winfield

Pest Code	Pest Name	Crop Type, Code	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	IPOSS mornglry C -		
Crop Name	Rating Type	Rating Unit	Control %	Control %	Control %	Control %		
		Rating Date	07/19/18	07/19/18	08/09/18	08/09/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing		
1	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target	4.5 AS 2.9 SL 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A	95.3 a	98.0 a	99.0 a	99.0 a
2	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target Class Act Ridion	4.5 AS 2.9 SL 100 L 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	95.1 a	98.5 a	99.0 a	99.0 a
3	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target Class Act Ridion	4.5 AS 2.9 SL 100 L 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	97.6 a	100.0 a	99.0 a	99.0 a
4	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target AG18047	4.5 AS 2.9 SL 100 L 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	96.6 a	99.0 a	99.0 a	99.0 a
5	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target AG18047	4.5 AS 2.9 SL 100 L 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	95.1 a	99.0 a	99.0 a	99.0 a
6	Roundup PowerMax..glyphosate Xtendimax.....dicamba No adjuvant	4.5 AS 2.9 SL	0.77 lb ae/a 0.5 lb ae/a	2-4" wds A 2-4" wds A	97.0 a	100.0 a	99.0 a	99.0 a
7	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target	4.5 AS 2.9 SL 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A	93.3 a	98.5 a	99.0 a	99.0 a
8	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target Class Act Ridion	4.5 AS 2.9 SL 100 L 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	97.7 a	99.0 a	99.0 a	99.0 a
9	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target Class Act Ridion	4.5 AS 2.9 SL 100 L 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	97.0 a	99.0 a	99.0 a	99.0 a
10	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target AG18047	4.5 AS 2.9 SL 100 L 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	93.7 a	98.0 a	99.0 a	99.0 a
11	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target AG18047	4.5 AS 2.9 SL 100 L 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A	91.7 a	98.5 a	98.7 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=1; Average=2

Could not calculate LSD (% mean diff) for columns 4,5 because error mean square = 0.

Pest Code		DIGSA							
Pest Name	L.crbgrs	C	C GLXMA						
Crop Type, Code	C -								
Crop Name			Soybean						
Rating Type		Control	Yield						
Rating Unit	%	08/09/18	Bu/A						
Rating Date			11/30/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target	4.5 AS 2.9 SL 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	40.0 a		
2	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target Class Act Ridion	4.5 AS 2.9 SL 100 L 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	37.2 a		
3	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target Class Act Ridion	4.5 AS 2.9 SL 100 L 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	34.4 a		
4	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target AG18047	4.5 AS 2.9 SL 100 L 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	35.9 a		
5	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target AG18047	4.5 AS 2.9 SL 100 L 100 L	0.77 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	33.7 a		
6	Roundup PowerMax..glyphosate Xtendimax.....dicamba No adjuvant	4.5 AS 2.9 SL	0.77 lb ae/a 0.5 lb ae/a	2-4" wds A 2-4" wds A		99.0 a	35.3 a		
7	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target	4.5 AS 2.9 SL 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	37.3 a		
8	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target Class Act Ridion	4.5 AS 2.9 SL 100 L 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	37.9 a		
9	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target Class Act Ridion	4.5 AS 2.9 SL 100 L 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	37.1 a		
10	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target AG18047	4.5 AS 2.9 SL 100 L 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 0.5 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	37.6 a		
11	Roundup PowerMax..glyphosate Xtendimax.....dicamba On Target AG18047	4.5 AS 2.9 SL 100 L 100 L	0.387 lb ae/a 0.25 lb ae/a 0.5 % v/v 1 % v/v	2-4" wds A 2-4" wds A 2-4" wds A 2-4" wds A		99.0 a	38.1 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=1; Average=2

Could not calculate LSD (% mean diff) for columns 4,5 because error mean square = 0.

## University of Delaware

Pest Code	IPOSS mornglry	DIGSA L.crbgrs	AMAPA PalmerAm	IPOSS mornglry						
Pest Name	C -	C -	C -	C -						
Crop Type, Code										
Crop Name										
Rating Type	Control %	Control %	Control %	Control %						
Rating Unit	07/19/18	07/19/18	08/09/18	08/09/18						
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
12 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4" wds	A			90.7 a	99.0 a	99.0 a	99.0 a
Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4" wds	A						
No adjvant										
LSD P=.05			6.23		3.00		0.28			.
Standard Deviation			3.60		0.85		0.17		0.00	
CV			3.79		0.86		0.17		0.0	
Replicate F			5.488		0.029		1.000		0.000	
Replicate Prob(F)			0.0153		0.9722		0.3840		1.0000	
Treatment F			1.237		1.706		1.000		0.000	
Treatment Prob(F)			0.3395		0.4270		0.4767		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:Yates=1; Average=2

Could not calculate LSD (% mean diff) for columns 4,5 because error mean square = 0.

## University of Delaware

Pest Code	DIGSA								
Pest Name	L.crbgrs								
Crop Type, Code	C - C	GLXMA							
Crop Name		Soybean							
Rating Type		Yield							
Rating Unit		Bu/A							
Rating Date	08/09/18	11/30/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
12	Roundup PowerMax..glyphosate Xtendimax.....dicamba No adjuvant	4.5 AS 2.9 SL	0.387 lb ae/a 0.25 lb ae/a	2-4"wds A 2-4"wds A				99.0 a	36.3 a
LSD P=.05							.		4.09
Standard Deviation							0.00		2.41
CV							0.0		6.57
Replicate F							0.000		30.222
Replicate Prob(F)							1.0000		0.0001
Treatment F							0.000		1.531
Treatment Prob(F)							1.0000		0.1900

Means followed by same letter 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; Average=2  
 Could not calculate LSD (% mean diff) for columns 4,5 because error mean square = 0.

Non-AMS water conditioners for Roundup PowerMax and Xtendimax  
 Trial ID: Soy2-18 Location: Field #7 Trial Year: 2018  
 Protocol ID: Soy2-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Winfield

Pest Code	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	IPOSS mornglry C -
Crop Name	Control %	Control %	Control %	Control %
Rating Type	07/19/18	07/19/18	08/09/18	08/09/18
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		96.4	98.8	99.0
Replicate 2		96.5	98.9	98.9
Replicate 3		92.3	98.9	99.0
TABLE OF A (Herbicide Rate) MEANS				
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A	
LSD P=.05		2.54	1.22	0.12
Standard Deviation		3.60	0.85	0.17
CV		3.79	0.86	0.17
TABLE OF B (Adjuvant Combo) MEANS				
1 On Target	100 L	0.5 % v/v	2-4"wds A	
2 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A	
3 On Target	100 L	0.5 % v/v	2-4"wds A	
3 Class Act Ridion	100 L	1 % v/v	2-4"wds A	
4 On Target	100 L	0.5 % v/v	2-4"wds A	
4 AG18047	100 L	0.5 % v/v	2-4"wds A	
5 On Target	100 L	0.5 % v/v	2-4"wds A	
5 AG18047	100 L	1 % v/v	2-4"wds A	
6 No adjuvant				
LSD P=.05		4.41	2.12	0.20
Standard Deviation		3.60	0.85	0.17
CV		3.79	0.86	0.17
TABLE OF A (Herbicide Rate) B (Adjuvant Combo) MEANS				
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A	
1 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A	
1 On Target	100 L	0.5 % v/v	2-4"wds A	
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A	
2 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A	
2 On Target	100 L	0.5 % v/v	2-4"wds A	
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds 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		DIGSA						
Pest Name		L.crbgrs						
Crop Type, Code		C - C	GLXMA					
Crop Name			Soybean					
Rating Type		Control	Yield					
Rating Unit		%	Bu/A					
Rating Date		08/09/18	11/30/18					
Trt No.	Treatment Name	Form Conc	Form Rate	Rate Unit	Appl Timing	Appl Code		
<b>TABLE OF R MEANS</b>								
Replicate 1						99.0	34.8	
Replicate 2						99.0	41.2	
Replicate 3						99.0	34.3	
<b>TABLE OF A (Herbicide Rate) MEANS</b>								
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A		99.0 a	36.1 a		
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A					
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A		99.0 a	37.4 a		
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A					
<b>LSD P=.05</b>								
Standard Deviation						0.00	1.67	
CV						0.00	2.41	
						0.00	6.57	
<b>TABLE OF B (Adjuvant Combo) MEANS</b>								
1 On Target	100 L	0.5 % v/v	2-4"wds A		99.0 a	38.7 a		
2 On Target	100 L	0.5 % v/v	2-4"wds A		99.0 a	37.6 a		
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A					
3 On Target	100 L	0.5 % v/v	2-4"wds A		99.0 a	35.8 a		
3 Class Act Ridion	100 L	1 % v/v	2-4"wds A					
4 On Target	100 L	0.5 % v/v	2-4"wds A		99.0 a	36.8 a		
4 AG18047	100 L	0.5 % v/v	2-4"wds A					
5 On Target	100 L	0.5 % v/v	2-4"wds A		99.0 a	35.9 a		
5 AG18047	100 L	1 % v/v	2-4"wds A					
6 No adjuvant					99.0 a	35.8 a		
<b>LSD P=.05</b>								
Standard Deviation						0.00	2.89	
CV						0.00	2.41	
						0.00	6.57	
<b>TABLE OF A (Herbicide Rate) B (Adjuvant Combo) MEANS</b>								
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A		99.0 a	40.0 a		
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A					
1 On Target	100 L	0.5 % v/v	2-4"wds A					
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A		99.0 a	37.3 a		
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A					
1 On Target	100 L	0.5 % v/v	2-4"wds A					
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A		99.0 a	37.2 a		
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A					
2 On Target	100 L	0.5 % v/v	2-4"wds A					
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds A					
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A		99.0 a	37.9 a		
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A					
2 On Target	100 L	0.5 % v/v	2-4"wds A					
2 Class Act Ridion	100 L	0.5 % v/v	2-4"wds 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 mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	IPOSS mornglry C -
Crop Name	Control %	Control %	Control %	Control %
Rating Type	07/19/18	07/19/18	08/09/18	08/09/18
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Timing	Appl Code
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A	
3 On Target	100 L	0.5 % v/v	2-4"wds A	
3 Class Act Ridion	100 L	1 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A	
3 On Target	100 L	0.5 % v/v	2-4"wds A	
3 Class Act Ridion	100 L	1 % v/v	2-4"wds A	
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A	
4 On Target	100 L	0.5 % v/v	2-4"wds A	
4 AG18047	100 L	0.5 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A	
4 On Target	100 L	0.5 % v/v	2-4"wds A	
4 AG18047	100 L	0.5 % v/v	2-4"wds A	
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A	
5 On Target	100 L	0.5 % v/v	2-4"wds A	
5 AG18047	100 L	1 % v/v	2-4"wds A	
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A	
5 On Target	100 L	0.5 % v/v	2-4"wds A	
5 AG18047	100 L	1 % v/v	2-4"wds A	
1 Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"wds A	
1 Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"wds A	
6 No adjuvant				
2 Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"wds A	
2 Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"wds A	
6 No adjuvant				
LSD P=.05		6.23	3.00	0.28
Standard Deviation		3.60	0.85	0.17
CV		3.79	0.86	0.17
				0.00

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

Pest Code		DIGSA							
Pest Name	L.crbgrs	C - C	GLXMA						
Crop Type, Code									
Crop Name			Soybean						
Rating Type			Yield						
Rating Unit		%	Bu/A						
Rating Date	08/09/18		11/30/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"	wds	A		99.0 a	34.4 a
1	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"	wds	A			
3	On Target	100 L	0.5 % v/v	2-4"	wds	A			
3	Class Act Ridion	100 L	1 % v/v	2-4"	wds	A			
2	Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"	wds	A		99.0 a	37.1 a
2	Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"	wds	A			
3	On Target	100 L	0.5 % v/v	2-4"	wds	A			
3	Class Act Ridion	100 L	1 % v/v	2-4"	wds	A			
1	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"	wds	A		99.0 a	35.9 a
1	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"	wds	A			
4	On Target	100 L	0.5 % v/v	2-4"	wds	A			
4	AG18047	100 L	0.5 % v/v	2-4"	wds	A			
2	Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"	wds	A		99.0 a	37.6 a
2	Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"	wds	A			
4	On Target	100 L	0.5 % v/v	2-4"	wds	A			
4	AG18047	100 L	0.5 % v/v	2-4"	wds	A			
1	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"	wds	A		99.0 a	33.7 a
1	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"	wds	A			
5	On Target	100 L	0.5 % v/v	2-4"	wds	A			
5	AG18047	100 L	1 % v/v	2-4"	wds	A			
2	Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"	wds	A		99.0 a	38.1 a
2	Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"	wds	A			
5	On Target	100 L	0.5 % v/v	2-4"	wds	A			
5	AG18047	100 L	1 % v/v	2-4"	wds	A			
1	Roundup PowerMax..glyphosate	4.5 AS	0.77 lb ae/a	2-4"	wds	A		99.0 a	35.3 a
1	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4"	wds	A			
6	No adjuvant								
2	Roundup PowerMax..glyphosate	4.5 AS	0.387 lb ae/a	2-4"	wds	A		99.0 a	36.3 a
2	Xtendimax.....dicamba	2.9 SL	0.25 lb ae/a	2-4"	wds	A			
6	No adjuvant								
LSD P=.05							.		4.09
Standard Deviation							0.00		2.41
CV							0.00		6.57

Means followed by same letter 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 morngly C Control % 07/19/18 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	29	526.088229				
R	2	142.267653	71.133826	5.488	0.0153	
A	1	39.509739	39.509739	3.048	0.1000	2.5
B	5	69.451857	13.890371	1.072	0.4123	4.4
AB	5	67.461224	13.492245	1.041	0.4277	6.2
ERROR	16	207.397756	12.962360			

FACTORIAL/POOLED ERROR AOV For DIGSA L.crbgrs C Control % 07/19/18 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	15	15.187500				
R	2	0.041667	0.020833	0.029	0.9722	
A	1	1.562500	1.562500	2.143	0.2808	1.2
B	5	8.062500	1.612500	2.211	0.3401	2.1
AB	5	4.062500	0.812500	1.114	0.5355	3.0
ERROR	2	1.458333	0.729167			

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Control % 08/09/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	0.972222				
R	2	0.055556	0.027778	1.000	0.3840	
A	1	0.027778	0.027778	1.000	0.3282	0.1
B	5	0.138889	0.027778	1.000	0.4408	0.2
AB	5	0.138889	0.027778	1.000	0.4408	0.3
ERROR	22	0.611111	0.027778			

FACTORIAL/POOLED ERROR AOV For IPOSS morngly C Control % 08/09/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	0.000000				
R	2	0.000000	0.000000	0.000	1.0000	
A	1	0.000000	0.000000	0.000	1.0000	.
B	5	0.000000	0.000000	0.000	1.0000	.
AB	5	0.000000	0.000000	0.000	1.0000	.
ERROR	22	0.000000	0.000000			

FACTORIAL/POOLED ERROR AOV For DIGSA L.crbgrs C Control % 08/09/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	0.000000				
R	2	0.000000	0.000000	0.000	1.0000	.
A	1	0.000000	0.000000	0.000	1.0000	.
B	5	0.000000	0.000000	0.000	1.0000	.
AB	5	0.000000	0.000000	0.000	1.0000	.
ERROR	22	0.000000	0.000000			

FACTORIAL/POOLED ERROR AOV For C GLXMA Soybean Yield Bu/A 11/30/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	35	577.939806				
R	2	351.834787	175.917394	30.222	0.0001	
A	1	14.883809	14.883809	2.557	0.1241	1.7
B	5	41.901172	8.380234	1.440	0.2495	2.9
AB	5	41.259608	8.251922	1.418	0.2569	4.1
ERROR	22	128.060429	5.820929			

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

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

**K308 in No-Till Soybeans**

Trial ID: Soy3-18      Location: Field #7      Trial Year: 2018  
 Protocol ID: Soy3-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: UPI

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 12/01/18

**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	Variety: S43XS27
Attributes: Xtend	
Planting Date: 05/31/18	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: 82 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 06/04/18	Soil Moisture: ABONOR above normal, excessive
Harvest Date: 11/30/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.0	Harvested Width: 6.25 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>	Tillage Type: NOTILL no-till
Replications: 3	Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Total preemergence application of Clarity 8 fl.oz/A + Roundup PowerMax 1 qt/A on 05-31-18. Total postemergence application of Roundup PowerMax 1 qt/A + Xtendimax 22 fl.oz/A + NIS 0.25% v/v on 07-09-18.

**Soil Description**

Description Name: Field 7			
% Sand: 79	% OM: 2.1	Texture: LS	loamy sand
% Silt: 13	pH: 6.2	Soil Name: Rockawalkin	loamy sand, 0-2% slopes
% Clay: 8	CEC: 5.6	Fert. Level: G	good
Soil Drainage: G	good		

**Application Description**

A	
Application Date	05/21/18
Appl. Stop Time	10:30 AM
Application Method	SPRAY
Application Timing	7 EPP
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	72 F
% Relative Humidity Start, Stop	59
Wind Velocity+Dir. Start	2 mph NE
Wet Leaves (Y/N)	N no
Soil Temperature	72 F
Soil Moisture	WET
% Cloud Cover	30

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY

**Application Equipment**

A	
Appl. Equipment	Tractor
Equipment Type	TRMOSP
Operation Pressure	40 psi
Nozzle Type	AIRMIX
Nozzle Size	11002
Nozzle Spacing	20 in
Boom Length	10 ft
Boom Height	72 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

Context	Date	By	Notes
	06/19/18		Cereal rye suppressing most weeds in treatment plots as well as the untreated check.
STATUS	12/12/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

06/07/18: No observable differences. Plots weed free with no soybean injury.

K308 in No-Till Soybeans		Trial ID: Soy3-18	Location: Field #7	Trial Year: 2018			
Protocol ID: Soy3-18		Investigator: Mark VanGessel					
Study Director:							
Sponsor Contact: UPI							
Pest Code					AMAPA PalmerAm	ANVCR Sp.Anoda	IPOSS morngly
Pest Name					C -	C -	C -
Crop Type, Code					Soybean Stunting %	Control %	Control %
Crop Name					06/19/18	06/19/18	06/19/18
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check				0.0 a	33.3 a	33.3 a
2	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A	0.0 a	30.0 a
3	Tricor 4F.....metribuzin	4 F	0.188 lb ai/a	7EPP	A	0.0 a	100.0 a
4	Shutdown.....sulfentrazone	4.16 SC	0.189 lb ai/a	7EPP	A	0.0 a	66.7 a
5	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	7EPP	A	0.0 a	66.7 a
6	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A	0.0 a	100.0 a
	Tricor 4F.....metribuzin	4 F	0.188 lb ai/a	7EPP	A		66.7 a
7	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A	0.0 a	100.0 a
	Shutdown.....sulfentrazone	4.16 SC	0.189 lb ai/a	7EPP	A		100.0 a
8	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A	0.0 a	100.0 a
	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	7EPP	A		90.0 a
9	Tripzin ZC Premix	4 ZC	0.69 lb ai/a	7EPP	A	0.0 a	76.7 a
	----pendimethalin	2.9	0.5				100.0 a
	----metribuzin	1.1	0.19				91.7 a
10	Moccasin MTZ Premix	4.5 EC	0.77 lb ai/a	7EPP	A	0.0 a	66.7 a
	----s-metolachlor	3.4	0.58				100.0 a
	----metribuzin	1.1	0.188				100.0 a
11	Tripzin ZC Premix	4 ZC	0.69 lb ai/a	7EPP	A	0.0 a	53.3 a
	----pendimethalin	2.9	0.5				100.0 a
	----metribuzin	1.1	0.19				100.0 a
	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A		
12	Moccasin MTZ Premix	4.5 EC	0.77 lb ai/a	7EPP	A	0.0 a	66.7 a
	----s-metolachlor	3.4	0.58				100.0 a
	----metribuzin	1.1	0.188				66.7 a
	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A		
LSD P=.05					.	77.52	42.54
Standard Deviation					0.00	45.78	25.12
CV					0.0	66.46	27.66
Replicate F					0.000	1.150	0.040
Replicate Prob(F)					1.0000	0.3348	0.9612
Treatment F					0.000	0.782	2.008
Treatment Prob(F)					1.0000	0.6550	0.0790
							0.132
							0.8768
							1.009
							0.4702

Means followed by same letter 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 1,11 because error mean square = 0.

Pest Code Pest Name Crop Type, Code	DIGSA L.crbgrs C -	C GLXMA	AMAPA PalmerAm C -	ANVCR Sp.Anoda C -
Crop Name Rating Type Rating Unit Rating Date	Control % 06/19/18	Soybean Stunting % 07/02/18	Control % 07/02/18	Control % 07/02/18
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing		
1 Untreated Check		33.3 b	0.0 a	0.0 c
2 KFD-308-01	3 CS 0.75 lb ai/a	7EPP A	97.7 a	0.0 a
3 Tricor 4F.....metribuzin	4 F 0.188 lb ai/a	7EPP A	97.7 a	0.0 a
4 Shutdown.....sulfentrazone	4.16 SC 0.189 lb ai/a	7EPP A	96.7 a	0.0 a
5 Sharpen.....saflufenacil	2.85 SC 0.0223 lb ai/a	7EPP A	97.7 a	0.0 a
6 KFD-308-01	3 CS 0.75 lb ai/a	7EPP A	94.3 a	0.0 a
Tricor 4F.....metribuzin	4 F 0.188 lb ai/a	7EPP A		
7 KFD-308-01	3 CS 0.75 lb ai/a	7EPP A	97.7 a	10.0 a
Shutdown.....sulfentrazone	4.16 SC 0.189 lb ai/a	7EPP A		
8 KFD-308-01	3 CS 0.75 lb ai/a	7EPP A	97.7 a	0.0 a
Sharpen.....saflufenacil	2.85 SC 0.0223 lb ai/a	7EPP A		
9 Tripzin ZC Premix	4 ZC 0.69 lb ai/a	7EPP A	98.3 a	0.0 a
----pendimethalin	2.9 0.5			
----metribuzin	1.1 0.19			
10 Moccasin MTZ Premix	4.5 EC 0.77 lb ai/a	7EPP A	97.0 a	0.0 a
----s-metolachlor	3.4 0.58			
----metribuzin	1.1 0.188			
11 Tripzin ZC Premix	4 ZC 0.69 lb ai/a	7EPP A	99.3 a	0.0 a
----pendimethalin	2.9 0.5			
----metribuzin	1.1 0.19			
KFD-308-01	3 CS 0.75 lb ai/a	7EPP A		
12 Moccasin MTZ Premix	4.5 EC 0.77 lb ai/a	7EPP A	99.3 a	5.0 a
----s-metolachlor	3.4 0.58			
----metribuzin	1.1 0.188			
KFD-308-01	3 CS 0.75 lb ai/a	7EPP A		
LSD P=.05		27.87	9.64	36.22
Standard Deviation		16.46	5.69	21.39
CV		17.85	455.27	19.32
Replicate F		1.603	0.579	25.72
Replicate Prob(F)		0.2240	0.5688	0.1172
Treatment F		3.828	0.895	5.049
Treatment Prob(F)		0.0036	0.5595	0.0006

Means followed by same letter 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 1,11 because error mean square = 0.

Pest Code		IPOSS mornglry C -	SETFA G.foxtl C -	C GLXMA	AMAPA PalmerAm C -						
Crop Name		Control %	Control %	Soybean Stunting %	Control %						
Rating Type		07/02/18	07/02/18	07/13/18	07/13/18						
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code				
1	Untreated Check							0.0 a	0.0 d	0.0 a	0.0 c
2	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A		0.0 a	54.3 abc		0.0 a	85.7 ab
3	Tricor 4F.....metribuzin	4 F	0.188 lb ai/a	7EPP	A		0.0 a	43.3 c		0.0 a	88.7 ab
4	Shutdown.....sulfentrazone	4.16 SC	0.189 lb ai/a	7EPP	A		33.3 a	94.3 a		0.0 a	91.0 ab
5	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	7EPP	A		33.3 a	49.3 bc		0.0 a	81.7 b
6	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A		33.3 a	68.3 abc		0.0 a	95.0 a
	Tricor 4F.....metribuzin	4 F	0.188 lb ai/a	7EPP	A						
7	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A		0.0 a	85.3 ab		0.0 a	91.7 a
	Shutdown.....sulfentrazone	4.16 SC	0.189 lb ai/a	7EPP	A						
8	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A		0.0 a	83.3 abc		0.0 a	90.7 ab
	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	7EPP	A						
9	Tripzin ZC Premix	4 ZC	0.69 lb ai/a	7EPP	A		33.3 a	88.3 ab		0.0 a	90.7 ab
	----pendimethalin	2.9	0.5								
	----metribuzin	1.1	0.19								
10	Moccasin MTZ Premix	4.5 EC	0.77 lb ai/a	7EPP	A		33.3 a	76.7 abc		0.0 a	93.3 a
	----s-metolachlor	3.4	0.58								
	----metribuzin	1.1	0.188								
11	Tripzin ZC Premix	4 ZC	0.69 lb ai/a	7EPP	A		33.3 a	92.3 a		0.0 a	89.3 ab
	----pendimethalin	2.9	0.5								
	----metribuzin	1.1	0.19								
	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A						
12	Moccasin MTZ Premix	4.5 EC	0.77 lb ai/a	7EPP	A		33.3 a	90.0 ab		0.0 a	89.0 ab
	----s-metolachlor	3.4	0.58								
	----metribuzin	1.1	0.188								
	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A						
LSD P=.05				68.60		41.03		.		9.68	
Standard Deviation				40.51		24.23		0.00		5.72	
CV				208.36		35.22		0.0		6.96	
Replicate F				3.215		0.730		0.000		7.455	
Replicate Prob(F)				0.0596		0.4934		1.0000		0.0034	
Treatment F				0.538		3.972		0.000		62.586	
Treatment Prob(F)				0.8560		0.0029		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.  
Could not calculate LSD (% mean diff) for columns 1,11 because error mean square = 0.

Pest Code		GGGAN							
Pest Name		AnnGrass							
Crop Type, Code		C -	C GLXMA						
Crop Name									
Rating Type			Soybean						
Rating Unit			Yield						
Rating Date		07/13/18	Bu/A	11/30/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 a	38.2 a
2	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A			63.3 a	39.9 a
3	Tricor 4F.....metribuzin	4 F	0.188 lb ai/a	7EPP	A			61.7 a	39.8 a
4	Shutdown.....sulfentrazone	4.16 SC	0.189 lb ai/a	7EPP	A			63.3 a	39.5 a
5	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	7EPP	A			76.7 a	40.4 a
6	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A			65.0 a	35.7 a
	Tricor 4F.....metribuzin	4 F	0.188 lb ai/a	7EPP	A				
7	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A			81.7 a	39.5 a
	Shutdown.....sulfentrazone	4.16 SC	0.189 lb ai/a	7EPP	A				
8	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A			78.3 a	42.0 a
	Sharpen.....saflufenacil	2.85 SC	0.0223 lb ai/a	7EPP	A				
9	Tripzin ZC Premix	4 ZC	0.69 lb ai/a	7EPP	A			85.0 a	37.8 a
	----pendimethalin	2.9	0.5						
	----metribuzin	1.1	0.19						
10	Moccasin MTZ Premix	4.5 EC	0.77 lb ai/a	7EPP	A			71.7 a	39.4 a
	----s-metolachlor	3.4	0.58						
	----metribuzin	1.1	0.188						
11	Tripzin ZC Premix	4 ZC	0.69 lb ai/a	7EPP	A			80.0 a	38.7 a
	----pendimethalin	2.9	0.5						
	----metribuzin	1.1	0.19						
	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A				
12	Moccasin MTZ Premix	4.5 EC	0.77 lb ai/a	7EPP	A			95.0 a	38.2 a
	----s-metolachlor	3.4	0.58						
	----metribuzin	1.1	0.188						
	KFD-308-01	3 CS	0.75 lb ai/a	7EPP	A				
LSD P=.05				51.61		4.95			
Standard Deviation				30.48		2.92			
CV				44.52		7.48			
Replicate F				0.391		14.425			
Replicate Prob(F)				0.6810		0.0001			
Treatment F				1.837		0.847			
Treatment Prob(F)				0.1083		0.5996			

Means followed by same letter 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 1,11 because error mean square = 0.

Panther Pro and Panther MTZ in No-Till Soybeans

Trial ID: Soy4-18

Location: Field #7

Trial Year: 2018

Protocol ID: Soy4-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Nufarm

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Initiation Date: 03/01/18

Completion Date: 12/01/18

**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

Variety: S42LL63

Attributes: Liberty Link

Planting Date: 05/31/18

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: 82 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 06/04/18

Harvest Date: 11/30/18

Harvest Equipment: Plot combine

Harvested Width: 6.25 FT

% Standard Moisture: 13.0

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: DIGSA Digitaria sanguinalis

Common Name: large crabgrass

**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: 4

Tillage Type: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 7

% Sand: 79

% OM: 2.1

Texture: LS

loamy sand

% Silt: 13

pH: 6.2

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

% Clay: 8

CEC: 5.6

Fert. Level: G good

Soil Drainage: G

good

**Application Description**

	A	B	C
Application Date	05/15/18	05/31/18	06/21/18
Appl. Stop Time	11:15 AM	05:30 PM	10:35 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	14EPP	PRE	3-4"wds
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Air Temperature Start, Stop	80 82 F	81 82 F	81 81 F
% Relative Humidity Start, Stop	69 70	78 77	72 72
Wind Velocity+Dir. Start	6 mph SSW	2 mph SE	3 mph NW
Wind Velocity+Dir. Stop	6 mph SSW	2 mph SE	3 mph NW
Wind Velocity+Dir. Max	16 mph SSW	2 mph SE	3 mph NW
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	80 F	81 F	81 F
Soil Moisture	WET	WET	NORMAL
% Cloud Cover	75	35	70
Moisture 6 Hours after Appl.	0 IN	0 IN	0 IN
Moisture 1 Week after Appl.	4.75 IN	1.09 IN	0.74 IN

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used			DESC
Stage Majority, Percent			V-2 100
Height Average			7 in
Height Minimum, Maximum			6 8

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	DIGSA W	DIGSA W	DIGSA W
Stage Majority, Percent			veg 100
Height Average			4 in
Height Minimum, Maximum			2 7
Density Average			15 m2

**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
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	72 in	72 in	30 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
	07/10/18		At all rating dates, most summer annual weeds were outcompeted in plots with poor grass control.
STATUS	12/12/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

Trial Comments

Panther Pro and Panther MTZ in No-Till Soybeans

Trial ID: Soy4-18

Location: Field #7

Trial Year: 2018

Protocol ID: Soy4-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Nufarm

Pest Code	Pest Name	Crop Type, Code	C SECCE	ANVCR Sp.anoda C -	IPOSS mornglry C -	SIDSP PrklSida C -
Crop Name	Rating Type	Rye	Burndown %	Control %	Control %	Control %
Rating Unit	Rating Date		06/07/18	06/07/18	06/07/18	06/07/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code
1	Untreated Check					
2	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v	14EPP A 14EPP A 14EPP A		
3	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate Panther Pro Premix ----metribuzin ----flumioxazin ----imazethapyr Methylated Seed Oil Cheetah.....glufosinate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D 4.2 SC 3 0.67 0.53 100 L 2.34 SL 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v 0.394 lb ai/a 0.281 0.063 0.0497 1 % v/v 0.53 lb ai/a 1.02 % w/v	14EPP A 14EPP A PRE B	100.0 a	100.0 a
4	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate Panther MTZ Premix ----metribuzin ----flumioxazin Methylated Seed Oil Cheetah.....glufosinate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D 3.67 SC 3 0.67 100 L 2.34 SL 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v 0.344 lb ai/a 0.28 0.063 1 % v/v 0.53 lb ai/a 1.02 % w/v	14EPP A 14EPP A PRE B	100.0 a	100.0 a
LSD P=.05				.	57.67	57.67
Standard Deviation				0.00	28.87	27.39
CV				0.0	49.49	43.82
Replicate F				0.000	1.000	0.833
Replicate Prob(F)				1.0000	0.4219	0.4871
Treatment F				0.000	9.000	9.167
Treatment Prob(F)				1.0000	0.0122	0.0122
						0.0178

Means followed by same letter 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

Could not calculate LSD (% mean diff) for columns 1,6,7,11,13 because error mean square = 0.

Pest Code Pest Name Crop Type, Code		SETFA G.foxtl C -	C GLXMA	ANVCR Sp.anoda C -	IPOSS mornlry C -
Crop Name Rating Type Rating Unit Rating Date		Control % 06/07/18	Soybean Injury % 06/19/18	Control % 06/19/18	Control % 06/19/18
Trt No. Treatment Name	Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
1 Untreated Check				0.0 b	0.0 a
2 Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v	14EPP A 14EPP A	0.0 b	0.0 a
3 Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate Panther Pro Premix ----metribuzin ----flumioxazin ----imazethapyr Methylated Seed Oil Cheetah.....glufosinate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D 4.2 SC 3 0.67 0.53 100 L 2.34 SL 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v 0.394 lb ai/a 0.281 0.063 0.0497 1 % v/v 0.53 lb ai/a 1.02 % w/v	14EPP A 14EPP A PRE B	96.0 a	0.0 a
4 Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate Panther MTZ Premix ----metribuzin ----flumioxazin Methylated Seed Oil Cheetah.....glufosinate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D 3.67 SC 3 0.67 100 L 2.34 SL 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v 0.344 lb ai/a 0.28 0.063 1 % v/v 0.53 lb ai/a 1.02 % w/v	14EPP A 14EPP A PRE B	91.0 a	0.0 a
LSD P=.05 Standard Deviation CV			5.19 2.60 5.56	. 0.00 0.0	59.03 29.55 57.65
Replicate F Replicate Prob(F) Treatment F			1.593 0.2787 1297.000	0.000 1.0000 0.000	4.131 0.0744 4.375
Treatment Prob(F)			0.0001	1.0000	1.0000
					0.0590

Means followed by same letter 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

Could not calculate LSD (% mean diff) for columns 1,6,7,11,13 because error mean square = 0.

Pest Code		SIDSP PrkISida C -	SETFA G.foxtl C -	C GLXMA	SETFA G.foxtl C -						
Crop Name		Control %	Control %	Soybean Stunting %	Control %						
Rating Type		06/19/18	06/19/18	07/02/18	07/02/18						
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code					
1	Untreated Check						0.0 b	0.0 c	0.0 a	0.0 c	
2	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v	14EPP A 14EPP A 14EPP A		33.3 b	0.0 c	0.0 a	0.0 c		
3	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate Panther Pro Premix ----metribuzin ----flumioxazin ----imazethapyr Methylated Seed Oil Cheetah.....glufosinate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D 4.2 SC 3 0.67 0.53 100 L 2.34 SL 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v 0.394 lb ai/a 0.281 0.063 0.0497 1 % v/v 0.53 lb ai/a 1.02 % w/v	14EPP A 14EPP A PRE B		100.0 a	94.3 a	0.0 a	98.3 a		
4	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate Panther MTZ Premix ----metribuzin ----flumioxazin Methylated Seed Oil Cheetah.....glufosinate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D 3.67 SC 3 0.67 100 L 2.34 SL 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v 0.344 lb ai/a 0.28 0.063 1 % v/v 0.53 lb ai/a 1.02 % w/v	14EPP A 14EPP A PRE B		100.0 a	25.0 b	0.0 a	90.0 b		
LSD P=.05				57.67	1.15	.	2.88				
Standard Deviation				28.87	0.58	0.00	1.44				
CV				49.49	1.94	0.0	3.07				
Replicate F				1.000	1.000	0.000	1.000				
Replicate Prob(F)				0.4219	0.4219	1.0000	0.4219				
Treatment F				9.000	17891.002	0.000	4273.000				
Treatment Prob(F)				0.0122	0.0001	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=4

Could not calculate LSD (% mean diff) for columns 1,6,7,11,13 because error mean square = 0.

Pest Code Pest Name Crop Type, Code		C GLXMA	DIGSA L.crbgrs							
Crop Name Rating Type Rating Unit Rating Date		Soybean Injury %	Control %	Soybean Yield Bu/A						
	07/10/18	07/10/18		11/30/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check							0.0 a	27.7 a	0.0 c
2	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v	14EPP A 14EPP A 14EPP A				0.0 a	33.3 a	0.0 c
3	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate Panther Pro Premix ----metribuzin ----flumioxazin ----imazethapyr Methylated Seed Oil Cheetah.....glufosinate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D 4.2 SC 3 0.67 0.53 100 L 2.34 SL 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v 0.394 lb ai/a 0.281 0.063 0.0497 1 % v/v 0.53 lb ai/a 1.02 % w/v	14EPP A 14EPP A 14EPP A PRE B 3-4"wds C 3-4"wds C				0.0 a	61.0 a	33.0 a
4	Spitfire Premix ----dicamba ----2,4-D ester Credit Xtreme...glyphosate Dry Ammonium Sulfate Panther MTZ Premix ----metribuzin ----flumioxazin Methylated Seed Oil Cheetah.....glufosinate Dry Ammonium Sulfate	3.57 L 0.5 3.07 4.5 AS 100 D 3.67 SC 3 0.67 100 L 2.34 SL 100 D	0.56 lb ae/a 0.0784 0.48 1.13 lb ae/a 1.02 % w/v 0.344 lb ai/a 0.28 0.063 1 % v/v 0.53 lb ai/a 1.02 % w/v	14EPP A 14EPP A 14EPP A PRE B 3-4"wds C 3-4"wds C				0.0 a	60.3 a	20.8 b
LSD P=.05 Standard Deviation CV								.000	110.71 55.41 0.0	7.49 3.75 27.88
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)								0.000 1.0000 0.000 1.0000	0.665 0.5486 0.302 0.8235	0.353 0.7160 56.781 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

Could not calculate LSD (% mean diff) for columns 1,6,7,11,13 because error mean square = 0.

## University of Delaware

Evaluation of Residual Herbicides for Soybeans - Coarse Textured Soils  
 Trial ID: Soy5a-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: Soy5a-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 11/24/18

**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
Variety: R2C4775	
Attributes: Roundup Ready	
Planting Date: 05/04/18	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: 86 F	Seed Bed: MEDIUM medium
Emergence Date: 05/12/18	Soil Moisture: ABONOR above normal, excessive
Harvest Date: 11/01/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.0	Harvested Width: 6.25 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>	Tillage Type: CONTIL conventional-till
Replications: 3	Study Design: RACOBL Randomized Complete Block (RCB)

## Field Prep./Maintenance:

Total Postemergence application of Roundup PowerMax 1qt/A + Reflex 1.5 pt/A on 6-21-18.

**Soil Description**

Description Name: Field 18B			
% Sand: 81	% OM: 1.0	Texture: LS	loamy sand
% Silt: 12	pH: 6.4	Soil Name: Rosedale	loamy sand, 0-2% slopes
% Clay: 7	CEC: 4.5	Fert. Level: G	good
Soil Drainage: G	good		

**Application Description**

A	
Application Date	05/05/18
Appl. Stop Time	01:00 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	VanGessl
Air Temperature Start, Stop	85 F
% Relative Humidity Start, Stop	46
Wind Velocity+Dir. Start	2 mph SW
Wet Leaves (Y/N)	N no
Soil Temperature	85 F
Soil Moisture	NORMAL
% Cloud Cover	90

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY

**Application Equipment**

A	
Appl. Equipment	Backpack
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	11/28/18	Mark VanGesl	Automatically added by ARM: Trial Status updated to 'E' when Harvest Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

06/02/18: Ragweed control was poor in treatment 3 and fair to good in treatment 13. No ragweed was observed in other treatments.

06/15/18: Ragweed control was poor in treatments 3 7 10 11 12 13 14; lambsquarter control was poor in treatments 7, 14

07/05/18: Morningglory seedlings have emerged since POST applications. Ratings are based on plants present at the time of POST treatments, residual control was not considered.

Evaluation of Residual Herbicides for Soybeans - Coarse Textured Soils  
 Trial ID: Soy5a-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: Soy5a-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Pest Code	Pest Name				AMAPA		
Crop Type, Code		C GLXMA	C GLXMA		Palmer amaranth		
Crop Name		Soybean	Soybean				
Rating Type		Stunting	Stunting				
Rating Unit		%	%				
Rating Date		05/24/18	06/02/18		06/02/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code		
1	Untreated Check			0.0 g	0.0 d	0.0 c	
2	Authority First Premix	70 DF	0.236 lb ai/a	PRE A	10.7 a-d	13.0 bc	100.0 a
	----sulfentrazone	62.1	0.21				
	----cloransulam	7.9	0.0266				
3	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE A	4.7 efg	0.0 d	91.7 b
	----sulfentrazone	18	0.135				
	----metribuzin	27	0.203				
4	Authority XL Premix	70 DG	0.232 lb ai/a	PRE A	4.7 efg	20.0 a	100.0 a
	----sulfentrazone	62.2	0.206				
	----chlorimuron	7.8	0.0259				
5	Canopy Premix	75 DF	0.188 lb ai/a	PRE A	5.7 def	12.3 bc	95.7 ab
	----metribuzin	64.3	0.161				
	----chlorimuron	10.7	0.0268				
6	Fierce Premix	76 WG	0.178 lb ai/a	PRE A	14.7 ab	17.3 ab	99.7 a
	----flumioxazin	33.5	0.0785				
	----pyroxasulfone	42.5	0.1				
7	Prefix Premix	5.3 E	1.33 lb ai/a	PRE A	7.3 c-f	0.0 d	94.0 ab
	----s-metolachlor	4.35	1.09				
	----fomesafen	0.95	0.238				
8	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE A	9.7 b-e	8.0 c	99.7 a
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE A			
9	Valor XLT Premix	40.3 WG	0.088 lb ai/a	PRE A	12.3 abc	12.3 bc	99.0 a
	----flumioxazin	30	0.0655				
	----chlorimuron	10.3	0.0225				
10	Trivence Premix	61.3 WG	0.257 lb ai/a	PRE	0.0 g	10.0 c	100.0 a
	----chlorimuron	3.9	0.0164				
	----metribuzin	44.6	0.187				
	----flumioxazin	12.8	0.0537				
11	Fierce XLT Premix	62.4 WG	0.146 lb ai/a	PRE A	15.7 a	17.3 ab	100.0 a
	----flumioxazin	24.57	0.0575				
	----pyroxasulfone	31.16	0.073				
	----chlorimuron	6.67	0.0156				
12	---Gangster/Surveil Co-Pack				2.3 fg	8.0 c	100.0 a
	_Valor SX.....flumioxazin	51 WG	0.08 lb ai/a	PRE A			
	_Firstrate.....cloransulam	84 WG	0.0263 lb ai/a	PRE A			
13	BroadAxe Premix	7 SC	1.37 lb ai/a	PRE A	7.3 c-f	10.7 c	100.0 a
	----sulfentrazone	0.7	0.137				
	----s-metolachlor	6.3	1.23				

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.  
 Missing data estimates are included in columns:Average=8

Pest Code Pest Name		IPOSS Morning glory	DIGSA large crabgrass							
Crop Type, Code		C -	C -	GLXMA						
Crop Name										
Rating Type										
Rating Unit				Soybean						
Rating Date		Control %	Control %	Stunting %						
	06/02/18		06/02/18	06/15/18						
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 e
2	Authority First Premix	70 DF	0.236 lb ai/a	PRE	A			94.7 a	93.0 ab	2.3 de
	----sulfentrazone	62.1	0.21							
	----cloransulam	7.9	0.0266							
3	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A			92.0 a	87.3 b	6.3 a-d
	----sulfentrazone	18	0.135							
	----metribuzin	27	0.203							
4	Authority XL Premix	70 DG	0.232 lb ai/a	PRE	A			92.0 a	92.3 ab	0.0 e
	----sulfentrazone	62.2	0.206							
	----chlorimuron	7.8	0.0259							
5	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A			93.7 a	92.3 ab	10.3 a
	----metribuzin	64.3	0.161							
	----chlorimuron	10.7	0.0268							
6	Fierce Premix	76 WG	0.178 lb ai/a	PRE	A			98.3 a	97.7 a	9.0 ab
	----flumioxazin	33.5	0.0785							
	----pyroxasulfone	42.5	0.1							
7	Prefix Premix	5.3 E	1.33 lb ai/a	PRE	A			86.0 a	97.0 a	5.7 bcd
	----s-metolachlor	4.35	1.09							
	----fomesafen	0.95	0.238							
8	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A			83.0 a	94.7 a	0.0 e
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A					
9	Valor XLT Premix	40.3 WG	0.088 lb ai/a	PRE	A			92.7 a	93.7 ab	10.0 ab
	----flumioxazin	30	0.0655							
	----chlorimuron	10.3	0.0225							
10	Trivence Premix	61.3 WG	0.257 lb ai/a	PRE				91.0 a	93.3 ab	8.0 abc
	----chlorimuron	3.9	0.0164							
	----metribuzin	44.6	0.187							
	----flumioxazin	12.8	0.0537							
11	Fierce XLT Premix	62.4 WG	0.146 lb ai/a	PRE	A			97.0 a	96.3 a	9.7 ab
	----flumioxazin	24.57	0.0575							
	----pyroxasulfone	31.16	0.073							
	----chlorimuron	6.67	0.0156							
12	---Gangster/Surveil Co-Pack							93.0 a	97.7 a	9.0 ab
	_Valor SX.....flumioxazin	51 WG	0.08 lb ai/a	PRE	A					
	_Firstrate.....cloransulam	84 WG	0.0263 lb ai/a	PRE	A					
13	BroadAxe Premix	7 SC	1.37 lb ai/a	PRE	A			94.7 a	98.0 a	2.3 de
	----sulfentrazone	0.7	0.137							
	----s-metolachlor	6.3	1.23							

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.  
Missing data estimates are included in columns:Average=8

Pest Code	Pest Name		AMAPA Palmer amaranth	IPOSS Morning glory	DIGSA large crabgrass
Crop Type, Code			C -	C -	C -
Crop Name					
Rating Type					
Rating Unit			Control %	Control %	Control %
Rating Date			06/15/18	06/15/18	06/15/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1	Untreated Check				0.0 e
2	Authority First Premix	70 DF ----sulfentrazone ----cloransulam	0.236 lb ai/a 0.21 0.0266	A	95.0 ab
3	Authority MTZ Premix	45 DF ----sulfentrazone ----metribuzin	0.338 lb ai/a 0.135 0.203	A	76.7 cd
4	Authority XL Premix	70 DG ----sulfentrazone ----chlorimuron	0.232 lb ai/a 0.206 0.0259	A	90.7 ab
5	Canopy Premix	75 DF ----metribuzin ----chlorimuron	0.188 lb ai/a 0.161 0.0268	A	70.0 d
6	Fierce Premix	76 WG ----flumioxazin ----pyroxasulfone	0.178 lb ai/a 0.0785 0.1	A	89.0 ab
7	Prefix Premix	5.3 E ----s-metolachlor ----fomesafen	1.33 lb ai/a 1.09 0.238	A	86.7 abc
8	Valor SX.....Metribuzin.....metribuzin	51 WG 75 DF	0.064 lb ai/a 0.188 lb ai/a	PRE A	85.0 bc
9	Valor XLT Premix	40.3 WG ----flumioxazin ----chlorimuron	0.088 lb ai/a 0.0655 0.0225	A	89.7 ab
10	Trivence Premix	61.3 WG ----chlorimuron ----metribuzin ----flumioxazin	0.257 lb ai/a 3.9 0.0164 44.6 0.187 12.8 0.0537		97.7 a
11	Fierce XLT Premix	62.4 WG ----flumioxazin ----pyroxasulfone ----chlorimuron	0.146 lb ai/a 24.57 0.0575 31.16 0.073 6.67 0.0156	A	98.3 a
12	---Gangster/Surveil Co-Pack				96.0 ab
	_Valor SX.....flumioxazin	51 WG	0.08 lb ai/a	PRE A	84.7 a
	_Firstrate.....cloransulam	84 WG	0.0263 lb ai/a	PRE A	90.0 a
13	BroadAxe Premix	7 SC ----sulfentrazone ----s-metolachlor	1.37 lb ai/a 0.7 0.137 6.3 1.23	A	93.0 ab
					84.0 a
					90.0 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=8

Pest Code			C	GLXMA	AMAPA Palmer amaranth C -	IPOSS Morning glory C -
Crop Name				Soybean Stunting %	Control %	Control %
Rating Type				07/05/18	07/05/18	07/05/18
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated Check					
2	Authority First Premix	70 DF 62.1 ----sulfentrazone 7.9 ----cloransulam	0.236 lb ai/a 0.21 0.0266	PRE	A	5.7 a
3	Authority MTZ Premix	45 DF 18 ----sulfentrazone 27 ----metribuzin	0.338 lb ai/a 0.135 0.203	PRE	A	8.3 a
4	Authority XL Premix	70 DG 62.2 ----sulfentrazone 7.8 ----chlorimuron	0.232 lb ai/a 0.206 0.0259	PRE	A	11.7 a
5	Canopy Premix	75 DF 64.3 ----metribuzin 10.7 ----chlorimuron	0.188 lb ai/a 0.161 0.0268	PRE	A	2.3 a
6	Fierce Premix	76 WG 33.5 ----flumioxazin 42.5 ----pyroxasulfone	0.178 lb ai/a 0.0785 0.1	PRE	A	2.3 a
7	Prefix Premix	5.3 E 4.35 ----s-metolachlor 0.95 ----fomesafen	1.33 lb ai/a 1.09 0.238	PRE	A	4.7 a
8	Valor SX.....Metribuzin	51 WG 75 DF	0.064 lb ai/a 0.188 lb ai/a	PRE	A	0.0 a
9	Valor XLT Premix	40.3 WG 30 ----flumioxazin 10.3 ----chlorimuron	0.088 lb ai/a 0.0655 0.0225	PRE	A	5.0 a
10	Trivence Premix	61.3 WG 3.9 ----chlorimuron 44.6 ----metribuzin 12.8 ----flumioxazin	0.257 lb ai/a 0.0164 0.187 0.0537	PRE		11.3 a
11	Fierce XLT Premix	62.4 WG 24.57 ----flumioxazin 31.16 ----pyroxasulfone 6.67 ----chlorimuron	0.146 lb ai/a 0.0575 0.073 0.0156	PRE	A	4.0 a
12	---Gangster/Surveil Co-Pack					
	_Valor SX.....flumioxazin	51 WG	0.08 lb ai/a	PRE	A	2.3 a
	_Firstrate.....cloransulam	84 WG	0.0263 lb ai/a	PRE	A	
13	BroadAxe Premix	7 SC 0.7 ----sulfentrazone 6.3 ----s-metolachlor	1.37 lb ai/a 0.137 1.23	PRE	A	8.0 a
						99.0 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:Average=8

Pest Code						C GLXMA
Pest Name						Soybean
Crop Type, Code						Yield Bu/A
Crop Name						11/01/18
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing Code
1	Untreated Check					36.5 a
2	Authority First Premix	70 DF	0.236 lb ai/a	PRE	A	50.7 a
	----sulfentrazone	62.1	0.21			
	----cloransulam	7.9	0.0266			
3	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A	46.2 a
	----sulfentrazone	18	0.135			
	----metribuzin	27	0.203			
4	Authority XL Premix	70 DG	0.232 lb ai/a	PRE	A	47.0 a
	----sulfentrazone	62.2	0.206			
	----chlorimuron	7.8	0.0259			
5	Canopy Premix	75 DF	0.188 lb ai/a	PRE	A	47.8 a
	----metribuzin	64.3	0.161			
	----chlorimuron	10.7	0.0268			
6	Fierce Premix	76 WG	0.178 lb ai/a	PRE	A	53.0 a
	----flumioxazin	33.5	0.0785			
	----pyroxasulfone	42.5	0.1			
7	Prefix Premix	5.3 E	1.33 lb ai/a	PRE	A	51.2 a
	----s-metolachlor	4.35	1.09			
	----fomesafen	0.95	0.238			
8	Valor SX.....Metribuzin	51 WG	0.064 lb ai/a	PRE	A	51.5 a
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A	
9	Valor XLT Premix	40.3 WG	0.088 lb ai/a	PRE	A	53.3 a
	----flumioxazin	30	0.0655			
	----chlorimuron	10.3	0.0225			
10	Trivence Premix	61.3 WG	0.257 lb ai/a	PRE		47.7 a
	----chlorimuron	3.9	0.0164			
	----metribuzin	44.6	0.187			
	----flumioxazin	12.8	0.0537			
11	Fierce XLT Premix	62.4 WG	0.146 lb ai/a	PRE	A	49.1 a
	----flumioxazin	24.57	0.0575			
	----pyroxasulfone	31.16	0.073			
	----chlorimuron	6.67	0.0156			
12	---Gangster/Surveil Co-Pack					56.2 a
	_Valor SX.....flumioxazin	51 WG	0.08 lb ai/a	PRE	A	
	_Firstrate.....cloransulam	84 WG	0.0263 lb ai/a	PRE	A	
13	BroadAxe Premix	7 SC	1.37 lb ai/a	PRE	A	49.1 a
	----sulfentrazone	0.7	0.137			
	----s-metolachlor	6.3	1.23			

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.  
Missing data estimates are included in columns:Average=8

## University of Delaware

Pest Code		C	GLXMA	C	GLXMA	AMAPA
Pest Name						Palmer amaranth
Crop Type, Code						C -
Crop Name						
Rating Type			Soybean		Soybean	
Rating Unit			Stunting		Stunting	Control
Rating Date			%		%	%
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
14	Zidua.....pyroxasulfone	85 WG	0.106 lb	ai/a	PRE	A
	Tricor DF.....metribuzin	75 DF	0.188 lb	ai/a	PRE	A
LSD P=.05				13.3 ab	18.3 ab	98.0 ab
Standard Deviation					5.52	6.01
CV					3.29	3.58
Replicate F					42.5	34.03
Replicate Prob(F)						6.63
Treatment F						3.95
Treatment Prob(F)						4.33
					0.220	0.180
					0.8039	0.8362
					7.425	10.825
					0.0001	0.0001
						0.331
						0.7215
						133.789
						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=8

## University of Delaware

Pest Code Pest Name	IPOSS Morning glory	DIGSA large crabgrass								
Crop Type, Code	C -	C -	C GLXMA							
Crop Name			Soybean							
Rating Type	Control	Control	Stunting							
Rating Unit	%	%	%							
Rating Date	06/02/18	06/02/18	06/15/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
14	Zidua.....pyroxasulfone	85	WG	0.106	lb ai/a	PRE	A	91.3 a	98.7 a	4.0 cde
	Tricor DF.....metribuzin	75	DF	0.188	lb ai/a	PRE	A			
LSD P=.05				15.37				6.47		4.39
Standard Deviation				9.16				3.86		2.62
CV				10.69				4.38		47.81
Replicate F				3.389				6.866		2.608
Replicate Prob(F)				0.0492				0.0040		0.0928
Treatment F				22.292				131.373		6.917
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=8

## University of Delaware

Pest Code Pest Name	AMAPA Palmer amaranth	IPOSS Morning glory	DIGSA large crabgrass				
Crop Type, Code	C -	C -	C -				
Crop Name	Control %	Control %	Control %				
Rating Type	06/15/18	06/15/18	06/15/18				
Rating Unit							
Rating Date							
Trt Treatment No. Name	Form Conc Type Rate	Rate Unit	Appl Timing Appl Code				
14 Zidua.....pyroxasulfone Tricor DF.....metribuzin	85 WG 75 DF	0.106 lb ai/a 0.188 lb ai/a	PRE PRE	A A	86.7 abc	60.0 a	90.0 a
LSD P=.05					11.93	26.33	14.50
Standard Deviation					7.11	15.51	8.64
CV					8.62	22.21	10.91
Replicate F					0.204	4.465	2.520
Replicate Prob(F)					0.8168	0.0242	0.0999
Treatment F					37.109	5.924	22.190
Treatment Prob(F)					0.0001	0.0002	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=8

## University of Delaware

Pest Code		C	GLXMA	AMAPA Palmer amaranth	IPOSS Morning glory
Pest Name				C -	C -
Crop Type, Code					
Crop Name			Soybean		
Rating Type			Stunting	Control	Control
Rating Unit			%	%	%
Rating Date			07/05/18	07/05/18	07/05/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
14	Zidua.....pyroxasulfone	85 WG	0.106 lb	ai/a	PRE A
	Tricor DF.....metribuzin	75 DF	0.188 lb	ai/a	PRE A
LSD P=.05				8.56	14.51
Standard Deviation				5.10	8.65
CV				91.59	10.02
Replicate F				1.095	0.465
Replicate Prob(F)				0.3496	0.6331
Treatment F				2.010	26.488
Treatment Prob(F)				0.0630	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=8

## University of Delaware

Pest Code		C	GLXMA					
Pest Name		Soybean						
Crop Type, Code		Yield						
Crop Name		Bu/A						
Rating Type								
Rating Unit								
Rating Date			11/01/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
14	Zidua.....pyroxasulfone Tricor DF.....metribuzin	85 75	WG DF	0.106 0.188	lb ai/a	PRE	A	54.5 a
LSD P=.05								15.30
Standard Deviation								9.12
CV								18.39
Replicate F								2.687
Replicate Prob(F)								0.0870
Treatment F								0.824
Treatment Prob(F)								0.6329

Means followed by same letter 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

## University of Delaware

Evaluation of Residual Soybean Herbicides for Vegetable Rotations - Coarse Textured Soils  
 Trial ID: Soy6a-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: Soy6a-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 11/24/18

**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	Variety: S42LL63	
Attributes: Liberty Link	Planting Date: 06/07/18	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: 74 F	Harvest Date: 11/01/18	Soil Moisture: ABONOR above normal, excessive
Emergence Date: 06/14/18	Harvest Equipment: Plot combine	Harvested Width: 6.25 FT
Harvest Date: 11/01/18	Harvested Length: 25 FT	
% Standard Moisture: 13.0		

**Site and Design**

Treated Plot Width: 6.67 FT	Treated Plot Length: 25 FT	Site Type: FIELD field
Treated Plot Area: 166.75 FT <sup>2</sup>	Treatments: 10	Tillage Type: CONTIL conventional-till
Replications: 3		Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Total Postemergence application of Liberty 280 at 26 fl.oz/A + AMS on 7-11-18.

**Soil Description**

Description Name: Field 18B	% Sand: 81	% OM: 1.0	Texture: LS	loamy sand
	% Silt: 12	pH: 6.4	Soil Name: Rosedale loamy sand, 0-2% slopes	
	% Clay: 7	CEC: 4.5	Fert. Level: G	good
Soil Drainage: G				

**Application Description**

A	
Application Date	06/07/18
Appl. Stop Time	01:30 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	73 F
% Relative Humidity Start, Stop	58
Wind Velocity+Dir. Start	1 mph SE
Wet Leaves (Y/N)	N no
Soil Temperature	73 F
Soil Moisture	NORMAL
% Cloud Cover	30

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY

**Application Equipment**

A	
Appl. Equipment	Tractor
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
	07/10/18		High carpetweed/crabgrass competition--plots with high carpetweed had fewere crabgrass and vice versa.
STATUS	11/28/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

Trial Comments

## Evaluation of Residual Soybean Herbicides for Vegetable Rotations - Coarse Textured Soils

Trial ID: Soy6a-18

Location: Field #18

Trial Year: 2018

Protocol ID: Soy6a-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code		C	GLXMA	AMAPA PalmerAm C -	AMBEL C.ragwd C -	IPOSS mornlry C -
Crop Name		Soybean	Stunting %	Control %	Control %	Control %
Rating Type			06/25/18	06/25/18	06/25/18	06/25/18
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated Check					
2	Boundary Premix ----s-metolachlor ----metribuzin	6.5 EC 5.25 1.25	1.02 lb ai/a 0.82 0.196		A	
3	Boundary Premix ----s-metolachlor ----metribuzin Dual II Magnum..s-metolachlor	6.5 EC 5.25 1.25 7.64 E	1.02 lb ai/a 0.82 0.196 0.478 lb ai/a	PRE	A	
4	Canopy Premix ----metribuzin ----chlorimuron	75 DF 64.3 10.7	0.188 lb ai/a 0.161 0.0268		A	
5	---Gangster/Surveil Co-Pack _Valor SX.....flumioxazin _Firstrate.....cloransulam	51 WG 84 WG	0.08 lb ai/a 0.0263 lb ai/a	PRE	A	
6	Linex.....linuron Dual II Magnum..s-metolachlor	4 L 7.64 E	0.625 lb ai/a 1.24 lb ai/a	PRE	A	
7	Prefix Premix ----s-metolachlor ----fomesafen	5.3 E 4.35 0.95	1.33 lb ai/a 1.09 0.238		A	
8	Valor XLT Premix ----flumioxazin ----chlorimuron	40.3 WG 30 10.3	0.088 lb ai/a 0.0655 0.0225		A	
9	Valor SX.....flumioxazin Linex.....linuron	51 WG 4 L	0.064 lb ai/a 0.625 lb ai/a	PRE	A	
10	Valor SX.....flumioxazin Tricor DF.....metribuzin	51 WG 75 DF	0.064 lb ai/a 0.188 lb ai/a	PRE	A	
LSD P=.05			8.02	8.74	3.92	29.34
Standard Deviation			4.67	5.10	2.28	17.11
CV			280.48	6.0	2.61	35.42
Replicate F			0.153	3.853	4.679	0.197
Replicate Prob(F)			0.8596	0.0405	0.0231	0.8228
Treatment F			0.847	106.999	548.498	17.867
Treatment Prob(F)			0.5846	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.  
Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code Pest Name Crop Type, Code	DIGSA L.crbgrs C -	C GLXMA	AMAPA PalmerAm C -	IPOSS morngly C -
Crop Name Rating Type Rating Unit Rating Date	Control % 06/25/18	Soybean Injury % 07/10/18	Control % 07/10/18	Control % 07/10/18
Trt No. Treatment Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing		
1 Untreated Check		0.0 c	0.0 a	0.0 c
2 Boundary Premix ----s-metolachlor ----metribuzin	6.5 EC 5.25 1.25	1.02 lb ai/a 0.82 0.196	A A	97.3 a
3 Boundary Premix ----s-metolachlor ----metribuzin Dual II Magnum..s-metolachlor	6.5 EC 5.25 1.25 7.64 E	1.02 lb ai/a 0.82 0.196 0.478 lb ai/a	PRE A	97.0 a
4 Canopy Premix ----metribuzin ----chlorimuron	75 DF 64.3 10.7	0.188 lb ai/a 0.161 0.0268	PRE A	92.3 b
5 ---Gangster/Surveil Co-Pack _Valor SX.....flumioxazin _Firstrate.....cloransulam	51 WG 84 WG	0.08 lb ai/a 0.0263 lb ai/a	PRE A	98.0 a
6 Linex.....linuron Dual II Magnum..s-metolachlor	4 L 7.64 E	0.625 lb ai/a 1.24 lb ai/a	PRE A	98.7 a
7 Prefix Premix ----s-metolachlor ----fomesafen	5.3 E 4.35 0.95	1.33 lb ai/a 1.09 0.238	PRE A	98.7 a
8 Valor XLT Premix ----flumioxazin ----chlorimuron	40.3 WG 30 10.3	0.088 lb ai/a 0.0655 0.0225	PRE A	97.3 a
9 Valor SX.....flumioxazin Linex.....linuron	51 WG 4 L	0.064 lb ai/a 0.625 lb ai/a	PRE A	96.3 a
10 Valor SX.....flumioxazin Tricor DF.....metribuzin	51 WG 75 DF	0.064 lb ai/a 0.188 lb ai/a	PRE A	97.0 a
LSD P=.05		3.73		21.05
Standard Deviation		2.17	0.00	12.27
CV		2.49	0.0	25.48
Replicate F		1.385	0.000	3.059
Replicate Prob(F)		0.2758	1.0000	0.0718
Treatment F		599.809	0.000	19.096
Treatment Prob(F)		0.0001	1.0000	0.0001
				2.986
				0.0759
				2.910
				0.0257

Means followed by same letter 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		MOLVE	DIGSA							
Pest Name		Carpetwd	L.crbgrs	C GLXMA						
Crop Type, Code		C -	C -							
Crop Name				Soybean						
Rating Type				Yield						
Rating Unit				Bu/A						
Rating Date				11/01/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1	Untreated Check							0.0 d	0.0 c	28.6 a
2	Boundary Premix ----s-metolachlor ----metribuzin	6.5 EC 5.25 1.25	1.02 lb ai/a 0.82 0.196		PRE	A		11.7 d	89.3 a	42.7 a
3	Boundary Premix ----s-metolachlor ----metribuzin Dual II Magnum..s-metolachlor	6.5 EC 5.25 1.25 7.64 E	1.02 lb ai/a 0.82 0.196 0.478 lb ai/a	PRE	A		30.0 c	92.3 a	32.8 a	
4	Canopy Premix ----metribuzin ----chlorimuron	75 DF 64.3 10.7	0.188 lb ai/a 0.161 0.0268		PRE	A	88.3 a	61.7 b	39.1 a	
5	---Gangster/Surveil Co-Pack _Valor SX.....flumioxazin _Firstrate.....cloransulam	51 WG 84 WG	0.08 lb ai/a 0.0263 lb ai/a	PRE	A		92.0 a	88.3 a	32.5 a	
6	Linex.....linuron Dual II Magnum..s-metolachlor	4 L 7.64 E	0.625 lb ai/a 1.24 lb ai/a	PRE	A		8.3 d	89.0 a	31.5 a	
7	Prefix Premix ----s-metolachlor ----fomesafen	5.3 E 4.35 0.95	1.33 lb ai/a 1.09 0.238		PRE	A	13.3 d	92.7 a	34.2 a	
8	Valor XLT Premix ----flumioxazin ----chlorimuron	40.3 WG 30 10.3	0.088 lb ai/a 0.0655 0.0225		PRE	A	92.7 a	80.0 a	31.8 a	
9	Valor SX.....flumioxazin Linex.....linuron	51 WG 4 L	0.064 lb ai/a 0.625 lb ai/a	PRE	A		73.3 b	85.0 a	32.9 a	
10	Valor SX.....flumioxazin Tricor DF.....metribuzin	51 WG 75 DF	0.064 lb ai/a 0.188 lb ai/a	PRE	A		71.7 b	83.3 a	31.5 a	
LSD P=.05					14.36	13.86	19.06			
Standard Deviation					8.37	8.08	11.11			
CV					17.4	10.61	32.89			
Replicate F					0.048	0.524	3.138			
Replicate Prob(F)					0.9537	0.6008	0.0677			
Treatment F					64.103	36.624	0.414			
Treatment Prob(F)					0.0001	0.0001	0.9110			

Means followed by same letter 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.

**Corteva Soybean Herbicide Programs**

Trial ID: Soy7-18      Location: Field #7      Trial Year: 2018  
 Protocol ID: Soy7-18      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  
 Initiation Date: 03/01/18  
 Completion Date: 12/01/18

**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	Variety: S43XS27
Attributes: Xtend	
Planting Date: 05/31/18	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: 82 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 06/04/18	Soil Moisture: ABONOR above normal, excessive
Harvest Date: 11/30/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.0	Harvested Width: 6.25 FT
	Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W      Code: SECCE Secale cereale  
 Common Name: Rye  
 Attributes: Planted for cover crop      Artificial Population: X  
 Establishment Rate: 120 lb/A  
 Establishment Method/Description: Spun on and turbo-tilled in

Pest 2 Type: W      Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory

Pest 3 Type: W      Code: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass

**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: NOTILL no-till  
 Replications: 3      Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 7  
 % Sand: 79 % OM: 2.1 Texture: LS loamy sand  
 % Silt: 13 pH: 6.2 Soil Name: Rockawalkin loamy sand, 0-2% slopes  
 % Clay: 8 CEC: 5.6 Fert. Level: G good  
 Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	05/15/18	05/21/18	06/27/18
Appl. Stop Time	11:30 AM	10:30 AM	01:30 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	14EPP	7EPP	2-4"wds
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Air Temperature Start, Stop	80 F	72 F	77 F
% Relative Humidity Start, Stop	69	59	65
Wind Velocity+Dir. Start	6 mph SW	2 mph NE	6 mph S
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	80 F	72 F	77 F
Soil Moisture	WET	WET	NORMAL
% Cloud Cover	75	30	70

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used			DESC
Stage Majority, Percent			V-3 100
Height Average			7 in
Height Minimum, Maximum			6 7

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	SECCE W	SECCE W	SECCE W
Stage Majority, Percent	EaAnth 100	PoAnth 100	
Height Average	55 in	55 in	
Height Minimum, Maximum	50 60	50 60	
Density Average	150 m2	150 m2	
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent			veg 100
Height Average			3 in
Height Minimum, Maximum			2 4
Density Average			1 m2
Pest 3 Code, Type, Scale	DIGSA W	DIGSA W	DIGSA W
Stage Majority, Percent			tillrd 100
Height Average			7 in
Density Average			15 m2

**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
Boom Length	6.7 ft	6.7 ft	6.7 ft
Boom Height	72 in	72 in	36 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
	06/19/18		Heavy cereal rye supressing many weeds including those in the untreated check.
STATUS	12/12/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

Trial Comments

## Corteva Soybean Herbicide Programs

Trial ID: Soy7-18 Location: Field #7 Trial Year: 2018  
Protocol ID: Soy7-18 Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact: Corteva

Pest Code	Pest Name					AMAPA		
Crop Type, Code		C SECCE	C GLXMA	C -	PalmerAm			
Crop Name		Rye	Soybean					
Rating Type		Burndown %	Injury %					
Rating Unit		06/05/18	06/19/18		Control %			
Rating Date					06/19/18			
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code		
1	Untreated Check							
2	Elevore.....halauxifen 2,4-D ester Sonic Premix ----sulfentrazone ----cloransulam Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 70 DF 62.1 7.9 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.175 lb ai/a 0.155 0.0198 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 2-4" wds C 0.0315 lb ai/a 2-4" wds C	14EPP A 14EPP A 14EPP A 14EPP A	A A A A A A A A A	98.3 a	0.0 a	16.7 bc
3	Elevore.....halauxifen 2,4-D ester Surveil Premix ----cloransulam ----flumioxazin Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 48 WG 12 36 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.105 lb ai/a 0.0262 0.079 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 2-4" wds C 0.0315 lb ai/a 2-4" wds C	14EPP A 14EPP A 14EPP A	A A A A A A A A A	98.3 a	0.0 a	50.0 abc
4	Elevore.....halauxifen 2,4-D ester Envive Premix ----chlorimuron ----flumioxazin ----thifensulfuron Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 41.3 WG 9.199999 29.2 2.9 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.09 lb ai/a 0.02 .0636 0.0063 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 2-4" wds C 0.0315 lb ai/a 2-4" wds C	14EPP A 14EPP A 14EPP A	A A A A A A A A A	100.0 a	0.0 a	90.0 a
5	Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin 2,4-D ester Gramoxone SL....paraquat Crop Oil Concentrate Abundit Edge....glyphosate FirstRate.....cloransulam EverPreX.....s-metolachlor	61.3 WG 3.9 44.6 12.8 3.8 L 2 SL 100 L 5.5 SL 84 WG 7.62 EC	0.268 lb ai/a 0.017 0.195 0.056 0.475 lb ae/a 1 lb ai/a 1 % v/v 1.38 lb ae/a 2-4" wds C 0.0315 lb ai/a 2-4" wds C 0.95 lb ai/a 2-4" wds C	7EPP B 7EPP B 7EPP B 7EPP B	B B B B B B B B B	100.0 a	0.0 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.  
Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

Pest Code		IPOSS	GGGAN						
Pest Name		mornglry	Annual grasses						
Crop Type, Code		C -	C -	C GLXMA					
Crop Name									
Rating Type		Control	Control	Soybean					
Rating Unit		%	%	Injury					
Rating Date		06/19/18	06/19/18	%					
07/02/18									
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code			
1	Untreated Check						0.0 a	0.0 a	0.0 a
2	Elevore.....halauxifen 2,4-D ester Sonic Premix ----sulfentrazone ----cloransulam Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 70 DF 62.1 7.9 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.175 lb ai/a 0.155 0.0198 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 0.0315 lb ai/a	14EPP 14EPP 14EPP A A A A 2-4"wds C 2-4"wds C	A A A A A A A C C	33.3 a		35.0 a	0.0 a
3	Elevore.....halauxifen 2,4-D ester Surveil Premix ----cloransulam ----flumioxazin Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 48 WG 12 36 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.105 lb ai/a 0.0262 0.079 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 0.0315 lb ai/a	14EPP 14EPP 14EPP A A A A 2-4"wds C 2-4"wds C	A A A A A A A C C	0.0 a		50.0 a	3.3 a
4	Elevore.....halauxifen 2,4-D ester Envive Premix ----chlorimuron ----flumioxazin ----thifensulfuron Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 41.3 WG 9.199999 29.2 2.9 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.09 lb ai/a 0.02 .0636 0.0063 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 0.0315 lb ai/a	14EPP 14EPP 14EPP A A A A A A A C C	A A A A A A A A A C C	33.3 a		65.0 a	1.7 a
5	Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin 2,4-D ester Gramoxone SL....paraquat Crop Oil Concentrate Abundit Edge....glyphosate FirstRate.....cloransulam EverPreX.....s-metolachlor	61.3 WG 3.9 44.6 12.8 3.8 L 2 SL 100 L 5.5 SL 84 WG 7.62 EC	0.268 lb ai/a 0.017 0.195 0.056 0.475 lb ae/a 1 lb ai/a 1 % v/v 1.38 lb ae/a 0.0315 lb ai/a 0.95 lb ai/a	7EPP 7EPP 7EPP B B B B 2-4"wds C 2-4"wds C 2-4"wds C	B B B B B B B C C C	100.0 a		96.7 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.  
Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

Pest Code Pest Name		AMAPA PalmerAm	IPOSS morngly	SETFA G.foxtl		
Crop Type, Code		C -	C -	C -	C GLXMA	
Crop Name					Soybean	
Rating Type		Control %	Control %	Control %	Injury %	
Rating Unit		07/02/18	07/02/18	07/02/18	07/10/18	
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing Appl Code	
1	Untreated Check					
2	Elevore.....halauxifen 2,4-D ester Sonic Premix ----sulfentrazone ----cloransulam Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 70 DF 62.1 7.9 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.175 lb ai/a 0.155 0.0198 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 2-4" wds C 0.0315 lb ai/a 2-4" wds C	14EPP A 14EPP A 14EPP A 14EPP A	A A A A A A A C C	
3	Elevore.....halauxifen 2,4-D ester Surveil Premix ----cloransulam ----flumioxazin Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 48 WG 12 36 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.105 lb ai/a 0.0262 0.079 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 2-4" wds C 0.0315 lb ai/a 2-4" wds C	14EPP A 14EPP A 14EPP A A A A A C C	61.7 b 66.7 a 98.7 a 0.0 b	0.0 b 0.0 b 0.0 b 0.0 b
4	Elevore.....halauxifen 2,4-D ester Envive Premix ----chlorimuron ----flumioxazin ----thifensulfuron Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 41.3 WG 9.199999 29.2 2.9 5.5 SL 100 L 5.5 SL 84 WG	0.00445 lb ae/a 0.475 lb ae/a 0.09 lb ai/a 0.02 .0636 0.0063 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 2-4" wds C 0.0315 lb ai/a 2-4" wds C	14EPP A 14EPP A 14EPP A A A A A C C	80.0 ab 85.0 a 3.3 b 100.0 a 0.0 b	99.3 a 100.0 a 0.0 b 0.0 b
5	Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin 2,4-D ester Gramoxone SL....paraquat Crop Oil Concentrate Abundit Edge....glyphosate FirstRate.....cloransulam EverPreX.....s-metolachlor	61.3 WG 3.9 44.6 12.8 3.8 L 2 SL 100 L 5.5 SL 84 WG 7.62 EC	0.268 lb ai/a 0.017 0.195 0.056 0.475 lb ae/a 1 lb ai/a 1 % v/v 1.38 lb ae/a 2-4" wds C 0.0315 lb ai/a 2-4" wds C 0.95 lb ai/a 2-4" wds C	7EPP B 7EPP B 7EPP B B B B B C C C	96.7 a 96.7 a 100.0 a 100.0 a 1.7 b	100.0 a 100.0 a 100.0 a 100.0 a 1.7 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 2,13 because error mean square = 0.

Pest Code Pest Name			AMAPA PalmerAm	IPOSS morngly	DIGSA L.crbgrs					
Crop Type, Code			C -	C -	C -	C GLXMA				
Crop Name			Control	Control	Control	Soybean Yield Bu/A				
Rating Type			07/10/18	07/10/18	07/17/18	11/30/18				
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing				
1	Untreated Check									
2	Elevore.....halauxifen 2,4-D ester Sonic Premix ----sulfentrazone ----cloransulam Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 70 DF 62.1 7.9 5.5 SL 100 L 5.5 SL 84 WG	SC L DF ----- SL L SL WG	0.00445 lb ae/a 0.475 lb ae/a 0.175 lb ai/a 0.155 0.0198 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 0.0315 lb ai/a	14EPP A 14EPP A 14EPP A 14EPP A 14EPP A 2-4"wds C 2-4"wds C	A A A A A A A C C	70.0 b	90.0 a	100.0 a	37.1 a
3	Elevore.....halauxifen 2,4-D ester Surveil Premix ----cloransulam ----flumioxazin Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 48 WG 12 36 5.5 SL 100 L 5.5 SL 84 WG	SC L WG ----- SL L SL WG	0.00445 lb ae/a 0.475 lb ae/a 0.105 lb ai/a 0.0262 0.079 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 0.0315 lb ai/a	14EPP A 14EPP A 14EPP A A A 2-4"wds C 2-4"wds C	A A A A A A A C C	100.0 a	70.0 a	100.0 a	39.8 a
4	Elevore.....halauxifen 2,4-D ester Envive Premix ----chlorimuron ----flumioxazin ----thifensulfuron Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate FirstRate.....cloransulam	0.57 SC 3.8 L 41.3 WG 9.199999 29.2 2.9 5.5 SL 100 L 5.5 SL 84 WG	SC L WG ----- SL L SL WG	0.00445 lb ae/a 0.475 lb ae/a 0.09 lb ai/a 0.02 .0636 0.0063 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 0.0315 lb ai/a	14EPP A 14EPP A 14EPP A A A 2-4"wds C 2-4"wds C	A A A A A A A C C	100.0 a	100.0 a	100.0 a	41.5 a
5	Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin 2,4-D ester Gramoxone SL....paraquat Crop Oil Concentrate Abundit Edge....glyphosate FirstRate.....cloransulam EverPreX.....s-metolachlor	61.3 WG 3.9 44.6 12.8 3.8 L 2 SL 100 L 5.5 SL 84 WG 7.62 EC	WG ----- ----- ----- L SL L SL WG EC	0.268 lb ai/a 0.017 0.195 0.056 0.475 lb ae/a 1 lb ai/a 1 % v/v 1.38 lb ae/a 0.0315 lb ai/a 0.95 lb ai/a	7EPP B 7EPP B 7EPP B 2-4"wds C 2-4"wds C	B B B B B B B C C	100.0 a	100.0 a	100.0 a	40.0 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 2,13 because error mean square = 0.

## University of Delaware

Pest Code						AMAPA			
Pest Name						PalmerAm			
Crop Type, Code						C -			
Crop Name					Rye				
Rating Type					Burndown	Soybean			
Rating Unit					%	Injury			
Rating Date					06/05/18	%			
06/19/18					06/19/18	Control			
06/19/18						%			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code			
6	Elevore.....halauxifen	0.57 SC	0.00445 lb ae/a	14EPP	A	98.3 a	0.0 a	56.7 ab	
	2,4-D ester	3.8 L	0.475 lb ae/a	14EPP	A				
	Trivence Premix	61.3 WG	0.268 lb ai/a	14EPP	A				
	----chlorimuron	3.9	0.017						
	----metribuzin	44.6	0.195						
	----flumioxazin	12.8	0.056						
	Abundit Edge....glyphosate	5.5 SL	1.38 lb ae/a	14EPP	A				
	Methylated Seed Oil	100 L	1 % v/v	14EPP	A				
	Abundit Edge....glyphosate	5.5 SL	1.38 lb ae/a	2-4"wds	C				
	Reflex.....fomesafen	2 L	0.375 lb ai/a	2-4"wds	C				
LSD P=.05						4.07	.	55.84	
Standard Deviation						2.24	0.00	30.70	
CV						2.71	0.0	60.06	
Replicate F						0.000	0.000	1.792	
Replicate Prob(F)						1.0000	1.0000	0.2161	
Treatment F						980.500	0.000	4.538	
Treatment Prob(F)						0.0001	1.0000	0.0202	

Means followed by same letter 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 2,13 because error mean square = 0.

## University of Delaware

Pest Code	IPOSS	GGGAN								
Pest Name	mornglry	Annual grasses								
Crop Type, Code	C -	C -	C GLXMA							
Crop Name			Soybean							
Rating Type	Control	Control	Injury							
Rating Unit	%	%	%							
Rating Date	06/19/18	06/19/18	07/02/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
6	Elevore.....halauxifen	0.57	SC	0.00445	lb ae/a	14EPP	A	33.3 a	51.7 a	0.0 a
	2,4-D ester	3.8	L	0.475	lb ae/a	14EPP	A			
	Trivence Premix	61.3	WG	0.268	lb ai/a	14EPP	A			
	----chlorimuron	3.9		0.017						
	----metribuzin	44.6		0.195						
	----flumioxazin	12.8		0.056						
	Abundit Edge....glyphosate	5.5	SL	1.38	lb ae/a	14EPP	A			
	Methylated Seed Oil	100	L	1	% v/v	14EPP	A			
	Abundit Edge....glyphosate	5.5	SL	1.38	lb ae/a	2-4"wds	C			
	Reflex.....fomesafen	2	L	0.375	lb ai/a	2-4"wds	C			
LSD P=.05				81.36				65.23		4.98
Standard Deviation				44.72				35.85		2.74
CV				134.16				72.11		328.63
Replicate F				0.000				0.964		0.556
Replicate Prob(F)				1.0000				0.4143		0.5905
Treatment F				2.000				2.394		0.778
Treatment Prob(F)				0.1642				0.1125		0.5875

Means followed by same letter 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 2,13 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		AMAPA PalmerAm	IPOSS morngly	SETFA G.foxtl							
Crop Type, Code		C -	C -	C -	C GLXMA						
Crop Name		Control %	Control %	Control %	Soybean Injury %						
Rating Type											
Rating Unit											
Rating Date		07/02/18	07/02/18	07/02/18	07/10/18						
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code					
6	Elevore.....halauxifen 2,4-D ester Trivence Premix ----chlorimuron ----metribuzin ----flumioxazin Abundit Edge....glyphosate Methylated Seed Oil Abundit Edge....glyphosate Reflex.....fomesafen	0.57 SC 3.8 L 61.3 WG 3.9 44.6 12.8 5.5 SL 100 L 5.5 SL 2 L	0.00445 lb ae/a 0.475 lb ae/a 0.268 lb ai/a 0.017 0.195 0.056 1.38 lb ae/a 1 % v/v 1.38 lb ae/a 0.375 lb ai/a	14EPP 14EPP 14EPP A A A A A 2-4"wds C 2-4"wds C	86.7 a	100.0 a	98.7 a	10.0 a			
LSD P=.05				21.65	43.94	1.44	2.14				
Standard Deviation				11.90	24.15	0.79	1.18				
CV				17.42	53.67	0.95	60.61				
Replicate F				0.471	0.771	1.429	1.000				
Replicate Prob(F)				0.6378	0.4880	0.2846	0.4019				
Treatment F				26.541	12.657	7930.644	34.600				
Treatment Prob(F)				0.0001	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.  
Could not calculate LSD (% mean diff) for columns 2,13 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		AMAPA PalmerAm	IPOSS morngly	DIGSA L.crbgrs						
Crop Type, Code		C -	C -	C -	C GLXMA					
Crop Name					Soybean					
Rating Type		Control	Control	Control	Yield					
Rating Unit		07/10/18	07/10/18	07/17/18	Bu/A					
Rating Date					11/30/18					
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code				
6	Elevore.....halauxifen	0.57 SC	0.00445 lb ae/a	14EPP	A	91.7 a	96.7 a	100.0 a	38.8 a	
	2,4-D ester	3.8 L	0.475 lb ae/a	14EPP	A					
	Trivence Premix	61.3 WG	0.268 lb ai/a	14EPP	A					
	----chlorimuron	3.9	0.017							
	----metribuzin	44.6	0.195							
	----flumioxazin	12.8	0.056							
	Abundit Edge....glyphosate	5.5 SL	1.38 lb ae/a	14EPP	A					
	Methylated Seed Oil	100 L	1 % v/v	14EPP	A					
	Abundit Edge....glyphosate	5.5 SL	1.38 lb ae/a	2-4"wds	C					
	Reflex.....fomesafen	2 L	0.375 lb ai/a	2-4"wds	C					
LSD P=.05				10.72	32.10	.	10.57			
Standard Deviation				5.89	17.65	0.00	5.81			
CV				7.66	23.18	0.0	15.41			
Replicate F				1.720	0.406	0.000	1.076			
Replicate Prob(F)				0.2280	0.6769	1.0000	0.3774			
Treatment F				134.440	14.619	0.000	1.739			
Treatment Prob(F)				0.0001	0.0003	1.0000	0.2135			

Means followed by same letter 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 2,13 because error mean square = 0.

Soybean Response to Various POST Herbicides and Affect On Yield  
 Trial ID: Soy8-18 Location: REC Fld #14 Trial Year: 2018  
 Protocol ID: Soy8-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 12/01/18

**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	Variety: S43XS27
Attributes: Xtend	
Planting Date: 07/06/18	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: 83 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 07/12/18	Soil Moisture: ABONOR above normal, excessive
Harvest Date: 11/29/18	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

**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
Treatments: 10	Study Design: RACOBL Randomized Complete Block (RCB)
Replications: 3	

Trial Initiation Comments:  
 Double-crop after wheat.

## Field Prep./Maintenance:

Total Preemergence application of Roundup PowerMax 1 qt/A + BroadAxe 25 oz/A + Dual Magnum 8 fl.oz/A on 7-5-18.

**Soil Description**

Description Name: Field 14-C			
% Sand: 79	% OM: 1.5	Texture: LS	loamy sand
% Silt: 14	ph: 6.7	Soil Name: Klej loamy sand, 0-2% slopes	
% Clay: 7	CEC: 4.8	Fert. Level: E	excellent
Soil Drainage: G	good		

**Application Description**

	A	B
Application Date	07/09/18	08/02/18
Appl. Stop Time	03:00 PM	02:00 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	21DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	83 F	87 F
% Relative Humidity Start, Stop	40	64
Wind Velocity+Dir. Start	2 mph E	3 mph S
Wet Leaves (Y/N)	N no	N no
Soil Temperature	83 F	87 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	15	30

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC
Stage Majority, Percent		V3-4 100
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
Stage Majority, Percent		veg 100
Height Average		3 in
Height Minimum, Maximum		2 4
Density Average		3 m2

**Application Equipment**

	A	B
Appl. Equipment	Tractor	Tractor
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	12/13/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

Trial Comments

Soybean Response to Various POST Herbicides and Affect On Yield  
 Trial ID: Soy8-18 Location: REC Fld #14 Trial Year: 2018  
 Protocol ID: Soy8-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

Crop Type, Code		C GLXMA	C GLXMA	C GLXMA						
Crop Name		Soybean LeafBurn %	Soybean Stunting %	Soybean Stunting %						
Rating Type		08/06/18	08/06/18	09/10/18						
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1	Untreated Check							0.0 c	0.0 d	0.0 b
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B					
2	Metribuzin.....metribuzin	75 DF	0.234 lb ai/a	PRE	A			0.0 c	4.7 bcd	2.3 b
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B					
3	Reflex.....fomesafen	2 L	0.375 lb ai/a	21DAP	B			8.3 b	2.3 cd	0.0 b
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B					
4	Reflex.....fomesafen	2 L	0.375 lb ai/a	21DAP	B			9.0 b	8.0 bc	4.7 b
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B					
	Dry Ammonium Sulfate	100 D	1.2 % w/v	21DAP	B					
5	Flexstar GT Premix	3.3 L	1.86 lb ai/a	21DAP	B			0.0 c	0.0 d	1.7 b
	----fomesafen	0.66	0.372							
	----glyphosate	2.64	1.49							
6	Flexstar GT Premix	3.3 L	1.86 lb ai/a	21DAP	B			9.0 b	2.3 cd	2.3 b
	----fomesafen	0.66	0.372							
	----glyphosate	2.64	1.49							
	Dry Ammonium Sulfate	100 D	1.2 % w/v	21DAP	B					
7	Ultra Blazer....acifluorfen	2 L		21DAP	B			14.7 a	8.7 b	4.7 b
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B					
8	Storm Premix	4 EC	0.375 lb ai/a	21DAP	B			0.0 c	0.0 d	0.0 b
	----bentazon	2.67	0.25							
	----acifluorfen	1.33	0.125							
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B					
9	Raptor.....imazamox	1 AS	0.625 lb ai/a	21DAP	B					
	Crop Oil Concentrate	100 L	1.25 % v/v	21DAP	B					
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	21DAP	B					
10	Cobra.....lactofen	2 EC	0.195 lb ai/a	21DAP	B				56.7 a	16.7 a
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B					
	Dry Ammonium Sulfate	100 D	1.2 % w/v	21DAP	B					
LSD P=.05								5.19	5.96	5.51
Standard Deviation								2.97	3.44	3.18
CV								57.86	37.49	88.61
Replicate F								1.038	3.695	0.091
Replicate Prob(F)								0.3799	0.0479	0.9132
Treatment F								11.525	82.979	8.098
Treatment Prob(F)								0.0001	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

Crop Type, Code		C GLXMA					
Crop Name		Soybean					
Rating Type		Yield					
Rating Unit		Bu/A					
Rating Date		11/29/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code
1	Untreated Check						42.4 a
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B		
2	Metribuzin.....metribuzin	75 DF	0.234 lb ai/a	PRE	A		40.6 ab
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B		
3	Reflex.....fomesafen	2 L	0.375 lb ai/a	21DAP	B		32.3 cd
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B		
4	Reflex.....fomesafen	2 L	0.375 lb ai/a	21DAP	B		39.0 abc
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B		
	Dry Ammonium Sulfate	100 D	1.2 % w/v	21DAP	B		
5	Flexstar GT Premix	3.3 L	1.86 lb ai/a	21DAP	B		36.0 a-d
	----fomesafen	0.66	0.372				
	----glyphosate	2.64	1.49				
6	Flexstar GT Premix	3.3 L	1.86 lb ai/a	21DAP	B		32.8 bcd
	----fomesafen	0.66	0.372				
	----glyphosate	2.64	1.49				
	Dry Ammonium Sulfate	100 D	1.2 % w/v	21DAP	B		
7	Ultra Blazer....acifluorfen	2 L		21DAP	B		35.1 a-d
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B		
8	Storm Premix	4 EC	0.375 lb ai/a	21DAP	B		32.6 bcd
	----bentazon	2.67	0.25				
	----acifluorfen	1.33	0.125				
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B		
9	Raptor.....imazamox	1 AS	0.625 lb ai/a	21DAP	B		5.1 e
	Crop Oil Concentrate	100 L	1.25 % v/v	21DAP	B		
	30% Urea Ammonium Nitrate	100 L	2.5 % v/v	21DAP	B		
10	Cobra.....lactofen	2 EC	0.195 lb ai/a	21DAP	B		29.6 d
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B		
	Dry Ammonium Sulfate	100 D	1.2 % w/v	21DAP	B		
LSD P=.05							8.27
Standard Deviation							4.80
CV							14.76
Replicate F							0.892
Replicate Prob(F)							0.4282
Treatment F							14.206
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=6

PPO-Resistant Common Ragweed Control in Soybeans  
 Trial ID: Soy9-18 Location: Dorchester County Trial Year: 2018  
 Protocol ID: Soy9-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Monsanto

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

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

Attributes: Xtend

Planting Date: 06/29/18

Depth: 1 in

Planting Method: DRILLE drilled

Row Spacing: 15 in

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 90 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 07/04/18

**Pest Description**

Pest 1 Type: W Code: AMBEL Ambrosia artemisiifolia

Common Name: Common ragweed

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: 16 Tillage Type: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Application Description**

	A	B	C
Application Date	06/29/18	07/18/18	08/01/18
Appl. Stop Time	11:30 AM	01:30 PM	12:10 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	2-4" wds	4 WAP
Application Placement	BROSOI	BROADC	BROADC
Applied By	Vollmer, K.	Vollmer, K.	VanGessl
Air Temperature Start, Stop	86 F	84 F	83 F
% Relative Humidity Start, Stop	57	45	75
Wind Velocity+Dir. Start	5 MPH NW	4 mph NW	5 mph SW
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	86 F	84 F	83 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	30	20	50

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC	DESC
Stage Majority, Percent		veg 100	veg 100
Height Average		3 in	5 in
Height Minimum, Maximum		1 5	4 7
Crop Coverage (%)		15	15

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMBEL W	AMBEL W	AMBEL W
Stage Majority, Percent		2-leaf 60	4-leaf 60
Stage Minimum, Percent		cot 20	4-leaf 60
Stage Maximum, Percent		4-leaf 20	6-leaf 40
Height Average		1.5 in	3 in
Height Minimum, Maximum		1 2	2 4
Density Average		4 plot	4 plot

**Application Equipment**

	A	B	C
Appl. Equipment	Backpack	Backpack	Backpack
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	9 ft	9 ft	9 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	COMCO2	COMCO2	COMCO2

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

07/10/18: Due to poor soybean stand and heavy deer feeding, soybean injury was not rated. Ragweed density was light and variable, presumably due to late seeding date. A few ragweed plants in rep 1, where it was a little lower and soil had more moisture later into the season.

Some treatments have not been applied yet.

08/01/18: Only 3 to 5 plants per plot in untreated checks, ranging from 2 to 6" tall. Soys are short and stand is poor; soybeans providing less than 20% ground cover.

## PPO-Resistant Common Ragweed Control in Soybeans

Trial ID: Soy9-18      Location: Dorchester County      Trial Year: 2018  
 Protocol ID: Soy9-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Monsanto

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	AMBEL C.ragwd	AMBEL C.ragwd	AMBEL C.ragwd
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Control %	Control %	Control %
1	Reflex.....fomesafen Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion	2 L 4.5 AS 2.9 SL 43.18 L 100 L	0.25 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	PRE 4 WAP 4 WAP 4 WAP 4 WAP	A C C C C	07/10/18	99.0 a	36.7 fg	93.0 a-d
2	Reflex.....fomesafen Nonionic Surfactant	2 L 100 L	0.25 lb ai/a 0.25 % v/v	2-4" wds 2-4" wds	B B			60.0 cde	36.7 f
3	Spartan.....sulfentrazone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion	4 F 4.5 AS 2.9 SL 43.18 L 100 L	0.375 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	PRE 4 WAP 4 WAP 4 WAP 4 WAP	A C C C C	99.0 a	40.0 ef	86.0 d	
4	Warrant Ultra Premix ----acetochlor ----fomesafen Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion	3.45 SC 2.82 0.6300001 4.5 AS 2.9 SL 43.18 L 100 L	1.36 lb ai/a 1.11 0.248 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	PRE 4 WAP 4 WAP 4 WAP 4 WAP	A C C C C	94.3 a	33.3 fg	96.7 ab	
5	Warrant.....acetochlor Metribuzin.....metribuzin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion	3 CS 75 DF 4.5 AS 2.9 SL 43.18 L 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	PRE PRE 4 WAP 4 WAP 4 WAP 4 WAP	A A C C C C	99.0 a	58.3 de	87.7 cd	
6	Warrant.....acetochlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion	3 CS 2.9 SL 4.5 AS 2.9 SL 43.18 L 100 L	1.13 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	PRE PRE 4 WAP 4 WAP 4 WAP 4 WAP	A A C C C C	99.0 a	100.0 a	95.3 abc	
7	Fierce Premix ----flumioxazin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion	76 WG 33.5 42.5 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 1 % v/v	PRE 4 WAP 4 WAP 4 WAP 4 WAP 4 WAP 4 WAP	A C C C C C C	99.0 a	95.0 ab	88.3 cd	
8	Authority MTZ Premix ----sulfentrazone ----metribuzin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Class Act Ridion	45 DF 18 27 4.5 AS 2.9 SL 43.18 L 100 L	0.394 lb ai/a 0.158 0.236 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 1 % v/v	PRE 4 WAP 4 WAP 4 WAP 4 WAP 4 WAP 4 WAP	A C C C C C C	94.3 a	43.3 ef	88.3 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=2

Pest Code				AMBEL C.ragwd	AMBEL C.ragwd	AMBEL C.ragwd
Pest Name			C -	C -	C -	
Crop Type, Code				Control %	Control %	Control %
Crop Name				07/10/18	08/01/18	08/29/18
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing
9	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4 WAP	C	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	4 WAP	C	
	Intact Drift Retardant	43.18 L	0.5 % v/v	4 WAP	C	
	Class Act Ridion	100 L	1 % v/v	4 WAP	C	
10	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A	
	Metribuzin.....metribuzin	75 DF	0.25 lb ai/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4 WAP	C	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	4 WAP	C	
	Intact Drift Retardant	43.18 L	0.5 % v/v	4 WAP	C	
	Class Act Ridion	100 L	1 % v/v	4 WAP	C	
11	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4" wds	B	
	Class Act Ridion	100 L	1 % v/v	2-4" wds	B	
12	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-4" wds	B	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4" wds	B	
	Intact Drift Retardant	43.18 L	0.5 % v/v	2-4" wds	B	
	Class Act Ridion	100 L	1 % v/v	2-4" wds	B	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4 WAP	C	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	4 WAP	C	
	Intact Drift Retardant	43.18 L	0.5 % v/v	4 WAP	C	
	Class Act Ridion	100 L	1 % v/v	4 WAP	C	
13	Warrant Ultra Premix	3.45 SC	1.36 lb ai/a	2-4" wds	B	
	----acetochlor	2.82	1.11			
	----fomesafen	0.6300001	0.248			
	Nonionic Surfactant	100 L	0.25 % v/v	2-4" wds	B	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4 WAP	C	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	4 WAP	C	
	Intact Drift Retardant	43.18 L	0.5 % v/v	4 WAP	C	
	Class Act Ridion	100 L	1 % v/v	4 WAP	C	
14	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	2-4" wds	B	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	2-4" wds	B	
	Intact Drift Retardant	43.18 L	0.5 % v/v	2-4" wds	B	
	Class Act Ridion	100 L	1 % v/v	2-4" wds	B	
	Warrant Ultra Premix	3.45 SC	1.36 lb ai/a	4 WAP	C	
	----acetochlor	2.82	1.11			
	----fomesafen	0.6300001	0.248			
	Nonionic Surfactant	100 L	0.25 % v/v	4 WAP	C	
15	Untreated Check				0.0 b	0.0 g
16	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	4 WAP	C	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	4 WAP	C	
	Intact Drift Retardant	43.18 L	0.5 % v/v	4 WAP	C	
	Class Act Ridion	100 L	1 % v/v	4 WAP	C	
LSD P=.05				7.59	20.36	8.15
Standard Deviation				4.43	12.15	4.89
CV				5.05	21.53	6.13
Replicate F				1.000	0.279	1.271
Replicate Prob(F)				0.3874	0.7585	0.2952
Treatment F				146.079	23.285	92.587
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

Weed Control and yield benefits of Roundup-Ready or Liberty-Link Soybean Systems  
 Trial ID: Soy10-18 Location: Field #3 Trial Year: 2018  
 Protocol ID: Soy10-18 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  
 Initiation Date: 03/01/18  
 Completion Date: 11/24/18

**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
Variety: see treatment list	
Attributes: Xtend / Liberty Link	
Planting Date: 05/25/18	Planting Rate: 180000 S/A
Depth: 1 in	
Rows per Plot: 16	Planting Method: DRILLE drilled
Row Spacing: 7 in	Planting Equipment: CP Cone Planter
Soil Temperature: 89 F	Seed Bed: MEDTRA medium/trashy
Emergence Date: 05/31/18	Soil Moisture: NORMAL normal, adequate
Harvest Date: 11/21/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.0	Harvested Width: 7 FT
	Harvested Length: 40 FT

**Pest Description**

Pest 1 Type: W Code: ERICA Conyza canadensis  
 Common Name: Canada horseweed

Pest 2 Type: W Code: VIORA Viola bicolor  
 Common Name: Field Pansy

Pest 3 Type: W Code: OEOLA Oenothera laciniiata  
 Common Name: Cutleaf eveningprimrose

Pest 4 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth

Pest 5 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory

Pest 6 Type: W Code: SIDSP Sida spinosa  
 Common Name: Prickly sida

**Site and Design**

Treated Plot Width: 10 FT Site Type: FIELD field  
 Treated Plot Length: 45 FT  
 Treated Plot Area: 450 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: 1.7 Texture: LS loamy sand  
 % Silt: 12 pH: 6.3 Soil Name: Rockawalkin loamy sand, 0-2% slopes  
 % Clay: 8 CEC: 6.1 Fert. Level: E excellent  
 Soil Drainage: G good

**Application Description**

	A	B
Application Date	05/25/18	06/27/18
Appl. Stop Time	02:30 PM	03:10 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	V3-5
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	82 F	77 F
% Relative Humidity Start, Stop	49	65
Wind Velocity+Dir. Start	2 mph SW	6 mph S
Wet Leaves (Y/N)	N no	N no
Soil Temperature	82 F	77 F
Soil Moisture	WET	NORMAL
% Cloud Cover	40	70

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC
Stage Majority, Percent		V4-5 100
Height Average		8 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	ERICAW	ERICAW
Stage Majority, Percent	bolt 100	
Height Average	5 in	
Height Minimum, Maximum	4 6	
Density Average	5 m <sup>2</sup>	
Pest 2 Code, Type, Scale	VIORAW	VIORAW
Stage Majority, Percent	flower 100	
Height Average	7 in	
Density Average	3 m <sup>2</sup>	
Pest 3 Code, Type, Scale	OEOLAW	OEOLAW
Stage Majority, Percent	flower 100	
Height Average	7 in	
Height Minimum, Maximum	5 8	
Density Average	1 m <sup>2</sup>	
Pest 4 Code, Type, Scale	AMAPAW	AMAPAW
Stage Majority, Percent	veg 100	
Height Average	2 in	
Density Average	2 m <sup>2</sup>	
Pest 5 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		veg 65
Stage Minimum, Percent		veg 65
Stage Maximum, Percent		run 35
Height Average		4 in
Height Minimum, Maximum		2 7
Density Average		8 m <sup>2</sup>
Pest 6 Code, Type, Scale	SIDSP W	SIDSP W
Stage Majority, Percent		veg 100
Height Average		3 in
Height Minimum, Maximum		2 4
Density Average		3 plot

**Application Equipment**

	A	B
Appl. Equipment	Backpack	Backpack
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX
Nozzle Size	11002	11002
Nozzle Spacing	18 in	24 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	11/28/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

10/10/18: Previous weed control ratings were done at the whole plot level. No differences observed between soybean varieties. Ratings on 10/10 taken by variety in case varieites differed in their competeitve ability.

## University of Delaware

Weed Control and yield benefits of Roundup-Ready or Liberty-Link Soybean Systems

Trial ID: Soy10-18

Location: Field #3

Trial Year: 2018

Protocol ID: Soy10-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Monsanto

Pest Code Pest Name		AMAPA PalmerAm	IPOSS mornglry	SIDSP PrklSida	DIGSA L.crbgrs		
Crop Type, Code		C -	C -	C -	C -		
Crop Name		Control %	Control %	Control %	Control %		
Rating Type		10/10/18	10/10/18	10/10/18	10/10/18		
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code
1	4218R2X/SR						
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	PRE	A	
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	PRE	A	
	Tricor 4F.....metribuzin	4 F		0.25 lb ai/a	PRE	A	
	Intact Drift Retardant	43.18 L		0.5 % v/v	PRE	A	
	Class Act Ridion	100 L		1 % v/v	PRE	A	
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	V3-5	B	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V3-5	B	
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	V3-5	B	
	Intact Drift Retardant	43.18 L		0.5 % v/v	V3-5	B	
	Class Act Ridion	100 L		1 % v/v	V3-5	B	
2	AG43X8						
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	PRE	A	
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	PRE	A	
	Tricor 4F.....metribuzin	4 F		0.25 lb ai/a	PRE	A	
	Intact Drift Retardant	43.18 L		0.5 % v/v	PRE	A	
	Class Act Ridion	100 L		1 % v/v	PRE	A	
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	V3-5	B	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V3-5	B	
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	V3-5	B	
	Intact Drift Retardant	43.18 L		0.5 % v/v	V3-5	B	
	Class Act Ridion	100 L		1 % v/v	V3-5	B	
3	AG46X6						
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	PRE	A	
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	PRE	A	
	Tricor 4F.....metribuzin	4 F		0.25 lb ai/a	PRE	A	
	Intact Drift Retardant	43.18 L		0.5 % v/v	PRE	A	
	Class Act Ridion	100 L		1 % v/v	PRE	A	
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	V3-5	B	
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V3-5	B	
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	V3-5	B	
	Intact Drift Retardant	43.18 L		0.5 % v/v	V3-5	B	
	Class Act Ridion	100 L		1 % v/v	V3-5	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=8

Pest Code			PANDI						
Pest Name			F.panicm						
Crop Type, Code			C -	C GLXMA					
Crop Name				Soybean					
Rating Type			Control	Yield					
Rating Unit			%	Bu/A					
Rating Date			10/10/18	11/21/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	4218R2X/SR								
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	PRE	A		100.0 a	33.7 a
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	PRE	A			
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	PRE	A			
	Tricor 4F.....metribuzin	4 F		0.25 lb ai/a	PRE	A			
	Intact Drift Retardant	43.18 L		0.5 % v/v	PRE	A			
	Class Act Ridion	100 L		1 % v/v	PRE	A			
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	V3-5	B			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V3-5	B			
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	V3-5	B			
	Intact Drift Retardant	43.18 L		0.5 % v/v	V3-5	B			
	Class Act Ridion	100 L		1 % v/v	V3-5	B			
2	AG43X8							100.0 a	29.1 a
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	PRE	A			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	PRE	A			
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	PRE	A			
	Tricor 4F.....metribuzin	4 F		0.25 lb ai/a	PRE	A			
	Intact Drift Retardant	43.18 L		0.5 % v/v	PRE	A			
	Class Act Ridion	100 L		1 % v/v	PRE	A			
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	V3-5	B			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V3-5	B			
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	V3-5	B			
	Intact Drift Retardant	43.18 L		0.5 % v/v	V3-5	B			
	Class Act Ridion	100 L		1 % v/v	V3-5	B			
3	AG46X6							100.0 a	33.6 a
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	PRE	A			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	PRE	A			
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	PRE	A			
	Tricor 4F.....metribuzin	4 F		0.25 lb ai/a	PRE	A			
	Intact Drift Retardant	43.18 L		0.5 % v/v	PRE	A			
	Class Act Ridion	100 L		1 % v/v	PRE	A			
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	V3-5	B			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V3-5	B			
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	V3-5	B			
	Intact Drift Retardant	43.18 L		0.5 % v/v	V3-5	B			
	Class Act Ridion	100 L		1 % v/v	V3-5	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=8

## University of Delaware

Pest Code Pest Name			AMAPA PalmerAm	IPOSS mornglry	SIDSP PrklSida	DIGSA L.crbgrs
Crop Type, Code			C -	C -	C -	C -
Crop Name			Control %	Control %	Control %	Control %
Rating Type			10/10/18	10/10/18	10/10/18	10/10/18
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
4	AG48X7					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	PRE	A	
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A	
	Tricor 4F.....metribuzin	4 F	0.25 lb ai/a	PRE	A	
	Intact Drift Retardant	43.18 L	0.5 % v/v	PRE	A	
	Class Act Ridion	100 L	1 % v/v	PRE	A	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3-5	B	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3-5	B	
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	V3-5	B	
	Intact Drift Retardant	43.18 L	0.5 % v/v	V3-5	B	
	Class Act Ridion	100 L	1 % v/v	V3-5	B	
5	HS44L60					
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	PRE	A	
	Authority Maxx Premix	72 DG	0.288 lb ai/a	PRE	A	
	----sulfentrazone	68	0.272			
	----chlorimuron	4	0.016			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	PRE	A	
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	V3-5	B	
	Anthem Maxx Premix	4.3 SC	0.101 lb ai/a	V3-5	B	
	----pyroxasulfone	4.174	0.098			
	----fluthiacet	0.126	0.00296			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-5	B	
6	HS47L44					
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	PRE	A	
	Authority Maxx Premix	72 DG	0.288 lb ai/a	PRE	A	
	----sulfentrazone	68	0.272			
	----chlorimuron	4	0.016			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	PRE	A	
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	V3-5	B	
	Anthem Maxx Premix	4.3 SC	0.101 lb ai/a	V3-5	B	
	----pyroxasulfone	4.174	0.098			
	----fluthiacet	0.126	0.00296			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-5	B	
7	S42LL63					
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	PRE	A	
	Authority Maxx Premix	72 DG	0.288 lb ai/a	PRE	A	
	----sulfentrazone	68	0.272			
	----chlorimuron	4	0.016			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	PRE	A	
	Liberty 280.....glufosinate	2.34 SL	0.585 lb ai/a	V3-5	B	
	Anthem Maxx Premix	4.3 SC	0.101 lb ai/a	V3-5	B	
	----pyroxasulfone	4.174	0.098			
	----fluthiacet	0.126	0.00296			
	Dry Ammonium Sulfate	100 D	1.02 % w/v	V3-5	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=8

## University of Delaware

Pest Code Pest Name Crop Type, Code		PANDI F.panicle C - C	GLXMA						
Crop Name			Soybean						
Rating Type			Yield						
Rating Unit			Bu/A						
Rating Date		10/10/18	11/21/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
4 AG48X7	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	PRE	A		100.0 a	40.6 a
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	PRE	A			
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	PRE	A			
	Tricor 4F.....metribuzin	4 F		0.25 lb ai/a	PRE	A			
	Intact Drift Retardant	43.18 L		0.5 % v/v	PRE	A			
	Class Act Ridion	100 L		1 % v/v	PRE	A			
	Xtendimax.....dicamba	2.9 SL		0.5 lb ae/a	V3-5	B			
	Roundup PowerMax..glyphosate	4.5 AS		1.13 lb ae/a	V3-5	B			
	Warrant.....acetochlor	3 CS		1.13 lb ai/a	V3-5	B			
	Intact Drift Retardant	43.18 L		0.5 % v/v	V3-5	B			
	Class Act Ridion	100 L		1 % v/v	V3-5	B			
5 HS44L60								95.0 a	36.1 a
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	PRE	A			
	Authority Maxx Premix	72 DG		0.288 lb ai/a	PRE	A			
	----sulfentrazone	68		0.272					
	----chlorimuron	4		0.016					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	PRE	A			
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	V3-5	B			
	Anthem Maxx Premix	4.3 SC		0.101 lb ai/a	V3-5	B			
	----pyroxasulfone	4.174		0.098					
	----fluthiacet	0.126		0.00296					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	V3-5	B			
6 HS47L44								93.3 a	30.9 a
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	PRE	A			
	Authority Maxx Premix	72 DG		0.288 lb ai/a	PRE	A			
	----sulfentrazone	68		0.272					
	----chlorimuron	4		0.016					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	PRE	A			
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	V3-5	B			
	Anthem Maxx Premix	4.3 SC		0.101 lb ai/a	V3-5	B			
	----pyroxasulfone	4.174		0.098					
	----fluthiacet	0.126		0.00296					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	V3-5	B			
7 S42LL63								95.0 a	28.2 a
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	PRE	A			
	Authority Maxx Premix	72 DG		0.288 lb ai/a	PRE	A			
	----sulfentrazone	68		0.272					
	----chlorimuron	4		0.016					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	PRE	A			
	Liberty 280....glufosinate	2.34 SL		0.585 lb ai/a	V3-5	B			
	Anthem Maxx Premix	4.3 SC		0.101 lb ai/a	V3-5	B			
	----pyroxasulfone	4.174		0.098					
	----fluthiacet	0.126		0.00296					
	Dry Ammonium Sulfate	100 D		1.02 % w/v	V3-5	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=8

## University of Delaware

Pest Code Pest Name		AMAPA PalmerAm	IPOSS mornglry	SIDSP PrklSida	DIGSA L.crbgrs						
Crop Type, Code		C -	C -	C -	C -						
Crop Name		Control %	Control %	Control %	Control %						
Rating Type		10/10/18	10/10/18	10/10/18	10/10/18						
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
8 5150 LL											
Liberty 280.....glufosinate		2.34 SL		0.585 lb ai/a	PRE	A					
Authority Maxx Premix		72 DG		0.288 lb ai/a	PRE	A					
----sulfentrazone		68		0.272							
----chlorimuron		4		0.016							
Dry Ammonium Sulfate		100 D		1.02 % w/v	PRE	A					
Liberty 280.....glufosinate		2.34 SL		0.585 lb ai/a	V3-5	B					
Anthem Maxx Premix		4.3 SC		0.101 lb ai/a	V3-5	B					
----pyroxasulfone		4.174		0.098							
----fluthiacet		0.126		0.00296							
Dry Ammonium Sulfate		100 D		1.02 % w/v	V3-5	B					
LSD P=.05					13.42	19.99	20.13	8.66			
Standard Deviation					7.67	11.42	11.50	4.94			
CV					8.06	12.83	13.76	5.11			
Replicate F					1.077	1.374	0.883	0.143			
Replicate Prob(F)					0.3672	0.2851	0.4354	0.8679			
Treatment F					1.713	1.716	6.909	3.687			
Treatment Prob(F)					0.1854	0.1846	0.0011	0.0180			

Means followed by same letter 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

## University of Delaware

Pest Code		PANDI							
Pest Name		F.panicm							
Crop Type, Code		C - C	GLXMA						
Crop Name			Soybean						
Rating Type			Yield						
Rating Unit			Bu/A						
Rating Date		10/10/18	11/21/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8 5150 LL								96.7 a	32.9 a
Liberty 280.....glufosinate		2.34 SL		0.585 lb ai/a	PRE	A			
Authority Maxx Premix		72 DG		0.288 lb ai/a	PRE	A			
----sulfentrazone		68		0.272					
----chlorimuron		4		0.016					
Dry Ammonium Sulfate		100 D		1.02 % w/v	PRE	A			
Liberty 280.....glufosinate		2.34 SL		0.585 lb ai/a	V3-5	B			
Anthem Maxx Premix		4.3 SC		0.101 lb ai/a	V3-5	B			
----pyroxasulfone		4.174		0.098					
----fluthiacet		0.126		0.00296					
Dry Ammonium Sulfate		100 D		1.02 % w/v	V3-5	B			
LSD P=.05					10.75		7.82		
Standard Deviation					6.14		4.43		
CV					6.29		13.38		
Replicate F					0.083		1.594		
Replicate Prob(F)					0.9208		0.2404		
Treatment F					0.632		2.446		
Treatment Prob(F)					0.7224		0.0777		

Means followed by same letter 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

Authority Supreme in Conventional Tillage Soybeans  
 Trial ID: Soy11-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: Soy11-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: FMC

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 11/24/18

**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	Variety: S43XS27
Attributes: Xtend	
Planting Date: 06/07/18	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: MEDIUM medium
Emergence Date: 06/15/18	Soil Moisture: ABONOR above normal, excessive
Harvest Date: 11/01/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.0	Harvested Width: 6.25 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>	Tillage Type: CONTIL conventional-till
Replications: 3	Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Total Postemergence application of Roundup PowerMax at 1 qt/A + Reflex 1.5 pt/A on 7-11-18.

**Soil Description**

Description Name: Field 18B			
% Sand: 81	% OM: 1.0	Texture: LS	loamy sand
% Silt: 12	pH: 6.4	Soil Name: Rosedale	loamy sand, 0-2% slopes
% Clay: 7	CEC: 4.5	Fert. Level: G	good
Soil Drainage: G	good		

**Application Description**

A	
Application Date	06/07/18
Appl. Stop Time	03:00 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	73 F
% Relative Humidity Start, Stop	58
Wind Velocity+Dir. Start	1 mph SE
Wet Leaves (Y/N)	N no
Soil Temperature	73 F
Soil Moisture	NORMAL
% Cloud Cover	30

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY

**Application Equipment**

A	
Appl. Equipment	Tractor
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	18 in
Ground Speed	3 mph
Carrier	WATER
Application Amount	20 gal/ac
Propellant	COMAIR

Context	Date	By	Notes
	06/26/18		Plot 307 has a lot of crabgrass emerging.
	07/10/18		Poor soybean stand. Heavy grass pressure in plot 307.
STATUS	11/28/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

06/18/18: No crop injury.

06/22/18: No crop injury.

07/20/18: No crop injury.

08/06/18: No crop injury from herbicide treatments. Plots are essentially weed free with 95-100% control of all species

previously rated.

Authority Supreme in Conventional Tillage Soybeans

Location: Field #18

Trial Year: 2018

Protocol ID: Soy11-18

Investigator: Mark VanGessel

### **Study Director:**

Sponsor Contact: FMC

Pest Code							AMAPA	AMBEL	MOLVE
Pest Name							PalmerAm	C.ragwd	Carpetwd
Crop Type, Code						C GLXMA	C -	C -	C -
Crop Name						Soybean			
Rating Type						Stunting %			
Rating Unit						06/26/18	Control %	Control %	Control %
Rating Date						06/26/18	06/26/18	06/26/18	06/26/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check							0.0 c	0.0 c
2	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone	4.16 SC 2.08 2.08	0.211 lb ai/a 0.105 0.105	lb ai/a	PRE	A		15.0 a	98.3 a
3	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone	4.16 SC 2.08 2.08	0.26 lb ai/a 0.13 0.13	lb ai/a	PRE	A		10.0 ab	100.0 a
4	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Spartan Charge Premix ----carfentrazone ----sulfentrazone	4.16 SC 2.08 2.08 3.5 F 0.35 3.15	0.211 lb ai/a 0.105 0.105 0.0547 lb ai/a 0.00547 0.049	lb ai/a	PRE	A		5.0 bc	98.3 a
5	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Spartan Charge Premix ----carfentrazone ----sulfentrazone	4.16 SC 2.08 2.08 3.5 F 0.35 3.15	0.211 lb ai/a 0.105 0.105 0.109 lb ai/a 0.0109 0.098	lb ai/a	PRE	A		6.7 bc	100.0 a
6	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Metribuzin.....metribuzin	4.16 SC 2.08 2.08 75 DF	0.211 lb ai/a 0.105 0.105 0.188 lb ai/a	lb ai/a	PRE	A		0.0 c	93.3 ab
7	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone	4.09 SC 0.48 1.33 2.28	0.192 lb ai/a 0.0225 0.0624 0.107	lb ai/a	PRE	A		3.3 bc	93.3 ab
8	Fierce Premix ----flumioxazin ----pyroxasulfone	76 WG 33.5 42.5	0.143 lb ai/a 0.063 0.08	lb ai/a	PRE	A		0.0 c	96.7 ab
9	Envive Premix ----chlorimuron ----flumioxazin ----thifensulfuron	41.3 WG 9.199999 29.2 2.9	0.09 lb ai/a 0.02 .0636 0.0063	lb ai/a	PRE	A		3.3 bc	98.3 ab

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

Means followed by same letter(s) by superscript sign indicate P(F) < 0.05, LSD.

Pest Code				C	GLXMA	AMAPA PalmerAm C -	AMBEL C.ragwd C -	IPOSS mornglry C -
Crop Name					Soybean Injury %			
Rating Type						Control %	Control %	Control %
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Untreated Check							
2	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone	4.16 SC 2.08 2.08	0.211 lb ai/a 0.105 0.105	lb ai/a	PRE	A	0.0 a	0.0 b 81.7 a 75.0 a 80.0 a
3	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone	4.16 SC 2.08 2.08	0.26 lb ai/a 0.13 0.13	lb ai/a	PRE	A	0.0 a	90.0 a 60.7 a 66.7 a
4	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Spartan Charge Premix ----carfentrazone ----sulfentrazone	4.16 SC 2.08 2.08 3.5 F 0.35 3.15	0.211 lb ai/a 0.105 0.105 0.0547 lb ai/a 0.00547 0.049	lb ai/a	PRE	A	0.0 a	86.7 a 36.7 a 33.3 a
5	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Spartan Charge Premix ----carfentrazone ----sulfentrazone	4.16 SC 2.08 2.08 3.5 F 0.35 3.15	0.211 lb ai/a 0.105 0.105 0.109 lb ai/a 0.0109 0.098	lb ai/a	PRE	A	0.0 a	86.7 a 40.0 a 70.0 a
6	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Metribuzin.....metribuzin	4.16 SC 2.08 2.08 75 DF	0.211 lb ai/a 0.105 0.105 0.188 lb ai/a	lb ai/a	PRE	A	0.0 a	96.7 a 60.0 a 60.0 a
7	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone	4.09 SC 0.48 1.33 2.28	0.192 lb ai/a 0.0225 0.0624 0.107	lb ai/a	PRE	A	0.0 a	70.0 a 60.0 a 68.3 a
8	Fierce Premix ----flumioxazin ----pyroxasulfone	76 WG 33.5 42.5	0.143 lb ai/a 0.063 0.08	lb ai/a	PRE	A	0.0 a	95.0 a 61.7 a 50.0 a
9	Envive Premix ----chlorimuron ----flumioxazin ----thifensulfuron	41.3 WG 9.199999 29.2 2.9	0.09 lb ai/a 0.02 .0636 0.0063	lb ai/a	PRE	A	0.0 a	85.0 a 86.7 a 53.3 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 4,5 because error mean square = 0.

Pest Code Pest Name Crop Type, Code	MOLVE Carpetwd C -	DIGSA L.crbgrs C -	C GLXMA						
Crop Name Rating Type Rating Unit Rating Date	Control % 07/10/18	Control % 07/10/18	Soybean Yield Bu/A 11/01/18						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1 Untreated Check							0.0 c	0.0 c	24.6 a
2 Authority Supreme Premix ----sulfentrazone ----pyroxasulfone	4.16 SC 2.08 2.08		0.211 lb ai/a 0.105 0.105	PRE	A		87.0 ab	97.7 a	21.9 a
3 Authority Supreme Premix ----sulfentrazone ----pyroxasulfone	4.16 SC 2.08 2.08		0.26 lb ai/a 0.13 0.13	PRE	A		100.0 a	95.3 a	19.5 a
4 Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Spartan Charge Premix ----carfentrazone ----sulfentrazone	4.16 SC 2.08 2.08 3.5 F 0.35 3.15		0.211 lb ai/a 0.105 0.105 0.0547 lb ai/a 0.00547 0.049	PRE	A		90.7 ab	90.0 a	31.6 a
5 Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Spartan Charge Premix ----carfentrazone ----sulfentrazone	4.16 SC 2.08 2.08 3.5 F 0.35 3.15		0.211 lb ai/a 0.105 0.105 0.109 lb ai/a 0.0109 0.098	PRE	A		93.3 ab	91.7 a	32.4 a
6 Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Metribuzin.....metribuzin	4.16 SC 2.08 2.08 75 DF		0.211 lb ai/a 0.105 0.105 0.188 lb ai/a	PRE	A		93.3 ab	94.7 a	27.6 a
7 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone	4.09 SC 0.48 1.33 2.28		0.192 lb ai/a 0.0225 0.0624 0.107	PRE	A		90.0 ab	87.3 a	30.2 a
8 Fierce Premix ----flumioxazin ----pyroxasulfone	76 WG 33.5 42.5		0.143 lb ai/a 0.063 0.08	PRE	A		91.7 ab	87.3 a	32.2 a
9 Envive Premix ----chlorimuron ----flumioxazin ----thifensulfuron	41.3 WG 9.199999 29.2 2.9		0.09 lb ai/a 0.02 .0636 0.0063	PRE	A		100.0 a	60.0 b	36.7 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.  
Could not calculate LSD (% mean diff) for columns 4,5 because error mean square = 0.

## University of Delaware

Pest Code Pest Name			AMAPA PalmerAm	AMBEL C.ragwd	MOLVE Carpetwd										
Crop Type, Code	C GLXMA	C -	C -	C -											
Crop Name	Soybean														
Rating Type	Stunting		Control	Control	Control										
Rating Unit	%		%	%	%										
Rating Date	06/26/18		06/26/18	06/26/18	06/26/18										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code								
10	Authority Supreme Premix	4.16	SC	0.26	lb ai/a	PRE	A	5.0	bc	70.0	b	100.0	a	100.0	a
	----sulfentrazone	2.08		0.13											
	----pyroxasulfone	2.08		0.13											
	Spartan Charge Premix	3.5	F	0.0684	lb ai/a	PRE	A								
	----carfentrazone	0.35		0.00684											
	----sulfentrazone	3.15		0.0616											
LSD P=.05						8.02		28.06		7.74					
Standard Deviation						4.67		16.36		4.51					0.00
CV						96.72		18.91		5.27					0.0
Replicate F						2.441		1.187		0.100					0.000
Replicate Prob(F)						0.1154		0.3279		0.9055					1.0000
Treatment F						3.174		11.322		134.414					0.000
Treatment Prob(F)						0.0177		0.0001		0.0001					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 4,5 because error mean square = 0.

## University of Delaware

Pest Code		C	GLXMA	AMAPA PalmerAm		AMBEL C.ragwd	IPOSS mornlry
Pest Name		C	-	C	-	C	-
Crop Type, Code							
Crop Name				Soybean			
Rating Type				Injury			
Rating Unit				%			
Rating Date				07/10/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
10 Authority Supreme Premix		4.16	SC	0.26	lb ai/a	PRE	A
----sulfentrazone		2.08		0.13			
----pyroxasulfone		2.08		0.13			
Spartan Charge Premix		3.5	F	0.0684	lb ai/a	PRE	A
----carfentrazone		0.35		0.00684			
----sulfentrazone		3.15		0.0616			
LSD P=.05				.	30.56	50.43	62.96
Standard Deviation				0.00	17.81	29.40	36.71
CV				0.0	22.6	53.39	69.47
Replicate F				0.000	4.210	1.257	2.684
Replicate Prob(F)				1.0000	0.0316	0.3083	0.0955
Treatment F				0.000	7.861	2.059	1.171
Treatment Prob(F)				1.0000	0.0001	0.0918	0.3687

Means followed by same letter 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 4,5 because error mean square = 0.

## University of Delaware

Pest Code		MOLVE	DIGSA							
Pest Name		Carpetwd	L.crbgrs							
Crop Type, Code		C -	C -	C GLXMA						
Crop Name				Soybean						
Rating Type		Control	Control	Yield						
Rating Unit		%	%	Bu/A						
Rating Date		07/10/18	07/10/18	11/01/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
10	Authority Supreme Premix	4.16	SC	0.26	lb ai/a	PRE	A	67.0 b	93.3 a	30.6 a
	----sulfentrazone	2.08		0.13						
	----pyroxasulfone	2.08		0.13						
	Spartan Charge Premix	3.5	F	0.0684	lb ai/a	PRE	A			
	----carfentrazone	0.35		0.00684						
	----sulfentrazone	3.15		0.0616						
LSD P=.05					28.65	23.87	10.94			
Standard Deviation					16.70	13.91	6.38			
CV					20.54	17.45	22.2			
Replicate F					1.192	1.871	4.885			
Replicate Prob(F)					0.3264	0.1827	0.0202			
Treatment F					9.690	13.919	2.092			
Treatment Prob(F)					0.0001	0.0001	0.0872			

Means followed by same letter 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 4,5 because error mean square = 0.

Authority Brands in Conventional Tillage Soybeans

Trial ID: Soy12-18

Location: Field #18

Trial Year: 2018

Protocol ID: Soy12-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: FMC

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Initiation Date: 03/01/18

Completion Date: 11/24/18

**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

Variety: S43XS27

Attributes: Xtend

Planting Date: 06/07/18

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: 74 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 06/15/18

Harvest Date: 11/01/18

Harvest Equipment: Plot combine

Harvested Width: 6.25 FT

% Standard Moisture: 13.0

Harvested Length: 25 FT

**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: DIGSA Digitaria sanguinalis

Common Name: large crabgrass

**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 18B

% Sand: 81

% OM: 1.0

Texture: LS

loamy sand

% Silt: 12

pH: 6.4

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

% Clay: 7

CEC: 4.5

Fert. Level: G

good

Soil Drainage: G

good

**Application Description**

	A	B
Application Date	06/08/18	07/05/18
Appl. Stop Time	08:00 AM	03:00 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	28DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	76 F	87 F
% Relative Humidity Start, Stop	64	71
Wind Velocity+Dir. Start	2 mph SW	3 mph SW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	76 F	87 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	20	80

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC
Stage Majority, Percent		V3 100
Height Average		5.5 in
Height Minimum, Maximum		5 6

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100
Height Average		3 in
Height Minimum, Maximum		2 4
Density Average		1 m2
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		veg 100
Height Average		2 in
Height Minimum, Maximum		1 3
Density Average		2 m2
Pest 3 Code, Type, Scale	DIGSA W	DIGSA W
Stage Majority, Percent		1-tilr 50
Stage Minimum, Percent		3-leaf 20
Stage Maximum, Percent		2-tilr 30
Height Average		3 in
Height Minimum, Maximum		2 4
Density Average		5 m2

**Application Equipment**

	A	B
Appl. Equipment	Tractor	Backpack
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	11/28/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

06/18/18: Crop injury from herbicide treatments not evident due to poor stand counts throughout the field.

06/22/18: Crop injury from herbicide treatments not evident due to poor stand counts throughout the field.

08/06/18: No crop injury from herbicide treatments. Plots are essentially weed free with 95-100% control of all species previously rated.

Authority Brands in Conventional Tillage Soybeans			
Trial ID: Soy12-18	Location: Field #18	Trial Year: 2018	
Protocol ID: Soy12-18	Investigator: Mark VanGessel		
Study Director:			
Sponsor Contact: FMC			

Pest Code	Pest Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	AMAPA PalmerAm	AMBEL C.ragwd
Crop Type, Code					C GLXMA		C -	C -
Crop Name						Soybean Stunting %		
Rating Type						Control %		
Rating Unit						06/26/18	06/26/18	06/26/18
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing		
1	Untreated Check						0.0 a	0.0 b
2	Authority XL Premix	70 DG	0.175 lb ai/a	PRE	A		0.0 a	98.3 a
	----sulfentrazone	62.2	0.156					97.7 ab
	----chlorimuron	7.8	0.0195					
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A			
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B			
	----pyroxasulfone	4.174	0.0815					
	----fluthiacet	0.126	0.00246					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B			
3	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A		0.0 a	90.7 a
	----sulfentrazone	18	0.135					86.7 d
	----metribuzin	27	0.203					
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B			
	----pyroxasulfone	4.174	0.0815					
	----fluthiacet	0.126	0.00246					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B			
4	Authority Elite Premix	7 EC	1.37 lb ai/a	PRE	A		1.7 a	92.7 a
	----sulfentrazone	0.7	0.137					91.0 c
	----s-metolachlor	6.3	1.23					
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B			
	----pyroxasulfone	4.174	0.0815					
	----fluthiacet	0.126	0.00246					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B			
5	Authority Elite Premix	7 EC	1.37 lb ai/a	PRE	A		3.3 a	100.0 a
	----sulfentrazone	0.7	0.137					96.0 b
	----s-metolachlor	6.3	1.23					
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A			
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B			
	----pyroxasulfone	4.174	0.0815					
	----fluthiacet	0.126	0.00246					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B			
6	Envive Premix	41.3 WG	0.09 lb ai/a	PRE	A		0.0 a	100.0 a
	----chlorimuron	9.19999	0.02					100.0 a
	----flumioxazin	29.2	.0636					
	----thifensulfuron	2.9	0.0063					
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	V3	B			
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	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			MOLVE		AMAPA			
Pest Name			Carpetwd		PalmerAm			
Crop Type, Code			C -	C GLXMA	C -			
Crop Name								
Rating Type								
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing Appl Code			
1	Untreated Check					0.0 b	0.0 b	0.0 c
2	Authority XL Premix	70 DG	0.175 lb ai/a	PRE	A	100.0 a	30.0 a	98.3 ab
	----sulfentrazone	62.2	0.156					
	----chlorimuron	7.8	0.0195					
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A			
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B			
	----pyroxasulfone	4.174	0.0815					
	----fluthiacet	0.126	0.00246					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B			
3	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A	96.0 a	33.3 a	98.3 ab
	----sulfentrazone	18	0.135					
	----metribuzin	27	0.203					
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B			
	----pyroxasulfone	4.174	0.0815					
	----fluthiacet	0.126	0.00246					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B			
4	Authority Elite Premix	7 EC	1.37 lb ai/a	PRE	A	98.0 a	33.3 a	97.7 ab
	----sulfentrazone	0.7	0.137					
	----s-metolachlor	6.3	1.23					
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B			
	----pyroxasulfone	4.174	0.0815					
	----fluthiacet	0.126	0.00246					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B			
5	Authority Elite Premix	7 EC	1.37 lb ai/a	PRE	A	98.3 a	30.0 a	96.0 b
	----sulfentrazone	0.7	0.137					
	----s-metolachlor	6.3	1.23					
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A			
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B			
	----pyroxasulfone	4.174	0.0815					
	----fluthiacet	0.126	0.00246					
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B			
6	Envive Premix	41.3 WG	0.09 lb ai/a	PRE	A	100.0 a	0.0 b	98.3 ab
	----chlorimuron	9.19999	0.02					
	----flumioxazin	29.2	.0636					
	----thifensulfuron	2.9	0.0063					
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	V3	B			
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	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					AMBEL	MOLVE	GGGAN
Pest Name				C.ragwd	Carpetwd	AnnGrass	
Crop Type, Code				C -	C -	C -	
Crop Name							
Rating Type				Control	Control	Control	
Rating Unit				%	%	%	
Rating Date				07/09/18	07/09/18	07/09/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check						
2	Authority XL Premix ----sulfentrazone ----chlorimuron Metribuzin.....metribuzin Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Xtendimax.....dicamba Roundup PowerMax..glyphosate	70 DG 62.2 7.8 75 DF 4.3 SC 4.174 0.126 2.9 SL 4.5 AS		0.175 lb ai/a 0.156 0.0195 0.188 lb ai/a 0.084 lb ai/a 0.0815 0.00246 0.5 lb ae/a 1.13 lb ae/a	PRE A V3 B V3 B		98.3 a 99.3 a 98.0 bc
3	Authority MTZ Premix ----sulfentrazone ----metribuzin Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Xtendimax.....dicamba Roundup PowerMax..glyphosate	45 DF 18 27 4.3 SC 4.174 0.126 2.9 SL 4.5 AS		0.338 lb ai/a 0.135 0.203 0.084 lb ai/a 0.0815 0.00246 0.5 lb ae/a 1.13 lb ae/a	PRE A V3 B V3 B		98.3 a 99.3 a 98.0 bc
4	Authority Elite Premix ----sulfentrazone ----s-metolachlor Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Xtendimax.....dicamba Roundup PowerMax..glyphosate	7 EC 0.7 6.3 4.3 SC 4.174 0.126 2.9 SL 4.5 AS		1.37 lb ai/a 0.137 1.23 0.084 lb ai/a 0.0815 0.00246 0.5 lb ae/a 1.13 lb ae/a	PRE A V3 B V3 B		97.7 a 100.0 a 98.7 ab
5	Authority Elite Premix ----sulfentrazone ----s-metolachlor Metribuzin.....metribuzin Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Xtendimax.....dicamba Roundup PowerMax..glyphosate	7 EC 0.7 6.3 75 DF 4.3 SC 4.174 0.126 2.9 SL 4.5 AS		1.37 lb ai/a 0.137 1.23 0.188 lb ai/a 0.084 lb ai/a 0.0815 0.00246 0.5 lb ae/a 1.13 lb ae/a	PRE A V3 B V3 B		96.7 a 100.0 a 100.0 a
6	Envive Premix ----chlorimuron ----flumioxazin ----thifensulfuron Warrant.....acetochlor Xtendimax.....dicamba Roundup PowerMax..glyphosate	41.3 WG 9.19999 29.2 2.9 3 CS 2.9 SL 4.5 AS		0.09 lb ai/a 0.02 .0636 0.0063 1.13 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE A V3 B V3 B V3		100.0 a 100.0 a 97.0 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.

Pest Code						C GLXMA Soybean Yield Bu/A 11/01/18	
Pest Name							
Crop Type, Code							
Crop Name							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code	
1	Untreated Check						29.5 a
2	Authority XL Premix	70 DG	0.175 lb ai/a	PRE	A		29.9 a
	----sulfentrazone	62.2	0.156				
	----chlorimuron	7.8	0.0195				
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A		
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B		
	----pyroxasulfone	4.174	0.0815				
	----fluthiacet	0.126	0.00246				
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B		
3	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A		33.4 a
	----sulfentrazone	18	0.135				
	----metribuzin	27	0.203				
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B		
	----pyroxasulfone	4.174	0.0815				
	----fluthiacet	0.126	0.00246				
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B		
4	Authority Elite Premix	7 EC	1.37 lb ai/a	PRE	A		27.1 a
	----sulfentrazone	0.7	0.137				
	----s-metolachlor	6.3	1.23				
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B		
	----pyroxasulfone	4.174	0.0815				
	----fluthiacet	0.126	0.00246				
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B		
5	Authority Elite Premix	7 EC	1.37 lb ai/a	PRE	A		27.6 a
	----sulfentrazone	0.7	0.137				
	----s-metolachlor	6.3	1.23				
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A		
	Anthem Maxx Premix	4.3 SC	0.084 lb ai/a	V3	B		
	----pyroxasulfone	4.174	0.0815				
	----fluthiacet	0.126	0.00246				
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	B		
6	Envive Premix	41.3 WG	0.09 lb ai/a	PRE	A		33.6 a
	----chlorimuron	9.199999	0.02				
	----flumioxazin	29.2	.0636				
	----thifensulfuron	2.9	0.0063				
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	V3	B		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	V3	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	V3	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				AMAPA	AMBEL		
Pest Name				PalmerAm	C.ragwd		
Crop Type, Code			C GLXMA	C -	C -		
Crop Name			Soybean				
Rating Type			Stunting	Control	Control		
Rating Unit			%	%	%		
Rating Date			06/26/18	06/26/18	06/26/18		
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	4.09 SC 0.48 1.33 2.28 6 L 5 SL 4.5 AS	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	PRE V3 A B B V3 B V3	1.7 a       	100.0 a       	100.0 a       
8	Fierce Premix ----flumioxazin ----pyroxasulfone Dual II Magnum..s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate	76 WG 33.5 42.5 7.64 E 2.9 SL 4.5 AS	0.143 lb ai/a 0.063 0.08 0.955 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	PRE V3 A B B V3 B V3	3.3 a       	70.0 a       	100.0 a       
LSD P=.05 Standard Deviation CV					3.02 1.73 138.01	32.46 18.54 22.75	3.57 2.04 2.43
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)					4.200 0.0373 2.200 0.0991	1.095 0.3617 10.345 0.0001	2.774 0.0966 845.751 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.

## University of Delaware

Pest Code		MOLVE		AMAPA						
Pest Name		Carpetwd		PalmerAm						
Crop Type, Code		C - C	GLXMA	C -						
Crop Name		Control	Soybean	Control						
Rating Type		%	Leaf brn	%						
Rating Unit		06/26/18	%	07/09/18						
Rating Date		07/09/18		07/09/18						
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	4.09 0.48 1.33 2.28 6 L 5 SL 4.5 AS	SC 0.0225 0.0624 0.107 0.56 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	0.192 0.0225 0.0624 0.107 V3 V3 V3	lb ai/a 0.0225 0.0624 0.107 V3 V3 V3	PRE A B B B		96.7 a	1.0 b	96.7 ab
8	Fierce Premix ----flumioxazin ----pyroxasulfone Dual II Magnum..s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate	76 WG 33.5 42.5 7.64 E 2.9 SL 4.5 AS		0.143 0.063 0.08 0.955 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	lb ai/a 0.063 0.08 V3 V3 V3	PRE A B B B		100.0 a	4.3 b	100.0 a
LSD P=.05								4.61	4.88	3.95
Standard Deviation								2.63	2.79	2.26
CV								3.06	16.89	2.63
Replicate F								3.623	5.359	1.384
Replicate Prob(F)								0.0539	0.0187	0.2829
Treatment F								524.937	102.841	707.144
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 Pest Name		AMBEL C.ragwd	MOLVE Carpetwd	GGGAN AnnGrass						
Crop Type, Code		C -	C -	C -						
Crop Name		Control	Control	Control						
Rating Type		%	%	%						
Rating Unit										
Rating Date		07/09/18	07/09/18	07/09/18						
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	4.09 0.48 1.33 2.28 6 L 5 SL 4.5 AS	SC 0.0225 0.0624 0.107 0.56 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	0.192 0.0225 0.0624 0.107 V3 V3 V3	lb ai/a 0.0225 0.0624 0.107 V3 V3 V3	PRE A B B B		96.0 a	100.0 a	99.3 ab
8	Fierce Premix ----flumioxazin ----pyroxasulfone Dual II Magnum..s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate	76 WG 33.5 42.5 7.64 E 2.9 SL 4.5 AS		0.143 0.063 0.08 0.955 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	lb ai/a 0.063 0.08 V3 V3 V3	PRE A B B B		96.7 a	100.0 a	98.3 bc
LSD P=.05 Standard Deviation CV								4.05 2.31 2.71	35.81 20.45 22.35	1.65 0.94 1.09
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)								2.831 0.0928 668.603 0.0001	0.977 0.4008 3.963 0.0136	2.020 0.1695 4103.088 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						C GLXMA
Pest Name						Soybean
Crop Type, Code						Yield Bu/A
Crop Name						11/01/18
Rating Type						
Rating Unit						
Rating Date						
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	4.09 0.48 1.33 2.28 6 L 5 SL 4.5 AS	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	PRE V3 B B V3 B V3	A	32.4 a
8	Fierce Premix ----flumioxazin ----pyroxasulfone Dual II Magnum..s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate	76 WG 33.5 42.5 7.64 E 2.9 SL 4.5 AS	0.143 lb ai/a 0.063 0.08 0.955 lb ai/a 0.5 lb ae/a 1.13 lb ae/a	V3 B B V3 B V3	A	35.7 a
LSD P=.05						12.31
Standard Deviation						7.03
CV						22.57
Replicate F						1.046
Replicate Prob(F)						0.3772
Treatment F						0.582
Treatment Prob(F)						0.7595

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



<b>Application Description</b>		A	B	C	D	E
Application Date	06/07/18	06/27/18	07/05/18	07/09/18	07/19/18	
Appl. Stop Time	02:00 PM	02:00 PM	10:30 AM	02:30 PM	09:20 AM	
Application Method	SPRAY	SPRAY	SPRAY	SPRAY	SPRAY	
Application Timing	PRE	1-3"wds	B+7-10d	6"wds	D+7-10d	
Application Placement	BROADC	BROADC	BROADC	BROADC	BROADC	
Applied By	Johnson	Johnson	Johnson	Johnson	Johnson	
Air Temperature Start, Stop	73 F	76 F	85 F	82 F	80 F	
% Relative Humidity Start, Stop	58	66	70	38	45	
Wind Velocity+Dir. Start	1 mph SE	6 mph S	3 mph SW	1 mph NE	1 mph NE	
Wet Leaves (Y/N)	N no					
Soil Temperature	73 F	76 F	85 F	82 F	80 F	
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	
% Cloud Cover	30	70	85	0	30	

<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	
Stage Scale Used		DESC	DESC	DESC	DESC	
Stage Majority, Percent		1-2 trif 100	V4-5 100	V5 100	veg 100	
Height Average		5 in	7 in	7 in	10 in	
Height Minimum, Maximum		4 5	5 8	6 8	9 12	

<b>Pest Stage At Each Application</b>		A	B	C	D	E
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W	AMAPA W	AMAPA W	
Stage Majority, Percent		veg 100				
Height Average		1.2 in				
Height Minimum, Maximum		1 1.5				
Density Average		2 m2				
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W	IPOSS W	IPOSS W	
Stage Majority, Percent		cotyl 100		veg 100	veg 100	
Height Average		1 in		3 in	4 in	
Height Minimum, Maximum				2 4		
Density Average		1 m2		1 m2	1 m2	
Pest 3 Code, Type, Scale	DIGSA W	DIGSA W	DIGSA W	DIGSA W	DIGSA W	
Stage Majority, Percent		2-leaf 55		tiller 100	tiller 100	
Stage Minimum, Percent		2-leaf 55				
Stage Maximum, Percent		3-leaf 45				
Height Average		1.5 in		5 in	7 in	
Height Minimum, Maximum		1 2.5		4 6	6 9	
Density Average		10 m2		18 m2	5 m2	

**Application Equipment**

	A	B	C	D	E
Appl. Equipment	Tractor	Tractor	Tractor	Tractor	Tractor
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	6.7 ft				
Boom Height	18 in	21 in	24 in	24 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
	07/05/18		Plot 105 had no pigweed, but high crabgrass pressure that may have interfered with pigweed emergence.
	06/25/18		No injury. Entire study had 85-100% Palmer control, and 90-100% ragweed control.
	07/09/18		Injury = yellowing and/or draw stringing.
STATUS	11/28/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

07/05/18: No weeds present in treatment 2 at application.

Liberty Rates in Liberty Link Soybeans									
Trial ID: Soy13-18		Location: Field #18		Trial Year: 2018					
Protocol ID: Soy13-18		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: Bayer									
Pest Code					AMAPA PalmerAm	AMBEL C.ragwd	MOLVE Carpetwd		
Pest Name					C -	C -	C -		
Crop Type, Code				C GLXMA					
Crop Name				Soybean Injury					
Rating Type					Control	Control	Control		
Rating Unit					07/05/18	07/05/18	07/05/18		
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check								
2	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A	0.0 a	0.0 b		
	----sulfentrazone	18	0.135			100.0 a	100.0 a		
	----metribuzin	27	0.203						
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	1-3"wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	1-3"wds	B				
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	B+7-10d	C				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	B+7-10d	C				
3	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A	0.0 a	16.7 b		
	----sulfentrazone	18	0.135			76.7 b	86.0 ab		
	----metribuzin	27	0.203						
	Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	6"wds	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	6"wds	D				
	Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	D+7-10d	E				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	D+7-10d	E				
4	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A	0.0 a	100.0 a		
	----sulfentrazone	18	0.135			100.0 a	100.0 a		
	----metribuzin	27	0.203						
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	1-3"wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	1-3"wds	B				
5	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A	0.0 a	33.3 b		
	----sulfentrazone	18	0.135			80.0 b	81.7 b		
	----metribuzin	27	0.203						
	Liberty 280....glufosinate	2.34 SL	0.79 lb ai/a	6"wds	D				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	6"wds	D				
6	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	A	0.0 a	100.0 a		
	----sulfentrazone	18	0.135			100.0 a	100.0 a		
	----metribuzin	27	0.203						
	Liberty 280....glufosinate	2.34 SL	0.585 lb ai/a	1-3"wds	B				
	Dry Ammonium Sulfate	100 D	1.02 % w/v	1-3"wds	B				
	Anthem Maxx Premix	4.3 SC	0.108 lb ai/a	1-3"wds	B				
	----pyroxasulfone	4.174	0.105						
	----fluthiacet	0.126	0.00316						
LSD P=.05					.49.82	14.73	14.88		
Standard Deviation					0.00 27.39	8.10	8.18		
CV					0.0 46.95	10.64	10.49		
Replicate F				0.000	0.556	1.610	1.000		
Replicate Prob(F)				1.0000	0.5905	0.2476	0.4019		
Treatment F				0.000	8.778	68.831	68.293		
Treatment Prob(F)				1.0000	0.0020	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 because error mean square = 0.

Pest Code		IPOSS	DIGSA		AMAPA						
Pest Name		mornglry	L.crbgrs		PalmerAm						
Crop Type, Code		C -	C -	C GLXMA	C -						
Crop Name				Soybean Injury %							
Rating Type		Control	Control		Control %						
Rating Unit											
Rating Date		07/05/18	07/05/18	07/09/18	07/09/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Untreated Check							0.0 c	0.0 c	0.0 c	0.0 c
2	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D 2.34 SL 100 D	0.338 lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v 0.585 lb ai/a 1.02 % w/v	PRE 1-3"wds B B+7-10d C B+7-10d C	A	100.0 a	100.0 a	6.7 b	100.0 a		
3	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D 2.34 SL 100 D	0.338 lb ai/a 0.135 0.203 0.79 lb ai/a 1.02 % w/v 0.79 lb ai/a 1.02 % w/v	PRE 6"wds D D D+7-10d E D+7-10d E	A	46.7 b	85.0 a	3.3 bc	10.0 c		
4	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D	0.338 lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v	PRE 1-3"wds B 1-3"wds B	A	100.0 a	100.0 a	1.7 c	100.0 a		
5	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D	0.338 lb ai/a 0.135 0.203 0.79 lb ai/a 1.02 % w/v	PRE 6"wds D 6"wds D	A	86.7 a	55.0 b	1.7 c	23.3 b		
6	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	45 DF 18 27 2.34 SL 100 D 4.3 SC 4.174 0.126	0.338 lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v 0.108 lb ai/a 0.105 0.00316	PRE 1-3"wds B 1-3"wds B B	A	100.0 a	100.0 a	16.7 a	100.0 a		
LSD P=.05						36.94	29.00	4.98	12.83		
Standard Deviation						20.30	15.94	2.74	7.05		
CV						28.11	21.74	54.77	12.69		
Replicate F						1.712	1.000	0.556	1.201		
Replicate Prob(F)						0.2295	0.4019	0.5905	0.3408		
Treatment F						12.216	18.846	15.111	146.324		
Treatment Prob(F)						0.0005	0.0001	0.0002	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 because error mean square = 0.

Pest Code		AMBEL	IPOSS	MOLVE	DIGSA						
Pest Name	C.ragwd	morngly	Carpetwd	L.crbgrs							
Crop Type, Code	C -	C -	C -	C -							
Crop Name											
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							0.0 c	0.0 c	0.0 b	0.0 c
2	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D 2.34 SL 100 D	lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v 0.585 lb ai/a 1.02 % w/v	0.338 1-3"wd 1-3"wd B B B+7-10d C	PRE	A	100.0 a	100.0 a	100.0 a	100.0 a	
3	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D 2.34 SL 100 D	lb ai/a 0.135 0.203 0.79 lb ai/a 1.02 % w/v 0.79 lb ai/a 1.02 % w/v	0.338 6"wd 6"wd D D D+7-10d E	PRE	A	6.7 c	66.7 ab	33.3 b	78.3 a	
4	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D	lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v	0.338 1-3"wd 1-3"wd B B	PRE	A	100.0 a	100.0 a	100.0 a	100.0 a	
5	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D	lb ai/a 0.135 0.203 0.79 lb ai/a 1.02 % w/v	0.338 6"wd 6"wd D D	PRE	A	26.7 b	33.3 bc	28.3 b	26.7 b	
6	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	45 DF 18 27 2.34 SL 100 D 4.3 SC 4.174 0.126	lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v 0.108 lb ai/a 0.105 0.00316	0.338 1-3"wd 1-3"wd B B 1-3"wd B	PRE	A	100.0 a	100.0 a	100.0 a	100.0 a	
LSD P=.05							10.85	66.43	39.50	23.55	
Standard Deviation							5.96	36.51	21.71	12.94	
CV							10.73	54.77	36.02	19.17	
Replicate F							2.500	0.000	1.028	0.920	
Replicate Prob(F)							0.1317	1.0000	0.3925	0.4296	
Treatment F							206.500	4.000	12.873	34.065	
Treatment Prob(F)							0.0001	0.0297	0.0004	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 because error mean square = 0.

Pest Code Pest Name Crop Type, Code	C GLXMA								
Crop Name Rating Type Rating Unit Rating Date	Soybean Yield Bu/A 11/01/18								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check							29.6 a	
2	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D 2.34 SL 100 D		0.338 lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v 0.585 lb ai/a 1.02 % w/v		1-3"wd 1-3"wd B+7-10d C B+7-10d C		A	39.3 a
3	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D 2.34 SL 100 D		0.338 lb ai/a 0.135 0.203 0.79 lb ai/a 1.02 % w/v 0.79 lb ai/a 1.02 % w/v		6"wd 6"wd D+7-10d E D+7-10d E		A	37.3 a
4	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D		0.338 lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v		1-3"wd 1-3"wd B		A	37.4 a
5	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate	45 DF 18 27 2.34 SL 100 D		0.338 lb ai/a 0.135 0.203 0.79 lb ai/a 1.02 % w/v		6"wd 6"wd D		A	41.2 a
6	Authority MTZ Premix ----sulfentrazone ----metribuzin Liberty 280....glufosinate Dry Ammonium Sulfate Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	45 DF 18 27 2.34 SL 100 D 4.3 SC 4.174 0.126		0.338 lb ai/a 0.135 0.203 0.585 lb ai/a 1.02 % w/v 0.108 lb ai/a 0.105 0.00316		1-3"wd 1-3"wd B		A	35.0 a
LSD P=.05 Standard Deviation CV									17.19 9.45 25.8
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)									1.144 0.3569 0.547 0.7376

Means followed by same letter 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.

Soil-Applied Herbicides fb Liberty 280 in Soybean

Trial ID: Soy14-18

Location: Field #18

Trial Year: 2018

Protocol ID: Soy14-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Valent

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Trial Status: E established

Initiation Date: 03/01/18

Completion Date: 11/24/18

**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

Variety: S42LL63

Attributes: Liberty Link

Planting Date: 06/07/18

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: ABONOR above normal, excessive

Emergence Date: 06/14/18

Harvest Date: 11/01/18

Harvest Equipment: Plot combine

Harvested Width: 5 FT

% Standard Moisture: 13.0

Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: IPOSS Ipomoea sp.

Common Name: Morning glory

Pest 2 Type: W Code: AMBEL Ambrosia artemisiifolia

Common Name: Common ragweed

**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: CONTIL conventional-till

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

**Soil Description**

Description Name: Field 18B

% Sand: 81 % OM: 1.0 Texture: LS loamy sand

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

% Clay: 7 CEC: 4.5 Fert. Level: G good

Soil Drainage: G good

**Application Description**

	A	B	C
Application Date	06/07/18	06/21/18	07/05/18
Appl. Stop Time	02:15 PM	10:00 AM	10:30 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	14DAP	28DAP
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Air Temperature Start, Stop	73 F	81 F	85 F
% Relative Humidity Start, Stop	58	72	70
Wind Velocity+Dir. Start	1 mph SE	3 mph NW	3 mph SW
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	73 F	81 F	85 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	30	70	85

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC	DESC
Stage Majority, Percent		1-trif 70	4-trif 100
Stage Minimum, Percent		unifol 30	
Stage Maximum, Percent		1-trif 70	
Height Average		3 in	8 in
Height Minimum, Maximum		2 3	

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		cot 100	veg 100
Height Average		1 in	3 in
Height Minimum, Maximum			2 4
Density Average		1 m2	4 m2
Pest 2 Code, Type, Scale	AMBEL W	AMBEL W	AMBEL W
Stage Majority, Percent		cot 75	veg 100
Stage Minimum, Percent		cot 75	
Stage Maximum, Percent		2-leaf 25	
Height Average		0.7 in	5 in
Height Minimum, Maximum			2 7
Density Average		1 m2	2 m2

**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
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	11/29/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

06/20/18: Heavy rains and potential ponding may have contributed to stunting.

06/03/18: Poor control of common ragweed with treatments 5, 7, 10. Third row is missing in plots 104, 109, 204, 209, 304.

07/07/18: Some chlorotic leaf blotches on oldest, fully expanded trifoliates. Typical symptoms from glufosinate and is consistent throughout the study. IPOSS control ratings based on POST activity CntrlPOS or residual activity (weeds emerging since POST application) CntrlPRE.

Soil-Applied Herbicides fb Liberty 280 in Soybean									
Trial ID: Soy14-18		Location: Field #18		Trial Year: 2018					
Protocol ID: Soy14-18		Investigator: Mark VanGessel							
Study Director:									
Sponsor Contact: Valent									
Pest Code									
Pest Name									
Crop Type, Code				C GLXMA	C GLXMA	C -	C -		
Crop Name				Soybean Stunting	Soybean Stunting	Control	Control		
Rating Type									
Rating Unit				%	%	%	%		
Rating Date				06/20/18	07/03/18	07/03/18	07/03/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check								
2	Liberty 280.....glufosinate Dry Ammonium Sulfate Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	2.34 SL 100 D 2.34 SL 1 EC 100 D 100 L	SL D SL EC D L	0.53 lb ai/a 1.5 % w/v 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	14DAP B 14DAP B 28DAP C 28DAP C 28DAP C 28DAP C		0.0 c 0.0 d 0.0 d 0.0 d 97.7 a 84.0 ab		
3	Fierce Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	76 WG 33.5 42.5 2.34 SL 1 EC 100 D 100 L	WG 33.5 42.5 SL EC D L	0.143 lb ai/a 0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A A 28DAP C 28DAP C 28DAP C 28DAP C	10.7 b	2.3 cd 95.3 a 82.7 ab		
4	Boundary Premix ----s-metolachlor ----metribuzin Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	6.5 EC 5.25 1.25 2.34 SL 1 EC 100 D 100 L	EC 5.25 1.25 SL EC D L	1.63 lb ai/a 1.32 0.313 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A A 28DAP C 28DAP C 28DAP C 28DAP C	9.7 b	4.0 bcd 87.7 b 60.0 c		
5	Authority Elite Premix ----sulfentrazone ----s-metolachlor Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	7 EC 0.7 6.3 2.34 SL 1 EC 100 D 100 L	EC 0.7 6.3 SL EC D L	1.37 lb ai/a 0.137 1.23 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A A 28DAP C 28DAP C 28DAP C 28DAP C	0.0 c	5.7 abc 82.3 c 75.7 ab		
6	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	4.09 SC 0.48 1.33 2.28 2.34 SL 1 EC 100 D 100 L	SC 0.48 1.33 2.28 SL EC D L	0.144 lb ai/a 0.0169 0.047 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A A A 28DAP C 28DAP C 28DAP C 28DAP C	7.3 b	9.7 a 98.3 a 86.0 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=1,7,10,13,16,17

Pest Code Pest Name		MOLVE Carpetwd	DIGSA L.crbgrs	GLXMA	AMAPA PalmerAm						
Crop Type, Code		C -	C -	C	C -						
Crop Name				Soybean Stunting							
Rating Type											
Rating Unit		%	%	%	%						
Rating Date		07/03/18	07/03/18	07/12/18	07/12/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1	Untreated Check							0.0 d	0.0 c	0.0 a	0.0 c
2	Liberty 280.....glufosinate Dry Ammonium Sulfate Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	2.34 SL 100 D 2.34 SL 1 EC 100 D 100 L	SL D SL EC D L	0.53 lb ai/a 1.5 % w/v 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		14DAP B 14DAP B 28DAP C 28DAP C 28DAP C 28DAP C		92.3 ab	95.3 ab	0.0 a	100.0 a
3	Fierce Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	76 WG 33.5 42.5 2.34 SL 1 EC 100 D 100 L	WG 33.5 42.5 SL EC D L	0.143 lb ai/a 0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		PRE A 28DAP C 28DAP C 28DAP C 28DAP C		96.0 a	92.3 ab	3.3 a	100.0 a
4	Boundary Premix ----s-metolachlor ----metribuzin Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	6.5 EC 5.25 1.25 2.34 SL 1 EC 100 D 100 L	EC 5.25 1.25 SL EC D L	1.63 lb ai/a 1.32 0.313 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		PRE A 28DAP C 28DAP C 28DAP C 28DAP C		85.0 bc	97.0 a	0.0 a	100.0 a
5	Authority Elite Premix ----sulfentrazone ----s-metolachlor Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	7 EC 0.7 6.3 2.34 SL 1 EC 100 D 100 L	EC 0.7 6.3 SL EC D L	1.37 lb ai/a 0.137 1.23 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		PRE A 28DAP C 28DAP C 28DAP C 28DAP C		80.0 c	88.0 b	3.3 a	100.0 a
6	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	4.09 SC 0.48 1.33 2.28 2.34 SL 1 EC 100 D 100 L	SC 0.48 1.33 2.28 SL EC D L	0.144 lb ai/a 0.0169 0.047 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		PRE A 28DAP C 28DAP C 28DAP C 28DAP C		94.7 a	96.0 ab	8.0 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=1,7,10,13,16,17

Pest Code	Pest Name	Crop Type, Code	IPOSS mornglry C -	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -		
Crop Name	Rating Type		CntrlPOS	CntrlPRE	Control	Control		
Rating Unit	Rating Date		% 07/12/18	% 07/12/18	% 07/12/18	% 08/08/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing		
1	Untreated Check				0.0 c	0.0 d		
2	Liberty 280.....glufosinate Dry Ammonium Sulfate Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	2.34 SL 100 D 2.34 SL 1 EC 100 D 100 L	SL D SL EC D L	0.53 lb ai/a 1.5 % w/v 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	14DAP B 14DAP B 28DAP C 28DAP C 28DAP C 28DAP C		94.7 ab 50.0 c	100.0 a 92.3 b
3	Fierce Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	76 WG 33.5 42.5 2.34 SL 1 EC 100 D 100 L	WG 33.5 42.5 SL EC D L	0.143 lb ai/a 0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A 28DAP C 28DAP C 28DAP C 28DAP C		97.3 ab 61.7 bc	100.0 a 100.0 a
4	Boundary Premix ----s-metolachlor ----metribuzin Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	6.5 EC 5.25 1.25 2.34 SL 1 EC 100 D 100 L	EC 5.25 1.25 SL EC D L	1.63 lb ai/a 1.32 0.313 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A 28DAP C 28DAP C 28DAP C 28DAP C		91.0 b 85.0 ab	100.0 a 95.0 ab
5	Authority Elite Premix ----sulfentrazone ----s-metolachlor Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	7 EC 0.7 6.3 2.34 SL 1 EC 100 D 100 L	EC 0.7 6.3 SL EC D L	1.37 lb ai/a 0.137 1.23 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A 28DAP C 28DAP C 28DAP C 28DAP C		98.3 ab 85.0 ab	100.0 a 100.0 a
6	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	4.09 SC 0.48 1.33 2.28 2.34 SL 1 EC 100 D 100 L	SC 0.48 1.33 2.28 SL EC D L	0.144 lb ai/a 0.0169 0.047 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A 28DAP C 28DAP C 28DAP C 28DAP C		91.3 b 73.3 abc	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=1,7,10,13,16,17

Pest Code	Pest Name	Crop Type, Code	IPOSS morngly C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	IPOSS morngly C -			
Crop Name	Rating Type	Rating Unit	Control % 08/08/18	Control % 08/08/18	Control % 09/10/18	Control % 09/10/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check				0.0 d	0.0 c	0.0 c	0.0 d	
2	Liberty 280.....glufosinate Dry Ammonium Sulfate Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	2.34 SL 100 D 2.34 SL 1 EC 100 D 100 L	SL D SL EC D L	0.53 lb ai/a 1.5 % w/v 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	14DAP B 14DAP B 28DAP C 28DAP C 28DAP C 28DAP C	66.7 bc	90.7 ab	99.0 a	59.4 c
3	Fierce Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	76 WG 33.5 42.5 2.34 SL 1 EC 100 D 100 L	WG 33.5 42.5 SL EC D L	0.143 lb ai/a 0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A A 28DAP C 28DAP C 28DAP C 28DAP C	66.1 bc	93.3 ab	99.0 a	59.4 c
4	Boundary Premix ----s-metolachlor ----metribuzin Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	6.5 EC 5.25 1.25 2.34 SL 1 EC 100 D 100 L	EC 5.25 1.25 SL EC D L	1.63 lb ai/a 1.32 0.313 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A A 28DAP C 28DAP C 28DAP C 28DAP C	66.7 bc	100.0 a	96.0 b	63.3 bc
5	Authority Elite Premix ----sulfentrazone ----s-metolachlor Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	7 EC 0.7 6.3 2.34 SL 1 EC 100 D 100 L	EC 0.7 6.3 SL EC D L	1.37 lb ai/a 0.137 1.23 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A A 28DAP C 28DAP C 28DAP C 28DAP C	77.7 a	96.7 a	99.0 a	72.2 ab
6	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	4.09 SC 0.48 1.33 2.28 2.34 SL 1 EC 100 D 100 L	SC 0.48 1.33 2.28 SL EC D L	0.144 lb ai/a 0.0169 0.047 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	PRE A A A 28DAP C 28DAP C 28DAP C 28DAP C	60.0 c	95.0 a	99.0 a	63.3 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.  
Missing data estimates are included in columns:Yates=1,7,10,13,16,17

Pest Code Pest Name Crop Type, Code	DIGSA L.crbgrs C - C	GLXMA					
Crop Name Rating Type Rating Unit Rating Date	Control % 09/10/18	Soybean Yield Bu/A 11/01/18					
Trt No. Treatment Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code		
1 Untreated Check						0.0 c	36.0 a
2 Liberty 280.....glufosinate Dry Ammonium Sulfate Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	2.34 SL 100 D 2.34 SL 1 EC 100 D 100 L	0.53 lb ai/a 1.5 % w/v 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	14DAP B 14DAP B 28DAP C 28DAP C 28DAP C 28DAP C			98.8 a	38.9 a
3 Fierce Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	76 WG 33.5 42.5 2.34 SL 1 EC 100 D 100 L	0.143 lb ai/a 0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		PRE	A	93.0 ab	36.7 a
4 Boundary Premix ----s-metolachlor ----metribuzin Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	6.5 EC 5.25 1.25 2.34 SL 1 EC 100 D 100 L	1.63 lb ai/a 1.32 0.313 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		PRE	A	99.0 a	38.3 a
5 Authority Elite Premix ----sulfentrazone ----s-metolachlor Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	7 EC 0.7 6.3 2.34 SL 1 EC 100 D 100 L	1.37 lb ai/a 0.137 1.23 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		PRE	A	99.0 a	48.1 a
6 Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	4.09 SC 0.48 1.33 2.28 2.34 SL 1 EC 100 D 100 L	0.144 lb ai/a 0.0169 0.047 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v		PRE	A	96.0 a	43.0 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=1,7,10,13,16,17

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Pest Code						AMAPA PalmerAm	IPOSS morngly		
Pest Name									
Crop Type, Code			C GLXMA	C GLXMA	C -	C -			
Crop Name			Soybean	Soybean					
Rating Type			Stunting	Stunting	Control	Control			
Rating Unit			%	%	%	%			
Rating Date			06/20/18	07/03/18	07/03/18	07/03/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
7	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	2.64 0.5000001 1.5 0.64 2.34 SL 1 EC 100 D 100 L	SC 0.0625 0.188 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	0.33 lb ai/a 0.0625 0.188 0.08 28DAP C 28DAP C 28DAP C 28DAP C	A A	20.0 a	8.0 ab	97.7 a	81.0 ab
8	Fierce Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	76 WG 33.5 42.5 2.34 SL 1 EC 100 D 100 L	0.178 lb ai/a 0.0785 0.1 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	0.178 lb ai/a 0.0785 0.1 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	A A	10.7 b	2.3 cd	98.3 a	85.7 ab
9	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	4.16 SC 2.08 2.08 2.34 SL 1 EC 100 D 100 L	0.25 lb ai/a 0.125 0.125 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	0.25 lb ai/a 0.125 0.125 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	A A	8.7 b	4.0 bcd	97.7 a	84.0 ab
10	Fierce EZ Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	3.04 SC 1.34 1.7 2.34 SL 1 EC 100 D 100 L	0.143 lb ai/a 0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	0.143 lb ai/a 0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	A A	8.7 b	0.0 d	97.7 a	71.0 bc
LSD P=.05					5.28	5.57	3.69	14.71	
Standard Deviation					3.07	3.25	2.15	8.57	
CV					40.54	90.26	2.52	12.07	
Replicate F					0.216	3.248	0.310	1.054	
Replicate Prob(F)					0.8078	0.0624	0.7370	0.3690	
Treatment F					12.488	3.247	602.114	28.109	
Treatment Prob(F)					0.0001	0.0160	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=1,7,10,13,16,17

## University of Delaware

Pest Code		MOLVE	DIGSA		AMAPA	
Pest Name		Carpetwd	L.crbgrs		PalmerAm	
Crop Type, Code		C -	C -	GLXMA	C -	
Crop Name				Soybean		
Rating Type		Control	Control	Stunting	Control	
Rating Unit		%	%	%	%	
Rating Date		07/03/18	07/03/18	07/12/18	07/12/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code	
7	Fierce MTZ Premix ----flumioxazin ----metribuzin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	2.64 0.5000001 1.5 0.64 2.34 SL 1 EC 100 D 100 L	SC 0.0625 0.188 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	0.33 lb ai/a 0.0625 0.188 0.08 28DAP C 28DAP C 28DAP C 28DAP C	A A	93.0 ab 90.7 ab 7.3 a 98.3 b
8	Fierce Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	76 WG 33.5 42.5 2.34 SL 1 EC 100 D 100 L	0.178 lb ai/a 0.0785 0.1 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	0.0785 0.1 0.53 lb ai/a 0.047 lb ai/a 28DAP C 28DAP C 28DAP C 28DAP C	A A	97.7 a 96.0 ab 5.7 a 100.0 a
9	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	4.16 SC 2.08 2.08 2.34 SL 1 EC 100 D 100 L	0.25 lb ai/a 0.125 0.125 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	0.125 0.125 0.53 lb ai/a 0.047 lb ai/a 28DAP C 28DAP C 28DAP C 28DAP C	A A	98.3 a 95.3 ab 5.7 a 100.0 a
10	Fierce EZ Premix ----flumioxazin ----pyroxasulfone Liberty 280.....glufosinate Select Max.....clethodim Dry Ammonium Sulfate Nonionic Surfactant	3.04 SC 1.34 1.7 2.34 SL 1 EC 100 D 100 L	0.143 lb ai/a 0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 1.5 % w/v 0.25 % v/v	0.063 0.08 0.53 lb ai/a 0.047 lb ai/a 28DAP C 28DAP C 28DAP C 28DAP C	A A	93.7 ab 91.3 ab 0.0 a 100.0 a
LSD P=.05				9.21	8.72	7.47
Standard Deviation				5.37	5.08	4.32
CV				6.46	6.03	129.28
Replicate F				3.313	6.209	0.784
Replicate Prob(F)				0.0595	0.0089	0.4735
Treatment F				92.097	102.680	1.674
Treatment Prob(F)				0.0001	0.0001	0.1767
						3587.667
						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=1,7,10,13,16,17

## University of Delaware

Pest Code	IPOSS mornglry C -	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -							
Crop Type, Code											
Crop Name											
Rating Type	CntrlPOS	CntrlPRE	Control	Control							
Rating Unit	%	%	%	%							
Rating Date	07/12/18	07/12/18	07/12/18	08/08/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
7	Fierce MTZ Premix	2.64	SC	0.33	lb ai/a	PRE	A	99.0 a	61.7 bc	100.0 a	100.0 a
	----flumioxazin	0.5000001		0.0625							
	----metribuzin	1.5		0.188							
	----pyroxasulfone	0.64		0.08							
	Liberty 280.....glufosinate	2.34	SL	0.53	lb ai/a	28DAP	C				
	Select Max.....clethodim	1	EC	0.047	lb ai/a	28DAP	C				
	Dry Ammonium Sulfate	100	D	1.5	% w/v	28DAP	C				
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	C				
8	Fierce Premix	76	WG	0.178	lb ai/a	PRE	A	96.0 ab	65.9 abc	100.0 a	100.0 a
	----flumioxazin	33.5		0.0785							
	----pyroxasulfone	42.5		0.1							
	Liberty 280.....glufosinate	2.34	SL	0.53	lb ai/a	28DAP	C				
	Select Max.....clethodim	1	EC	0.047	lb ai/a	28DAP	C				
	Dry Ammonium Sulfate	100	D	1.5	% w/v	28DAP	C				
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	C				
9	Authority Supreme Premix	4.16	SC	0.25	lb ai/a	PRE	A	96.7 ab	61.7 bc	97.3 b	100.0 a
	----sulfentrazone	2.08		0.125							
	----pyroxasulfone	2.08		0.125							
	Liberty 280.....glufosinate	2.34	SL	0.53	lb ai/a	28DAP	C				
	Select Max.....clethodim	1	EC	0.047	lb ai/a	28DAP	C				
	Dry Ammonium Sulfate	100	D	1.5	% w/v	28DAP	C				
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	C				
10	Fierce EZ Premix	3.04	SC	0.143	lb ai/a	PRE	A	98.3 ab	90.0 a	100.0 a	100.0 a
	----flumioxazin	1.34		0.063							
	----pyroxasulfone	1.7		0.08							
	Liberty 280.....glufosinate	2.34	SL	0.53	lb ai/a	28DAP	C				
	Select Max.....clethodim	1	EC	0.047	lb ai/a	28DAP	C				
	Dry Ammonium Sulfate	100	D	1.5	% w/v	28DAP	C				
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	C				
LSD P=.05					7.62	25.65	2.51	6.20			
Standard Deviation					4.44	14.89	1.46	3.62			
CV					5.15	23.48	1.63	4.08			
Replicate F					0.265	0.617	1.000	1.042			
Replicate Prob(F)					0.7702	0.5512	0.3874	0.3729			
Treatment F					140.734	8.948	1398.917	224.666			
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=1,7,10,13,16,17

## University of Delaware

Pest Code	Pest Name	Crop Type, Code	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	IPOSS mornglry C -
Crop Name	Rating Type	Rating Unit	Control %	Control %	Control %	Control %
			08/08/18	08/08/18	09/10/18	09/10/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code
7	Fierce MTZ Premix	2.64 SC 0.5000001	0.33 lb ai/a	PRE	A	66.7 bc
	----flumioxazin	0.0625				
	----metribuzin	1.5	0.188			
	----pyroxasulfone	0.64	0.08			
	Liberty 280.....glufosinate	2.34 SL	0.53 lb ai/a	28DAP	C	
	Select Max.....clethodim	1 EC	0.047 lb ai/a	28DAP	C	
	Dry Ammonium Sulfate	100 D	1.5 % w/v	28DAP	C	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	C	
8	Fierce Premix	76 WG	0.178 lb ai/a	PRE	A	66.7 bc
	----flumioxazin	33.5	0.0785			
	----pyroxasulfone	42.5	0.1			
	Liberty 280.....glufosinate	2.34 SL	0.53 lb ai/a	28DAP	C	
	Select Max.....clethodim	1 EC	0.047 lb ai/a	28DAP	C	
	Dry Ammonium Sulfate	100 D	1.5 % w/v	28DAP	C	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	C	
9	Authority Supreme Premix	4.16 SC	0.25 lb ai/a	PRE	A	71.7 ab
	----sulfentrazone	2.08	0.125			
	----pyroxasulfone	2.08	0.125			
	Liberty 280.....glufosinate	2.34 SL	0.53 lb ai/a	28DAP	C	
	Select Max.....clethodim	1 EC	0.047 lb ai/a	28DAP	C	
	Dry Ammonium Sulfate	100 D	1.5 % w/v	28DAP	C	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	C	
10	Fierce EZ Premix	3.04 SC	0.143 lb ai/a	PRE	A	68.3 abc
	----flumioxazin	1.34	0.063			
	----pyroxasulfone	1.7	0.08			
	Liberty 280.....glufosinate	2.34 SL	0.53 lb ai/a	28DAP	C	
	Select Max.....clethodim	1 EC	0.047 lb ai/a	28DAP	C	
	Dry Ammonium Sulfate	100 D	1.5 % w/v	28DAP	C	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	C	
LSD P=.05				10.92	10.91	2.92
Standard Deviation				6.34	6.36	1.70
CV				10.38	7.64	1.92
Replicate F				3.076	4.126	0.770
Replicate Prob(F)				0.0724	0.0335	0.4776
Treatment F				35.846	64.825	1006.483
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=1,7,10,13,16,17

## University of Delaware

Pest Code Pest Name Crop Type, Code	DIGSA L.crbgrs C - C	GLXMA					
Crop Name	Control %	Soybean Yield Bu/A					
Rating Type	09/10/18	11/01/18					
Rating Unit							
Rating Date							
Trt No. Name	Form Conc	Form Type Rate	Rate Unit	Appl Timing	Appl Code		
7 Fierce MTZ Premix	2.64 SC	0.33 lb ai/a	PRE	A		99.0 a	35.6 a
----flumioxazin	0.5000001	0.0625					
----metribuzin	1.5	0.188					
----pyroxasulfone	0.64	0.08					
Liberty 280.....glufosinate	2.34 SL	0.53 lb ai/a	28DAP	C			
Select Max.....clethodim	1 EC	0.047 lb ai/a	28DAP	C			
Dry Ammonium Sulfate	100 D	1.5 % w/v	28DAP	C			
Nonionic Surfactant	100 L	0.25 % v/v	28DAP	C			
8 Fierce Premix	76 WG	0.178 lb ai/a	PRE	A		95.3 ab	45.9 a
----flumioxazin	33.5	0.0785					
----pyroxasulfone	42.5	0.1					
Liberty 280.....glufosinate	2.34 SL	0.53 lb ai/a	28DAP	C			
Select Max.....clethodim	1 EC	0.047 lb ai/a	28DAP	C			
Dry Ammonium Sulfate	100 D	1.5 % w/v	28DAP	C			
Nonionic Surfactant	100 L	0.25 % v/v	28DAP	C			
9 Authority Supreme Premix	4.16 SC	0.25 lb ai/a	PRE	A		93.7 ab	47.3 a
----sulfentrazone	2.08	0.125					
----pyroxasulfone	2.08	0.125					
Liberty 280.....glufosinate	2.34 SL	0.53 lb ai/a	28DAP	C			
Select Max.....clethodim	1 EC	0.047 lb ai/a	28DAP	C			
Dry Ammonium Sulfate	100 D	1.5 % w/v	28DAP	C			
Nonionic Surfactant	100 L	0.25 % v/v	28DAP	C			
10 Fierce EZ Premix	3.04 SC	0.143 lb ai/a	PRE	A		88.3 b	40.4 a
----flumioxazin	1.34	0.063					
----pyroxasulfone	1.7	0.08					
Liberty 280.....glufosinate	2.34 SL	0.53 lb ai/a	28DAP	C			
Select Max.....clethodim	1 EC	0.047 lb ai/a	28DAP	C			
Dry Ammonium Sulfate	100 D	1.5 % w/v	28DAP	C			
Nonionic Surfactant	100 L	0.25 % v/v	28DAP	C			
LSD P=.05						7.09	16.96
Standard Deviation						4.12	9.89
CV						4.77	24.1
Replicate F						0.539	0.910
Replicate Prob(F)						0.5930	0.4203
Treatment F						164.660	0.692
Treatment Prob(F)						0.0001	0.7074

Means followed by same letter 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=1,7,10,13,16,17

Soil-Applied Herbicides fb Roundup + Xtendimax in Soybean  
 Trial ID: Soy15-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: Soy15-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Valent

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 11/24/18

**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  
 Variety: S43XS27  
 Attributes: Xtend  
 Planting Date: 06/07/18 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: 06/15/18 Soil Moisture: ABONOR above normal, excessive  
 Harvest Date: 11/01/18 Harvest Equipment: Plot combine  
 % Standard Moisture: 13.0 Harvested Width: 5 FT  
 Harvested Length: 25 FT

**Pest Description**

Pest 1 Type: W Code: AMBEL Ambrosia artemisiifolia  
 Common Name: Common ragweed

Pest 2 Type: W Code: IPOSS Ipomoea sp.  
 Common Name: Morning glory

Pest 3 Type: W Code: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass

**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 18B  
 % Sand: 81 % OM: 1.0 Texture: LS loamy sand  
 % Silt: 12 pH: 6.4 Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 7 CEC: 4.5 Fert. Level: G good  
 Soil Drainage: G good

**Application Description**

	A	B
Application Date	06/07/18	07/05/18
Appl. Stop Time	01:15 PM	11:00 AM
Application Method	SPRAY	SPRAY
Application Timing	PRE	28DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	73 F	85 F
% Relative Humidity Start, Stop	58	70
Wind Velocity+Dir. Start	1 mph SE	3 mph SW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	73 F	85 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	30	85

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC
Stage Majority, Percent		V3 100
Height Average		7 in

**Pest Stage At Each Application**

	A	B
Pest 1 Code, Type, Scale	AMBEL W	AMBEL W
Stage Majority, Percent		veg 100
Height Average		3 in
Height Minimum, Maximum		2 4
Density Average		2 plot
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		veg 70
Stage Minimum, Percent		veg 70
Stage Maximum, Percent		run 30
Height Average		4 in
Height Minimum, Maximum		2 6
Density Average		1 m2
Pest 3 Code, Type, Scale	DIGSA W	DIGSA W
Stage Majority, Percent		4-leaf 40
Stage Minimum, Percent		3-leaf 30
Stage Maximum, Percent		1-tlr 30
Height Average		5 in
Height Minimum, Maximum		3 8
Density Average		5 m2

**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
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
	06/25/18		90-100% weed control in all plots including UTC. AMAPA, AMBEL, IPOSS, and DIGSA beginning to emerge.
	07/09/18		Mostly smooth pigweed rated, but Palmer becoming more prevalent in rep 3.
STATUS	11/29/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

08/06/18: No soybean injury. Plots essentially weed free 100% control of all weeds previously rated.

## Soil-Applied Herbicides fb Roundup + Xtendimax in Soybean

Trial ID: Soy15-18

Location: Field #18

Trial Year: 2018

Protocol ID: Soy15-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Valent

Pest Code	Pest Name				AMAPA
Crop Type, Code		C GLXMA	C GLXMA		PalmerAm
Crop Name		Soybean	Soybean		
Rating Type		Stunting	Stunting		
Rating Unit		%	%		
Rating Date		06/25/18	07/09/18		07/09/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing Appl Code
1	Untreated Check				
2	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	28DAP B 28DAP B 28DAP B 28DAP B	
3	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4.09 SC 0.48 1.33 2.28 4.5 AS 2.9 SL 43.18 L 100 L	0.144 lb ai/a 0.0169 0.047 0.08 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	A PRE 28DAP B 28DAP B 28DAP B 28DAP B	
4	Valor EZ.....flumioxazin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4 SC 4.5 AS 2.9 SL 43.18 L 100 L	0.078 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B	
5	Fierce Premix ----flumioxazin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	76 WG 33.5 42.5 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	A PRE A 28DAP B 28DAP B 28DAP B 28DAP B	
6	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	A PRE A 28DAP B 28DAP B 28DAP B 28DAP B	
7	Authority MTZ Premix ----sulfentrazone ----metribuzin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	45 DF 18 27 4.5 AS 2.9 SL 43.18 L 100 L	0.31 lb ai/a 0.124 0.186 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	A PRE A 28DAP B 28DAP B 28DAP B 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.

Pest Code			AMBEL	IPOSS	GGGAN			
Pest Name		C.ragwd	C -	mornlry	AnnGrass			
Crop Type, Code				C -	C -			
Crop Name			Control	Control	Control			
Rating Type		%	07/09/18	07/09/18	07/09/18			
Rating Unit								
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	0.0 d
2	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	28DAP B 28DAP B 28DAP B 28DAP B		96.7 ab	90.0 b	96.7 abc
3	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4.09 SC 0.48 1.33 2.28 4.5 AS 2.9 SL 43.18 L 100 L	0.144 lb ai/a 0.0169 0.047 0.08 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	28DAP B 28DAP B 28DAP B 28DAP B		96.0 b	93.3 ab	98.7 ab
4	Valor EZ.....flumioxazin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4 SC 4.5 AS 2.9 SL 43.18 L 100 L	0.078 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	28DAP B 28DAP B 28DAP B 28DAP B		96.7 ab	91.0 b	94.3 c
5	Fierce Premix ----flumioxazin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	76 WG 33.5 42.5 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	28DAP B 28DAP B 28DAP B 28DAP B		98.3 ab	91.7 ab	98.0 ab
6	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	28DAP B 28DAP B 28DAP B 28DAP B		98.3 ab	90.7 b	100.0 a
7	Authority MTZ Premix ----sulfentrazone ----metribuzin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	45 DF 18 27 4.5 AS 2.9 SL 43.18 L 100 L	0.31 lb ai/a 0.124 0.186 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	28DAP B 28DAP B 28DAP B 28DAP B		96.7 ab	93.3 ab	96.3 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						C GLXMA Soybean Yield Bu/A 11/01/18	
Pest Name							
Crop Type, Code							
Crop Name							
Rating Type						Soybean Yield Bu/A	
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing Code	
1	Untreated Check						43.6 a
2	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	28DAP B 28DAP B 28DAP B 28DAP B		55.8 a
3	Zidua PRO Premix ----saflufenacil ----imazethapyr ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4.09 SC 0.48 1.33 2.28 4.5 AS 2.9 SL 43.18 L 100 L		0.144 lb ai/a 0.0169 0.047 0.08 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B		47.9 a
4	Valor EZ.....flumioxazin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4 SC 4.5 AS 2.9 SL 43.18 L 100 L		0.078 lb ai/a 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B		58.0 a
5	Fierce Premix ----flumioxazin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	76 WG 33.5 42.5 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 28DAP B 28DAP B 28DAP B 28DAP B		50.9 a
6	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 28DAP B 28DAP B 28DAP B 28DAP B		47.1 a
7	Authority MTZ Premix ----sulfentrazone ----metribuzin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	45 DF 18 27 4.5 AS 2.9 SL 43.18 L 100 L		0.31 lb ai/a 0.124 0.186 1.13 lb ae/a 0.5 lb ae/a 0.5 % v/v 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B		40.7 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						AMAPA
Pest Name						PalmerAm
Crop Type, Code						C -
Crop Name						
Rating Type						Soybean
Rating Unit						Stunting
Rating Date						%
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing
8	Authority Supreme Premix	4.16 SC	0.25 lb ai/a	PRE	A	
	----sulfentrazone	2.08	0.125			
	----pyroxasulfone	2.08	0.125			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B	
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B	
9	Fierce Premix	76 WG	0.178 lb ai/a	PRE	A	
	----flumioxazin	33.5	0.0785			
	----pyroxasulfone	42.5	0.1			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B	
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B	
10	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	28DAP	B	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B	
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B	
11	Warrant.....acetochlor	3 CS	0.94 lb ai/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B	
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B	
12	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A	
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B	
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B	
LSD P=.05					17.41	3.04
Standard Deviation					10.28	2.41
CV					202.22	2.66
Replicate F					0.543	2.544
Replicate Prob(F)					0.5888	0.1014
Treatment F					1.109	422.294
Treatment Prob(F)					0.3993	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			AMBEL	IPOSS	GGGAN
Pest Name			C.ragwd	mornlry	AnnGrass
Crop Type, Code			C -	C -	C -
Crop Name					
Rating Type			Control	Control	Control
Rating Unit			%	%	%
Rating Date			07/09/18	07/09/18	07/09/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
8	Authority Supreme Premix	4.16 SC	0.25 lb ai/a	PRE	A
	----sulfentrazone	2.08	0.125		
	----pyroxasulfone	2.08	0.125		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B
9	Fierce Premix	76 WG	0.178 lb ai/a	PRE	A
	----flumioxazin	33.5	0.0785		
	----pyroxasulfone	42.5	0.1		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B
10	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	28DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B
11	Warrant.....acetochlor	3 CS	0.94 lb ai/a	PRE	A
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B
12	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B
	Intact Drift Retardant	43.18 L	0.5 % v/v	28DAP	B
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B
LSD P=.05				3.79	5.34
Standard Deviation				2.24	3.15
CV				2.5	3.71
Replicate F				9.103	1.125
Replicate Prob(F)				0.0013	0.3427
Treatment F				475.887	216.772
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.

Pest Code							C GLXMA	
Pest Name								
Crop Type, Code								
Crop Name							Soybean	
Rating Type							Yield	
Rating Unit							Bu/A	
Rating Date							11/01/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code	
8	Authority Supreme Premix ----sulfentrazone ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	4.16 SC 2.08 2.08 4.5 AS 2.9 SL 43.18 L 100 L	SC lb ai/a 0.125 0.125 AS lb ae/a 28DAP B SL lb ae/a 28DAP B L % v/v 28DAP B L % v/v 28DAP B	0.25 0.125 0.125 1.13 0.5 0.5 0.25 0.25	lb ai/a ae/a v/v v/v	PRE 28DAP B 28DAP B 28DAP B 28DAP B 28DAP B 28DAP B	A	39.4 a
9	Fierce Premix ----flumioxazin ----pyroxasulfone Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	76 WG 33.5 42.5 4.5 AS 2.9 SL 43.18 L 100 L	WG lb ai/a 0.0785 0.1 AS lb ae/a 28DAP B SL lb ae/a 28DAP B L % v/v 28DAP B L % v/v 28DAP B	0.178 1.13 0.5 0.5 0.25 0.25	lb ai/a ae/a v/v v/v	PRE 28DAP B 28DAP B 28DAP B 28DAP B 28DAP B	A	42.2 a
10	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	SC lb ai/a 0.063 0.08 AS lb ae/a 28DAP B SL lb ae/a 28DAP B L % v/v 28DAP B L % v/v 28DAP B	0.143 1.13 0.5 0.5 0.25 0.25	lb ai/a ae/a v/v v/v	PRE 28DAP B 28DAP B 28DAP B 28DAP B 28DAP B	A	43.6 a
11	Warrant.....acetochlor Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	3 CS 4.5 AS 2.9 SL 43.18 L 100 L	CS lb ai/a 0.94 AS lb ae/a 28DAP B SL lb ae/a 28DAP B L % v/v 28DAP B L % v/v 28DAP B	1.13 0.5 0.5 0.25	lb ai/a ae/a v/v v/v	PRE 28DAP B 28DAP B 28DAP B 28DAP B	A	50.1 a
12	Metribuzin.....metribuzin Valor SX.....flumioxazin Roundup PowerMax..glyphosate Xtendimax.....dicamba Intact Drift Retardant Nonionic Surfactant	75 DF 51 WG 4.5 AS 2.9 SL 43.18 L 100 L	DF WG AS SL L L	0.188 0.064 1.13 0.5 0.5 0.25	lb ai/a lb ai/a lb ae/a lb ae/a % v/v % v/v	PRE PRE 28DAP B 28DAP B 28DAP B 28DAP B	A	49.2 a
LSD P=.05								19.15
Standard Deviation								11.31
CV								23.87
Replicate F								14.852
Replicate Prob(F)								0.0001
Treatment F								0.792
Treatment Prob(F)								0.6457

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

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



**Application Description**

	A	B
Application Date	06/08/18	07/05/18
Appl. Stop Time	08:30 AM	03:30 PM
Application Method	SPRAY	SPRAY
Application Timing	PRE	28DAP
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	76 F	87 F
% Relative Humidity Start, Stop	64	71
Wind Velocity+Dir. Start	2 mph SW	3 mph SW
Wet Leaves (Y/N)	N no	N no
Soil Temperature	76 F	87 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	20	80

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC
Stage Majority, Percent		V3 100
Height Average		5.5 in
Height Minimum, Maximum		5 6

**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		3 m2
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W
Stage Majority, Percent		veg 70
Stage Minimum, Percent		veg 70
Stage Maximum, Percent		run 30
Height Average		4 in
Height Minimum, Maximum		3 5
Density Average		3 m2
Pest 3 Code, Type, Scale	DIGSA W	DIGSA W
Stage Majority, Percent		4-leaf 40
Stage Minimum, Percent		3-leaf 30
Stage Maximum, Percent		1-tir 30
Height Average		4 in
Height Minimum, Maximum		2 5
Density Average		20 m2

**Application Equipment**

	A	B
Appl. Equipment	Tractor	Backpack
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
	07/09/18		Leaf mottling on Engenia treatments.
STATUS	11/29/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

Trial Comments

Engenia Pro Sandy Soils		Trial ID: Soy16-18		Location: Field #18		Trial Year: 2018		
Protocol ID: Soy16-18		Investigator: Mark VanGessel						
Study Director:								
Sponsor Contact: BASF								
Pest Code	Pest Name					AMAPA PalmerAm	AMBEL C.ragwd	MOLVE Carpetwd
Crop Type, Code				C GLXMA	C -	C -	C -	
Crop Name				Soybean Stunting %	Control %	Control %	Control %	
Rating Type				06/25/18	06/25/18	06/25/18	06/25/18	
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Untreated Check							0.0 a
2	Engenia Pro Premix	4.86	SL	0.608	lb ae/a	PRE	A	0.0 a
	----dicamba	4		0.5				
	----pyroxasulfone	0.86		0.108				
	Engenia.....dicamba	5	SL	0.5 lb	ae/a	28DAP	B	
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	28DAP	B	
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	B	
3	Engenia Pro Premix	4.86	SL	0.608	lb ae/a	PRE	A	0.0 a
	----dicamba	4		0.5				
	----pyroxasulfone	0.86		0.108				
	Engenia.....dicamba	5	SL	0.5 lb	ae/a	28DAP	B	
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	28DAP	B	
	Outlook.....dimethenamid-p	6	L	0.47	lb ai/a	28DAP	B	
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	B	
4	Engenia.....dicamba	5	SL	0.5	lb ae/a	PRE	A	0.0 a
	Outlook.....dimethenamid-p	6	L	0.47	lb ai/a	PRE	A	
	Engenia Pro Premix	4.86	SL	0.608	lb ae/a	28DAP	B	
	----dicamba	4		0.5				
	----pyroxasulfone	0.86		0.108				
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	28DAP	B	
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	B	
5	Engenia Pro Premix	4.86	SL	0.608	lb ae/a	PRE	A	0.0 a
	----dicamba	4		0.5				
	----pyroxasulfone	0.86		0.108				
	Engenia Pro Premix	4.86	SL	0.608	lb ae/a	28DAP	B	
	----dicamba	4		0.5				
	----pyroxasulfone	0.86		0.108				
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	28DAP	B	
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	B	
6	Engenia Pro Premix	4.86	SL	0.486	lb ae/a	PRE	A	0.0 a
	----dicamba	4		0.4				
	----pyroxasulfone	0.86		0.086				
	Engenia Pro Premix	4.86	SL	0.486	lb ae/a	28DAP	B	
	----dicamba	4		0.4				
	----pyroxasulfone	0.86		0.086				
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	28DAP	B	
	Nonionic Surfactant	100	L	0.25	% v/v	28DAP	B	
7	Xtendimax.....dicamba	2.9	SL	0.5	lb ae/a	PRE	A	0.0 a
	Warrant.....acetochlor	3	CS	1.13	lb ai/a	PRE	A	
	Xtendimax.....dicamba	2.9	SL	0.5	lb ae/a	28DAP	B	
	Warrant.....acetochlor	3	CS	1.13	lb ai/a	28DAP	B	
	Roundup PowerMax..glyphosate	4.5	AS	1.13	lb ae/a	28DAP	B	
	Nonionic Surfactant	100	L	0.25	% v/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.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code						AMAPA PalmerAm	AMBEL C.ragwd	MOLVE Carpetwd	
Pest Name									
Crop Type, Code					C GLXMA	C -	C -	C -	
Crop Name					Soybean Injury %				
Rating Type					07/09/18	Control %	Control %	Control %	
Rating Unit						07/09/18	07/09/18	07/09/18	
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check								
2	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 100 L	0.608 lb ae/a 0.5 0.108 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B		0.0 a	0.0 d	0.0 b	0.0 d
3	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Outlook.....dimethenamid-p Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 6 L 100 L	0.608 lb ae/a 0.5 0.108 0.5 lb ae/a 1.13 lb ae/a 0.47 lb ai/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B		0.0 a	97.7 ab	97.7 a	100.0 a
4	Engenia.....dicamba Outlook.....dimethenamid-p Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	5 SL 6 L 4.86 SL 4 0.86 4.5 AS 100 L	0.5 lb ae/a 0.47 lb ai/a 0.608 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B		0.0 a	96.0 abc	96.7 a	98.7 ab
5	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.608 lb ae/a 0.5 0.108 0.608 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B		0.3 a	99.3 a	94.3 a	100.0 a
6	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.486 lb ae/a 0.4 0.086 0.486 lb ae/a 0.4 0.086 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B		1.0 a	92.7 c	96.7 a	100.0 a
7	Xtendimax.....dicamba Warrant.....acetochlor Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 3 CS 2.9 SL 3 CS 4.5 AS 100 L	0.5 lb ae/a 1.13 lb ai/a 0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B		0.0 a	95.0 bc	97.7 a	97.0 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.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	IPOSS morngly C -	GGGAN AnnGrass C -	C GLXMA		
Crop Name	Rating Type	Rating Unit	Control % 07/09/18	Control % 07/09/18	Soybean Yield Bu/A 11/01/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check				0.0 c	0.0 c	54.5 a
2	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 100 L	0.608 lb ae/a 0.5 0.108 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B	90.0 b	98.0 a	56.4 a
3	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Outlook.....dimethenamid-p Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 6 L 100 L	0.608 lb ae/a 0.5 0.108 0.5 lb ae/a 1.13 lb ae/a 0.47 lb ai/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B	90.0 b	98.0 a	56.2 a
4	Engenia.....dicamba Outlook.....dimethenamid-p Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	5 SL 6 L 4.86 SL 4 0.86 4.5 AS 100 L	0.5 lb ae/a 0.47 lb ai/a 0.608 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B	90.0 b	97.0 ab	63.2 a
5	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.608 lb ae/a 0.5 0.108 0.608 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B	90.0 b	98.0 a	55.9 a
6	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.486 lb ae/a 0.4 0.086 0.486 lb ae/a 0.4 0.086 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B	90.0 b	97.0 ab	68.1 a
7	Xtendimax.....dicamba Warrant.....acetochlor Xtendimax.....dicamba Warrant.....acetochlor Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 3 CS 2.9 SL 3 CS 4.5 AS 100 L	0.5 lb ae/a 1.13 lb ai/a 0.5 lb ae/a 1.13 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A 28DAP B 28DAP B 28DAP B 28DAP B	90.0 b	96.0 b	56.3 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 1 because error mean square = 0.

## University of Delaware

Pest Code		C	GLXMA	AMAPA PalmerAm	AMBEL C.ragwd	MOLVE Carpetwd
Pest Name				C -	C -	C -
Crop Type, Code						
Crop Name						
Rating Type		Soybean		Control	Control	Control
Rating Unit		Stunting	%	%	%	%
Rating Date		06/25/18	06/25/18	06/25/18	06/25/18	06/25/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
						Code
8	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A	
	Dual Magnum.....s-metolachlor	7.62 E	0.95 lb ai/a	PRE	A	
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B	
	Dual Magnum.....s-metolachlor	7.62 E	0.95 lb ai/a	28DAP	B	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B	
9	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A	
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A	
	Reflex.....fomesafen	2 L	0.375 lb ai/a	28DAP	B	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B	
10	Engenia Pro Premix	4.86 SL	0.61 lb ae/a	PRE	A	
	----dicamba	4	0.5			
	----pyroxasulfone	0.86	0.108			
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A	
	Engenia.....dicamba	5 SL	0.5 lb ae/a	28DAP	B	
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B	
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B	
LSD P=.05			.	11.87	6.29	8.38
Standard Deviation			0.00	6.92	3.67	4.88
CV			0.0	8.33	4.22	5.64
Replicate F			0.000	5.004	0.634	3.793
Replicate Prob(F)			1.0000	0.0187	0.5419	0.0422
Treatment F			0.000	57.022	209.436	118.226
Treatment Prob(F)			1.0000	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.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		C GLXMA	AMAPA PalmerAm	AMBEL C.ragwd	MOLVE Carpetwd						
Crop Type, Code		C -	C -	C -							
Crop Name	Soybean										
Rating Type	Injury										
Rating Unit	%										
Rating Date	07/09/18	Control %	Control %	Control %	07/09/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
8	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A			0.3 a	95.0 bc	94.3 a	98.0 bc
	Dual Magnum.....s-metolachlor	7.62 E	0.95 lb ai/a	PRE	A						
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP	B						
	Dual Magnum.....s-metolachlor	7.62 E	0.95 lb ai/a	28DAP	B						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B						
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B						
9	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A			2.0 a	98.7 a	96.3 a	100.0 a
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A						
	Reflex.....fomesafen	2 L	0.375 lb ai/a	28DAP	B						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B						
10	Engenia Pro Premix	4.86 SL	0.61 lb ae/a	PRE	A			1.0 a	98.3 ab	95.0 a	98.7 ab
	----dicamba	4	0.5								
	----pyroxasulfone	0.86	0.108								
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A						
	Engenia.....dicamba	5 SL	0.5 lb ae/a	28DAP	B						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP	B						
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP	B						
LSD P=.05				1.61		3.37		4.82		1.44	
Standard Deviation				0.94		1.97		2.81		0.84	
CV				201.19		2.26		3.26		0.94	
Replicate F				1.966		0.060		0.522		1.000	
Replicate Prob(F)				0.1689		0.9416		0.6018		0.3874	
Treatment F				1.529		727.762		349.808		4204.873	
Treatment Prob(F)				0.2115		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.  
Could not calculate LSD (% mean diff) for columns 1 because error mean square = 0.

## University of Delaware

Pest Code		IPOSS mornglry	GGGAN AnnGrass				
Pest Name		C -	C -	C GLXMA			
Crop Type, Code							
Crop Name							
Rating Type		Control %	Control %	Soybean Yield			
Rating Unit		07/09/18	07/09/18	Bu/A			
Rating Date				11/01/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate			
				Appl Unit			
				Appl Timing			
				Code			
8	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE A	93.3 ab	98.0 a	57.2 a
	Dual Magnum.....s-metolachlor	7.62 E	0.95 lb ai/a	PRE A			
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	28DAP B			
	Dual Magnum.....s-metolachlor	7.62 E	0.95 lb ai/a	28DAP B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP B			
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP B			
9	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE A	96.7 a	98.0 a	55.5 a
	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE A			
	Reflex.....fomesafen	2 L	0.375 lb ai/a	28DAP B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP B			
10	Engenia Pro Premix	4.86 SL	0.61 lb ae/a	PRE A	90.0 b	97.0 ab	52.5 a
	----dicamba	4	0.5				
	----pyroxasulfone	0.86	0.108				
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE A			
	Engenia.....dicamba	5 SL	0.5 lb ae/a	28DAP B			
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	28DAP B			
	Nonionic Surfactant	100 L	0.25 % v/v	28DAP B			
LSD P=.05					4.30	1.88	15.12
Standard Deviation					2.51	1.10	8.82
CV					3.06	1.25	15.31
Replicate F					1.588	1.000	5.125
Replicate Prob(F)					0.2316	0.3874	0.0173
Treatment F					397.882	2375.028	0.812
Treatment Prob(F)					0.0001	0.0001	0.6119

Means followed by same letter 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.



**Application Description**

	A	B	C
Application Date	06/07/18	07/05/18	07/19/18
Appl. Stop Time	05:00 PM	03:50 PM	09:10 AM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	28DAP	V3
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Air Temperature Start, Stop	73 F	87 F	80 F
% Relative Humidity Start, Stop	58	71	45
Wind Velocity+Dir. Start	1 mph SE	3 mph SW	1 mph NE
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	73 F	87 F	80 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	30	80	30

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC	DESC
Stage Majority, Percent		V3 100	V4 100
Height Average		5.5 in	8 in
Height Minimum, Maximum		5 6	7 9

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMBEL W	AMBEL W	AMBEL W
Stage Majority, Percent		veg 100	veg 100
Height Average		1.5 in	3 in
Height Minimum, Maximum		1 2	2 4
Density Average		2 m2	1 m2
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		veg 65	run 100
Stage Minimum, Percent		veg 65	
Stage Maximum, Percent		run 35	
Height Average		3 in	6 in
Height Minimum, Maximum		2 5	5 8
Density Average		4 m2	1 m2

**Application Equipment**

	A	B	C
Appl. Equipment	Tractor	Backpack	Tractor
Equipment Type	TRMOSP	SPRBAC	TRMOSP
Operation Pressure	40 psi	31 psi	40 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	18 in	20 in
Boom Length	6.7 ft	6 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
Propellant	COMAIR	COMCO2	COMAIR

Context	Date	By	Notes
STATUS	11/29/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

07/03/18: Poor control of lambsquarters with treatments 2, 6, 7, 8. Poor control of common ragweed with treatments 2, 3, 5, 6, 7, 8, 9.

07/12/18: Ratings based on POST control of weeds emerged at time of application. Poor stand of soybeans due to wet conditions at time of planting.

Engenia Pro Medium Soils		Trial ID: Soy17-18		Location: Field #18		Trial Year: 2018					
Protocol ID: Soy17-18		Investigator: Mark VanGessel									
Pest Code	Pest Name									AMAPA PalmerAm	IPOSS morngrly
Crop Type, Code						C GLXMA	C GLXMA		C -	C -	
Crop Name						Soybean Stunting %	Soybean Stunting %		Control %	Control %	
Rating Type						06/20/18	07/03/18		07/03/18	07/03/18	
Rating Unit											
Rating Date											
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	0.0 f	0.0 c
2	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 100 L	SL 4 0.108 5 SL 1.13 lb ae/a 0.25 % v/v	0.61 lb ae/a 0.5 0.5 lb ae/a 21DAP B 21DAP B 21DAP B	PRE A		11.3 a	4.7 bc	86.7 abc	73.3 a	
3	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	SL 4 0.108 SL 4 0.108 1.13 lb ae/a 0.25 % v/v	0.61 lb ae/a 0.5 0.61 lb ae/a 21DAP B 21DAP B 21DAP B	PRE A		8.3 a	2.3 bc	90.7 ab	82.7 a	
4	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	SL 4 0.108 SL 4 0.108 1.13 lb ae/a 0.25 % v/v	0.61 lb ae/a 0.5 0.61 lb ae/a V3 V3	PRE A	C	9.3 a	7.0 ab	94.7 a	80.7 a	
5	Zidua SC.....pyroxasulfone Metribuzin.....metribuzin Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.17 SC 75 DF 4.86 SL 4 0.86 4.5 AS 100 L	SC DF SL 4 0.108 AS L	0.108 lb ai/a 0.188 lb ai/a 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B		8.0 a	11.3 a	92.0 ab	77.5 a	
6	Xtendimax.....dicamba Dual Magnum....s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 4.5 AS 100 L	SL E SL AS L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B		8.0 a	4.7 bc	81.7 bcd	35.0 b	
7	Xtendimax.....dicamba Dual Magnum....s-metolachlor Xtendimax.....dicamba Dual Magnum....s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 7.62 E 4.5 AS 100 L	SL E SL E AS L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 0.95 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B		9.0 a	0.0 c	77.7 cd	40.0 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.

Missing data estimates are included in columns: Yates=1,2,12,13,14,16; Average=4

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

Pest Code Pest Name		MOLVE Carpetwd	DIGSA L.crbgrs								
Crop Type, Code		C -	C -	C GLXMA	C GLXMA						
Crop Name				Soybean	Soybean						
Rating Type		Control	Control	Lf burn	Stunting						
Rating Unit		%	%	%	%						
Rating Date		07/03/18	07/03/18	07/07/18	07/12/18						
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 b	0.0 b
2	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B			90.7 ab	92.3 ab		0.0 b	4.0 b
3	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B			92.3 ab	95.3 a		0.0 b	7.0 ab
4	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A V3 C V3 C			87.3 ab	95.3 a		0.0 b	12.0 a
5	Zidua SC.....pyroxasulfone Metribuzin.....metribuzin Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.17 SC 75 DF 4.86 SL 4 0.86 4.5 AS 100 L	0.108 lb ai/a 0.188 lb ai/a 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B			99.0 a	97.7 a		0.0 b	13.3 a
6	Xtendimax.....dicamba Dual Magnum....s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 4.5 AS 100 L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B			65.0 c	92.0 ab		0.0 b	0.0 b
7	Xtendimax.....dicamba Dual Magnum....s-metolachlor Xtendimax.....dicamba Dual Magnum....s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 7.62 E 4.5 AS 100 L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 0.95 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B 21DAP B			53.3 cd	91.7 ab		0.0 b	6.7 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=1,2,12,13,14,16; Average=4

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

Pest Code	Pest Name		AMAPA PalmerAm	IPOSS mornglry	DIGSA L.crbgrs	AMAPA PalmerAm		
Crop Type, Code			C -	C -	C -	C -		
Crop Name								
Rating Type			Control %	Control %	Control %	Control %		
Rating Unit			07/12/18	07/12/18	07/12/18	08/08/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code		
1	Untreated Check				0.0 b	0.0 e	0.0 b	0.0 c
2	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	100.0 a	93.7 bc	100.0 a	96.7 a
3	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	99.0 a	98.3 ab	100.0 a	100.0 a
4	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A V3 C V3 C				91.2 b
5	Zidua SC.....pyroxasulfone Metribuzin.....metribuzin Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.17 SC 75 DF 4.86 SL 4 0.86 4.5 AS 100 L	0.108 lb ai/a 0.188 lb ai/a 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B	100.0 a	100.0 a	100.0 a	100.0 a
6	Xtendimax.....dicamba Dual Magnum.....s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 4.5 AS 100 L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B	99.0 a	91.3 cd	100.0 a	100.0 a
7	Xtendimax.....dicamba Dual Magnum.....s-metolachlor Xtendimax.....dicamba Dual Magnum.....s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 7.62 E 4.5 AS 100 L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 0.95 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B	100.0 a	88.0 d	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=1,2,12,13,14,16; Average=4

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

Pest Code	Pest Name	Crop Type, Code	IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	IPOSS mornglry C -		
Crop Name	Rating Type	Rating Unit	Control % 08/08/18	Control % 08/08/18	Control % 09/10/18	Control % 09/10/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code		
1	Untreated Check				0.0 d	0.0 b		
2	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	81.7 bc	93.3 a	97.7 a	63.3 bc
3	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	97.3 a	100.0 a	97.7 a	66.7 abc
4	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A V3 C V3 C	81.2 bc	97.0 a	94.3 a	75.0 ab
5	Zidua SC.....pyroxasulfone Metribuzin.....metribuzin Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.17 SC 75 DF 4.86 SL 4 0.86 4.5 AS 100 L	0.108 lb ai/a 0.188 lb ai/a 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	96.0 a	100.0 a	99.0 a	71.7 ab
6	Xtendimax.....dicamba Dual Magnum....s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 4.5 AS 100 L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	93.3 a	100.0 a	97.7 a	73.3 ab
7	Xtendimax.....dicamba Dual Magnum....s-metolachlor Xtendimax.....dicamba Dual Magnum....s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 7.62 E 4.5 AS 100 L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 0.95 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	91.7 a	100.0 a	97.7 a	63.4 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=1,2,12,13,14,16; Average=4

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

Pest Code	Pest Name	Crop Type, Code	DIGSA L.crbgrs C - C	GLXMA					
Crop Name	Rating Type	Rating Unit	Control %	Soybean Yield Bu/A					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Untreated Check				0.0 e		30.4 a		
2	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 5 SL 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	86.7 c		36.6 a		
3	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A 21DAP B 21DAP B 21DAP B	93.3 b		35.2 a		
4	Engenia Pro Premix ----dicamba ----pyroxasulfone Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.86 SL 4 0.86 4.86 SL 4 0.86 4.5 AS 100 L	0.61 lb ae/a 0.5 0.108 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE A V3 C V3 C V3 C	97.0 ab		24.7 a		
5	Zidua SC.....pyroxasulfone Metribuzin.....metribuzin Engenia Pro Premix ----dicamba ----pyroxasulfone Roundup PowerMax..glyphosate Nonionic Surfactant	4.17 SC 75 DF 4.86 SL 4 0.86 4.5 AS 100 L	0.108 lb ai/a 0.188 lb ai/a 0.61 lb ae/a 0.5 0.108 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B	99.0 a		20.2 a		
6	Xtendimax.....dicamba Dual Magnum....s-metolachlor Xtendimax.....dicamba Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 4.5 AS 100 L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B	93.0 b		32.8 a		
7	Xtendimax.....dicamba Dual Magnum....s-metolachlor Xtendimax.....dicamba Dual Magnum....s-metolachlor Roundup PowerMax..glyphosate Nonionic Surfactant	2.9 SL 7.62 E 2.9 SL 7.62 E 4.5 AS 100 L	0.5 lb ae/a 0.95 lb ai/a 0.5 lb ae/a 0.95 lb ai/a 1.13 lb ae/a 0.25 % v/v	PRE PRE 21DAP B 21DAP B 21DAP B 21DAP B	99.0 a		31.6 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.

Missing data estimates are included in columns:Yates=1,2,12,13,14,16; Average=4

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

## University of Delaware

Pest Code		C	GLXMA	C	GLXMA	AMAPA PalmerAm	IPOSS morngrly
Pest Name							
Crop Type, Code						C -	C -
Crop Name							
Rating Type							
Rating Unit							
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
8	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A		
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A		
	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		
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B		
9	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A	11.3 a	0.0 c
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A		
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B		
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	21DAP	B		
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B		
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B		
10	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A	10.7 a	7.3 ab
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A		
	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		
	Reflex.....fomesafen	2 L	0.313 lb ai/a	21DAP	B		
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B		
LSD P=.05				5.10	6.11	12.16	19.25
Standard Deviation				2.96	3.54	7.09	10.58
CV				35.56	89.31	9.5	18.5
Replicate F				0.514	0.098	5.390	0.527
Replicate Prob(F)				0.6072	0.9068	0.0146	0.6060
Treatment F				3.627	3.402	46.729	19.811
Treatment Prob(F)				0.0107	0.0143	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=1,2,12,13,14,16; Average=4

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

## University of Delaware

Pest Code Pest Name	MOLVE Carpetwd	DIGSA L.crbgrs	GLXMA	GLXMA							
Crop Type, Code	C -	C -	C GLXMA	C GLXMA							
Crop Name			Soybean	Soybean							
Rating Type	Control	Control	Lf burn	Stunting							
Rating Unit	%	%	%	%							
Rating Date	07/03/18	07/03/18	07/07/18	07/12/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
8	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A			55.0 cd	79.3 b	0.0 b	4.0 b
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A						
	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						
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B						
9	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A			43.3 d	80.0 b	0.0 b	7.3 ab
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A						
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B						
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	21DAP	B						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B						
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B						
10	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A			83.3 b	84.3 ab	10.7 a	13.3 a
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A						
	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						
	Reflex.....fomesafen	2 L	0.313 lb ai/a	21DAP	B						
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B						
LSD P=.05						13.69	15.04	2.19	7.71		
Standard Deviation						7.98	8.77	1.28	4.49		
CV						11.93	10.85	119.81	66.38		
Replicate F						0.368	0.027	1.000	0.284		
Replicate Prob(F)						0.6974	0.9731	0.3874	0.7560		
Treatment F						43.360	33.056	20.898	3.649		
Treatment Prob(F)						0.0001	0.0001	0.0001	0.0093		

Means followed by same letter 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=1,2,12,13,14,16; Average=4

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

## University of Delaware

Pest Code		AMAPA PalmerAm	IPOSS mornglry	DIGSA L.crbgrs	AMAPA PalmerAm						
Pest Name		C -	C -	C -	C -						
Crop Type, Code											
Crop Name											
Rating Type		Control %	Control %	Control %	Control %						
Rating Unit		07/12/18	07/12/18	07/12/18	08/08/18						
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
8	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A			97.3 a	96.7 ab	100.0 a	100.0 a
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A						
	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						
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B						
9	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A			100.0 a	97.3 ab	100.0 a	100.0 a
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A						
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B						
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	21DAP	B						
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B						
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B						
10	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A			100.0 a	100.0 a	100.0 a	100.0 a
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A						
	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						
	Reflex.....fomesafen	2 L	0.313 lb ai/a	21DAP	B						
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B						
LSD P=.05				2.98	4.89					4.43	
Standard Deviation				1.72	2.83				0.00	2.57	
CV				1.95	3.32				0.0	2.9	
Replicate F				1.211	8.998				0.000	1.982	
Replicate Prob(F)				0.3239	0.0024				1.0000	0.1684	
Treatment F				1110.986	388.331				0.000	444.372	
Treatment Prob(F)				0.0001	0.0001				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=1,2,12,13,14,16; Average=4

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

## University of Delaware

Pest Code		IPOSS mornglry C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	IPOSS mornglry C -
Crop Name		Control %	Control %	Control %	Control %
Rating Type		08/08/18	08/08/18	09/10/18	09/10/18
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
					Appl Timing
8	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A
	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
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B
9	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	21DAP	B
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B
10	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A
	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
	Reflex.....fomesafen	2 L	0.313 lb ai/a	21DAP	B
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B
LSD P=.05			9.78	7.98	4.95
Standard Deviation			5.65	4.63	2.89
CV			7.05	5.28	3.28
Replicate F			1.912	3.534	0.432
Replicate Prob(F)			0.1801	0.0521	0.6560
Treatment F			78.262	134.129	345.365
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=1,2,12,13,14,16; Average=4

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

## University of Delaware

Pest Code		DIGSA							
Pest Name		L.crbgrs							
Crop Type, Code		C -	C GLXMA						
Crop Name			Soybean						
Rating Type		Control	Yield						
Rating Unit		%	Bu/A						
Rating Date		09/10/18	11/01/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
8	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A			80.0 d	36.6 a
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A				
	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				
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B				
9	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	PRE	A			99.0 a	31.8 a
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	PRE	A				
	Xtendimax.....dicamba	2.9 SL	0.5 lb ae/a	21DAP	B				
	Warrant.....acetochlor	3 CS	1.13 lb ai/a	21DAP	B				
	Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	21DAP	B				
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B				
10	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A			99.0 a	28.6 a
	Metribuzin.....metribuzin	75 DF	0.188 lb ai/a	PRE	A				
	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				
	Reflex.....fomesafen	2 L	0.313 lb ai/a	21DAP	B				
	Nonionic Surfactant	100 L	0.25 % v/v	21DAP	B				
LSD P=.05								5.22	12.19
Standard Deviation								3.04	7.10
CV								3.6	23.03
Replicate F								0.680	0.370
Replicate Prob(F)								0.5191	0.6957
Treatment F								299.135	1.619
Treatment Prob(F)								0.0001	0.1835

Means followed by same letter 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=1,2,12,13,14,16; Average=4

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

**Comparison of Residual Herbicides for Early-POST Applications**

Trial ID: Soy18a-19      Location: Field #7      Trial Year: 2019  
 Protocol ID: Soy18-19      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: 01/16/20  
 Initiation Date: 03/01/18  
 Completion Date: 12/01/18

**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	Variety: S42LL63	Attributes: Liberty Link
Planting Date: 05/31/18	Planting Rate: 180000 S/A	Depth: 1 in
Rows per Plot: 7	Planting Method: PLANTD planted	Row Spacing: 15 in
Row Spacing: 15 in	Planting Equipment: FE Field Equipment	Seed Bed: MEDTRA medium/trashy
Soil Temperature: 82 F	Soil Moisture: ABONOR above normal, excessive	Harvest Date: 11/30/18
Emergence Date: 06/04/18	Harvest Equipment: Plot combine	Harvested Width: 6.25 FT
Harvest Date: 11/30/18	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)

**Field Prep./Maintenance:**

Total 14 day preplant application of Roundup Powermax 1 qt/A + Valor SX 2 oz/A + Metribuzin 75WG 4 oz/A second week of May.

**Soil Description**

Description Name: Field 7	% Sand: 79	% OM: 2.1	Texture: LS	loamy sand
	% Silt: 13	pH: 6.2	Soil Name: Rockawalkin loamy sand, 0-2% slopes	
	% Clay: 8	CEC: 5.6	Fert. Level: G	good
Soil Drainage: G	good			

**Application Description**

		A
Application Date	06/21/18	
Appl. Stop Time	01:00 PM	
Application Method	SPRAY	
Application Timing	2nd Trifol	
Application Placement	BROADC	
Applied By	Johnson	
Air Temperature Start, Stop	82 F	
% Relative Humidity Start, Stop	68	
Wind Velocity+Dir. Start	3 mph NW	
Wet Leaves (Y/N)	N no	
Soil Temperature	82 F	
Soil Moisture	NORMAL	
% Cloud Cover	70	

**Crop Stage At Each Application**

		A
Crop 1 Code, BBCH Scale	GLXMA BSOY	
Stage Scale Used	DESC	
Stage Majority, Percent	2-trifol 100	
Height Average	6 in	
Height Minimum, Maximum	5 7	

**Application Equipment**

		A
Appl. Equipment	Tractor	
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	24 in	
Ground Speed	3 mph	
Carrier	WATER	
Application Amount	20 gal/ac	
Propellant	COMAIR	

Context	Date	By	Notes
STATUS	12/13/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

07/12/18: Palmer amaranth and morningglory control based on treatment 2 (Liberty only treatment). Palmer is 2 to 3" tall (4 to 6 lvs) and morningglory are 1 to 2" tall (1 to 2 lvs). Poor control of spurred anoda with treatments 4, 5, 7, 8, 10, 12.

08/03/18: Poor control of spurred anoda with 2, 3, 4, 5, 6, 7, 10.

09/19/18: Palmer amaranth density is very low in rep 3 and if none seen in running check of the plot, it was not rated.

## Comparison of Residual Herbicides for Early-POST Applications

Trial ID: Soy18a-19

Location: Field #7

Trial Year: 2019

Protocol ID: Soy18-19

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code	Crop Type, Code	C GLXMA	C GLXMA	C GLXMA						
Description		Soybean	Soybean	Soybean						
Rating Type		Leaf burn %	Stunting %	Stunting %						
Rating Unit		06/26/18	06/26/18	07/03/18						
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated							0.0 f	0.0 f	0.0 e
2	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A				3.0 e	0.0 f	0.0 e
3	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	4.3 SC 4.174 0.126	0.108 lb ai/a 0.105 0.00316	2nd Trifol A				10.7 b	5.0 cde	10.0 bc
	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A						
4	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				5.7 cd	5.7 c	7.3 cd
5	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.08 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A				7.0 c	5.3 cd	7.0 cd
6	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				14.7 a	13.3 b	12.3 ab
7	Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	2 L 2.34 SL 100 D	0.25 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A				15.3 a	14.0 ab	13.3 ab
8	Prefix Premix ----s-metolachlor ----fomesafen	5.3 E 4.35 0.95	1.33 lb ai/a 1.09 0.238	2nd Trifol A				16.3 a	15.7 a	15.7 a
	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A						
9	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				4.7 de	3.3 de	4.0 de
10	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				4.3 de	3.3 de	2.3 e
11	Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A				0.0 f	3.0 e	0.0 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.

Missing data estimates are included in columns:Yates=5,7,9,10; Average=8

Pest Code Crop Type, Code			AMAPA C - C	GLXMA	AMAPA C - PalmerAm	IPOSS C - mornglry					
Description			PalmerAm	Soybean	PalmerAm						
Rating Type			Control %	Stunting %	Control %	Control %					
Rating Unit			07/03/18	07/12/18	07/12/18	07/12/18					
Rating Date											
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 a
2	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A	96.3 b	0.7 cd	0.0 b	0.0 a			
3	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet	4.3 SC 4.174 0.126	0.108 lb ai/a 0.105 0.00316	2nd Trifol A	99.0 a	10.3 a	100.0 a	23.4 a			
	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A							
4	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	100.0 a	10.3 a	100.0 a	4.8 a			
5	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.08 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A	100.0 a	0.0 d	100.0 a	45.0 a			
6	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	100.0 a	0.0 d	100.0 a	45.0 a			
7	Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	2 L 2.34 SL 100 D	0.25 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A	100.0 a	6.5 ab	66.7 a	16.7 a			
8	Prefix Premix ----s-metolachlor ----fomesafen	5.3 E 4.35 0.95	1.33 lb ai/a 1.09 0.238	2nd Trifol A	100.0 a	5.7 abc	66.7 a	28.3 a			
	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A							
9	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	99.0 a	0.0 d	100.0 a	16.7 a			
10	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	100.0 a	6.3 ab	95.0 a	73.3 a			
11	Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A	100.0 a	2.3 bcd	95.0 a	45.0 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=5,7,9,10; Average=8

Pest Code Crop Type, Code Description			AMAPA C - PalmerAm	IPOSS C - mornglry	AMAPA C - PalmerAm	C GLXMA Soybean		
Rating Type			Control %	Control %	Control %	Yield Bu/A		
Rating Unit			08/03/18	08/03/18	08/03/18	11/30/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing		
1	Untreated							
2	Liberty 280....glufosinate Dry Ammonium Sulfate	2.34 SL 100 D	0.402 lb ai/a 1.2 % w/v	2nd Trifol A	50.0 c	46.7 a	0.0 d	34.5 ab
3	Anthem Maxx Premix ----pyroxasulfone ----fluthiacet Liberty 280....glufosinate Dry Ammonium Sulfate	4.3 SC 4.174 0.126	0.108 lb ai/a 0.105 0.00316	2nd Trifol A	100.0 a	50.0 a	94.7 ab	37.8 ab
4	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	100.0 a	56.7 a	80.3 ab	36.5 ab
5	Zidua.....pyroxasulfone Liberty 280....glufosinate Dry Ammonium Sulfate	85 WG 2.34 SL 100 D	0.08 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A	100.0 a	50.0 a	95.0 ab	41.4 a
6	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	100.0 a	46.7 a	99.0 a	39.1 ab
7	Reflex.....fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	2 L 2.34 SL 100 D	0.25 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A	100.0 a	60.0 a	60.6 bc	33.1 ab
8	Prefix Premix ----s-metolachlor ----fomesafen Liberty 280....glufosinate Dry Ammonium Sulfate	5.3 E 4.35 0.95	1.33 lb ai/a 1.09 0.238	2nd Trifol A	70.0 b	60.0 a	41.2 c	30.7 b
9	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	100.0 a	40.0 a	91.3 ab	40.9 ab
10	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	90.0 a	46.7 a	70.8 abc	33.1 ab
11	Dual II Magnum..s-metolachlor Liberty 280....glufosinate Dry Ammonium Sulfate	7.64 E 2.34 SL 100 D	1 lb ai/a 0.402 lb ai/a 1.2 % w/v	2nd Trifol A	93.3 a	43.3 a	66.4 abc	37.6 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=5,7,9,10; Average=8

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	C GLXMA	C GLXMA				
Description		Soybean	Soybean	Soybean				
Rating Type		Leaf burn %	Stunting %	Stunting %				
Rating Unit								
Rating Date		06/26/18	06/26/18	07/03/18				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
12	Dual II Magnum..s-metolachlor	7.64	E	1 lb	ai/a	2nd	Trifol A	
	Prowl H2O.....pendimethalin	3.8	CS	0.71	lb ai/a	2nd	Trifol A	
	Liberty 280.....glufosinate	2.34	SL	0.402	lb ai/a	2nd	Trifol A	
	Dry Ammonium Sulfate	100	D	1.2	% w/v	2nd	Trifol A	
LSD P=.05				1.85		2.24		4.39
Standard Deviation				1.09		1.33		2.59
CV				14.85		21.79		37.32
Replicate F				2.953		3.983		0.612
Replicate Prob(F)				0.0731		0.0334		0.5512
Treatment F				81.207		48.211		14.182
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=5,7,9,10; Average=8

## University of Delaware

Pest Code Crop Type, Code		AMAPA C - C GLXMA	AMAPA C -	IPOSS C -
Description	PalmerAm	Soybean	PalmerAm	mornglry
Rating Type	Control	Stunting	Control	Control
Rating Unit	%	%	%	%
Rating Date	07/03/18	07/12/18	07/12/18	07/12/18
Trt No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing Appl Code
12 Dual II Magnum..s-metolachlor	7.64 E	1 lb ai/a	2nd	Trifol A
Prowl H2O.....pendimethalin	3.8 CS	0.71 lb ai/a	2nd	Trifol A
Liberty 280.....glufosinate	2.34 SL	0.402 lb ai/a	2nd	Trifol A
Dry Ammonium Sulfate	100 D	1.2 % w/v	2nd	Trifol A
LSD P=.05		2.38	5.43	39.04
Standard Deviation		1.41	3.20	23.06
CV		1.54	73.99	29.96
Replicate F		0.266	3.209	1.824
Replicate Prob(F)		0.7687	0.0608	0.1850
Treatment F		1249.910	5.430	8.154
Treatment Prob(F)		0.0001	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=5,7,9,10; Average=8

## University of Delaware

Pest Code		AMAPA C - PalmerAm	IPOSS C - mornglry	AMAPA C - PalmerAm	C GLXMA Soybean
Rating Type		Control %	Control %	Control %	Yield Bu/A
Rating Unit		08/03/18	08/03/18	08/03/18	11/30/18
Rating Date					
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing	Appl Code
12 Dual II Magnum..s-metolachlor	7.64 E		1 lb ai/a	2nd Trifol A	
Prowl H2O.....pendimethalin	3.8 CS		0.71 lb ai/a	2nd Trifol A	
Liberty 280....glufosinate	2.34 SL		0.402 lb ai/a	2nd Trifol A	
Dry Ammonium Sulfate	100 D		1.2 % w/v	2nd Trifol A	
LSD P=.05			14.21	14.32	36.95
Standard Deviation			7.91	8.38	20.56
CV			8.71	16.45	28.71
Replicate F			0.230	0.000	0.862
Replicate Prob(F)			0.7981	1.0000	0.4491
Treatment F			12.616	2.194	6.232
Treatment Prob(F)			0.0001	0.0675	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=5,7,9,10; Average=8

## University of Delaware

## Comparison of Residual Herbicides for Early-POST Applications

Trial ID: Soy18b-18      Location: E Dukes      Trial Year: 2017  
 Protocol ID: Soy18-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18 Planned Completion Date: 10/31/18

**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  
 Variety: S42LL63  
 Attributes: Liberty Link  
 Planting Date: 06/19/18      Planting Rate: 180000 S/A  
 Depth: 1 in  
 Rows per Plot: 24      Planting Method: PLANTD planted  
 Row Spacing: 15 in      Planting Equipment: FE Field Equipment  
 Seed Bed: MEDTRA medium/trashy  
 Soil Temperature: 89 F      Soil Moisture: NORMAL normal, adequate  
 Emergence Date: 06/25/18  
 % Standard Moisture: 13.0

**Site and Design**

Treated Plot Width: 30 FT      Site Type: FIELD field  
 Treated Plot Length: 200 FT  
 Treated Plot Area: 6000 FT<sup>2</sup> Treatments: 6      Tillage Type: NOTILL no-till  
 Replications: 1      Study Design: RACOBL Randomized Complete Block (RCB)

## Field Prep./Maintenance:

Total 14EPP application Roundup PowerMax 1 qt/A + 2,4-D ester 1 pt/A + Metribuzin 75DF 4 oz/A applied by farm manager. Total POST application of Select Max 16 fl.oz/A + NIS applied 7-27-18 by farm manager.

**Moisture and Weather Conditions**

Overall Moisture Conditions: NORMAL normal  
 Closest Weather Station: UDREC      Distance: 0.6 mi

**Application Description**

	A	B
Application Date	07/09/18	07/19/18
Appl. Stop Time	01:00 PM	10:50 AM
Application Method	SPRAY	SPRAY
Application Timing	2nd Trifol	+10days
Application Placement	BROADC	BROADC
Applied By	Johnson	Johnson
Air Temperature Start, Stop	82 F	80 F
% Relative Humidity Start, Stop	38	45
Wind Velocity+Dir. Start	1 mph NE	1 mph NE
Wet Leaves (Y/N)	N no	N no
Soil Temperature	82 F	80 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	0	30

**Crop Stage At Each Application**

	A	B
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY
Stage Scale Used	DESC	DESC
Stage Majority, Percent	2-trifol 100	3-4 trif 100
Height Average	6 in	9 in
Height Minimum, Maximum	5 7	8 10

**Application Equipment**

	A	B
Appl. Equipment	Tractor	Tractor
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**

08/09/18: Broadleaf weed control was very good for all treatments. Texas panicum control looks good for all treatments. Treatment 2 had a issue (appears to be tank contamination with dicamba) and all soybeans are dead

11/01/18: Plot 1 (Liberty plus Zidua) had very few Palmer amaranth plants (2 to 3 for entire plot), but Palmer plants were same height as the soybeans; 1 Texas panicum plant observed in the whole plot.

Plot 2 (Liberty plus Reflex) all beans gone. No Palmer amaranth observed, but heavy infestation of Texas panicum and common lambsquarters.

Plots 3 through 6 no Palmer amarnath and no Texas panicum in them; excellent treatments.

## Comparison of Residual Herbicides for Early-POST Applications

Trial ID: Soy18b-18

Location: E Dukes

Trial Year: 2017

Protocol ID: Soy18-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code	C GLXMA	C GLXMA	C GLXMA							
Crop Name	Soybean Stunting %	Soybean Chlorosis %	Soybean Twisting %							
Rating Type										
Rating Unit										
Rating Date	07/16/18	07/16/18	07/16/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Zidua.....pyroxasulfone	85	WG	0.106	lb ai/a	2nd	Trifol A	50.0	35.0	70.0
	Liberty 280.....glufosinate	2.34	SL	0.585	lb ai/a	2nd	Trifol A			
	Dry Ammonium Sulfate	100	D	1.2 %	w/v	2nd	Trifol A			
2	Reflex.....fomesafen	2	L	0.375	lb ai/a	2nd	Trifol A	10.0	15.0	0.0
	Liberty 280.....glufosinate	2.34	SL	0.585	lb ai/a	2nd	Trifol A			
	Dry Ammonium Sulfate	100	D	1.2 %	w/v	2nd	Trifol A			
3	Prefix Premix	5.3	E	1.54	lb ai/a	2nd	Trifol A	7.0	20.0	0.0
	----s-metolachlor	4.35		1.26						
	----fomesafen	0.95		0.276						
	Liberty 280.....glufosinate	2.34	SL	0.585	lb ai/a	2nd	Trifol A			
	Dry Ammonium Sulfate	100	D	1.2 %	w/v	2nd	Trifol A			
4	Dual II Magnum..s-metolachlor	7.64	E	1.19	lb ai/a	2nd	Trifol A	0.0	8.0	0.0
	Liberty 280.....glufosinate	2.34	SL	0.585	lb ai/a	2nd	Trifol A			
	Dry Ammonium Sulfate	100	D	1.2 %	w/v	2nd	Trifol A			
5	Dual II Magnum..s-metolachlor	7.64	E	1	lb ai/a	2nd	Trifol A	10.0	12.0	0.0
	Prowl H2O.....pendimethalin	3.8	CS	0.71	lb ai/a	2nd	Trifol A			
	Liberty 280.....glufosinate	2.34	SL	0.585	lb ai/a	2nd	Trifol A			
	Dry Ammonium Sulfate	100	D	1.2 %	w/v	2nd	Trifol A			
6	Liberty 280.....glufosinate	2.34	SL	0.585	lb ai/a	2nd	Trifol A	0.0	0.0	0.0
	Dry Ammonium Sulfate	100	D	1.2 %	w/v	2nd	Trifol A			
	Liberty 280.....glufosinate	2.34	SL	0.585	lb ai/a	+10 days	B			
	Dry Ammonium Sulfate	100	D	1.2 %	w/v	+10 days	B			
LSD P=.05				.	.	.	.	.	.	.
Standard Deviation				.	.	.	.	.	.	.
CV				.	.	.	.	.	.	.

Means followed by same letter 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 1,2,3 because error mean square = 0.

**V-10425 in Conventional Tillage Soybeans**

Trial ID: Soy19-18      Location: Field #18      Trial Year: 2018  
 Protocol ID: Soy19-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Valent

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 11/24/18

**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
Variety: R2C4775	
Attributes: Roundup Ready	
Planting Date: 05/04/18	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: 86 F	Seed Bed: MEDIUM medium
Emergence Date: 05/12/18	Soil Moisture: ABONOR above normal, excessive
Harvest Date: 11/01/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.0	Harvested Width: 6.25 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: 8      Tillage Type: CONTIL conventional-till  
 Replications: 3      Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Total Postemergence application of Roundup PowerMax 1qt/A + Reflex 1.5 pt/A on 6-21-18.

**Soil Description**

Description Name: Field 18B  
 % Sand: 81      % OM: 1.0      Texture: LS      loamy sand  
 % Silt: 12      pH: 6.4      Soil Name: Rosedale loamy sand, 0-2% slopes  
 % Clay: 7      CEC: 4.5      Fert. Level: G      good  
 Soil Drainage: G      good

**Application Description**

	A
Application Date	05/05/18
Appl. Stop Time	12:30 PM
Application Method	SPRAY
Application Timing	PRE
Application Placement	BROADC
Applied By	VanGessl
Air Temperature Start, Stop	85 F
% Relative Humidity Start, Stop	46
Wind Velocity+Dir. Start	2 mph SW
Wet Leaves (Y/N)	N no
Soil Temperature	85 F
Soil Moisture	NORMAL
% Cloud Cover	90

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY

**Application Equipment**

	A
Appl. Equipment	Backpack
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	11/29/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

**Trial Comments**

07/05/18: Treatments include the PRE treatments as well as the POST application of glyphosate plus Reflex. All plots have morningglory seedlings that emerged after the POST applicaiton. Appears to be consistent across all plots(no treatment effect).

## V-10425 in Conventional Tillage Soybeans

Trial ID: Soy19-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: Soy19-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: Valent

Pest Code					AMAPA	IPOSS					
Pest Name					PalmerAm	mornlgy					
Crop Type, Code	C GLXMA	C GLXMA		C -	C -						
Crop Name	Soybean	Soybean									
Rating Type	Stunting	Stunting									
Rating Unit	%	%									
Rating Date	05/24/18	06/02/18		06/02/18	06/02/18	06/02/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1	Untreated Check				0.0	d		0.0	c	0.0	b
2	Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A		13.0	c	2.3	a	71.7
3	Fierce Premix ----flumioxazin ----pyroxasulfone	76 WG 33.5 42.5	0.143 lb ai/a 0.063 0.08	PRE	A		19.0	b	23.3	a	100.0
4	V-10425 2002	1.52 CS	0.143 lb ai/a	PRE	A		19.0	b	23.3	a	100.0
5	V-10425 2078	1.52 CS	0.143 lb ai/a	PRE	A		21.7	ab	21.7	a	100.0
6	V-10425 2079	1.52 CS	0.143 lb ai/a	PRE	A		25.0	a	26.7	a	100.0
7	V-10425 2080	1.52 CS	0.143 lb ai/a	PRE	A		23.3	ab	25.0	a	100.0
8	Spartan.....sulfentrazone	4 F	0.188 lb ai/a	PRE	A		13.0	c	13.0	b	100.0
LSD P=.05					4.58		5.12		.		21.73
Standard Deviation					2.61		2.92		0.00		12.41
CV					15.6		17.29		0.0		18.97
Replicate F					0.128		2.080		0.000		4.471
Replicate Prob(F)					0.8807		0.1618		1.0000		0.0315
Treatment F					28.523		39.056		0.000		13.786
Treatment Prob(F)					0.0001		0.0001		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=7,8

Could not calculate LSD (% mean diff) for columns 3 because error mean square = 0.

Pest Code			AMAPA	IPOSS	DIGSA
Pest Name			PalmerAm	mornlry	L.crbgrs
Crop Type, Code	C GLXMA		C -	C -	C -
Crop Name	Soybean				
Rating Type	Stunting				
Rating Unit	%				
Rating Date	06/15/18		Control %	Control %	Control %
Trt Treatment No.	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1 Untreated Check				0.0 c	0.0 b
2 Valor SX.....flumioxazin	51 WG	0.064 lb ai/a	PRE	A	1.7 c
3 Fierce Premix ----flumioxazin ----pyroxasulfone	76 WG 33.5 42.5	0.143 lb ai/a 0.063 0.08		A	9.7 ab
4 V-10425 2002	1.52 CS	0.143 lb ai/a	PRE	A	15.0 a
5 V-10425 2078	1.52 CS	0.143 lb ai/a	PRE	A	8.7 b
6 V-10425 2079	1.52 CS	0.143 lb ai/a	PRE	A	10.7 ab
7 V-10425 2080	1.52 CS	0.143 lb ai/a	PRE	A	11.3 ab
8 Spartan.....sulfentrazone	4 F	0.188 lb ai/a	PRE	A	2.3 c
LSD P=.05				5.45	5.74
Standard Deviation				3.11	3.28
CV				41.97	13.83
Replicate F			0.430	7.60	15.34
Replicate Prob(F)			0.6588	0.0919	8.54
Treatment F			9.020	319.800	0.6668
Treatment Prob(F)			0.0003	28.349	37.324
				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=7,8

Could not calculate LSD (% mean diff) for columns 3 because error mean square = 0.

Pest Code Pest Name			AMAPA PalmerAm	IPOSS mornlry							
Crop Type, Code	C GLXMA	C -	C -	C GLXMA							
Crop Name	Soybean			Soybean							
Rating Type	Stunting	%	Control	Control	Yield						
Rating Unit	%	07/05/18	%	06/15/18	Bu/A						
Rating Date					11/01/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
1	Untreated Check							0.0 a			44.0 a
2	Valor SX.....flumioxazin	51	WG	0.064	lb ai/a	PRE	A	8.0 a	100.0 a	85.7 a	49.2 a
3	Fierce Premix ----flumioxazin ----pyroxasulfone	76 33.5 42.5	WG	0.143 0.063 0.08	lb ai/a	PRE	A	10.3 a	97.3 a	91.0 a	51.6 a
4	V-10425 2002	1.52	CS	0.143	lb ai/a	PRE	A	8.0 a	100.0 a	90.7 a	48.4 a
5	V-10425 2078	1.52	CS	0.143	lb ai/a	PRE	A	9.0 a	100.0 a	99.0 a	48.9 a
6	V-10425 2079	1.52	CS	0.143	lb ai/a	PRE	A	6.3 a	100.0 a	98.3 a	50.0 a
7	V-10425 2080	1.52	CS	0.143	lb ai/a	PRE	A	5.7 a	100.0 a	94.0 a	51.4 a
8	Spartan.....sulfentrazone	4	F	0.188	lb ai/a	PRE	A	3.3 a	83.3 b	99.0 a	47.3 a
LSD P=.05				7.62		4.77	14.72		10.05		
Standard Deviation				4.35		2.68	8.28		5.74		
CV				68.71		2.75	8.81		11.75		
Replicate F				0.042		1.619	4.264		16.188		
Replicate Prob(F)				0.9592		0.2384	0.0399		0.0002		
Treatment F				1.771		16.133	1.156		0.545		
Treatment Prob(F)				0.1719		0.0001	0.3897		0.7867		

Means followed by same letter 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  
 Could not calculate LSD (% mean diff) for columns 3 because error mean square = 0.

**Palmer Amaranth Control with Enlist Duo**

Trial ID: Soy20-18      Location: Field #3      Trial Year: 2018  
Protocol ID: Soy20-18      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  
Initiation Date: 03/01/18  
Completion Date: 11/30/18

**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

Attributes: Enlist

Planting Date: 06/19/18	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: MEDTRA medium/trashy
Emergence Date: 06/25/18	Soil Moisture: NORMAL normal, adequate
Harvest Date: 11/21/18	Harvest Equipment: Plot combine
% Standard Moisture: 13.0	Harvested Width: 6.25 FT
	Harvested Length: 20 FT

**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

**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 3			
% Sand: 80	% OM: 1.7	Texture: LS	loamy sand
% Silt: 12	pH: 6.3	Soil Name: Rockawalkin loamy sand, 0-2% slopes	
% Clay: 8	CEC: 6.1	Fert. Level: E	excellent
Soil Drainage: G	good		

**Application Description**

	A	B	C
Application Date	06/19/18	07/03/18	07/27/18
Appl. Stop Time	04:30 PM	11:50 AM	02:00 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PRE	<4"Palmer	+7days
Application Placement	BROADC	BROADC	BROADC
Applied By	Johnson	Johnson	Johnson
Air Temperature Start, Stop	85 F	90 F	88 F
% Relative Humidity Start, Stop	70	64	65
Wind Velocity+Dir. Start	3 mph N	1 mph S	1 mph SW
Wet Leaves (Y/N)	N no	Y yes	N no
Soil Temperature	85 F	90 F	88 F
Soil Moisture	NORMAL	NORMAL	WET
% Cloud Cover	90	80	30

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	GLXMA BSOY	GLXMA BSOY	GLXMA BSOY
Stage Scale Used		DESC	DESC
Stage Majority, Percent		1-trif 100	veg 70
Stage Minimum, Percent			veg 70
Stage Maximum, Percent			flower 30
Height Average		4 in	12 in
Height Minimum, Maximum		3 5	10 14

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent		veg 100	
Height Average		4 in	
Height Minimum, Maximum		3 5	
Density Average		4 plot	
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		veg 100	
Height Average		3 in	
Height Minimum, Maximum		2 4	
Density Average		1 m2	

**Application Equipment**

	A	B	C
Appl. Equipment	Tractor	Backpack	Backpack
Equipment Type	TRMOSP	SPRBAC	SPRBAC
Operation Pressure	40 psi	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002
Nozzle Spacing	20 in	18 in	18 in
Boom Length	6.7 ft	6 ft	6 ft
Boom Height	18 in	22 in	30 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	COMCO2	COMCO2

Context	Date	By	Notes
	07/09/18		Injury = leaf burn and/or yellowing. Leaf cupping from PGR drift prominent in first range.
STATUS	12/03/18	Mark VanGes	Automatically added by ARM: Trial Status updated to 'E' when Completion Date entered.

## Trial Comments

07/27/18: Very few weeds in plots to be treated.

Palmer Amaranth Control with Enlist Duo					
Trial ID: Soy20-18	Location: Field #3		Trial Year: 2018		
Protocol ID: Soy20-18	Investigator: Mark VanGessel				
Study Director:					
Sponsor Contact: Corteva					

Pest Code	Crop Type, Code	C	GLXMA	AMAPA C -	IPOSS C -	MOLVE C -
Description						
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 d	0.0 c
2	Surveil Premix ----cloransulam ----flumioxazin	48 12 36	WG 0.021 0.063	0.084 lb ai/a	PRE	A
3	Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Enlist Duo Premix ----2,4-D choline ----glyphosate	48 12 36 3.34 1.63 1.71 3.34 1.63 1.71	WG 0.021 0.063 SL 0.95 1 SL 0.95 1	0.084 lb ai/a 1.95 lb ae/a <4" 1.95 lb ae/a +21 days	PRE A	8.3 bc
4	Surveil Premix ----cloransulam ----flumioxazin Enlist One.....2,4-D choline Durango DMA.....glyphosate Enlist One.....2,4-D choline Durango DMA.....glyphosate	48 12 36 3.8 4 3.8 4	WG 0.021 0.063 SL 0.95 SL 0.95 SL 1 lb ae/a <4" 1 lb ae/a +21 days	0.084 lb ai/a 1.95 lb ae/a <4" 1.95 lb ae/a +21 days	PRE A	6.7 cd
5	Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Liberty 280.....glufosinate	48 12 36 2.34 2.34	WG 0.021 0.063 SL 0.475 lb ai/a <4"	0.084 lb ai/a 1.95 lb ae/a <4" 1.95 lb ae/a +21 days	PRE A	8.3 bc
6	Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Liberty 280.....glufosinate	48 12 36 3.34 1.63 1.71 2.34	WG 0.021 0.063 SL 0.95 1 SL 0.475 lb ai/a +21 days	0.084 lb ai/a 1.95 lb ae/a <4" 1.95 lb ae/a +21 days	PRE A	6.7 cd
7	Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Enlist Duo Premix ----2,4-D choline ----glyphosate	48 12 36 2.34 3.34 1.63 1.71	WG 0.021 0.063 SL 0.475 lb ai/a <4" 1.95 lb ae/a +21 days	0.084 lb ai/a 1.95 lb ae/a <4" 1.95 lb ae/a +21 days	PRE A	3.3 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=7,8,9

Pest Code Crop Type, Code	DIGSA C - L.crbgrs Control % 07/09/18	AMAPA C - PalmerAm Control % 10/10/18	C GLXMA Soybean Yield lb/plot 11/21/18
Trt Treatment No. Name	Form Conc Form Type Rate Rate Unit Unit Appl Timing Appl Code		
1 Untreated Check		0.0 c	0.0 c
2 Surveil Premix ----cloransulam ----flumioxazin	48 WG 0.084 lb ai/a 12 0.021 36 0.063	PRE A 97.7 b	6.793 a 68.3 b
3 Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Enlist Duo Premix ----2,4-D choline ----glyphosate	48 WG 0.084 lb ai/a 12 0.021 36 0.063 3.34 SL 1.95 lb ae/a <4"Palmer B 1.63 0.95 1.71 1 3.34 SL 1.95 lb ae/a +21 days C 1.63 0.95 1.71 1	PRE A 100.0 a	7.067 a 99.0 a
4 Surveil Premix ----cloransulam ----flumioxazin Enlist One.....2,4-D choline Durango DMA.....glyphosate Enlist One.....2,4-D choline Durango DMA.....glyphosate	48 WG 0.084 lb ai/a 12 0.021 36 0.063 3.8 SL 0.95 lb ae/a <4"Palmer B 4 SL 1 lb ae/a <4"Palmer B 3.8 SL 0.95 lb ae/a +21 days C 4 SL 1 lb ae/a +21 days C	PRE A 100.0 a	4.493 a 99.0 a
5 Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Liberty 280.....glufosinate	48 WG 0.084 lb ai/a 12 0.021 36 0.063 2.34 SL 0.475 lb ai/a <4"Palmer B 2.34 SL 0.475 lb ai/a +21 days C	PRE A 100.0 a	4.090 a 99.0 a
6 Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Liberty 280.....glufosinate	48 WG 0.084 lb ai/a 12 0.021 36 0.063 3.34 SL 1.95 lb ae/a <4"Palmer B 1.63 0.95 1.71 1 2.34 SL 0.475 lb ai/a +21 days C	PRE A 100.0 a	7.600 a 96.0 a
7 Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Enlist Duo Premix ----2,4-D choline ----glyphosate	48 WG 0.084 lb ai/a 12 0.021 36 0.063 2.34 SL 0.475 lb ai/a <4"Palmer B 3.34 SL 1.95 lb ae/a +21 days C 1.63 0.95 1.71 1	PRE A 100.0 a	6.820 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=7,8,9

Pest Code	Crop Type, Code		C GLXMA	C GLXMA				
Description			Soybean moisture %	Soybean Yield Bu/A				
Rating Type				11/21/18				
Rating Unit								
Rating Date								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code		
1	Untreated Check						16.40 a	37.8 a
2	Surveil Premix ----cloransulam ----flumioxazin	48 12 36	WG 0.084 lb ai/a 0.021 0.063		PRE	A	16.80 a	38.6 a
3	Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Enlist Duo Premix ----2,4-D choline ----glyphosate	48 12 36 3.34 SL 1.63 1.71 3.34 SL 1.63 1.71	WG 0.084 lb ai/a 0.021 0.063 1.95 lb ae/a <4"Palmer B 0.95 1 1.95 lb ae/a +21 days C 0.95 1		PRE	A	16.83 a	39.2 a
4	Surveil Premix ----cloransulam ----flumioxazin Enlist One.....2,4-D choline Durango DMA.....glyphosate Enlist One.....2,4-D choline Durango DMA.....glyphosate	48 12 36 3.8 SL 4 SL 3.8 SL 4 SL	WG 0.084 lb ai/a 0.021 0.063 0.95 lb ae/a <4"Palmer B 1 lb ae/a <4"Palmer B 0.95 lb ae/a +21 days C 1 lb ae/a +21 days C		PRE	A	16.80 a	24.9 a
5	Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Liberty 280.....glufosinate	48 12 36 2.34 SL 2.34 SL	WG 0.084 lb ai/a 0.021 0.063 0.475 lb ai/a <4"Palmer B 0.475 lb ai/a +21 days C		PRE	A	16.60 a	22.7 a
6	Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Liberty 280.....glufosinate	48 12 36 3.34 SL 1.63 1.71 2.34 SL	WG 0.084 lb ai/a 0.021 0.063 1.95 lb ae/a <4"Palmer B 0.95 1 0.475 lb ai/a +21 days C		PRE	A	16.70 a	42.3 a
7	Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Enlist Duo Premix ----2,4-D choline ----glyphosate	48 12 36 2.34 SL 3.34 SL 1.63 1.71	WG 0.084 lb ai/a 0.021 0.063 0.475 lb ai/a <4"Palmer B 1.95 lb ae/a +21 days C 0.95 1		PRE	A	16.87 a	37.8 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=7,8,9

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	AMAPA C -	IPOSS C -	MOLVE C -				
Description	Soybean Imjury %	PalmerAm Control %	mornlry Control %	Carpetwd Control %					
Rating Type	07/09/18	07/09/18	07/09/18	07/09/18					
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
8	Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Prefix Premix ----s-metolachlor ----fomesafen	48 WG 12 36 3.34 SL 1.63 1.71 5.3 E 4.35 0.95	0.084 lb ai/a 0.021 0.063 1.95 lb ae/a <4" 0.95 1 1.33 lb ai/a <4" 1.09 0.238	PRE Palmer B <4" 0.95 1 <4" <4" 0.95 0.238	A	40.0 a	95.7 a	100.0 a	100.0 a
9	Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Dual Magnum.....s-metolachlor	48 WG 12 36 3.34 SL 1.63 1.71 7.62 E	0.084 lb ai/a 0.021 0.063 1.95 lb ae/a <4" 0.95 1 0.95 lb ai/a <4"	PRE Palmer B <4" 0.95 1 <4"	A	8.3 bc	93.3 a	100.0 a	100.0 a
10	Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Prefix Premix ----s-metolachlor ----fomesafen Enlist One.....2,4-D choline	48 WG 12 36 2.34 SL 5.3 E 4.35 0.95 3.8 SL	0.084 lb ai/a 0.021 0.063 0.475 lb ai/a <4" 1.33 lb ai/a <4" 1.09 0.238 0.95 lb ae/a <4"	PRE Palmer B <4" <4" 0.95 0.238 0.95 lb ae/a <4"	A	40.0 a	97.7 a	100.0 a	98.3 ab
11	Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Dual Magnum.....s-metolachlor Enlist One.....2,4-D choline	48 WG 12 36 2.34 SL 7.62 E 3.8 SL	0.084 lb ai/a 0.021 0.063 0.475 lb ai/a <4" 0.95 lb ai/a <4" 0.95 lb ae/a <4"	PRE Palmer B <4" <4" 0.95 lb ae/a <4"	A	15.0 b	97.7 a	99.3 a	100.0 a
12	Surveil Premix ----cloransulam ----flumioxazin Enlist One.....2,4-D choline Liberty 280.....glufosinate Enlist One.....2,4-D choline Liberty 280.....glufosinate	48 WG 12 36 3.8 SL 2.34 SL 3.8 SL 2.34 SL	0.084 lb ai/a 0.021 0.063 0.95 lb ae/a <4" 0.475 lb ai/a <4" 0.95 lb ae/a +21 days 0.475 lb ai/a +21 days	PRE Palmer B <4" <4" +21 days +21 days	C	6.7 cd	97.0 a	100.0 a	100.0 a
LSD P=.05						8.06	9.57	19.87	4.76
Standard Deviation						4.76	5.65	11.74	2.81
CV						39.86	6.6	13.4	3.09
Replicate F						0.398	2.053	1.027	0.616
Replicate Prob(F)						0.6762	0.1523	0.3747	0.5492
Treatment F						24.858	76.173	19.886	312.856
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=7,8,9

## University of Delaware

Pest Code Crop Type, Code	DIGSA C - L.crbgrs Control % 07/09/18	AMAPA C - PalmerAm Control % 10/10/18	C GLXMA Soybean Yield lb/plot 11/21/18			
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Timing	Appl Code			
8 Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Prefix Premix ----s-metolachlor ----fomesafen	48 WG 12 36 3.34 SL 1.63 1.71 5.3 E 4.35 0.95	0.084 lb ai/a 0.021 0.063 1.95 lb ae/a <4" Palmer B 0.95 1 1.33 lb ai/a <4" Palmer B 1.09 0.238	PRE A	100.0 a	97.0 a	5.933 a
9 Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Dual Magnum.....s-metolachlor	48 WG 12 36 3.34 SL 1.63 1.71 7.62 E	0.084 lb ai/a 0.021 0.063 1.95 lb ae/a <4" Palmer B 0.95 1 0.95 lb ai/a <4" Palmer B	PRE A	100.0 a	99.0 a	7.243 a
10 Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Prefix Premix ----s-metolachlor ----fomesafen Enlist One.....2,4-D choline	48 WG 12 36 2.34 SL 5.3 E 4.35 0.95 3.8 SL	0.084 lb ai/a 0.021 0.063 0.475 lb ai/a <4" Palmer B 1.33 lb ai/a <4" Palmer B 1.09 0.238 0.95 lb ae/a <4" Palmer B	PRE A	100.0 a	94.3 a	8.663 a
11 Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Dual Magnum.....s-metolachlor Enlist One.....2,4-D choline	48 WG 12 36 2.34 SL 7.62 E 3.8 SL	0.084 lb ai/a 0.021 0.063 0.475 lb ai/a <4" Palmer B 0.95 lb ai/a <4" Palmer B 0.95 lb ae/a <4" Palmer B	PRE A	100.0 a	99.0 a	4.927 a
12 Surveil Premix ----cloransulam ----flumioxazin Enlist One.....2,4-D choline Liberty 280.....glufosinate Enlist One.....2,4-D choline Liberty 280.....glufosinate	48 WG 12 36 3.8 SL 2.34 SL 3.8 SL 2.34 SL	0.084 lb ai/a 0.021 0.063 0.95 lb ae/a <4" Palmer B 0.475 lb ai/a <4" Palmer B 0.95 lb ae/a +21 days C 0.475 lb ai/a +21 days C	PRE A	100.0 a	97.7 a	5.880 a
LSD P=.05 Standard Deviation CV				1.98 1.17 1.28	8.26 4.88 5.59	4.1866 2.4656 38.7
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				1.000 0.3840 1829.943 0.0001	2.017 0.1570 104.542 0.0001	3.120 0.0651 0.896 0.5591

Means followed by same letter 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=7,8,9

## University of Delaware

Pest Code Crop Type, Code		C GLXMA	C GLXMA		
Description		Soybean moisture %	Soybean Yield Bu/A		
Rating Type					
Rating Unit					
Rating Date		11/21/18	11/21/18		
Trt Treatment No. Name	Form Conc Type Rate	Rate Unit	Appl Timing Appl Code		
8 Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Prefix Premix ----s-metolachlor ----fomesafen	48 WG 12 36 3.34 SL 1.63 1.71 5.3 E 4.35 0.95	0.084 lb ai/a 0.021 0.063 1.95 lb ae/a <4"Palmer B 0.95 1 1.33 lb ai/a <4"Palmer B 1.09 0.238	PRE A	16.57 a	33.0 a
9 Surveil Premix ----cloransulam ----flumioxazin Enlist Duo Premix ----2,4-D choline ----glyphosate Dual Magnum.....s-metolachlor	48 WG 12 36 3.34 SL 1.63 1.71 7.62 E	0.084 lb ai/a 0.021 0.063 1.95 lb ae/a <4"Palmer B 0.95 1 0.95 lb ai/a <4"Palmer B	PRE A	16.77 a	40.2 a
10 Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Prefix Premix ----s-metolachlor ----fomesafen Enlist One.....2,4-D choline	48 WG 12 36 2.34 SL 5.3 E 4.35 0.95 3.8 SL	0.084 lb ai/a 0.021 0.063 0.475 lb ai/a <4"Palmer B 1.33 lb ai/a <4"Palmer B 1.09 0.238 0.95 lb ae/a <4"Palmer B	PRE A	16.60 a	48.2 a
11 Surveil Premix ----cloransulam ----flumioxazin Liberty 280.....glufosinate Dual Magnum.....s-metolachlor Enlist One.....2,4-D choline	48 WG 12 36 2.34 SL 7.62 E 3.8 SL	0.084 lb ai/a 0.021 0.063 0.475 lb ai/a <4"Palmer B 0.95 lb ai/a <4"Palmer B 0.95 lb ae/a <4"Palmer B	PRE A	16.53 a	27.4 a
12 Surveil Premix ----cloransulam ----flumioxazin Enlist One.....2,4-D choline Liberty 280.....glufosinate Enlist One.....2,4-D choline Liberty 280.....glufosinate	48 WG 12 36 3.8 SL 2.34 SL 3.8 SL 2.34 SL	0.084 lb ai/a 0.021 0.063 0.95 lb ae/a <4"Palmer B 0.475 lb ai/a <4"Palmer B 0.95 lb ae/a +21 days C 0.475 lb ai/a +21 days C	PRE A	16.60 a	32.7 a
LSD P=.05 Standard Deviation CV				0.649 0.382 2.29	23.17 13.65 38.52
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				0.694 0.5105 0.422 0.9290	3.163 0.0630 0.905 0.5520

Means followed by same letter 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=7,8,9

## PRE Herbicide Programs for HR Common Ragweed

Trial ID: Soy23-18

Location: Dorchester Co. Trial Year: 2016

Protocol ID: Soy23-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

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

Attributes: Xtend

Planting Date: 06/29/18

Depth: 1 in

Planting Method: DRILLE drilled

Row Spacing: 15 in

Planting Equipment: FE Field Equipment

Seed Bed: MEDTRA medium/trashy

Soil Temperature: 90 F

Soil Moisture: ABONOR above normal, excessive

Emergence Date: 07/04/18

**Pest Description**

Pest 1 Type: W Code: AMBEL Ambrosia artemisiifolia

Common Name: Common ragweed

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: 16 Tillage Type: NOTILL no-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

## Field Prep./Maintenance:

Total Preemergence application of Roundup PowerMax 1 qt/A + Liberty 280 1 qt/A on 5-30-18. Total Postemergence application of Roundup PowerMax 1 qt/A + Xtendimax 22 fl.oz/A + Dual Magnum 1.25 pt/A on 7-10-18.

**Application Description**

	A
Application Date	05/30/18
Appl. Stop Time	11:30 AM
Application Method	SPRAY
Application Timing	PREPLA
Application Placement	BROSOI
Applied By	VanGessel
Air Temperature Start, Stop	77 F
% Relative Humidity Start, Stop	74
Wind Velocity+Dir. Start	11 MPH E
Wet Leaves (Y/N)	N no
Soil Temperature	77 F
Soil Moisture	WET
% Cloud Cover	65

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY

**Pest Stage At Each Application**

	A
Pest 1 Code, Type, Scale	AMBEL W

**Application Equipment**

	A
Appl. Equipment	Backpack
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

## Trial Comments

07/10/18: Soys planted 10 days earlier and at the unifoliate stage. Ragweed density is not uniform. Study was sprayed immediately after rating with glyphosate (1qt) plus Xtendimax (22 fl oz) plus Dual (1.25 pts).

08/01/18: Ratings less than 90% involve weeds not controlled with Xtendimax(as well as new emergence), while ratings over 90% are due to emergence after the POST application.

## PRE Herbicide Programs for HR Common Ragweed

Trial ID: Soy23-18

Location: Dorchester Co. Trial Year: 2016

Protocol ID: Soy23-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Pest Code	Pest Name	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				0.0 e	0.0 f	84.5 a
2	Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	PRE	A	95.7 a	73.3 abc
3	Spartan.....sulfentrazone	4 F	0.25 lb ai/a	PRE	A	70.0 cd	60.0 cd
4	Tricor DF.....metribuzin	75 DF	0.14 lb ai/a	PRE	A	70.0 cd	45.0 e
5	Tricor DF.....metribuzin	75 DF	0.234 lb ai/a	PRE	A	70.0 cd	70.0 a-d
6	Linex.....linuron	4 L	0.875 lb ai/a	PRE	A	70.0 cd	63.3 bcd
7	Command.....clomazone	3 ME	0.47 lb ai/a	PRE	A	68.3 cd	56.7 de
8	Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	PRE	A	77.3 bc	68.3 a-d
	Tricor DF.....metribuzin	75 DF	0.234 lb ai/a	PRE	A		93.3 a
9	Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	PRE	A	94.7 a	80.0 a
	Linex.....linuron	4 L	0.875 lb ai/a	PRE	A		95.7 a
10	Valor SX.....flumioxazin	51 WG	0.096 lb ai/a	PRE	A	87.7 ab	75.0 ab
	Command.....clomazone	3 ME	0.47 lb ai/a	PRE	A		93.3 a
11	Spartan.....sulfentrazone	4 F	0.25 lb ai/a	PRE	A	90.2 a	69.7 a-d
	Tricor DF.....metribuzin	75 DF	0.234 lb ai/a	PRE	A		91.3 a
12	Spartan.....sulfentrazone	4 F	0.25 lb ai/a	PRE	A	68.3 cd	60.0 cd
	Linex.....linuron	4 L	0.875 lb ai/a	PRE	A		88.0 a
13	Spartan.....sulfentrazone	4 F	0.25 lb ai/a	PRE	A	75.0 c	66.7 a-d
	Command.....clomazone	3 ME	0.47 lb ai/a	PRE	A		100.0 a
14	Tricor DF.....metribuzin	75 DF	0.234 lb ai/a	PRE	A	76.7 bc	68.3 a-d
	Linex.....linuron	4 L	0.875 lb ai/a	PRE	A		87.7 a
15	Tricor DF.....metribuzin	75 DF	0.234 lb ai/a	PRE	A	61.7 d	56.7 de
	Command.....clomazone	3 ME	0.47 lb ai/a	PRE	A		86.0 a
16	Linex.....linuron	4 L	0.875 lb ai/a	PRE	A	73.3 cd	60.0 cd
	Command.....clomazone	3 ME	0.47 lb ai/a	PRE	A		89.3 a
LSD P=.05					11.86	14.82	15.57
Standard Deviation					7.10	8.87	9.31
CV					9.89	14.59	10.31
Replicate F					1.064	1.480	0.908
Replicate Prob(F)					0.3583	0.2442	0.4147
Treatment F					27.940	12.769	0.982
Treatment Prob(F)					0.0001	0.0001	0.4977

Means followed by same letter 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

Comparison of Zidua Formulations Early Postemergence in Soybean  
 Trial ID: Soy25-18 Location: Field #18 Trial Year: 2018  
 Protocol ID: Soy25-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18 Planned Completion Date: 10/31/18

**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
Variety: R2C4775	
Attributes: Roundup Ready	
Planting Date: 05/04/18	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: 86 F	Seed Bed: MEDIUM medium
Emergence Date: 05/12/18	Soil Moisture: ABONOR above normal, excessive
% Standard Moisture: 13.0	Harvest Equipment: Plot combine
	Harvested Width: 6.25 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>	Tillage Type: CONTIL conventional-till
Replications: 4	Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 18B			
% Sand: 81	% OM: 1.0	Texture: LS	loamy sand
% Silt: 12	pH: 6.4	Soil Name: Rosedale loamy sand, 0-2% slopes	
% Clay: 7	CEC: 4.5	Fert. Level: G	good
Soil Drainage: G	good		

**Application Description**

	A
Application Date	06/05/18
Appl. Stop Time	10:45 AM
Application Method	SPRAY
Application Timing	POST
Application Placement	BROADC
Applied By	Johnson
Air Temperature Start, Stop	74 F
% Relative Humidity Start, Stop	49
Wind Velocity+Dir. Start	4 mph SW
Wet Leaves (Y/N)	N no
Soil Temperature	74 F
Soil Moisture	NORMAL
% Cloud Cover	5

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	GLXMA BSOY
Stage Scale Used	DESC
Stage Majority, Percent	V2-3 100
Height Average	5 in
Height Minimum, Maximum	4 6

**Application Equipment**

	A
Appl. Equipment	Tractor
Equipment Type	TRMOSP
Operation Pressure	40 psi
Nozzle Type	AIRMIX
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

Trial Comments

## Comparison of Zidua Formulations Early Postemergence in Soybean

Trial ID: Soy25-18 Location: Field #18 Trial Year: 2018

Protocol ID: Soy25-18 Investigator: Mark VanGessel

Study Director:

Sponsor Contact:

Crop Type, Code	C GLXMA Soybean LfPuckr %	C GLXMA Soybean Stunting %	C GLXMA Soybean Stunting %	C GLXMA Soybean Stunting %
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Timing
1 Untreated Check				
Roundup PowerMax..glyphosate	4.5 AS	1.13 lb ae/a	POST	0.0 c
2 Roundup PowerMax..glyphosate Zidua.....pyroxasulfone	4.5 AS 85 WG	1.13 lb ae/a 0.106 lb ai/a	POST	10.3 b
3 Roundup PowerMax..glyphosate Zidua SC.....pyroxasulfone	4.5 AS 4.17 SC	1.13 lb ae/a 0.114 lb ai/a	POST	16.0 a
LSD P=.05				2.14
Standard Deviation				1.24
CV				14.13
Replicate F				2.527
Replicate Prob(F)				0.1539
Treatment F				171.982
Treatment Prob(F)				0.0001
				2.45
				1.41
				26.52
				127.82
				8.85
				5.11
				45.93
				4.83
				2.79
				0.979
				0.4628
				17.114
				0.0033
				0.213
				0.8842
				2.305
				0.1808

Means followed by same letter 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 4-18      Location: Trial Year: 2018  
 Protocol ID: Bean 4-18      Investigator: Kurt Vollmer  
                                     Study Director: Kurt Vollmer  
                                     Sponsor Contact:

**General Trial Information**

Study Director: Kurt Vollmer  
 Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Trial Status: E established  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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

Variety: Cypress

Planting Date: 06/21/18  
 Depth: 0.75 in

Planting Rate: 4 P/FT

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 in

Planting Equipment: FE Field Equipment

Soil Temperature: 81 F

Seed Bed: MEDIUM medium

Emergence Date: 06/26/18

Soil Moisture: NORMAL normal, adequate

Harvest Date: 09/05/18

Harvest Equipment: By Hand

Harvested Width: 5 ft

Harvested Length: 20 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 4

% Sand: 79	% OM: 1.1	Texture: LS	loamy sand
% Silt: 13	pH: 6.6	Soil Name: Hammonton loamy sand, 0-2% slopes	
% Clay: 8	CEC: 5.7	Fert. Level: G	good

Soil Drainage: F fair

**Application Description**

	A	B	C	D
Application Date	06/21/18	07/11/18	07/19/18	07/27/18
Appl. Stop Time	04:00 PM	09:30 AM	10:00 AM	11:45 AM
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PREPRE	3WAP	4WAP	5WAP
Application Placement	BROSOI	BROFOL	BROFOL	BROFOL
Applied By	Johnson	Johnson	Johnson	Vollmer, K.
Air Temperature Start, Stop	79 F	82 F	80 F	81 F
% Relative Humidity Start, Stop	74	55	45	76
Wind Velocity+Dir. Start	10.4 MPH NE	3 mph N	1 mph NE	7 MPH W
Wet Leaves (Y/N)	N no	N no	N no	N no
Soil Temperature	79 F	82	80 F	81 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	100	20	30	76
Next Moisture Occurred On	06/22/18			

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	PHSLU BVBE	PHSLU BVBE	PHSLU BVBE	PHSLU BVBE

**Application Equipment**

	A	B	C	D
Appl. Equipment	Tractor	Tractor	Tractor	Backpack
Equipment Type	TRMOSP	TRMOSP	TRMOSP	SPRBAC
Operation Pressure	40 psi	40 psi	40 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002	11002
Nozzle Spacing	20 in	20 in	20 in	18 in
Boom Length	10 ft	10 ft	10 ft	9 ft
Boom Height	18 in	30 in	40 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	COMAIR	COMAIR	COMAIR	COMCO2

Context	Date	By	Notes
STATUS	12/12/18	Kurt Vollme	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

**SE Definitions**

	1.
Crop Type, Code	C

Trial Comments

## Lima Bean Response to Different POST Timings of Dual

Trial ID: Bean 4-18

Location:

Trial Year: 2018

Protocol ID: Bean 4-18

Investigator: Kurt Vollmer

Study Director: Kurt Vollmer

Sponsor Contact:

Pest Code Pest Name		AMAPA PalmerAm	AMAPA PalmerAm	MOLVE Carpetwd	MOLVE Carpetwd	DIGSA L.crbgrs
Crop Type, Code		C -	C -	C -	C -	C -
Crop Name Rating Type		Control	Counts	Control	Counts	Counts
Rating Unit Rating Date		% 07/06/18	#/m2 07/06/18	% 07/06/18	#/m2 07/06/18	#/m2 07/06/18
Trt Treatment No. Name	Form Conc Rate	Form Type Rate	Rate Unit	Appl Timing Appl Code		
1 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	92.0 a-d	0.0 b
2 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	88.8 b-e	0.0 b
3 Dual Magnum Dual Magnum 5 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.714 lb ai/a	PRE POST 5 WAP	A B B	85.0 c-f	0.0 b
4 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	91.8 a-d	0.0 b
5 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	78.3 f	0.3 b
6 Dual Magnum Dual Magnum 5 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.95 lb ai/a	PRE POST 5 WAP	A B B	93.3 abc	0.0 b
7 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	95.3 ab	0.0 b
8 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	91.3 a-d	0.0 b
9 Dual Magnum Dual Magnum 5 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.714 lb ai/a	PRE POST 5 WAP	A B B	96.8 ab	0.0 b
10 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	96.3 ab	0.0 b
11 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	83.3 def	0.0 b
12 Dual Magnum Dual Magnum 5 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.95 lb ai/a	PRE POST 5 WAP	A B B	94.0 abc	0.0 b
13 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	87.5 b-f	0.0 b
14 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	92.0 a-d	0.5 b
					96.3 ab	1.5 b
						0.0 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.

Missing data estimates are included in columns: Yates=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

Pest Code		AMAPA	MOLVE	DIGSA								
Pest Name		PalmerAm	Carpetwd	L.crbgrs								
Crop Type, Code	C PHSLU	C -	C -	C -	C PHSLU							
Crop Name	Lima bean				Lima bean							
Rating Type	Injury	Counts	Counts	Counts	Inury							
Rating Unit	%	#/m2	#/m2	#/m2	%							
Rating Date	07/13/18	07/13/18	07/13/18	07/13/18	07/19/18							
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			2.5 a	0.0 b	0.0 b	0.0 b	18.0 cd
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B							
	3 wk			3 WAP	B							
2	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.0 a	0.0 b	0.0 b	0.0 b	6.0 fgh
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B							
	4 wk			4 WAP	B							
3	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.0 a	0.0 b	0.0 b	0.0 b	11.3 def
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B							
	5 wk			5 WAP	B							
4	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			2.5 a	0.0 b	0.0 b	0.3 b	36.3 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B							
	3 wk			3 WAP	B							
5	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.8 a	0.3 b	0.0 b	0.0 b	11.0 def
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B							
	4 wk			4 WAP	B							
6	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.0 a	0.0 b	0.0 b	0.0 b	8.8 ef
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B							
	5 wk			5 WAP	B							
7	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			2.5 a	0.0 b	0.0 b	0.0 b	25.0 c
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B							
	3 wk			3 WAP	B							
8	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.0 a	0.3 b	0.0 b	0.0 b	8.0 efg
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B							
	4 wk			4 WAP	B							
9	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.0 a	0.0 b	0.0 b	0.0 b	8.0 efg
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B							
	5 wk			5 WAP	B							
10	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.8 a	0.0 b	0.0 b	0.0 b	37.5 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B							
	3 wk			3 WAP	B							
11	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.0 a	0.0 b	0.0 b	0.0 b	13.8 de
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B							
	4 wk			4 WAP	B							
12	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.0 a	0.0 b	0.0 b	0.0 b	6.8 e-h
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B							
	5 wk			5 WAP	B							
13	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			0.0 a	0.0 b	0.0 b	0.0 b	7.5 efg
14	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			0.0 a	0.0 b	0.0 b	0.0 b	6.8 e-h

Means followed by same letter 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

Pest Code Pest Name			AMAPA PalmerAm	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs
Crop Type, Code		C -	C -	C -	C -	C -
Crop Name Rating Type	WeedCovr		Count	Count	Count	Count
Rating Unit Rating Date	% 07/19/18	#/m2 07/19/18	#/m2 07/19/18	#/m2 07/19/18	#/m2 07/19/18	#/m2 07/19/18
Trt No. Treatment Name	Form Conc Type	Rate Rate	Appl Unit	Appl Timing	Appl Code	
1 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	5.3 b	0.0 b
2 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	3.5 b	0.0 b
3 Dual Magnum Dual Magnum 5 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.714 lb ai/a	PRE POST 5 WAP	A B B	4.3 b	0.0 b
4 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	3.0 b	0.0 b
5 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 b	0.0 b
6 Dual Magnum Dual Magnum 5 wk	7.62 EC 7.62 EC	0.95 lb ai/a 0.95 lb ai/a	PRE POST 5 WAP	A B B	3.3 b	0.0 b
7 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	3.3 b	0.0 b
8 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	2.5 b	0.0 b
9 Dual Magnum Dual Magnum 5 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.714 lb ai/a	PRE POST 5 WAP	A B B	5.8 b	0.0 b
10 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 b	0.0 b
11 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	4.0 b	0.0 b
12 Dual Magnum Dual Magnum 5 wk	7.62 EC 7.62 EC	1.19 lb ai/a 0.95 lb ai/a	PRE POST 5 WAP	A B B	4.5 b	0.0 b
13 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	2.0 b	0.0 b
14 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	5.3 b	0.0 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.

Missing data estimates are included in columns: Yates=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

Pest Code Pest Name		AMAPA PalmerAm	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	
Crop Type, Code		C -	C -	C -	C -	C PHSLU
Crop Name		Count	Count	Count	Count	Lima bean
Rating Type		#/m2	#/m2	#/m2	#/m2	Injury %
Rating Unit		07/26/18	07/26/18	07/26/18	07/26/18	07/27/18
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	

Means followed by same letter 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

Pest Code	Pest Name		AMAPA PalmerAm		AMAPA PalmerAm	GGGAN AnnGrass
Crop Type, Code			C -	C PHSLU	C -	C -
Crop Name				Sieva bean Injury %		
Rating Type			Control %	08/06/18	Control %	Control %
Rating Unit					08/06/18	08/06/18
Rating Date			07/27/18			
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	

Means followed by same letter 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

Pest Code			AMAPA			
Pest Name			Palmer amaranth			
Crop Type, Code			C -	C PHSLU		C PHSLU
Crop Name				Lima bean		Lima bean
Rating Type			Cts ab cnpv	plump		plump
Rating Unit			#/plot	#/4 plnt		% of tot
Rating Date			08/06/18	09/05/18		09/05/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	

Means followed by same letter 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	C PHSLU	C PHSLU	C PHSLU	C PHSLU	
Crop Name	Rating Type	Rating Unit	Lima bean plump wt. g	Lima bean flat #/4 plnt	Lima bean flat % of tot	Lima bean flat wt. g	
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	103.50	abc	1.0 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B			
	3 wk			3 WAP B			
2	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	99.75	abc	0.3 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B			
	4 wk			4 WAP B			
3	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	157.03	a	0.0 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B			
	5 wk			5 WAP B			
4	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	151.50	a	0.0 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B			
	3 wk			3 WAP B			
5	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	156.00	a	0.3 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B			
	4 wk			4 WAP B			
6	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	163.75	a	1.5 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B			
	5 wk			5 WAP B			
7	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	94.25	abc	0.0 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B			
	3 wk			3 WAP B			
8	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	118.75	abc	1.3 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B			
	4 wk			4 WAP B			
9	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	97.25	abc	1.8 b
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST B			
	5 wk			5 WAP B			
10	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	143.00	ab	0.5 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B			
	3 wk			3 WAP B			
11	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	98.75	abc	0.0 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B			
	4 wk			4 WAP B			
12	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	38.25	c	0.3 b
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST B			
	5 wk			5 WAP B			
13	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE A	67.25	bc	0.3 b
14	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE A	39.50	c	0.3 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	C PHSLU Lima bean dry % of tot 09/05/18	C PHSLU Lima bean dry #/4 plnt 09/05/18	C PHSLU Lima bean dry wt. g 09/05/18	C PHSLU Lima bean total #/4 plnt 09/05/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		56.8058430791 c	50.5 de	102.75 bc	83.0 c
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
	3 wk			3 WAP	B					
2	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		68.6851469085 abc	85.5 a-d	144.50 abc	117.8 ab
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
	4 wk			4 WAP	B					
3	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		62.6922379767 bc	86.0 a-d	133.25 abc	132.3 a
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
	5 wk			5 WAP	B					
4	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		64.0448331645 abc	83.5 a-d	136.25 abc	130.0 ab
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
	3 wk			3 WAP	B					
5	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		62.1120807437 c	74.8 bcd	125.50 abc	124.3 ab
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
	4 wk			4 WAP	B					
6	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		61.1985428374 c	65.8 bcd	112.50 abc	116.0 abc
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
	5 wk			5 WAP	B					
7	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		76.4006453676 abc	101.8 ab	159.50 ab	134.8 a
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
	3 wk			3 WAP	B					
8	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		72.3074004157 abc	89.5 abc	147.75 abc	129.0 ab
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
	4 wk			4 WAP	B					
9	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		73.0846686060 abc	84.3 a-d	133.25 abc	115.5 abc
	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
	5 wk			5 WAP	B					
10	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		58.2076312058 c	53.8 cd	89.50 c	97.3 bc
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
	3 wk			3 WAP	B					
11	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		72.1503708825 abc	95.3 ab	145.75 abc	132.5 a
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
	4 wk			4 WAP	B					
12	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		87.0617018687 a	96.3 ab	143.75 abc	108.5 abc
	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
	5 wk			5 WAP	B					
13	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		76.9295441530 abc	75.0 bcd	115.75 abc	97.0 bc
14	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		74.0083171108 abc	82.0 a-d	150.50 abc	97.5 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

Pest Code						
Pest Name						
Crop Type, Code						
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	
	3 wk			3 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	
	4 wk			4 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	
	5 wk			5 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	

Means followed by same letter 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## University of Delaware

Pest Code Pest Name	AMAPA PalmerAm	AMAPA PalmerAm	MOLVE Carpetwd	MOLVE Carpetwd	DIGSA L.crbgrs
Crop Type, Code	C -	C -	C -	C -	C -
Crop Name Rating Type	Control	Counts	Control	Counts	Counts
Rating Unit Rating Date	% 07/06/18	#/m2 07/06/18	% 07/06/18	#/m2 07/06/18	#/m2 07/06/18
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit	Appl Timing Appl Code		
15 Dual Magnum Dual Magnum	7.62 EC 7.62 EC	0.95 lb ai/a 2.38 lb ai/a	PRE A 3 WAP B	81.3 ef	0.0 b
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 A 4 WAP B 4 WAP B	92.3 a-d	0.0 b
17 Weed Free		100.0 a	0.0 b	100.0 a	0.0 b
18 untreated		0.0 g	17.0 a	0.0 c	8.0 a
LSD P=.05 Standard Deviation CV		9.82 6.92 8.09	4.49 3.16 320.52	4.37 3.08 3.3	2.33 1.64 303.36
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)		2.626 0.0603 40.701 0.0001	0.876 0.4595 6.402 0.0001	2.980 0.0399 229.737 0.0001	1.980 0.1286 5.318 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.

Missing data estimates are included in columns:Yates=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## University of Delaware

Pest Code Pest Name	C PHSLU	AMAPA PalmerAm	MOLVE Carpetwd	DIGSA L.crbgrs	
Crop Type, Code	C -	C -	C -	C PHSLU	
Crop Name	Lima bean	Counts	Counts	Counts	Lima bean
Rating Type	Injury				Inury
Rating Unit	%	#/m2	#/m2	#/m2	%
Rating Date	07/13/18	07/13/18	07/13/18	07/13/18	07/19/18
Trt Treatment No. Name	Form Form Conc Type	Rate Rate Unit	Appl Appl Timing Code		
15 Dual Magnum Dual Magnum	7.62 EC 7.62 EC	0.95 lb ai/a 2.38 lb ai/a	PRE A 3 WAP B	3.0 a	0.0 b
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 A 4 WAP B 4 WAP B	0.8 a	0.0 b
17 Weed Free				0.0 a	0.0 b
18 untreated				0.0 a	22.8 a
LSD P=.05 Standard Deviation CV				2.47 1.74 246.02	4.90 3.45 267.19
Replicate F Replicate Prob(F) Treatment F Treatment Prob(F)				1.07 0.75 362.22 0.0001	1.19 0.84 501.37 0.0082
					7.47 5.27 35.5 0.180 0.9093 27.757 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA PalmerAm	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs								
Pest Name													
Crop Type, Code	C -	C -	C -	C -	C -								
Crop Name	WeedCovr	Count	Count	Count	Count								
Rating Type													
Rating Unit	%	#/m2	#/m2	#/m2	#/m2								
Rating Date	07/19/18	07/19/18	07/19/18	07/19/18	07/19/18								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code						
15	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			3.3 b	0.0 b	0.0 a	0.0 b	0.0 b	
	Dual Magnum	7.62 EC	2.38 lb ai/a	3	WAP B								
16	Local Standard							1.3 b	0.0 b	0.0 a	0.0 b	0.0 b	
	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							2.3 b	0.0 b	0.0 a	0.0 b	0.0 b	
18	untreated							78.8 a	2.0 a	0.3 a	2.8 a	0.8 a	
LSD P=.05				5.48		0.55		0.17		1.07		0.32	
Standard Deviation				3.86		0.39		0.12		0.75		0.23	
CV				49.72		342.73		902.94		493.93		541.6	
Replicate F				0.118		1.062		0.990		1.000		1.000	
Replicate Prob(F)				0.9493		0.3736		0.4053		0.4005		0.4005	
Treatment F				84.656		5.885		0.967		2.951		2.455	
Treatment Prob(F)				0.0001		0.0001		0.5074		0.0015		0.0070	

Means followed by same letter 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## University of Delaware

Pest Code Pest Name	AMAPA PalmerAm	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	
Crop Type, Code	C -	C -	C -	C -	C PHSLU
Crop Name	Count	Count	Count	Count	Lima bean
Rating Type	#/m2	#/m2	#/m2	#/m2	Injury %
Rating Unit	07/26/18	07/26/18	07/26/18	07/26/18	07/27/18
Rating Date					
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Rate Appl Unit	Appl Timing	Appl Code	
15 Dual Magnum Dual Magnum	7.62 EC 7.62 EC	0.95 lb ai/a 2.38 lb ai/a	PRE 3	A WAP B	0.0 a 0.0 b 0.0 b 18.8 abc
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	A WAP B	0.0 a 0.0 a 0.0 b 0.0 b 21.3 ab
17 Weed Free					0.0 a 0.0 a 0.0 b 0.0 b 0.0 f
18 untreated					1.5 a 0.0 a 6.8 a 1.3 a 0.0 f
LSD P=.05		0.80	.	2.15	0.42
Standard Deviation		0.56	0.00	1.52	0.30
CV		673.3	0.0	389.75	427.08
Replicate F		1.000	0.000	0.919	1.000
Replicate Prob(F)		0.4005	1.0000	0.4384	0.4005
Treatment F		1.588	0.000	4.394	3.947
Treatment Prob(F)		0.1027	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.

Missing data estimates are included in columns:Yates=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## University of Delaware

Pest Code Pest Name		AMAPA PalmerAm		AMAPA PalmerAm	GGGAN AnnGrass								
Crop Type, Code		C -	C PHSLU	C -	C -								
Crop Name			Sieva bean										
Rating Type		Control %	Injury %	Control %	Control %								
Rating Unit													
Rating Date		07/27/18	08/06/18	08/06/18	08/06/18								
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code						
15	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	88.8	abc	0.0	a	79.0	bc	100.0	a
	Dual Magnum	7.62 EC	2.38 lb ai/a	3	WAP B								
16	Local Standard	7.62 EC	1.43 lb ai/a	PRE	A	90.0	abc	0.0	a	84.5	bc	100.0	a
	Dual Magnum												
	Sandea	75 DF	0.031 lb ai/a	4	WAP B								
	nonionic surfactant	100 L	0.25 % v/v	4	WAP B								
17	Weed Free					93.8	a	0.0	a	100.0	a	100.0	a
18	untreated					0.0	e	0.0	a	0.0	d	25.0	b
LSD P=.05						13.08		2.93		14.97		17.47	
Standard Deviation						9.21		2.07		10.54		12.31	
CV						11.51		190.63		14.06		12.98	
Replicate F						4.947		1.602		4.475		1.422	
Replicate Prob(F)						0.0043		0.2003		0.0073		0.2472	
Treatment F						20.035		1.814		14.218		8.102	
Treatment Prob(F)						0.0001		0.0521		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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## University of Delaware

Pest Code		AMAPA							
Pest Name		Palmer amaranth							
Crop Type, Code		C - C	PHSLU	C PHSLU					
Crop Name		Lima bean		Lima bean					
Rating Type		plump		plump					
Rating Unit		#/plot		% of tot					
Rating Date		08/06/18	09/05/18	09/05/18					
Trt No.	Treatment Name	Form Conc	Rate	Appl Unit	Appl Timing	Code			
15	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A	0.8 cd	24.0 b-e	21.8053144455 b-e
	Dual Magnum	7.62 EC	2.38 lb	ai/a	3 WAP	B			
16	Local Standard	7.62 EC	1.43 lb	ai/a	PRE	A	1.5 bcd	24.5 b-e	18.9838991184 cde
	Dual Magnum	75 DF	0.031 lb	ai/a	4 WAP	B			
	Sandeal nonionic surfactant	100 L	0.25 %	v/v	4 WAP	B			
17	Weed Free						0.3 d	19.5 cde	14.1877350575 de
18	untreated						20.0 a	22.8 b-e	56.2980825523 a
LSD P=.05			2.90		23.99		21.98136112783		
Standard Deviation			2.04		16.90		15.48445424099		
CV			67.38		52.89			51.75	
Replicate F			2.574		30.621			25.550	
Replicate Prob(F)			0.0645		0.0001			0.0001	
Treatment F			18.456		1.924			2.015	
Treatment Prob(F)			0.0001		0.0371			0.0279	

Means followed by same letter 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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

University of Delaware

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 OSL.

Mean comparisons performed only when AOV Treatment (1) is Missing data estimates are included in columns: Yates=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## University of Delaware

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	C PHSLU Lima bean dry % of tot 09/05/18	C PHSLU Lima bean dry #/4 plnt 09/05/18	C PHSLU Lima bean dry wt. g 09/05/18	C PHSLU Lima bean total #/4 plnt 09/05/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing				
15	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		77.9342788609 abc	89.0 a-d	142.25 abc	113.3 abc
	Dual Magnum	7.62 EC	2.38 lb ai/a	3	WAP B					
16	Local Standard	7.62 EC	1.43 lb ai/a	PRE	A		79.9068765382 abc	103.3 ab	112.33 abc	129.0 ab
	Dual Magnum	75 DF	0.031 lb ai/a	4	WAP B					
	Sandea nonionic surfactant	100 L	0.25 % v/v	4	WAP B					
17	Weed Free						85.8122749437 ab	119.3 a	172.75 a	138.8 a
18	untreated						23.2051305248 d	12.3 e	25.25 d	41.8 d
LSD P=.05							23.69327339623	38.64	61.833	34.31
Standard Deviation							16.69038625905	27.22	43.558	24.17
CV							24.37	33.85	34.19	21.34
Replicate F							22.028	9.480	2.097	1.693
Replicate Prob(F)							0.0001	0.0001	0.1122	0.1801
Treatment F							2.972	3.089	2.278	3.865
Treatment Prob(F)							0.0014	0.0009	0.0122	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=12,13,25

Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## University of Delaware

Pest Code	C	PHSLU					
Pest Name		Lima bean					
Crop Type, Code		Yield					
Crop Name		kg/20 ft					
Rating Type							
Rating Unit							
Rating Date		09/05/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
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
16	Local Standard						1.095 abc
	Dual Magnum	7.62	EC	1.43	lb ai/a	PRE	A
	Sandea	75	DF	0.031	lb ai/a	4 WAP	B
	nonionic surfactant	100	L	0.25	% v/v	4 WAP	B
17	Weed Free						1.168 abc
18	untreated						0.250 d
LSD P=.05							0.2690
Standard Deviation							0.1895
CV							17.61
Replicate F							23.246
Replicate Prob(F)							0.0001
Treatment F							5.899
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=12,13,25  
 Could not calculate LSD (% mean diff) for columns 17 because error mean square = 0.

## Lima Bean Response to Different POST Timings of Dual

Trial ID: Bean 4-18

Location:

Trial Year: 2018

Protocol ID: Bean 4-18

Investigator: Kurt Vollmer

Study Director: Kurt Vollmer

Sponsor Contact:

Pest Code Pest Name	AMAPA PalmerAm	AMAPA PalmerAm	MOLVE Carpetwd	MOLVE Carpetwd
Crop Type, Code	C -	C -	C -	C -
Crop Name				
Rating Type	Control %	Counts #/m2	Control %	Counts #/m2
Rating Unit	07/06/18	07/06/18	07/06/18	07/06/18
Rating Date				
Trt Treatment	Form Form	Rate Appl	Appl	
No. Name	Conc Type Rate	Unit Timing	Code	
<b>TABLE OF R MEANS</b>				
Replicate 1		88.1	0.1	99.4
Replicate 2		88.4	0.0	97.8
Replicate 3		94.8	0.0	99.1
Replicate 4		90.7	0.0	99.4
<b>TABLE OF A (PRE treatment) MEANS</b>				
1 Dual Magnum	7.62 EC	0.95 lb ai/a PRE	A	88.2 b
2 Dual Magnum	7.62 EC	1.19 lb ai/a PRE	A	92.8 a
LSD P=.05				4.55
Standard Deviation				7.75
CV				8.57
<b>TABLE OF B (POST treatment) MEANS</b>				
1 Dual Magnum	7.62 EC	0.714 lb ai/a POST	B	91.5 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a POST	B	89.5 a
LSD P=.05				4.55
Standard Deviation				7.75
CV				8.57
<b>TABLE OF C (POST Timing) MEANS</b>				
1 3 wk		3 WAP B		93.8 a
2 4 wk		4 WAP B		85.4 b
3 5 wk		5 WAP B		92.3 a
LSD P=.05				5.58
Standard Deviation				7.75
CV				8.57
<b>TABLE OF A (PRE treatment) B (POST treatment) MEANS</b>				
1 Dual Magnum	7.62 EC	0.95 lb ai/a PRE	A	88.6 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	94.4 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	87.8 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	91.2 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a POST	B	
LSD P=.05				6.44
Standard Deviation				7.75
CV				8.57
<b>TABLE OF A (PRE treatment) C (POST Timing) MEANS</b>				
1 Dual Magnum	7.62 EC	0.95 lb ai/a PRE	A	91.9 a
1 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.

Pest Code Pest Name	DIGSA L.crbgrs	AMAPA PalmerAm	MOLVE Carpetwd
Crop Type, Code	C -	C PHSLU	C -
Crop Name	Counts	Lima bean	Counts
Rating Type	#/m <sup>2</sup>	Injury %	#/m <sup>2</sup>
Rating Unit	07/06/18	07/13/18	07/13/18
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	0.0	0.2
Replicate 2	0.0	1.3	0.0
Replicate 3	0.0	1.8	0.0
Replicate 4	0.0	0.0	0.0
TABLE OF A (PRE treatment) MEANS			
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.0 a	1.0 a	0.0 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	0.0 a	0.5 a	0.0 a
LSD P=.05	.	0.79	0.11
Standard Deviation	0.00	1.35	0.19
CV	0.00	179.79	467.10
TABLE OF B (POST treatment) MEANS			
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	0.0 a	0.8 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	0.0 a	0.7 a	0.0 a
LSD P=.05	.	0.79	0.11
Standard Deviation	0.00	1.35	0.19
CV	0.00	179.79	467.10
TABLE OF C (POST Timing) MEANS			
1 3 wk                    3 WAP B	0.0 a	2.1 a	0.0 a
2 4 wk                    4 WAP B	0.0 a	0.2 b	0.1 a
3 5 wk                    5 WAP B	0.0 a	0.0 b	0.0 a
LSD P=.05	.	0.97	0.14
Standard Deviation	0.00	1.35	0.19
CV	0.00	179.79	467.10
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	0.8 a	0.0 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	0.8 a	0.1 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	1.1 a	0.1 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	0.3 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B			
LSD P=.05	.	1.12	0.16
Standard Deviation	0.00	1.35	0.19
CV	0.00	179.79	467.10
TABLE OF A (PRE treatment) C (POST Timing) MEANS			
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 1 3 wk                    3 WAP B	0.0 a	2.5 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.

Pest Code Pest Name	DIGSA L.crbgrs	C -	C PHSLU Lima bean Inury %	C -	AMAPA PalmerAm
Crop Type, Code					
Crop Name					
Rating Type					
Rating Unit	Counts #/m <sup>2</sup>				
Rating Date	07/13/18		07/19/18	07/19/18	07/19/18
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code					
TABLE OF R MEANS					
Replicate 1	0.0	15.4	4.3	0.0	
Replicate 2	0.0	16.1	4.3	0.0	
Replicate 3	0.0	17.0	3.3	0.0	
Replicate 4	0.1	14.9	3.8	0.0	
TABLE OF A (PRE treatment) MEANS					
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.0 a	15.2 a	4.0 a	0.0 a	
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	0.0 a	16.5 a	3.8 a	0.0 a	
LSD P=.05	0.08	3.26	1.90	0.01	
Standard Deviation	0.14	5.56	3.24	0.02	
CV	692.82	35.06	82.63	703.56	
TABLE OF B (POST treatment) MEANS					
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	0.0 a	12.7 b	4.1 a	0.0 a	
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	0.0 a	19.0 a	3.8 a	0.0 a	
LSD P=.05	0.08	3.26	1.90	0.01	
Standard Deviation	0.14	5.56	3.24	0.02	
CV	692.82	35.06	82.63	703.56	
TABLE OF C (POST Timing) MEANS					
1 3 wk 3 WAP B	0.1 a	29.2 a	3.6 a	0.0 a	
2 4 wk 4 WAP B	0.0 a	9.7 b	3.8 a	0.0 a	
3 5 wk 5 WAP B	0.0 a	8.7 b	4.4 a	0.0 a	
LSD P=.05	0.10	4.00	2.33	0.02	
Standard Deviation	0.14	5.56	3.24	0.02	
CV	692.82	35.06	82.63	703.56	
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	11.8 a	4.3 a	0.0 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	13.7 a	3.8 a	0.0 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	0.1 a	18.7 a	3.8 a	0.0 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	19.3 a	3.8 a	0.0 a	
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B					
LSD P=.05	0.12	4.62	2.69	0.02	
Standard Deviation	0.14	5.56	3.24	0.02	
CV	692.82	35.06	82.63	703.56	
TABLE OF A (PRE treatment) C (POST Timing) MEANS					
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.1 a	27.1 a	4.1 a	0.0 a	
1 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.

Pest Code Pest Name	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm
Crop Type, Code	C -	C -	C -	C -
Crop Name				
Rating Type				
Rating Unit	Count #/m2	Count #/m2	Count #/m2	Count #/m2
Rating Date	07/19/18	07/19/18	07/19/18	07/26/18
Trt Treatment	Form Form	Rate Appl	Appl	
No. Name	Conc Type	Rate Unit	Timing	Code
<b>TABLE OF R MEANS</b>				
Replicate 1		0.0	0.0	0.0
Replicate 2		0.0	0.0	0.0
Replicate 3		0.0	0.0	0.0
Replicate 4		0.0	0.0	0.0
<b>TABLE OF A (PRE treatment) MEANS</b>				
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		0.00		
Standard Deviation		0.00	0.00	0.00
CV		-703.56	0.00	0.00
<b>TABLE OF B (POST treatment) MEANS</b>				
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		0.00		
Standard Deviation		0.00	0.00	0.00
CV		-703.56	0.00	0.00
<b>TABLE OF C (POST Timing) MEANS</b>				
1 3 wk		3 WAP B		
2 4 wk		4 WAP B		
3 5 wk		5 WAP B		
LSD P=.05		0.00		
Standard Deviation		0.00	0.00	0.00
CV		-703.56	0.00	0.00
<b>TABLE OF A (PRE treatment) B (POST treatment) MEANS</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
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		0.00		
Standard Deviation		0.00	0.00	0.00
CV		-703.56	0.00	0.00
<b>TABLE OF A (PRE treatment) C (POST Timing) MEANS</b>				
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A
1 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.

Pest Code Pest Name	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	
Crop Type, Code	C -	C -	C -	C PHSU
Crop Name	Count	Count	Count	Lima bean
Rating Type	#/m2	#/m2	#/m2	Injury %
Rating Unit	07/26/18	07/26/18	07/26/18	07/27/18
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	0.0	0.0	10.3
Replicate 2	0.0	0.1	0.0	17.9
Replicate 3	0.0	0.0	0.0	11.3
Replicate 4	0.0	0.0	0.0	19.2
TABLE OF A (PRE treatment) MEANS				
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.0 a	0.0 a	0.0 a	16.3 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	0.0 a	0.0 a	0.0 a	13.0 a
LSD P=.05	.	0.08	.	5.45
Standard Deviation	0.00	0.14	0.00	9.28
CV	0.00	692.82	0.00	63.37
TABLE OF B (POST treatment) MEANS				
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	0.0 a	0.0 a	0.0 a	11.2 b
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	0.0 a	0.0 a	0.0 a	18.1 a
LSD P=.05	.	0.08	.	5.45
Standard Deviation	0.00	0.14	0.00	9.28
CV	0.00	692.82	0.00	63.37
TABLE OF C (POST Timing) MEANS				
1 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	12.5 b
2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	22.2 a
3 5 wk 5 WAP B	0.0 a	0.1 a	0.0 a	9.3 b
LSD P=.05	.	0.10	.	6.68
Standard Deviation	0.00	0.14	0.00	9.28
CV	0.00	692.82	0.00	63.37
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	0.0 a	0.0 a	10.8 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	0.0 a	0.1 a	0.0 a	11.5 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	0.0 a	0.0 a	21.7 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	0.0 a	0.0 a	14.6 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B				
LSD P=.05	.	0.12	.	7.71
Standard Deviation	0.00	0.14	0.00	9.28
CV	0.00	692.82	0.00	63.37
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	0.0 a	0.0 a	14.4 a
1 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.

Pest Code Pest Name		AMAPA PalmerAm		AMAPA PalmerAm
Crop Type, Code		C -	C PHSLU	C -
Crop Name			Sieva bean	
Rating Type		Control	Injury %	Control
Rating Unit		%	08/06/18	%
Rating Date		07/27/18	08/06/18	08/06/18
Trt Treatment	Form Form	Rate	Appl	Appl
No. Name	Conc Type	Rate	Unit	Timing Code
<b>TABLE OF R MEANS</b>				
Replicate 1		76.7	0.5	71.2
Replicate 2		81.0	2.8	74.0
Replicate 3		88.8	1.8	85.3
Replicate 4		85.8	1.5	79.5
<b>TABLE OF A (PRE treatment) MEANS</b>				
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		5.73	1.47	6.91
Standard Deviation		9.76	2.51	11.77
CV		11.75	154.22	15.18
<b>TABLE OF B (POST treatment) MEANS</b>				
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		5.73	1.47	6.91
Standard Deviation		9.76	2.51	11.77
CV		11.75	154.22	15.18
<b>TABLE OF C (POST Timing) MEANS</b>				
1 3 wk		3 WAP B	84.7 a	0.8 a
2 4 wk		4 WAP B	80.6 a	1.3 a
3 5 wk		5 WAP B	83.9 a	2.8 a
LSD P=.05		7.02	1.80	8.46
Standard Deviation		9.76	2.51	11.77
CV		11.75	154.22	15.18
<b>TABLE OF A (PRE treatment) B (POST treatment) MEANS</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
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		7.02	1.80	8.46
Standard Deviation		9.76	2.51	11.77
CV		11.75	154.22	15.18
<b>TABLE OF A (PRE treatment) C (POST Timing) MEANS</b>				
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A
1 3 wk		3 WAP B	82.5 a	1.0 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		GGGAN	AMAPA								
Pest Name		AnnGrass	Palmer amaranth								
Crop Type, Code		C -	C -	C PHSLU							
Crop Name				Lima bean							
Rating Type		Control	Cts ab cnpv	plump							
Rating Unit		%	#/plot	#/4 plnt							
Rating Date		08/06/18	08/06/18	09/05/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
TABLE OF R MEANS											
Replicate 1								99.3		3.7	70.3
Replicate 2								100.0		2.6	53.3
Replicate 3								97.9		1.3	11.3
Replicate 4								98.3		1.9	14.3
TABLE OF A (PRE treatment) MEANS											
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A				98.2 a		2.7 a	42.4 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A				99.6 a		2.1 a	32.2 b
LSD P=.05								2.37		1.35	9.09
Standard Deviation								4.03		2.30	15.48
CV								4.08		95.64	41.54
TABLE OF B (POST treatment) MEANS											
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B				99.3 a		2.3 a	35.1 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B				98.5 a		2.5 a	39.5 a
LSD P=.05								2.37		1.35	9.09
Standard Deviation								4.03		2.30	15.48
CV								4.08		95.64	41.54
TABLE OF C (POST Timing) MEANS											
1 3 wk		3 WAP	B					99.5 a		1.5 a	38.5 a
2 4 wk		4 WAP	B					97.8 a		2.5 a	39.2 a
3 5 wk		5 WAP	B					99.4 a		3.1 a	34.1 a
LSD P=.05								2.90		1.66	11.14
Standard Deviation								4.03		2.30	15.48
CV								4.08		95.64	41.54
TABLE OF A (PRE treatment) B (POST treatment) MEANS											
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A				98.5 a		2.5 a	36.6 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				100.0 a		2.1 a	33.6 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				97.9 a		2.9 a	48.2 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				99.2 a		2.1 a	30.8 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B							
LSD P=.05								3.35		1.91	12.86
Standard Deviation								4.03		2.30	15.48
CV								4.08		95.64	41.54
TABLE OF A (PRE treatment) C (POST Timing) MEANS											
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A				99.0 a		1.4 a	39.0 a
1 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.

Pest Code Pest Name Crop Type, Code	C PHSLU	C PHSLU	C PHSLU
Crop Name Rating Type Rating Unit Rating Date	Lima bean plump % of tot 09/05/18	Lima bean plump wt. g 09/05/18	Lima bean flat #/4 plnt 09/05/18
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code			
TABLE OF R MEANS			
Replicate 1	59.2975758714	232.50	1.0
Replicate 2	42.7084857253	164.67	0.7
Replicate 3	10.8055845092	36.17	0.6
Replicate 4	13.5770030030	40.59	0.0
TABLE OF A (PRE treatment) MEANS			
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	36.9187547091 a	138.59 a	0.5 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	26.2755698454 b	98.38 b	0.6 a
LSD P=.05	7.99242607550	31.558	0.75
Standard Deviation	13.60843838909	53.732	1.27
CV	43.06855036704	45.351	226.40
TABLE OF B (POST treatment) MEANS			
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	31.0053253716 a	111.75 a	0.7 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	32.1889991829 a	125.21 a	0.4 a
LSD P=.05	7.99242607550	31.558	0.75
Standard Deviation	13.60843838909	53.732	1.27
CV	43.06855036704	45.351	226.40
TABLE OF C (POST Timing) MEANS			
1 3 wk 3 WAP B	35.6810394068 a	123.06 a	0.4 a
2 4 wk 4 WAP B	30.8471008546 a	118.31 a	0.4 a
3 5 wk 5 WAP B	28.2633465704 a	114.07 a	0.9 a
LSD P=.05	9.78868284594	38.650	0.92
Standard Deviation	13.60843838909	53.732	1.27
CV	43.06855036704	45.351	226.40
TABLE OF A (PRE treatment) B (POST treatment) MEANS			
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	36.7541513515 a	120.09 a	0.4 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	25.2564993917 a	103.42 a	1.0 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	37.0833580667 a	157.08 a	0.6 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	27.2946402991 a	93.33 a	0.3 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B			
LSD P=.05	11.30299735224	44.629	1.06
Standard Deviation	13.60843838909	53.732	1.27
CV	43.06855036704	45.351	226.40
TABLE OF A (PRE treatment) C (POST Timing) MEANS			
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	38.9224979000 a	127.50 a	0.5 a
1 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.

Pest Code Pest Name Crop Type, Code Crop Name Rating Type Rating Unit Rating Date	C PHSLU Lima bean flat % of tot 09/05/18	C PHSLU Lima bean flat wt. g 09/05/18
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code		
TABLE OF R MEANS		
Replicate 1	0.9451135715	3.250
Replicate 2	0.5582016847	0.453
Replicate 3	0.5243746173	1.392
Replicate 4	0.0000000000	0.000
TABLE OF A (PRE treatment) MEANS		
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.4914745061 a	1.023 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A	0.5223704306 a	1.524 a
LSD P=.05	0.68251006466	2.0477
Standard Deviation	1.16208721570	3.4865
CV	229.24360320337	273.7676
TABLE OF B (POST treatment) MEANS		
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B	0.6653609032 a	2.067 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B	0.3484840336 a	0.480 a
LSD P=.05	0.68251006466	2.0477
Standard Deviation	1.16208721570	3.4865
CV	229.24360320337	273.7676
TABLE OF C (POST Timing) MEANS		
1 3 wk 3 WAP B	0.4542323887 a	1.248 a
2 4 wk 4 WAP B	0.3391594084 a	1.188 a
3 5 wk 5 WAP B	0.7273756081 a	1.386 a
LSD P=.05	0.83590070136	2.5079
Standard Deviation	1.16208721570	3.4865
CV	229.24360320337	273.7676
TABLE OF A (PRE treatment) B (POST treatment) MEANS		
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.5181159938 a	1.442 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	0.8126058125 a	2.692 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	0.4648330184 a	0.604 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	0.2321350487 a	0.357 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B		
LSD P=.05	0.96521498989	2.8959
Standard Deviation	1.16208721570	3.4865
CV	229.24360320337	273.7676
TABLE OF A (PRE treatment) C (POST Timing) MEANS		
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A	0.6521739782 a	2.038 a
1 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.

Pest Code	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	C PHSLU	C PHSLU	C PHSLU
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Lima bean dry % of tot	Lima bean dry #/4 plnt	Lima bean dry wt. g
<b>TABLE OF R MEANS</b>									
Replicate 1							39.7573205577	47.5	97.8
Replicate 2							56.7333225908	78.8	127.1
Replicate 3							88.6700508737	98.6	154.2
Replicate 4							86.4230069965	97.4	145.7
<b>TABLE OF A (PRE treatment) MEANS</b>									
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			62.5897807850 b	74.3 a	125.8 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			73.2020697244 a	86.8 a	136.6 a
LSD P=.05							8.13078082308	15.94	24.83
Standard Deviation							13.84401042198	27.14	42.28
CV							20.39004808381	33.68	32.23
<b>TABLE OF B (POST treatment) MEANS</b>									
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B			68.3293237256 a	82.9 a	136.8 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B			67.4625267838 a	78.2 a	125.5 a
LSD P=.05							8.13078082308	15.94	24.83
Standard Deviation							13.84401042198	27.14	42.28
CV							20.39004808381	33.68	32.23
<b>TABLE OF C (POST Timing) MEANS</b>									
1 3 wk		3 WAP	B				63.8647382042 a	72.4 a	122.0 a
2 4 wk		4 WAP	B				68.8137497376 a	86.3 a	140.9 a
3 5 wk		5 WAP	B				71.0092878222 a	83.1 a	130.7 a
LSD P=.05							9.95813211347	19.52	30.41
Standard Deviation							13.84401042198	27.14	42.28
CV							20.39004808381	33.68	32.23
<b>TABLE OF A (PRE treatment) B (POST treatment) MEANS</b>									
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			62.7277426548 a	74.0 a	126.8 a
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B			73.9309047964 a	91.8 a	146.8 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			62.4518189152 a	74.7 a	124.8 a
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B			72.4732346523 a	81.8 a	126.3 a
LSD P=.05							11.49866051268	22.54	35.12
Standard Deviation							13.84401042198	27.14	42.28
CV							20.39004808381	33.68	32.23
<b>TABLE OF A (PRE treatment) C (POST Timing) MEANS</b>									
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			60.4253381218 a	67.0 a	119.5 a
1 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.

Pest Code		C	PHSLU	C	PHSLU
Pest Name			Lima bean		Lima bean
Crop Type, Code			total		Yield
Crop Name			#/4 plnt		kg/20 ft
Rating Type			09/05/18		09/05/18
Rating Unit					
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit
				Appl Timing	Appl Code
<b>TABLE OF R MEANS</b>					
Replicate 1				118.8	1.490
Replicate 2				132.7	1.195
Replicate 3				110.4	0.948
Replicate 4				111.7	0.914
<b>TABLE OF A (PRE treatment) MEANS</b>					
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	117.2 a
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A	119.6 a
LSD P=.05				14.16	0.1043
Standard Deviation				24.11	0.1776
CV				20.36	15.6231
<b>TABLE OF B (POST treatment) MEANS</b>					
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B	118.7 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B	118.1 a
LSD P=.05				14.16	0.1043
Standard Deviation				24.11	0.1776
CV				20.36	15.6231
<b>TABLE OF C (POST Timing) MEANS</b>					
1 3 wk		3 WAP	B	111.3 a	1.159 a
2 4 wk		4 WAP	B	125.9 a	1.163 a
3 5 wk		5 WAP	B	118.1 a	1.089 a
LSD P=.05				17.34	0.1278
Standard Deviation				24.11	0.1776
CV				20.36	15.6231
<b>TABLE OF A (PRE treatment) B (POST treatment) MEANS</b>					
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	111.0 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	126.4 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	123.4 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	112.8 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B	
LSD P=.05				20.02	0.1475
Standard Deviation				24.11	0.1776
CV				20.36	15.6231
<b>TABLE OF A (PRE treatment) C (POST Timing) MEANS</b>					
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A	106.5 a
1 3 wk		3 WAP	B		1.153 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 Pest Name		AMAPA PalmerAm	AMAPA PalmerAm	MOLVE Carpetwd	MOLVE Carpetwd
Crop Type, Code		C -	C -	C -	C -
Crop Name					
Rating Type		Control %	Counts #/m2	Control %	Counts #/m2
Rating Unit		07/06/18	07/06/18	07/06/18	07/06/18
Rating Date					
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing			
2 Dual Magnum 1 3 wk	7.62 EC	1.19 lb ai/a 3 WAP B	A	95.8 a	0.0 a
1 Dual Magnum 2 4 wk	7.62 EC	0.95 lb ai/a 4 WAP B	A	83.5 a	0.1 a
2 Dual Magnum 2 4 wk	7.62 EC	1.19 lb ai/a 4 WAP B	A	87.3 a	0.0 a
1 Dual Magnum 3 5 wk	7.62 EC	0.95 lb ai/a 5 WAP B	A	89.1 a	0.0 a
2 Dual Magnum 3 5 wk	7.62 EC	1.19 lb ai/a 5 WAP B	A	95.4 a	0.0 a
LSD P=.05			7.89	0.15	2.95
Standard Deviation			7.75	0.14	2.90
CV			8.57	692.82	0.14
TABLE OF B (POST treatment) C (POST Timing) MEANS					
1 Dual Magnum 1 3 wk	7.62 EC	0.714 lb ai/a 3 WAP B	B	93.6 a	0.0 a
2 Dual Magnum 1 3 wk	7.62 EC	0.95 lb ai/a 3 WAP B	B	94.0 a	0.0 a
1 Dual Magnum 2 4 wk	7.62 EC	0.714 lb ai/a 4 WAP B	B	90.0 a	0.0 a
2 Dual Magnum 2 4 wk	7.62 EC	0.95 lb ai/a 4 WAP B	B	80.8 a	0.1 a
1 Dual Magnum 3 5 wk	7.62 EC	0.714 lb ai/a 5 WAP B	B	90.9 a	0.0 a
2 Dual Magnum 3 5 wk	7.62 EC	0.95 lb ai/a 5 WAP B	B	93.6 a	0.0 a
LSD P=.05			7.89	0.15	2.95
Standard Deviation			7.75	0.14	2.90
CV			8.57	692.82	0.14
692.82			2.94	692.82	
TABLE OF A (PRE treatment) B (POST treatment) C (POST Timing) MEANS					
1 Dual Magnum 1 3 wk	7.62 EC	0.95 lb ai/a 3 WAP B	A	92.0 a	0.0 a
1 Dual Magnum 1 3 wk	7.62 EC	0.714 lb ai/a 3 WAP B	B		
2 Dual Magnum 1 3 wk	7.62 EC	1.19 lb ai/a 3 WAP B	A	95.3 a	0.0 a
1 Dual Magnum 2 4 wk	7.62 EC	0.714 lb ai/a 3 WAP B	B		
1 Dual Magnum 2 4 wk	7.62 EC	0.95 lb ai/a 3 WAP B	A	91.8 a	0.0 a
2 Dual Magnum 1 3 wk	7.62 EC	1.19 lb ai/a 3 WAP B	B		
2 Dual Magnum 1 3 wk	7.62 EC	0.95 lb ai/a 3 WAP B	A	96.3 a	0.0 a
1 Dual Magnum 2 4 wk	7.62 EC	0.95 lb ai/a 4 WAP B	A	88.8 a	0.0 a
1 Dual Magnum 2 4 wk	7.62 EC	0.714 lb ai/a 4 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.

## University of Delaware

Pest Code Pest Name	DIGSA L.crbgrs	AMAPA PalmerAm	MOLVE Carpetwd
Crop Type, Code	C -	C PHSLU	C -
Crop Name	Counts	Lima bean	Counts
Rating Type	#/m <sup>2</sup>	Injury %	#/m <sup>2</sup>
Rating Unit			
Rating Date	07/06/18	07/13/18	07/13/18
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code			
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 1 3 wk 3 WAP B	0.0 a	1.6 a	0.0 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 2 4 wk 4 WAP B	0.0 a	0.4 a	0.1 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 2 4 wk 4 WAP B	0.0 a	0.0 a	0.1 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a
LSD P=.05	.	1.37	0.20
Standard Deviation	0.00	1.35	0.19
CV	0.00	179.79	467.10
TABLE OF B (POST treatment) C (POST Timing) MEANS			
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 1 3 wk 3 WAP B	0.0 a	2.5 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 1 3 wk 3 WAP B	0.0 a	1.6 a	0.0 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 2 4 wk 4 WAP B	0.0 a	0.0 a	0.1 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 2 4 wk 4 WAP B	0.0 a	0.4 a	0.1 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a
LSD P=.05	.	1.37	0.20
Standard Deviation	0.00	1.35	0.19
CV	0.00	179.79	467.10
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 3 wk 3 WAP B	0.0 a	2.5 a	0.0 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 3 wk 3 WAP B	0.0 a	2.5 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 3 wk 3 WAP B	0.0 a	2.5 a	0.0 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 3 wk 3 WAP B	0.0 a	0.8 a	0.0 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 4 wk 4 WAP B	0.0 a	0.0 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 Pest Name	DIGSA L.crbgrs	C -	C PHSLU Lima bean Inury %	C -	AMAPA PalmerAm
Crop Type, Code	Counts #/m2		07/19/18	WeedCovr % 07/19/18	Count #/m2 07/19/18
Crop Name					
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code					
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 1 3 wk 3 WAP B		0.0 a	31.3 a	3.0 a	0.0 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 2 4 wk 4 WAP B		0.0 a	8.5 a	4.3 a	0.0 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 2 4 wk 4 WAP B		0.0 a	10.9 a	3.3 a	0.0 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 3 5 wk 5 WAP B		0.0 a	10.0 a	3.8 a	0.0 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 3 5 wk 5 WAP B		0.0 a	7.4 a	5.1 a	0.0 a
LSD P=.05	0.15	5.65	3.29	0.02	
Standard Deviation	0.14	5.56	3.24	0.02	
CV	692.82	35.06	82.63	703.56	
TABLE OF B (POST treatment) C (POST Timing) MEANS					
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 1 3 wk 3 WAP B		0.0 a	21.5 b	4.3 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 1 3 wk 3 WAP B		0.1 a	36.9 a	2.9 a	0.0 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 2 4 wk 4 WAP B		0.0 a	7.0 c	3.0 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 2 4 wk 4 WAP B		0.0 a	12.4 c	4.5 a	0.0 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 3 5 wk 5 WAP B		0.0 a	9.6 c	5.0 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 3 5 wk 5 WAP B		0.0 a	7.8 c	3.9 a	0.0 a
LSD P=.05	0.15	5.65	3.29	0.02	
Standard Deviation	0.14	5.56	3.24	0.02	
CV	692.82	35.06	82.63	703.56	
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 3 wk 3 WAP B		0.0 a	18.0 a	5.3 a	0.0 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 3 wk 3 WAP B		0.0 a	25.0 a	3.3 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 3 wk 3 WAP B		0.3 a	36.3 a	3.0 a	0.0 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 3 wk 3 WAP B		0.0 a	37.5 a	2.8 a	0.0 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 4 wk 4 WAP B		0.0 a	6.0 a	3.5 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 Pest Name	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm
Crop Type, Code	C -	C -	C -	C -
Crop Name	Count #/m2	Count #/m2	Count #/m2	Count #/m2
Rating Type	07/19/18	07/19/18	07/19/18	07/26/18
Rating Unit				
Rating Date				
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code				
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 1 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
LSD P=.05	0.00	.	.	.
Standard Deviation	0.00	0.00	0.00	0.00
CV	-703.56	0.00	0.00	0.00
TABLE OF B (POST treatment) C (POST Timing) MEANS				
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 1 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 1 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
LSD P=.05	0.00	.	.	.
Standard Deviation	0.00	0.00	0.00	0.00
CV	-703.56	0.00	0.00	0.00
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 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	0.0 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 3 wk 3 WAP B	0.0 a	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 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	0.0 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 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	0.0 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 4 wk 4 WAP B	0.0 a	0.0 a	0.0 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 Pest Name	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	
Crop Type, Code	C -	C -	C -	C PHSLU
Crop Name	Count #/m2	Count #/m2	Count #/m2	Lima bean Injury %
Rating Type	07/26/18	07/26/18	07/26/18	07/27/18
Rating Unit				
Rating Date				
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code				
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 1 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	10.6 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	23.1 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	21.3 a
1 Dual Magnum 7.62 EC 0.95 lb ai/a PRE A 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	11.3 a
2 Dual Magnum 7.62 EC 1.19 lb ai/a PRE A 3 5 wk 5 WAP B	0.0 a	0.1 a	0.0 a	7.3 a
LSD P=.05	.	0.15	.	9.44
Standard Deviation	0.00	0.14	0.00	9.28
CV	0.00	692.82	0.00	63.37
TABLE OF B (POST treatment) C (POST Timing) MEANS				
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 1 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	7.5 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 1 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	17.5 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	17.5 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	26.9 a
1 Dual Magnum 7.62 EC 0.714 lb ai/a POST B 3 5 wk 5 WAP B	0.0 a	0.1 a	0.0 a	8.5 a
2 Dual Magnum 7.62 EC 0.95 lb ai/a POST B 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	10.0 a
LSD P=.05	.	0.15	.	9.44
Standard Deviation	0.00	0.14	0.00	9.28
CV	0.00	692.82	0.00	63.37
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 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	7.5 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 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	7.5 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 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	21.3 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 3 wk 3 WAP B	0.0 a	0.0 a	0.0 a	13.8 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 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	16.3 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	Pest Name					AMAPA		AMAPA
Crop Type, Code						PalmerAm		PalmerAm
Crop Name						C -	C PHSLU	C -
Rating Type						Control	Sieva bean	Control
Rating Unit						%	Injury %	%
Rating Date						07/27/18	08/06/18	08/06/18
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
2 Dual Magnum 1 3 wk	7.62 EC	1.19 lb	ai/a	PRE	A	86.9 a	0.6 a	77.4 a
				3 WAP	B			
1 Dual Magnum 2 4 wk	7.62 EC	0.95 lb	ai/a	PRE	A	78.1 a	1.6 a	76.3 a
				4 WAP	B			
2 Dual Magnum 2 4 wk	7.62 EC	1.19 lb	ai/a	PRE	A	83.1 a	1.0 a	80.8 a
				4 WAP	B			
1 Dual Magnum 3 5 wk	7.62 EC	0.95 lb	ai/a	PRE	A	80.6 a	3.5 a	75.4 a
				5 WAP	B			
2 Dual Magnum 3 5 wk	7.62 EC	1.19 lb	ai/a	PRE	A	87.1 a	2.0 a	76.6 a
				5 WAP	B			
LSD P=.05						9.93	2.55	11.97
Standard Deviation						9.76	2.51	11.77
CV						11.75	154.22	15.18
TABLE OF B (POST treatment) C (POST Timing) MEANS								
1 Dual Magnum 1 3 wk	7.62 EC	0.714 lb	ai/a	POST	B	81.9 a	0.0 a	74.5 a
				3 WAP	B			
2 Dual Magnum 1 3 wk	7.62 EC	0.95 lb	ai/a	POST	B	87.5 a	1.6 a	81.5 a
				3 WAP	B			
1 Dual Magnum 2 4 wk	7.62 EC	0.714 lb	ai/a	POST	B	82.5 a	0.6 a	83.4 a
				4 WAP	B			
2 Dual Magnum 2 4 wk	7.62 EC	0.95 lb	ai/a	POST	B	78.8 a	2.0 a	73.6 a
				4 WAP	B			
1 Dual Magnum 3 5 wk	7.62 EC	0.714 lb	ai/a	POST	B	79.4 a	2.3 a	72.0 a
				5 WAP	B			
2 Dual Magnum 3 5 wk	7.62 EC	0.95 lb	ai/a	POST	B	88.4 a	3.3 a	80.0 a
				5 WAP	B			
LSD P=.05						9.93	2.55	11.97
Standard Deviation						9.76	2.51	11.77
CV						11.75	154.22	15.18
TABLE OF A (PRE treatment) B (POST treatment) C (POST Timing) MEANS								
1 Dual Magnum 1 3 wk	7.62 EC	0.95 lb	ai/a	PRE	A	81.3 a	0.0 a	76.0 a
				3 WAP	B			
2 Dual Magnum 1 3 wk	7.62 EC	1.19 lb	ai/a	PRE	A	82.5 a	0.0 a	73.0 a
				3 WAP	B			
1 Dual Magnum 2 4 wk	7.62 EC	0.714 lb	ai/a	POST	B	83.8 a	2.0 a	81.3 a
				3 WAP	B			
2 Dual Magnum 1 3 wk	7.62 EC	0.95 lb	ai/a	POST	B	91.3 a	1.3 a	81.8 a
				3 WAP	B			
1 Dual Magnum 2 4 wk	7.62 EC	0.95 lb	ai/a	PRE	A	78.8 a	0.0 a	80.8 a
				4 WAP	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.

## University of Delaware

Pest Code	GGGAN	AMAPA							
Pest Name	AnnGrass	Palmer amaranth							
Crop Type, Code	C -	C -	C PHSLU						
Crop Name			Lima bean						
Rating Type	Control	Cts ab cnpv	plump						
Rating Unit	%	#/plot	#/4 plnt						
Rating Date	08/06/18	08/06/18	09/05/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		100.0 a	1.7 a	38.0 a
1 3 wk				3 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		95.6 a	2.9 a	40.6 a
2 4 wk				4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		100.0 a	2.2 a	37.8 a
2 4 wk				4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		100.0 a	3.9 a	47.5 a
3 5 wk				5 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		98.8 a	2.4 a	20.8 b
3 5 wk				5 WAP	B				
LSD P=.05							4.10	2.34	15.75
Standard Deviation							4.03	2.30	15.48
CV							4.08	95.64	41.54
TABLE OF B (POST treatment) C (POST Timing) MEANS									
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		99.6 a	1.9 a	32.3 a
1 3 wk				3 WAP	B				
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		99.4 a	1.2 a	44.8 a
1 3 wk				3 WAP	B				
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		98.1 a	1.6 a	35.1 a
2 4 wk				4 WAP	B				
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		97.5 a	3.5 a	43.3 a
2 4 wk				4 WAP	B				
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B		100.0 a	3.4 a	37.9 a
3 5 wk				5 WAP	B				
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B		98.8 a	2.9 a	30.4 a
3 5 wk				5 WAP	B				
LSD P=.05							4.10	2.34	15.75
Standard Deviation							4.03	2.30	15.48
CV							4.08	95.64	41.54
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		99.3 a	1.0 a	31.5 a
1 3 wk				1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B	
							3 WAP	B	
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		100.0 a	2.8 a	33.0 a
1 3 wk				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		98.8 a	1.8 a	46.5 a
2 3 wk				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		100.0 a	0.6 a	43.0 a
2 3 wk				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		96.3 a	2.3 a	32.0 a
1 3 wk				1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B	
							4 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	Pest Name	Crop Type, Code	C PHSLU	C PHSLU	C PHSLU		
Crop Name	Rating Type	Rating Unit	Lima bean plump % of tot	Lima bean plump wt.	Lima bean flat #/4 plnt		
Rating Date			09/05/18	g 09/05/18	09/05/18		
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 3	A WAP	B	
1 3 wk							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 4	A WAP	B	
2 4 wk							
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 4	A WAP	B	
2 4 wk							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 5	A WAP	B	
3 5 wk							
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 5	A WAP	B	
3 5 wk							
LSD P=.05				13.84328803850	54.659	1.30	
Standard Deviation				13.60843838909	53.732	1.27	
CV				43.06855036704	45.351	226.40	
TABLE OF B (POST treatment) C (POST Timing) MEANS							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 3	B WAP	B	
1 3 wk							
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 3	B WAP	B	
1 3 wk							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 4	B WAP	B	
2 4 wk							
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 4	B WAP	B	
2 4 wk							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 5	B WAP	B	
3 5 wk							
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 5	B WAP	B	
3 5 wk							
LSD P=.05				13.84328803850	54.659	1.30	
Standard Deviation				13.60843838909	53.732	1.27	
CV				43.06855036704	45.351	226.40	
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		
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 3	B WAP	B	
1 3 wk							
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 1	A		
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST 3	WAP	B		
1 3 wk							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 2	A		
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST 3	WAP	B		
1 3 wk							
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 2	A		
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST 3	WAP	B		
1 3 wk							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 1	A		
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST 4	WAP	B		
2 4 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.

Pest Code		C	PHSLU	C	PHSLU		
Pest Name			Lima bean		Lima bean		
Crop Type, Code			flat		flat wt.		
Crop Name			% of tot				
Rating Type			09/05/18		g		
Rating Unit					09/05/18		
Rating Date							
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit		
					Timing Code		
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 3	A WAP B	0.2562907991 a	0.458 a
1 3 wk							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 4	A WAP B	0.2012195324 a	0.375 a
2 4 wk							
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 4	A WAP B	0.4770992843 a	2.000 a
2 4 wk							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 5	A WAP B	0.6210300077 a	0.656 a
3 5 wk							
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 5	A WAP B	0.8337212084 a	2.115 a
3 5 wk							
LSD P=.05						1.18214210866	3.5467
Standard Deviation						1.16208721570	3.4865
CV						229.24360320337	273.7676
TABLE OF B (POST treatment) C (POST Timing) MEANS							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 3	B WAP B	0.6521739782 a	2.038 a
1 3 wk							
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 3	B WAP B	0.2562907991 a	0.458 a
1 3 wk							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 4	B WAP B	0.6020992968 a	2.125 a
2 4 wk							
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 4	B WAP B	0.0762195199 a	0.250 a
2 4 wk							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 5	B WAP B	0.7418094344 a	2.038 a
3 5 wk							
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 5	B WAP B	0.7129417817 a	0.734 a
3 5 wk							
LSD P=.05						1.18214210866	3.5467
Standard Deviation						1.16208721570	3.4865
CV						229.24360320337	273.7676
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	1.3043479564 a	4.075 a
1 3 wk							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 3	B WAP B		
1 3 wk							
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 1	A	0.0000000000 a	0.000 a
1 3 wk							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 3	B WAP B	0.0000000000 a	0.000 a
2 4 wk							
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 1	A	0.5125815983 a	0.915 a
2 4 wk							
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 1	A	0.2500000250 a	0.250 a
1 3 wk							
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 4	B WAP B		
2 4 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	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	C PHSLU Lima bean dry % of tot 09/05/18	C PHSLU Lima bean dry #/4 plnt 09/05/18	C PHSLU Lima bean dry wt. g 09/05/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 1 3 wk	A 3 WAP B		67.3041382867 a	77.8 a	124.5 a
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 2 4 wk	A 4 WAP B		65.3986138261 a	80.1 a	135.0 a
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 2 4 wk	A 4 WAP B		72.2288856491 a	92.4 a	146.8 a
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 3 5 wk	A 5 WAP B		61.9453904070 a	75.9 a	122.9 a
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 3 5 wk	A 5 WAP B		80.0731852373 a	90.3 a	138.5 a
LSD P=.05							14.08292549078	27.60	43.01
Standard Deviation							13.84401042198	27.14	42.28
CV							20.39004808381	33.68	32.23
TABLE OF B (POST treatment) C (POST Timing) MEANS									
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 1 3 wk	B 3 WAP B		66.6032442233 a	76.1 a	131.1 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 1 3 wk	B 3 WAP B		61.1262321851 a	68.6 a	112.9 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 2 4 wk	B 4 WAP B		70.4962736621 a	87.5 a	146.1 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 2 4 wk	B 4 WAP B		67.1312258131 a	85.0 a	135.6 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 3 5 wk	B 5 WAP B		67.8884532913 a	85.1 a	133.3 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 3 5 wk	B 5 WAP B		74.1301223530 a	81.0 a	128.1 a
LSD P=.05							14.08292549078	27.60	43.01
Standard Deviation							13.84401042198	27.14	42.28
CV							20.39004808381	33.68	32.23
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 3 wk	A 3 WAP B		56.8058430791 a	50.5 b	102.8 a
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE 1 3 wk	A 3 WAP B		76.4006453676 a	101.8 a	159.5 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST 1 3 wk	B 3 WAP B		64.0448331645 a	83.5 ab	136.3 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST 1 3 wk	B 3 WAP B		58.2076312058 a	53.8 b	89.5 a
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE 2 4 wk	A 4 WAP B		68.6851469085 a	85.5 ab	144.5 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.

## University of Delaware

Pest Code		C PHSLU	C PHSLU						
Pest Name		Lima bean	Lima bean						
Crop Type, Code		total	Yield						
Crop Name		#/4 plnt	kg/20 ft						
Rating Type		09/05/18	09/05/18						
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			116.0 a	1.166 a
1 3 wk				3 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			121.0 a	1.101 a
2 4 wk				4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			130.8 a	1.224 a
2 4 wk				4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			124.1 a	1.165 a
3 5 wk				5 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			112.0 a	1.013 a
3 5 wk				5 WAP	B				
LSD P=.05								24.52	0.1807
Standard Deviation								24.11	0.1776
CV								20.36	15.6231
TABLE OF B (POST treatment) C (POST Timing) MEANS									
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B			108.9 a	1.176 a
1 3 wk				3 WAP	B				
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B			113.6 a	1.143 a
1 3 wk				3 WAP	B				
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B			123.4 a	1.124 a
2 4 wk				4 WAP	B				
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B			128.4 a	1.201 a
2 4 wk				4 WAP	B				
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B			123.9 a	1.179 a
3 5 wk				5 WAP	B				
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B			112.3 a	0.999 a
3 5 wk				5 WAP	B				
LSD P=.05								24.52	0.1807
Standard Deviation								24.11	0.1776
CV								20.36	15.6231
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			83.0 c	1.158 abc
1 3 wk				3 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			134.8 a	1.195 abc
1 3 wk				3 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B			130.0 ab	1.148 abc
2 3 wk				3 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			97.3 bc	1.138 abc
2 3 wk				3 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B			117.8 ab	0.970 c
2 4 wk				4 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 Pest Name	AMAPA PalmerAm	AMAPA PalmerAm	MOLVE Carpetwd	MOLVE Carpetwd							
Crop Type, Code	C -	C -	C -	C -							
Crop Name											
Rating Type	Control %	Counts #/m2	Control %	Counts #/m2							
Rating Unit	07/06/18	07/06/18	07/06/18	07/06/18							
Rating Date											
Trt Treatment	Form No.	Form Conc	Rate Rate	Appl Unit	Appl Timing	Code					
2 Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A		91.3 a	0.0 a	100.0 a	0.0 a
1 Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B					
2 4 wk					4 WAP	B					
1 Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A		78.3 a	0.3 a	100.0 a	0.0 a
2 Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B					
2 4 wk					4 WAP	B					
2 Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A		83.3 a	0.0 a	98.3 a	0.0 a
2 Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B					
2 4 wk					4 WAP	B					
1 Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A		85.0 a	0.0 a	94.8 a	0.0 a
1 Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B					
3 5 wk					5 WAP	B					
2 Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A		96.8 a	0.0 a	98.3 a	0.0 a
1 Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B					
3 5 wk					5 WAP	B					
1 Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A		93.3 a	0.0 a	100.0 a	0.0 a
2 Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B					
3 5 wk					5 WAP	B					
2 Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A		94.0 a	0.0 a	100.0 a	0.0 a
2 Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B					
3 5 wk					5 WAP	B					
LSD P=.05							11.15	0.21	4.18	0.21	
Standard Deviation							7.75	0.14	2.90	0.14	
CV							8.57	692.82	2.94	692.82	

Means followed by same letter 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 Pest Name	DIGSA L.crbgrs	AMAPA PalmerAm	MOLVE Carpetwd
Crop Type, Code	C -	C -	C -
Crop Name	Counts	Lima bean	Counts
Rating Type	#/m <sup>2</sup>	Injury %	#/m <sup>2</sup>
Rating Unit			
Rating Date	07/06/18	07/13/18	07/13/18
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code			
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 4 wk 4 WAP B	0.0 a	0.0 a	0.3 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 2 4 wk 4 WAP B	0.0 a	0.8 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 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 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 3 5 wk 5 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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a
LSD P=.05	.	1.94	0.28
Standard Deviation	0.00	1.35	0.19
CV	0.00	179.79	467.10
			0.00

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

Pest Code Pest Name	DIGSA L.crbgrs	C - C	PHSLU	C -	AMAPA PalmerAm
Crop Type, Code	Counts #/m2	Lima bean Inury %	07/19/18	WeedCovr % 07/19/18	Count #/m2 07/19/18
Crop Name					
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment	Form No.	Form Conc	Rate Rate	Appl Unit	Appl Timing
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 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
2 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
2 4 wk					4 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 5 wk					5 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 5 wk					5 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 5 wk					5 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 5 wk					5 WAP B
LSD P=.05			0.21	8.00	4.66
Standard Deviation			0.14	5.56	3.24
CV			692.82	35.06	82.63
					703.56

Means followed by same letter 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 Pest Name	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm
Crop Type, Code	C -	C -	C -	C -
Crop Name	Count #/m2	Count #/m2	Count #/m2	Count #/m2
Rating Type	07/19/18	07/19/18	07/19/18	07/26/18
Rating Unit				
Rating Date				
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code				
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 4 wk 4 WAP B	0.0 a	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 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	0.0 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 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	0.0 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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	0.0 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 3 5 wk 5 WAP B	0.0 a	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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	0.0 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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	0.0 a
LSD P=.05	0.00			
Standard Deviation	0.00	0.00	0.00	0.00
CV	-703.56	0.00	0.00	0.00

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

Pest Code Pest Name	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	
Crop Type, Code	C -	C -	C -	C PHSLU
Crop Name	Count #/m2	Count #/m2	Count #/m2	Lima bean Injury %
Rating Type	07/26/18	07/26/18	07/26/18	07/27/18
Rating Unit				
Rating Date				
Trt Treatment Form Form Rate Appl Appl No. Name Conc Type Rate Unit Timing Code				
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 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	18.8 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 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	30.0 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 2 4 wk 4 WAP B	0.0 a	0.0 a	0.0 a	23.8 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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	8.8 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 3 5 wk 5 WAP B	0.0 a	0.3 a	0.0 a	8.3 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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	13.8 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 3 5 wk 5 WAP B	0.0 a	0.0 a	0.0 a	6.3 a
LSD P=.05		0.21		13.35
Standard Deviation	0.00	0.14	0.00	9.28
CV	0.00	692.82	0.00	63.37

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		AMAPA		AMAPA						
Pest Name		PalmerAm		PalmerAm						
Crop Type, Code		C -	C PHSLU	C -						
Crop Name			Sieva bean							
Rating Type		Control	Injury	Control						
Rating Unit		%	%	%						
Rating Date		07/27/18	08/06/18	08/06/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		86.3 a	1.3 a	86.0 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
2	4 wk				4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		77.5 a	3.3 a	71.8 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
2	4 wk				4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		80.0 a	0.8 a	75.5 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
2	4 wk				4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		75.0 a	3.8 a	73.3 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
3	5 wk				5 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		83.8 a	0.8 a	70.8 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
3	5 wk				5 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		86.3 a	3.3 a	77.5 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
3	5 wk				5 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		90.5 a	3.3 a	82.5 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
3	5 wk				5 WAP	B				
LSD P=.05					14.04		3.61		16.93	
Standard Deviation					9.76		2.51		11.77	
CV					11.75		154.22		15.18	

Means followed by same letter 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		GGGAN	AMAPA							
Pest Name		AnnGrass	Palmer amaranth							
Crop Type, Code		C -	C -	C PHSLU						
Crop Name				Lima bean						
Rating Type		Control	Cts ab cnpv	plump						
Rating Unit		%	#/plot	#/4 plnt						
Rating Date		08/06/18	08/06/18	09/05/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		100.0 a	1.0 a	38.3 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
		2 4 wk			4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		95.0 a	3.5 a	49.3 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
		2 4 wk			4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		100.0 a	3.4 a	37.3 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
		2 4 wk			4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		100.0 a	4.3 a	46.3 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
		3 5 wk			5 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		100.0 a	2.5 a	29.5 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B				
		3 5 wk			5 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		100.0 a	3.5 a	48.8 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
		3 5 wk			5 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		97.5 a	2.3 a	12.0 a
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B				
		3 5 wk			5 WAP	B				
LSD P=.05					5.80	3.31	22.27			
Standard Deviation					4.03	2.30	15.48			
CV					4.08	95.64	41.54			

Means followed by same letter 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 Pest Name Crop Type, Code	C PHSLU	C PHSLU	C PHSLU						
Crop Name	Lima bean plump % of tot 09/05/18	Lima bean plump wt. g 09/05/18	Lima bean flat #/4 plnt 09/05/18						
Trt No. Treatment	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			26.7384110153 a	118.75 a	1.3 a
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
2 4 wk			4 WAP	B					
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			37.7354902185 a	156.00 a	0.3 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
2 4 wk			4 WAP	B					
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			27.8496391177 a	98.75 a	0.0 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
2 4 wk			4 WAP	B					
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			37.3077720233 a	157.03 a	0.0 a
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
3 5 wk			5 WAP	B					
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			25.4317225282 a	97.25 a	1.8 a
1 Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B					
3 5 wk			5 WAP	B					
1 Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A			37.5594071459 a	163.75 a	1.5 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
3 5 wk			5 WAP	B					
2 Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A			12.7544845842 a	38.25 a	0.3 a
2 Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B					
3 5 wk			5 WAP	B					
LSD P=.05							19.57736569189	77.300	1.83
Standard Deviation							13.60843838909	53.732	1.27
CV							43.06855036704	45.351	226.40

Means followed by same letter 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	PHSLU	C	PHSLU					
Pest Name			Lima bean		Lima bean					
Crop Type, Code			flat		flat wt.					
Crop Name			% of tot		g					
Rating Type			09/05/18		09/05/18					
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
2	Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	0.9541985687	a	4.000 a
1	Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B			
2	4 wk				4 WAP	B				
1	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	0.1524390397	a	0.500 a
2	Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B			
2	4 wk				4 WAP	B				
2	Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	0.0000000000	a	0.000 a
2	Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B			
2	4 wk				4 WAP	B				
1	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	0.0000000000	a	0.000 a
1	Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B			
3	5 wk				5 WAP	B				
2	Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	1.4836188689	a	4.075 a
1	Dual Magnum	7.62	EC	0.714	lb ai/a	POST	B			
3	5 wk				5 WAP	B				
1	Dual Magnum	7.62	EC	0.95	lb ai/a	PRE	A	1.2420600155	a	1.313 a
2	Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B			
3	5 wk				5 WAP	B				
2	Dual Magnum	7.62	EC	1.19	lb ai/a	PRE	A	0.1838235479	a	0.155 a
2	Dual Magnum	7.62	EC	0.95	lb ai/a	POST	B			
3	5 wk				5 WAP	B				
LSD P=.05								1.67180140272		5.0158
Standard Deviation								1.16208721570		3.4865
CV								229.24360320337		273.7676

Means followed by same letter 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	Pest Name	Crop Type, Code	Crop Name	Rating Type	Rating Unit	Rating Date	C PHSLU Lima bean dry % of tot 09/05/18	C PHSLU Lima bean dry #/4 plnt 09/05/18	C PHSLU Lima bean dry wt. g 09/05/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing			
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		72.3074004157 a	89.5 ab	147.8 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B				
2	4 wk			4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		62.1120807437 a	74.8 ab	125.5 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B				
2	4 wk			4 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		72.1503708825 a	95.3 a	145.8 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B				
2	4 wk			4 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		62.6922379767 a	86.0 ab	133.3 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B				
3	5 wk			5 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		73.0846686060 a	84.3 ab	133.3 a
1	Dual Magnum	7.62 EC	0.714 lb ai/a	POST	B				
3	5 wk			5 WAP	B				
1	Dual Magnum	7.62 EC	0.95 lb ai/a	PRE	A		61.1985428374 a	65.8 ab	112.5 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B				
3	5 wk			5 WAP	B				
2	Dual Magnum	7.62 EC	1.19 lb ai/a	PRE	A		87.0617018687 a	96.3 a	143.8 a
2	Dual Magnum	7.62 EC	0.95 lb ai/a	POST	B				
3	5 wk			5 WAP	B				
LSD P=.05							19.91626422695	39.04	60.83
Standard Deviation							13.84401042198	27.14	42.28
CV							20.39004808381	33.68	32.23

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.

Pest Code		C PHSLU	C PHSLU						
Pest Name		Lima bean	Lima bean						
Crop Type, Code		total	Yield						
Crop Name		#/4 plnt	kg/20 ft						
Rating Type		09/05/18	09/05/18						
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		129.0 ab	1.278 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B			
2	4 wk				4 WAP	B			
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		124.3 ab	1.233 ab
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B			
2	4 wk				4 WAP	B			
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		132.5 a	1.170 abc
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B			
2	4 wk				4 WAP	B			
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		132.3 a	1.348 a
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B			
3	5 wk				5 WAP	B			
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		115.5 abc	1.010 bc
1	Dual Magnum	7.62 EC	0.714 lb	ai/a	POST	B			
3	5 wk				5 WAP	B			
1	Dual Magnum	7.62 EC	0.95 lb	ai/a	PRE	A		116.0 abc	0.983 bc
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B			
3	5 wk				5 WAP	B			
2	Dual Magnum	7.62 EC	1.19 lb	ai/a	PRE	A		108.5 abc	1.015 bc
2	Dual Magnum	7.62 EC	0.95 lb	ai/a	POST	B			
3	5 wk				5 WAP	B			
LSD P=.05								34.68	0.2555
Standard Deviation								24.11	0.1776
CV								20.36	15.6231

Means followed by same letter 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 PalmerAm C Control % 07/06/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	3741.979167				
R	3	339.229167	113.076389	1.881	0.1520	
A	1	256.687500	256.687500	4.271	0.0467	4.6
B	1	50.020833	50.020833	0.832	0.3683	4.6
AB	1	17.520833	17.520833	0.291	0.5929	6.4
C	2	644.791667	322.395833	5.364	0.0096	5.6
AC	2	15.875000	7.937500	0.132	0.8768	7.9
BC	2	323.041667	161.520833	2.687	0.0829	7.9
ABC	2	111.291667	55.645833	0.926	0.4063	11.2
ERROR	33	1983.520833	60.106692			

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Counts #/m2 07/06/18						
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	1	0.020833	0.020833	1.000	0.3246	0.1
AB	1	0.020833	0.020833	1.000	0.3246	0.1
C	2	0.041667	0.020833	1.000	0.3788	0.1
AC	2	0.041667	0.020833	1.000	0.3788	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 MOLVE Carpetwd C Control % 07/06/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	411.666667				
R	3	22.666667	7.555556	0.896	0.4536	
A	1	8.333333	8.333333	0.988	0.3275	1.7
B	1	30.083333	30.083333	3.567	0.0678	1.7
AB	1	24.083333	24.083333	2.855	0.1005	2.4
C	2	13.791667	6.895833	0.818	0.4502	2.1
AC	2	5.041667	2.520833	0.299	0.7436	3.0
BC	2	22.541667	11.270833	1.336	0.2767	3.0
ABC	2	6.791667	3.395833	0.403	0.6718	4.2
ERROR	33	278.333333	8.434343			

FACTORIAL/POOLED ERROR AOV For MOLVE Carpetwd C Counts #/m2 07/06/18						
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	1	0.020833	0.020833	1.000	0.3246	0.1
AB	1	0.020833	0.020833	1.000	0.3246	0.1
C	2	0.041667	0.020833	1.000	0.3788	0.1
AC	2	0.041667	0.020833	1.000	0.3788	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 DIGSA L.crbgrs C Counts #/m2 07/06/18						
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			

Means followed by same letter 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 PHSLU Lima bean Injury % 07/13/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	141.000000				
R	3	28.500000	9.500000	5.225	0.0046	
A	1	2.083333	2.083333	1.146	0.2922	0.8
B	1	0.333333	0.333333	0.183	0.6713	0.8
AB	1	2.083333	2.083333	1.146	0.2922	1.1
C	2	41.625000	20.812500	11.447	0.0002	1.0
AC	2	1.541667	0.770833	0.424	0.6580	1.4
BC	2	3.291667	1.645833	0.905	0.4143	1.4
ABC	2	1.541667	0.770833	0.424	0.6580	1.9
ERROR	33	60.000000	1.818182			

## FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Counts #/m2 07/13/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	1.916667				
R	3	0.250000	0.083333	2.200	0.1066	
A	1	0.000000	0.000000	0.000	1.0000	0.1
B	1	0.000000	0.000000	0.000	1.0000	0.1
AB	1	0.083333	0.083333	2.200	0.1475	0.2
C	2	0.166667	0.083333	2.200	0.1268	0.1
AC	2	0.000000	0.000000	0.000	1.0000	0.2
BC	2	0.000000	0.000000	0.000	1.0000	0.2
ABC	2	0.166667	0.083333	2.200	0.1268	0.3
ERROR	33	1.250000	0.037879			

## FACTORIAL/POOLED ERROR AOV For MOLVE Carpetwd C Counts #/m2 07/13/18

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 DIGSA L.crbgrs C Counts #/m2 07/13/18

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	1	0.020833	0.020833	1.000	0.3246	0.1
AB	1	0.020833	0.020833	1.000	0.3246	0.1
C	2	0.041667	0.020833	1.000	0.3788	0.1
AC	2	0.041667	0.020833	1.000	0.3788	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 C PHSLU Lima bean Injury % 07/19/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	6551.979167				
R	3	29.229167	9.743056	0.315	0.8141	
A	1	20.020833	20.020833	0.648	0.4266	3.3
B	1	475.020833	475.020833	15.376	0.0004	3.3
AB	1	4.687500	4.687500	0.152	0.6994	4.6
C	2	4274.666667	2137.333333	69.182	0.0001	4.0
AC	2	98.166667	49.083333	1.589	0.2194	5.7
BC	2	600.166667	300.083333	9.713	0.0005	5.7
ABC	2	30.500000	15.250000	0.494	0.6149	8.0
ERROR	33	1019.520833	30.894571			

Means followed by same letter 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 WeedCovr % 07/19/18					
Source	DF	Sum of Squares	Mean Square	F Prob(F)	LSD (.05)
Total	47	403.666667			
R	3	9.833333	3.277778	0.313	0.8159
A	1	0.750000	0.750000	0.072	0.7907
B	1	1.333333	1.333333	0.127	0.7235
AB	1	0.750000	0.750000	0.072	0.7907
C	2	6.791667	3.395833	0.324	0.7254
AC	2	15.875000	7.937500	0.758	0.4767
BC	2	20.291667	10.145833	0.969	0.3901
ABC	2	2.375000	1.187500	0.113	0.8932
ERROR	33	345.666667	10.474747		4.7

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Count #/m2 07/19/18 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	46	0.024093			
R	3	0.001538	0.000513	0.970	0.4191
A	1	0.000513	0.000513	0.970	0.3321
B	1	0.000513	0.000513	0.970	0.3321
AB	1	0.000513	0.000513	0.970	0.3321
C	2	0.001025	0.000513	0.970	0.3901
AC	2	0.001025	0.000513	0.970	0.3901
BC	2	0.001025	0.000513	0.970	0.3901
ABC	2	0.001025	0.000513	0.970	0.3901
ERROR	32	0.016917	0.000529		0.0

FACTORIAL/POOLED ERROR AOV For CHEAL C.lmsqtr C Count #/m2 07/19/18 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	46	0.000425			
R	3	0.000027	0.000009	0.970	0.4191
A	1	0.000009	0.000009	0.970	0.3321
B	1	0.000009	0.000009	0.970	0.3321
AB	1	0.000009	0.000009	0.970	0.3321
C	2	0.000018	0.000009	0.970	0.3901
AC	2	0.000018	0.000009	0.970	0.3901
BC	2	0.000018	0.000009	0.970	0.3901
ABC	2	0.000018	0.000009	0.970	0.3901
ERROR	32	0.000298	0.000009		0.0

FACTORIAL/POOLED ERROR AOV For MOLVE Carpetwd C Count #/m2 07/19/18

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 DIGSA L.crbgrs C Count #/m2 07/19/18

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		.

Means followed by same letter 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 PalmerAm C Count #/m2 07/26/18						
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 CHEAL C.lmsqtr C Count #/m2 07/26/18						
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 MOLVE Carpetwd C Count #/m2 07/26/18						
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	1	0.020833	0.020833 1.000	0.3246	0.1	
AB	1	0.020833	0.020833 1.000	0.3246	0.1	
C	2	0.041667	0.020833 1.000	0.3788	0.1	
AC	2	0.041667	0.020833 1.000	0.3788	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 DIGSA L.crbgrs C Count #/m2 07/26/18						
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 C PHSLU Lima bean Injury % 07/27/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	6112.979167				
R	3	743.895833	247.965278 2.878	0.0507		
A	1	123.520833	123.520833 1.434	0.2397	5.5	
B	1	581.020833	581.020833 6.745	0.0139	5.5	
AB	1	180.187500	180.187500 2.092	0.1575	7.7	
C	2	1449.541667	724.770833 8.413	0.0011	6.7	
AC	2	10.791667	5.395833 0.063	0.9394	9.4	
BC	2	179.541667	89.770833 1.042	0.3640	9.4	
ABC	2	1.625000	0.812500 0.009	0.9906	13.4	
ERROR	33	2842.854167	86.147096			

Means followed by same letter 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 AMAPA PalmerAm C Control % 07/27/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	5248.812500				
R	3	1022.229167	340.743056	3.579	0.0241	
A	1	336.020833	336.020833	3.529	0.0692	5.7
B	1	157.687500	157.687500	1.656	0.2071	5.7
AB	1	3.520833	3.520833	0.037	0.8487	8.1
C	2	147.875000	73.937500	0.777	0.4682	7.0
AC	2	9.541667	4.770833	0.050	0.9512	9.9
BC	2	349.125000	174.562500	1.833	0.1758	9.9
ABC	2	80.791667	40.395833	0.424	0.6578	14.0
ERROR	33	3142.020833	95.212753			

FACTORIAL/POOLED ERROR AOV For C PHSLU Sieva bean Injury % 08/06/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	327.250000				
R	3	30.750000	10.250000	1.632	0.2007	
A	1	8.333333	8.333333	1.327	0.2576	1.5
B	1	21.333333	21.333333	3.397	0.0743	1.5
AB	1	0.750000	0.750000	0.119	0.7319	2.1
C	2	32.375000	16.187500	2.578	0.0912	1.8
AC	2	2.791667	1.395833	0.222	0.8019	2.5
BC	2	0.791667	0.395833	0.063	0.9390	2.5
ABC	2	22.875000	11.437500	1.821	0.1777	3.6
ERROR	33	207.250000	6.280303			

FACTORIAL/POOLED ERROR AOV For AMAPA PalmerAm C Control % 08/06/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	7034.000000				
R	3	1412.666667	470.888889	3.401	0.0290	
A	1	27.000000	27.000000	0.195	0.6617	6.9
B	1	36.750000	36.750000	0.265	0.6098	6.9
AB	1	30.083333	30.083333	0.217	0.6442	9.8
C	2	56.000000	28.000000	0.202	0.8179	8.5
AC	2	66.500000	33.250000	0.240	0.7879	12.0
BC	2	795.500000	397.750000	2.873	0.0708	12.0
ABC	2	40.666667	20.333333	0.147	0.8640	16.9
ERROR	33	4568.833333	138.449495			

FACTORIAL/POOLED ERROR AOV For GGGAN AnnGrass C Control % 08/06/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	700.479167				
R	3	32.229167	10.743056	0.660	0.5824	
A	1	22.687500	22.687500	1.394	0.2461	2.4
B	1	6.020833	6.020833	0.370	0.5472	2.4
AB	1	0.187500	0.187500	0.012	0.9152	3.4
C	2	28.291667	14.145833	0.869	0.4286	2.9
AC	2	64.125000	32.062500	1.970	0.1555	4.1
BC	2	2.041667	1.020833	0.063	0.9393	4.1
ABC	2	7.875000	3.937500	0.242	0.7865	5.8
ERROR	33	537.020833	16.273359			

FACTORIAL/POOLED ERROR AOV For AMAPA Palmer amaranth C Cts ab cnpv #/plot 08/06/18 Missing values in column 25 results in unbalanced data, Least Squares Analysis is preferred						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	45	259.133561				
R	3	37.917779	12.639260	2.397	0.0870	
A	1	4.544379	4.544379	0.862	0.3604	1.4
B	1	0.570020	0.570020	0.108	0.7445	1.4
AB	1	0.473866	0.473866	0.090	0.7663	1.9
C	2	20.632752	10.316376	1.957	0.1584	1.7
AC	2	6.675316	3.337658	0.633	0.5377	2.3
BC	2	15.642752	7.821376	1.484	0.2425	2.3
ABC	2	9.248137	4.624068	0.877	0.4260	3.3
ERROR	31	163.428561	5.271889			

Means followed by same letter 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 Lima bean plump #/4 plnt 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	43589.479167				
R	3	30666.062500	10222.020833	42.642	0.0001	
A	1	1250.520833	1250.520833	5.217	0.0289	9.1
B	1	229.687500	229.687500	0.958	0.3348	9.1
AB	1	623.520833	623.520833	2.601	0.1163	12.9
C	2	241.291667	120.645833	0.503	0.6091	11.1
AC	2	1648.791667	824.395833	3.439	0.0440	15.8
BC	2	884.375000	442.187500	1.845	0.1740	15.8
ABC	2	134.541667	67.270833	0.281	0.7571	22.3
ERROR	33	7910.687500	239.717803			

## FACTORIAL/POOLED ERROR AOV For C PHSLU Lima bean plump % of tot 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	29162.660605				
R	3	19773.479266	6591.159755	35.591	0.0001	
A	1	1359.328337	1359.328337	7.340	0.0106	7.9924260755
B	1	16.813001	16.813001	0.091	0.7651	7.9924260755
AB	1	8.761366	8.761366	0.047	0.8292	11.3029973522
C	2	453.679457	226.839728	1.225	0.3068	9.7886828459
AC	2	356.267443	178.133721	0.962	0.3926	13.8432880385
BC	2	336.103398	168.051699	0.907	0.4134	13.8432880385
ABC	2	746.972912	373.486456	2.017	0.1492	19.5773656919
ERROR	33	6111.255426	185.189558			

## FACTORIAL/POOLED ERROR AOV For C PHSLU Lima bean plump wt. g 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	491279.493125				
R	3	335710.150625	111903.383542	38.760	0.0001	
A	1	19404.541875	19404.541875	6.721	0.0141	31.56
B	1	2172.175208	2172.175208	0.752	0.3920	31.56
AB	1	6648.166875	6648.166875	2.303	0.1387	44.63
C	2	647.783750	323.891875	0.112	0.8942	38.65
AC	2	16700.408750	8350.204375	2.892	0.0696	54.66
BC	2	11235.125417	5617.562708	1.946	0.1589	54.66
ABC	2	3486.233750	1743.116875	0.604	0.5527	77.30
ERROR	33	95274.906875	2887.118390			

## FACTORIAL/POOLED ERROR AOV For C PHSLU Lima bean flat #/4 plnt 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	77.812500				
R	3	6.229167	2.076389	1.280	0.2973	
A	1	0.187500	0.187500	0.116	0.7360	0.7
B	1	1.020833	1.020833	0.629	0.4332	0.7
AB	1	2.520833	2.520833	1.554	0.2213	1.1
C	2	2.375000	1.187500	0.732	0.4885	0.9
AC	2	0.875000	0.437500	0.270	0.7652	1.3
BC	2	0.791667	0.395833	0.244	0.7848	1.3
ABC	2	10.291667	5.145833	3.173	0.0549	1.8
ERROR	33	53.520833	1.621843			

## FACTORIAL/POOLED ERROR AOV For C PHSLU Lima bean flat % of tot 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	64.604842				
R	3	5.422991	1.807664	1.339	0.2786	
A	1	0.011455	0.011455	0.008	0.9272	0.6825100647
B	1	1.204931	1.204931	0.892	0.3517	0.6825100647
AB	1	0.833781	0.833781	0.617	0.4376	0.9652149899
C	2	1.272324	0.636162	0.471	0.6285	0.8359007014
AC	2	1.100828	0.550414	0.408	0.6686	1.1821421087
BC	2	0.531494	0.265747	0.197	0.8223	1.1821421087
ABC	2	9.662307	4.831153	3.577	0.0392	1.6718014027
ERROR	33	44.564732	1.350446			

Means followed by same letter 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 PHSLU Lima bean flat wt. g 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	606.322898				
R	3	74.596306	24.865435	2.046	0.1265	
A	1	3.015019	3.015019	0.248	0.6218	2.048
B	1	30.194269	30.194269	2.484	0.1246	2.048
AB	1	6.727519	6.727519	0.553	0.4622	2.896
C	2	0.330304	0.165152	0.014	0.9865	2.508
AC	2	26.044888	13.022444	1.071	0.3542	3.547
BC	2	0.652888	0.326444	0.027	0.9735	3.547
ABC	2	63.614138	31.807069	2.617	0.0881	5.016
ERROR	33	401.147569	12.155987			

## FACTORIAL/POOLED ERROR AOV For C PHSLU Lima bean dry % of tot 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	29986.423044				
R	3	20294.417849	6764.805950	35.296	0.0001	
A	1	1351.447848	1351.447848	7.051	0.0121	8.1307808231
B	1	9.016041	9.016041	0.047	0.8296	8.1307808231
AB	1	4.189573	4.189573	0.022	0.8834	11.4986605127
C	2	428.574271	214.287135	1.118	0.3390	9.9581321135
AC	2	338.901615	169.450807	0.884	0.4226	14.0829254908
BC	2	312.102457	156.051228	0.814	0.4517	14.0829254908
ABC	2	923.106045	461.553023	2.408	0.1056	19.9162642269
ERROR	33	6324.667346	191.656586			

## FACTORIAL/POOLED ERROR AOV For C PHSLU Lima bean dry #/4 plnt 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	56533.812500				
R	3	20462.729167	6820.909722	9.263	0.0001	
A	1	1862.520833	1862.520833	2.529	0.1213	15.9
B	1	266.020833	266.020833	0.361	0.5519	15.9
AB	1	346.687500	346.687500	0.471	0.4974	22.5
C	2	1690.125000	845.062500	1.148	0.3297	19.5
AC	2	26.541667	13.270833	0.018	0.9821	27.6
BC	2	52.041667	26.020833	0.035	0.9653	27.6
ABC	2	7526.625000	3763.312500	5.111	0.0117	39.0
ERROR	33	24300.520833	736.379419			

## FACTORIAL/POOLED ERROR AOV For C PHSLU Lima bean dry wt. g 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	99741.312500				
R	3	22404.395833	7468.131944	4.177	0.0130	
A	1	1397.520833	1397.520833	0.782	0.3830	24.8
B	1	1530.020833	1530.020833	0.856	0.3616	24.8
AB	1	1017.520833	1017.520833	0.569	0.4559	35.1
C	2	2856.125000	1428.062500	0.799	0.4584	30.4
AC	2	231.291667	115.645833	0.065	0.9375	43.0
BC	2	348.291667	174.145833	0.097	0.9074	43.0
ABC	2	10960.291667	5480.145833	3.065	0.0601	60.8
ERROR	33	58995.854167	1787.753157			

## FACTORIAL/POOLED ERROR AOV For C PHSLU Lima bean total #/4 plnt 09/05/18

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	33939.479167				
R	3	3753.562500	1251.187500	2.153	0.1123	
A	1	67.687500	67.687500	0.116	0.7351	14.2
B	1	4.687500	4.687500	0.008	0.9290	14.2
AB	1	2041.020833	2041.020833	3.512	0.0698	20.0
C	2	1713.791667	856.895833	1.475	0.2436	17.3
AC	2	1261.625000	630.812500	1.085	0.3495	24.5
BC	2	726.125000	363.062500	0.625	0.5416	24.5
ABC	2	5193.791667	2596.895833	4.469	0.0192	34.7
ERROR	33	19177.187500	581.126894			

Means followed by same letter 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 Lima bean Yield kg/20 ft 09/05/18						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	4.243431				
R	3	2.558673	0.852891	27.036	0.0001	
A	1	0.000352	0.000352	0.011	0.9165	0.104
B	1	0.024752	0.024752	0.785	0.3821	0.104
AB	1	0.000752	0.000752	0.024	0.8782	0.148
C	2	0.055663	0.027831	0.882	0.4234	0.128
AC	2	0.153454	0.076727	2.432	0.1034	0.181
BC	2	0.133429	0.066715	2.115	0.1367	0.181
ABC	2	0.275304	0.137652	4.363	0.0208	0.256
ERROR	33	1.041052	0.031547			

Means followed by same letter 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  
 Trial ID: Bean 5-18 Location: Trial Year: 2018  
 Protocol ID: Bean 5-18 Investigator: Kurt Vollmer  
 Study Director: Kurt Vollmer  
 Sponsor Contact:

**General Trial Information**

Study Director: Kurt Vollmer  
 Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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

Variety: Cypress

Planting Date: 06/21/18  
 Depth: 0.75 in

Planting Rate: 4 P/FT

Rows per Plot: 4

Planting Method: PLANTD planted

Row Spacing: 30 in

Planting Equipment: FE Field Equipment

Soil Temperature: 81 F

Seed Bed: MEDIUM medium

Emergence Date: 06/26/18

Soil Moisture: NORMAL normal, adequate

Harvest Date: 09/04/18

Harvest Equipment: By Hand

Harvested Width: 5 ft

Harvested Length: 20 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 18C  
 % Sand: 83 Texture: LS loamy sand  
 % Silt: 10 Soil Name: Klej loamy sand, 0-2% slopes  
 % Clay: 7  
 Soil Drainage: F fair

<b>Application Description</b>		A	B	C
Application Date	06/21/18	07/11/18	07/30/18	
Appl. Stop Time	04:00 AM	10:00 AM	08:15 AM	
Interval to Prev. Appl.		20 DAYS	19 DAYS	
Application Method	SPRAY	SPRAY	SPRAY	
Application Timing	PREPRE	3WAP	6WAP	
Application Placement	BROSOI	BROFOL	BROFOL	
Applied By	Johnson, Q.	Johnson, Q.	Vollmer,K.	
Air Temperature Start, Stop	79 F	82 F	73 F	
% Relative Humidity Start, Stop	74	55	93	
Wind Velocity+Dir. Start	10.4 MPH NE	3 mph N	3 MPH ENE	
Wet Leaves (Y/N)	N no	N no	N no	
Soil Temperature	79 F	82 F	73 F	
Soil Moisture	NORMAL	NORMAL	NORMAL	
% Cloud Cover	100	20	100	
Next Moisture Occurred On	06/22/18	07/21/18	07/30/18	

<b>Crop Stage At Each Application</b>		A	B	C
Crop 1 Code, BBCH Scale	PHSLU BVBE	PHSLU BVBE	PHSLU BVBE	

<b>Application Equipment</b>		A	B	C
Appl. Equipment	Tractor	Tractor	Backpack	
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	26 in	40 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	

<b>SE Definitions</b>	
	1.
Crop Type, Code	C

Trial Comments

## Lima Bean Response to Multiple Postemergence Applications of Dual Magnum

Trial ID: Bean 5-18 Location: Trial Year: 2018

Protocol ID: Bean 5-18 Investigator: Kurt Vollmer

Study Director: Kurt Vollmer

Sponsor Contact:

Pest Code Pest Name	AMAPA PalmerAm	AMAPA PalmerAm	MOLVE Carpetwd	MOLVE Carpetwd	DIGSA L.crbgrs	
Crop Type, Code	C -	C -	C -	C -	C -	C PHSLU
Crop Name						
Rating Type	control	counts	control	counts	counts	Lima bean
Rating Unit	%	#/m <sup>2</sup>	%	#/m <sup>2</sup>	#/m <sup>2</sup>	injury
Rating Date	07/05/18	07/05/18	07/05/18	07/05/18	07/05/18	07/13/18
Trt Treatment	Form Form	Rate Appl	Appl			
No. Name	Conc Type	Rate	Unit	Timing	Code	
1 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
2 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.476 lb ai/a	6 WAP	C		
3 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	0.476 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
4 Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
5 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	1.19 lb ai/a	3 WAP	B		
6 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	1.19 lb ai/a	6 WAP	C		
7 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	1.43 lb ai/a	3 WAP	B		
8 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	1.43 lb ai/a	6 WAP	C		
9 Weed Free		75.0 a	0.0 b	75.0 a	0.0 c	0.0 b
10 untreated		0.0 b	4.0 a	0.0 b	6.8 a	11.0 a
LSD P=.05		31.46	2.04	23.59	1.58	3.55
Standard Deviation		21.69	1.41	16.26	1.09	2.45
CV		27.48	193.93	19.98	94.96	166.0
Replicate F		0.533	0.822	0.715	1.481	2.328
Replicate Prob(F)		0.6638	0.4932	0.5515	0.2418	0.0969
Treatment F		7.109	2.907	12.962	14.311	7.566
Treatment Prob(F)		0.0001	0.0153	0.0001	0.0001	1.0000

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.

Excluded replicate 4 in column 36

Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code Pest Name	AMAPA PalmerAm	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	C PHSLU Lima bean injury %	GrndCovr %
Crop Type, Code	C -	C -	C -	C -	C -	C -
Crop Name						
Rating Type						
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	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP C		
2 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP B		
Dual Magnum	7.62 EC	0.476 lb ai/a	6	WAP C		
3 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	0.476 lb ai/a	3	WAP B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP C		
4 Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP C		
5 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	1.19 lb ai/a	3	WAP B		
6 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	1.19 lb ai/a	6	WAP C		
7 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	1.43 lb ai/a	3	WAP B		
8 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A		
Dual Magnum	7.62 EC	1.43 lb ai/a	6	WAP C		
9 Weed Free		0.0 a	0.0 a	0.0 b	0.0 b	3.5 d
10 untreated		17.8 a	1.5 a	11.8 a	16.0 a	0.0 d
LSD P=.05		14.09	1.03	4.07	4.68	10.51
Standard Deviation		9.71	0.71	2.80	3.22	7.24
CV		451.71	177.43	155.67	107.44	37.23
Replicate F		0.816	0.926	0.849	1.701	1.736
Replicate Prob(F)		0.4963	0.4414	0.4793	0.1905	0.1833
Treatment F		1.281	1.897	6.968	8.626	21.889
Treatment Prob(F)		0.2916	0.0959	0.0001	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.

Excluded replicate 4 in column 36

Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code Pest Name	AMAPA PalmerAm	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	AMAPA PalmerAm	CHEAL C.lmsqtr
Crop Type, Code	C -	C -	C -	C -	C -	C -
Crop Name						
Rating Type	counts	counts	counts	counts	counts	counts
Rating Unit	#/m2	#/m2	#/m2	#/m2	#/m2	#/m2
Rating Date	07/19/18	07/19/18	07/19/18	07/19/18	07/26/18	07/26/18
Trt Treatment	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
No.	Name					
1	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
2	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.476 lb ai/a	6	WAP	C
3	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.476 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
4	Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
5	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb ai/a	3	WAP	B
6	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb ai/a	6	WAP	C
7	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.43 lb ai/a	3	WAP	B
8	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.43 lb ai/a	6	WAP	C
9	Weed Free					
10	untreated					
LSD P=.05		2.46	0.31	15.34	1.34	6.16
Standard Deviation		1.69	0.21	10.58	0.92	4.25
CV		161.35	421.64	153.84	246.52	129.74
Replicate F		0.406	2.250	0.852	0.263	0.448
Replicate Prob(F)		0.7496	0.1053	0.4775	0.8512	0.7206
Treatment F		3.674	1.000	6.492	1.511	1.835
Treatment Prob(F)		0.0041	0.4635	0.0001	0.1942	0.1074
						0.0036

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.

Excluded replicate 4 in column 36

Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code Pest Name Crop Type, Code	MOLVE Carpetwd C -	DIGSA Lcrbgrs C -	C PHSLU Lima bean injury %	C PHSLU Lima bean injury %	C PHSLU Lima bean injury %
Crop Name Rating Type Rating Unit Rating Date	counts #/m2 07/26/18	counts #/m2 07/26/18	07/27/18	07/31/18	08/06/18
Trt No. Treatment Name	Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
1 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP C	
2 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP B	
Dual Magnum	7.62 EC	0.476 lb ai/a	6	WAP C	
3 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
Dual Magnum	7.62 EC	0.476 lb ai/a	3	WAP B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP C	
4 Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A	
Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP C	
5 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
Dual Magnum	7.62 EC	1.19 lb ai/a	3	WAP B	
6 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
Dual Magnum	7.62 EC	1.19 lb ai/a	6	WAP C	
7 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
Dual Magnum	7.62 EC	1.43 lb ai/a	3	WAP B	
8 Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
Dual Magnum	7.62 EC	1.43 lb ai/a	6	WAP C	
9 Weed Free		0.0 c	0.0 a	0.0 d	0.0 b
10 untreated		75.5 a	3.3 a	0.0 d	0.0 b
LSD P=.05		16.72	2.32	6.98	2.13
Standard Deviation		11.52	1.60	4.81	1.47
CV		76.07	123.15	72.59	124.82
Replicate F		1.840	2.965	0.099	0.105
Replicate Prob(F)		0.1637	0.0497	0.9598	0.9567
Treatment F		14.888	1.838	8.351	5.012
Treatment Prob(F)		0.0001	0.1069	0.0001	0.0005
					0.797
					0.6217

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.

Excluded replicate 4 in column 36

Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code		AMAPA	CHEAL			
Pest Name	PalmerAm	C.lmsqtr	C -	C PHSLU	C PHSLU	C PHSLU
Crop Type, Code				Lima bean plump #/4 plnt	Lima bean plump % of tot	Lima bean plump wt. g
Crop Name				09/04/18	09/04/18	09/04/18
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
2	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.476 lb ai/a	6	WAP	C
3	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.476 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
4	Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
5	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb ai/a	3	WAP	B
6	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb ai/a	6	WAP	C
7	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.43 lb ai/a	3	WAP	B
8	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.43 lb ai/a	6	WAP	C
9	Weed Free			100.0	a	100.0 a
10	untreated			0.0	e	10.0 c
LSD P=.05				14.31	25.28	15.03
Standard Deviation				9.86	17.42	10.36
CV				14.01	23.24	62.13
Replicate F				0.137	1.628	0.521
Replicate Prob(F)				0.9373	0.2062	0.6716
Treatment F				28.955	8.109	1.027
Treatment Prob(F)				0.0001	0.0001	0.4447

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.

Excluded replicate 4 in column 36

Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	C PHSLU	C PHSLU	C PHSLU	C PHSLU
Crop Name		Lima bean flat #/4 plnt	Lima bean flat % of tot	Lima bean flat wt, g	Lima bean dry #/4 plnt	09/04/18
Rating Type		09/04/18	09/04/18	09/04/18	09/04/18	09/04/18
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
2	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.476 lb ai/a	6	WAP	C
3	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.476 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
4	Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb ai/a	3	WAP	B
	Dual Magnum	7.62 EC	0.714 lb ai/a	6	WAP	C
5	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb ai/a	3	WAP	B
6	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb ai/a	6	WAP	C
7	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.43 lb ai/a	3	WAP	B
8	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.43 lb ai/a	6	WAP	C
9	Weed Free			1.8 a	4.7916671459 a	3.7 a
10	untreated			0.4 a	3.4090912509 a	0.7 a
LSD P=.05		2.03 - 3.84		6.82828755044	4.50 - 11.50	27.47
Standard Deviation		0.39t		4.70636184814	0.61t	18.93
CV		134.88t		162.05	139.78t	32.79
Replicate F		1.352		1.751	0.773	3.782
Replicate Prob(F)		0.2786		0.1804	0.5193	0.0219
Treatment F		0.224		0.331	0.467	1.807
Treatment Prob(F)		0.9882		0.9570	0.8840	0.1132

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

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

Excluded replicate 4 in column 36

Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

Pest Code	Pest Name	Crop Type, Code	C PHSLU Lima bean dry % of tot 09/04/18	C PHSLU Lima bean dry wt. g 09/04/18	C PHSLU Lima bean total #/4 plnt 09/04/18	C PHSLU Lima bean Yield kg/20 ft 09/04/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	82.511041301 a
	Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
	Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
2	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	75.900277888 a
	Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
	Dual Magnum	7.62 EC	0.476 lb ai/a	6 WAP	C	
3	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	75.716360444 a
	Dual Magnum	7.62 EC	0.476 lb ai/a	3 WAP	B	
	Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
4	Dual Magnum	7.62 EC	0.476 lb ai/a	PRE	A	73.915109182 a
	Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
	Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
5	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	70.358083356 a
	Dual Magnum	7.62 EC	1.19 lb ai/a	3 WAP	B	
6	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	72.889622649 a
	Dual Magnum	7.62 EC	1.19 lb ai/a	6 WAP	C	
7	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	69.716100589 a
	Dual Magnum	7.62 EC	1.43 lb ai/a	3 WAP	B	
8	Dual Magnum	7.62 EC	0.714 lb ai/a	PRE	A	74.204828898 a
	Dual Magnum	7.62 EC	1.43 lb ai/a	6 WAP	C	
9	Weed Free					70.620034982 a
10	untreated					83.020113197 a
LSD P=.05			22.0367992527		36.17	23.48
Standard Deviation			15.1887498134		24.93	16.18
CV			20.28		26.17	21.22
Replicate F			2.118		3.540	2.853
Replicate Prob(F)			0.1214		0.0278	0.0559
Treatment F			0.379		2.341	4.404
Treatment Prob(F)			0.9349		0.0423	0.0013
						0.097
						0.9081
						1.873
						0.1230

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.

Excluded replicate 4 in column 36

Could not calculate LSD (% mean diff) for columns 6 because error mean square = 0.

## Bicyclopyprone Herbicide for Melons - Under Plastic Mulch

Trial ID: MELN1-18      Location: Field # 9      Trial Year: 2018  
Protocol ID: MELN1-18      Investigator: Mark VanGessel  
Study Director:  
Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
Initiation Date: 03/01/18  
Completion Date: 09/30/18

**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 CITLA Citrullus lanatus	Watermelon	BBCH Scale: BVVT
Variety: Fascination		
Attributes: Seedless		
Planting Date: 05/23/18	Planting Rate: 1 per 3 ft	
Row Spacing: 7 ft	Planting Method: TRAHAN transplanted - hand	
Spacing within Row: 3 FT		
Soil Temperature: 73 F	Soil Moisture: NORMAL normal, adequate	
Crop 2: C CUMMC Cucumis melo cantaloupensis Cantaloupe melon		BBCH Scale: BVVT
Variety: Athena		
Planting Date: 05/23/18	Planting Rate: 1 per 3 ft	
Row Spacing: 7 ft	Planting Method: TRAHAN transplanted - hand	
Spacing within Row: 3 FT	Soil Moisture: NORMAL normal, adequate	

**Site and Design**

Treated Plot Width: 6 FT      Site Type: FIELD field  
Treated Plot Length: 55 FT  
Treated Plot Area: 330 FT<sup>2</sup> Treatments: 6      Tillage Type: CONTIL conventional-till  
Replications: 3      Study Design: RACOBL Randomized Complete Block (RCB)

**Maintenance**

No.	Type	Maintenance Product Name	Form Conc	Form Unit	Form Type	Re-Entry Interval	Rate	Rate Unit
1.	HERB	Strategy Premix	2.1	lb/gal	E	24	3	PT/A
2.	HERB	Curbit.....ethalfluralin	3	lb/gal	E	24	8	FL OZ/A
3.	HERB	Sandea.....halosulfuron	75	%	DF	12	0.67	OZ WT/A

## Field Prep./Maintenance:

Total PRE (maintain weed free row middles) as a 2 nozl shielded spray at planting

**Soil Description**

Description Name: Field 9  
 % Sand: 83 % OM: 1.0 Texture: LS loamy sand  
 % Silt: 9 pH: 5.9 Soil Name: Pepperbox loamy sand, 0-2% slopes  
 % Clay: 8 CEC: 5.7 Fert. Level: F fair  
 Soil Drainage: F fair

**Application Description**

	A
Application Date	05/22/18
Appl. Stop Time	10:15 AM
Application Method	SPRAY
Application Timing	PRETRNS
Application Placement	BROADC
Applied By	Matt
Air Temperature Start, Stop	70 F
% Relative Humidity Start, Stop	70
Wind Velocity+Dir. Start	5 MPH SE
Wet Leaves (Y/N)	N no
Soil Temperature	70 F
Soil Moisture	NORMAL
% Cloud Cover	15

**Crop Stage At Each Application**

	A
Crop 1 Code, BBCH Scale	CITLA BVVT
Crop 2 Code, BBCH Scale	CUMMC BVVT

**Application Equipment**

	A
Appl. Equipment	Backpack
Equipment Type	SPRBAC
Operation Pressure	31 psi
Nozzle Type	AIR MIX
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

**SE Definitions**

	1.
Crop Type, Code	C

**Trial Comments**

06/06/18: Rep 3 untreated plastic too close to trt 6 (tractor had problem with bed formation) and some injury has resulted. No rating here.

## Bicyclopyrone Herbicide for Melons - Under Plastic Mulch

Trial ID: MELN1-18

Location: Field

## Trial Year: 2018

File ID: MEIN1-18  
Protocol ID: MEIN1-18

Investigator: Mark VanGessel

Investigator:  
Study Director:

Study Director:  
Sponsor Contact:

Crop Type, Code		C	CITLA	C	CITLA	C	CUMMC	C	CUMMC
Crop Name		Watrmeln	Watrmeln	Cantlope	Cantlope				
Rating Type		Chlrosis	Stunting	Chlrosis	Chlrosis				
Rating Unit		%	%	%	%				
Rating Date		06/01/18	06/01/18	06/01/18	06/01/18				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check							0.0 a	0.0 a
2	A16003	1.67	SL	0.11	lb ai/a	UndrPlas	A	2.3 a	0.0 a
3	A16003	1.67	SL	0.22	lb ai/a	UndrPlas	A	2.3 a	3.3 a
4	A16003 Sinbar.....terbacil	1.67	SL 80 W	0.11	lb ai/a	UndrPlas	A	0.0 a	0.0 a
				0.2	lb ai/a	UndrPlas	A		
5	Reflex.....fomesafen	2	L	0.188	lb ai/a	UndrPlas	A	0.0 a	0.0 a
6	A16003 Sandea.....halosulfuron	1.67	SL 75 DF	0.11	lb ai/a	UndrPlas	A	0.0 a	3.3 a
				0.0234	lb ai/a	UndrPlas	A		2.3 a
LSD P=.05				3.80		6.36		8.42	
Standard Deviation				2.09		3.50		4.63	
CV				268.33		314.64		95.71	
Replicate F				2.500		0.455		0.779	
Replicate Prob(F)				0.1317		0.6472		0.4849	
Treatment F				1.000		0.727		1.600	
Treatment Prob(F)				0.4651		0.6187		0.2463	

Means followed by same letter 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=7,8,9,10,12,14,16

Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.

Crop Type, Code		C C ITLA	C C ITLA	C C UMMC	C C UMMC						
Crop Name		Watrmeln Chlr/LfBrn %	Watrmeln Stunting %	Cantlope Chlr/LfBrn %	Cantlope Stunting %						
Rating Type		06/06/18	06/06/18	06/06/18	06/06/18						
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Untreated Check							0.0 a	0.0 b	2.2 c	0.0 a
2	A16003	1.67	SL	0.11 lb	ai/a	UndrPlas	A	7.3 a	0.0 b	20.0 ab	15.0 a
3	A16003	1.67	SL	0.22 lb	ai/a	UndrPlas	A	14.0 a	10.0 a	21.0 ab	16.7 a
4	A16003 Sinbar.....terbacil	1.67 80 W	SL	0.11 lb 0.2 lb	ai/a	UndrPlas	A	4.0 a	4.7 ab	35.0 a	11.7 a
5	Reflex.....fomesafen	2	L	0.188 lb	ai/a	UndrPlas	A	0.0 a	1.7 b	13.3 bc	7.3 a
6	A16003 Sandeal.....halosulfuron	1.67 75	SL DF	0.11 lb 0.0234 lb	ai/a	UndrPlas	A	4.7 a	4.7 ab	11.7 bc	13.3 a
LSD P=.05				10.73		6.29		16.45		10.60	
Standard Deviation				5.90		3.46		8.91		5.74	
CV				117.98		98.84		51.79		53.79	
Replicate F				0.134		4.694		1.778		4.743	
Replicate Prob(F)				0.8760		0.0365		0.2234		0.0392	
Treatment F				2.372		3.652		4.610		3.422	
Treatment Prob(F)				0.1149		0.0386		0.0231		0.0523	

Means followed by same letter 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=7,8,9,10,12,14,16  
 Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.

Crop Type, Code		C	CITLA	C	CUMMC	C	CITLA	C	CUMMC
Crop Name		Watrmeln Stunting %	06/13/18	Cantlope Stunting %		Watrmeln Stunting %	06/18/18	Cantlope Stunting %	
Rating Type				Rating Unit			Rating Date		
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code		
1	Untreated Check							0.0 a	0.2 c
2	A16003	1.67	SL	0.11	lb ai/a	UndrPlas	A	3.3 a	40.0 ab
3	A16003	1.67	SL	0.22	lb ai/a	UndrPlas	A	27.7 a	60.0 ab
4	A16003 Sinbar.....terbacil	1.67	SL 80 W	0.11	lb ai/a	UndrPlas	A	8.3 a	70.0 a
				0.2	lb ai/a	UndrPlas	A		
5	Reflex.....fomesafen	2	L	0.188	lb ai/a	UndrPlas	A	2.3 a	27.3 bc
6	A16003 Sandeal.....halosulfuron	1.67	SL 75 DF	0.11	lb ai/a	UndrPlas	A	12.3 a	31.0 bc
				0.0234	lb ai/a	UndrPlas	A		
LSD P=.05					21.83		33.14	15.77	13.50
Standard Deviation					11.82		17.94	8.67	7.31
CV					131.31		47.12	64.22	12.41
Replicate F					0.230		0.017	0.894	0.338
Replicate Prob(F)					0.7988		0.9830	0.4395	0.7218
Treatment F					2.223		5.788	6.206	57.912
Treatment Prob(F)					0.1405		0.0116	0.0072	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=7,8,9,10,12,14,16

Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.

Crop Type, Code		C CITLA	C CUMMC	C CITLA	C CUMMC						
Crop Name		Watrmeln Stunting %	Cantlope Stunting %	Watrmeln BiomRed %	Cantlope BiomRed %						
Rating Type		06/26/18	06/26/18	07/18/18	07/18/18						
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Untreated Check							0.0 b	0.0 e	0.0 b	0.0 d
2	A16003	1.67	SL	0.11	lb ai/a	UndrPlas	A	16.7 b	76.7 bc	9.0 ab	61.7 b
3	A16003	1.67	SL	0.22	lb ai/a	UndrPlas	A	55.0 a	86.7 ab	20.0 a	85.0 a
4	A16003 Sinbar.....terbacil	1.67	SL 80 W	0.11	lb ai/a	UndrPlas	A	11.7 b	96.7 a	0.0 b	96.7 a
5	Reflex.....fomesafen	2	L	0.188	lb ai/a	UndrPlas	A	6.7 b	48.3 d	4.0 b	32.7 c
6	A16003 Sandeal.....halosulfuron	1.67	SL 75 DF	0.11	lb ai/a	UndrPlas	A	21.0 b	70.0 c	4.0 b	51.7 bc
LSD P=.05				23.24		13.26		12.11		22.23	
Standard Deviation				12.77		7.18		6.66		12.04	
CV				69.05		11.39		107.93		22.04	
Replicate F				0.412		0.997		0.282		0.583	
Replicate Prob(F)				0.6733		0.4063		0.7600		0.5782	
Treatment F				6.879		71.165		3.858		25.722	
Treatment Prob(F)				0.0050		0.0001		0.0330		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=7,8,9,10,12,14,16

Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.

Crop Type, Code		C C ITLA	C C ITLA	C C ITLA	C C ITLA						
Crop Name		Watrmeln Yld 1 remainin 08/07/18	Watrmeln Yld 2 remainin 08/15/18	Watrmeln YldTtl wt lbs	Watrmeln YldTtl #/plot						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Untreated Check							8.7 bc	5.0 a	214.9 a	12 a
2	A16003	1.67	SL	0.11	lb ai/a	UndrPlas	A	9.7 bc	6.7 a	183.0 a	10 a
3	A16003	1.67	SL	0.22	lb ai/a	UndrPlas	A	13.7 a	10.3 a	129.8 a	6 a
4	A16003 Sinbar.....terbacil	1.67	SL 80 W	0.11	lb ai/a	UndrPlas	A	11.0 ab	7.0 a	244.7 a	13 a
5	Reflex.....fomesafen	2	L	0.188	lb ai/a	UndrPlas	A	7.3 c	5.7 a	227.9 a	13 a
6	A16003 Sandeal.....halosulfuron	1.67	SL 75 DF	0.11	lb ai/a	UndrPlas	A	8.0 bc	6.7 a	200.5 a	11 a
LSD P=.05								3.18	4.69	106.68	6.2
Standard Deviation								1.75	2.58	58.64	3.4
CV								17.98	37.45	29.3	31.4
Replicate F								6.891	1.661	0.019	0.121
Replicate Prob(F)								0.0131	0.2383	0.9813	0.8871
Treatment F								5.298	1.536	1.432	1.637
Treatment Prob(F)								0.0123	0.2632	0.2935	0.2369

Means followed by same letter 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=7,8,9,10,12,14,16

Could not calculate LSD (% mean diff) for columns 4 because error mean square = 0.

**Pumpkin Response to Different POST Timings of Dual**

Trial ID: Pmpkn 4-18

Location:

Trial Year: 2017

Protocol ID: Pmpkn 4-18

Investigator: Kurt Vollmer

Study Director: Kurt Vollmer

Sponsor Contact:

**General Trial Information**

Study Director: Kurt Vollmer

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 03/31/18

Completion Date: 09/30/18

**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 CUUMA Cucurbita maxima Pumpkin

BBCH Scale: BVVT

Variety: Gladiator

Planting Date: 06/21/18

Planting Rate: 2

P/FT

Depth: 1 in

Planting Method: SEEDHA seeded by hand

Row Spacing: 7.5 FT

Spacing within Row: 2 FT

Soil Temperature: 76 F

Soil Moisture: NORMAL normal, adequate

Emergence Date: 06/26/18

Harvest Date: 09/11/18

**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: NOTILL no-till

Replications: 4

Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 22B

% Sand: 81 % OM: 1.1 Texture: LS loamy sand

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

% Clay: 7 CEC: 4.1 Fert. Level: E excellent

Soil Drainage: F fair

**Application Description**

	A	B	C	D
Application Date	06/21/18	07/11/18	07/18/18	07/26/18
Appl. Stop Time	03:00 PM	08:00 AM	12:15 PM	08:30 AM
Interval to Prev. Appl.		20 DAYS	7 DAYS	8 DAYS
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PRE	3WAP	4WAP	5WAP
Application Placement	BROSOI	BROFOL	BROFOL	BROFOL
Applied By	Johnson, Q.	Vollmer, K.	Zoller, M.	Vollmer, K.
Air Temperature Start, Stop	79 F	77 F	83 F	75 F
% Relative Humidity Start, Stop	74	79	55	94
Wind Velocity+Dir. Start	10.4 MPH NE	5 MPH N	9 MPH NW	5 MPH W
Wet Leaves (Y/N)	N no	N no	N no	N no
Soil Temperature	79 F	77 F	83 F	75 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	100	45	20	100
Next Moisture Occurred On	06/22/18			

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	CUUMA	BVVT	CUUMA	BVVT

**Application Equipment**

	A	B	C	D
Appl. Equipment	Tractor	Backpack	Backpack	Backpack
Equipment Type	TRMOSP	SPRBAC	SPRBAC	SPRBAC
Operation Pressure	40 psi	31 psi	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002	11002
Nozzle Spacing	20 in	18 in	18 in	18 in
Boom Length	6.7 ft	6 ft	6 ft	6 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	COMAIR	COMCO2	COMCO2	COMCO2

Trial Comments

## Pumpkin Response to Different POST Timings of Dual

Trial ID: Pmpkn 4-18

Location:

Trial Year: 2017

Protocol ID: Pmpkn 4-18

Investigator: Kurt Vollmer

Study Director: Kurt Vollmer

Sponsor Contact:

Pest Code Pest Name		AMAPA PalmerAm	AMAPA PalmerAm		AMAPA PalmerAm	DIGSA L.crbgrs	
Crop Type, Code		C -	C -	CUUMA Pumpkin injury	C -	C -	C -
Crop Name Rating Type		control	count		count	count	BiomRed
Rating Unit Rating Date		% 07/05/18	#/m2 07/05/18	% 07/13/18	#/m2 07/13/18	#/m2 07/13/18	% 07/19/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Curbit	3 EC	1.13 lb	ai/a	PRE	A	100.0 a
2	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a	PRE	A	98.8 a
3	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a	PRE	A	98.8 a
4	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a	PRE	A	100.0 a
5	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a	PRE	A	100.0 a
6	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a	PRE	A	100.0 a
7	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a	PRE	A	100.0 a
8	Reflex	2 EC	0.375 lb	ai/a	PRE	A	96.5 a
9	Weed Free						100.0 a
10	untreated						50.0 b
LSD P=.05				26.94	0.79	1.15	1.17
Standard Deviation				18.57	0.54	0.79	0.81
CV				19.67	362.89	632.46	230.02
Replicate F				0.754	0.563	1.000	0.257
Replicate Prob(F)				0.5298	0.6444	0.4079	0.8556
Treatment F				2.839	0.975	1.000	0.874
Treatment Prob(F)				0.0172	0.4817	0.4635	0.5591
							11.8 a
							5.5 a
							12.46
							3.95
							8.59
							85.66
							3.103
							0.0432
							1.656
							0.0080
							0.1493

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.

Could not calculate LSD (% mean diff) for columns 12,17 because error mean square = 0.

Pest Code Pest Name	AMAPA PalmerAm	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs	CYPES Y.nutsge		
Crop Type, Code	C -	C -	C -	C -	C -	C	CUUMA
Crop Name	counts	counts	counts	counts	counts	Pumpkin	
Rating Type	#/m2	#/m2	#/m2	#/m2	#/m2	Injury	%
Rating Unit	07/19/18	07/19/18	07/19/18	07/19/18	07/19/18		
Rating Date						07/27/18	
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Curbit	3 EC	1.13 lb	ai/a	PRE	A	
2	Curbit	3 EC	1.13 lb	ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb	ai/a	3 WAP	B	
3	Curbit	3 EC	1.13 lb	ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb	ai/a	4 WAP	C	
4	Curbit	3 EC	1.13 lb	ai/a	PRE	A	
	Dual Magnum	7.62 EC	0.714 lb	ai/a	5 WAP	D	
5	Curbit	3 EC	1.13 lb	ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb	ai/a	3 WAP	B	
6	Curbit	3 EC	1.13 lb	ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb	ai/a	4 WAP	C	
7	Curbit	3 EC	1.13 lb	ai/a	PRE	A	
	Dual Magnum	7.62 EC	1.19 lb	ai/a	5 WAP	D	
8	Reflex	2 EC	0.375 lb	ai/a	PRE	A	
9	Weed Free						
10	untreated						
LSD P=.05		1.92	0.46	6.50	7.87	0.23	.
Standard Deviation		1.33	0.32	4.48	5.43	0.16	0.00
CV		212.16	632.46	121.09	96.92	632.46	0.0
Replicate F		1.000	1.000	0.465	3.243	1.000	0.000
Replicate Prob(F)		0.4079	0.4079	0.7091	0.0375	0.4079	1.0000
Treatment F		0.798	1.000	2.869	1.228	1.000	0.000
Treatment Prob(F)		0.6214	0.4635	0.0163	0.3195	0.4635	1.0000

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

Could not calculate LSD (% mean diff) for columns 12,17 because error mean square = 0.

Pest Code Pest Name		AMAPA PalmerAm	CHEAL C.lmsqtr	MOLVE Carpetwd	DIGSA L.crbgrs			AMAPA PalmerAm
Crop Type, Code		C -	C -	C -	C -	C	CUUMA	C -
Crop Name							Pumpkin injury %	
Rating Type		counts %	counts %	counts %	counts %			
Rating Unit		07/27/18	07/27/18	07/27/18	07/27/18			
Rating Date							08/06/18	08/06/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code	
1	Curbit	3 EC	1.13 lb	ai/a	PRE	A		81.3 abc
2	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a ai/a	PRE 3 WAP	A B		80.0 abc
3	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a ai/a	PRE 4 WAP	A C		75.0 abc
4	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a ai/a	PRE 5 WAP	A D		85.0 abc
5	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a ai/a	PRE 3 WAP	A B		91.3 ab
6	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a ai/a	PRE 4 WAP	A C		89.3 ab
7	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a ai/a	PRE 5 WAP	A D		66.3 bc
8	Reflex	2 EC	0.375 lb	ai/a	PRE	A		55.0 c
9	Weed Free							100.0 a
10	untreated							19.3 d
LSD P=.05		1.24	0.75	6.17	7.24			30.34
Standard Deviation		0.86	0.52	4.25	4.99			20.91
CV		163.01	259.99	103.73	114.05			28.18
Replicate F		2.037	2.712	1.983	3.308			1.112
Replicate Prob(F)		0.1324	0.0647	0.1403	0.0351			0.3615
Treatment F		1.779	1.192	5.403	2.473			4.912
Treatment Prob(F)		0.1192	0.3397	0.0003	0.0333			0.0006

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

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

Could not calculate LSD (% mean diff) for columns 12,17 because error mean square = 0.

Pest Code Pest Name Crop Type, Code	DIGSA L.crbgrs C - C	CUUMA Pumpkin	CUUMA NtFlOrang	CUUMA Pumpkin	CUUMA FulGreen	Pumpkin Total
Crop Name Rating Type Rating Unit Rating Date	control % 08/06/18	FulOrange # 09/11/18	# 09/11/18	# 09/11/18	# 09/11/18	# 09/11/18
Trt No. Treatment Name	Form Conc Rate	Form Type Rate	Appl Unit Timing	Appl Code		
1 Curbit	3 EC	1.13 lb ai/a	PRE	A	96.7 ab	11.4 a
2 Curbit	3 EC	1.13 lb ai/a	PRE	A	99.7 a	12.5 a
	Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP B		
3 Curbit	3 EC	1.13 lb ai/a	PRE	A	97.2 ab	10.7 a
	Dual Magnum	7.62 EC	0.714 lb ai/a	4 WAP C		
4 Curbit	3 EC	1.13 lb ai/a	PRE	A	99.7 a	13.0 a
	Dual Magnum	7.62 EC	0.714 lb ai/a	5 WAP D		
5 Curbit	3 EC	1.13 lb ai/a	PRE	A	99.7 a	12.1 a
	Dual Magnum	7.62 EC	1.19 lb ai/a	3 WAP B		
6 Curbit	3 EC	1.13 lb ai/a	PRE	A	97.2 ab	15.0 a
	Dual Magnum	7.62 EC	1.19 lb ai/a	4 WAP C		
7 Curbit	3 EC	1.13 lb ai/a	PRE	A	98.3 a	12.3 a
	Dual Magnum	7.62 EC	1.19 lb ai/a	5 WAP D		
8 Reflex	2 EC	0.375 lb ai/a	PRE	A	84.9 b	15.7 a
9 Weed Free					99.7 a	12.7 a
10 untreated					3.8 c	10.9 a
LSD P=.05		9.77 - 16.16	4.49 - 4.64	0.55 - 0.76	1.05 - 1.36	4.69
Standard Deviation		10.54t	0.10t	2.61t	3.18t	3.21
CV		14.09t	8.6t	153.5t	90.86t	22.73
Replicate F		2.004	0.397	3.207	4.090	1.480
Replicate Prob(F)		0.1372	0.7562	0.0389	0.0162	0.2451
Treatment F		19.252	1.087	1.057	1.851	1.459
Treatment Prob(F)		0.0001	0.4041	0.4240	0.1043	0.2239

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.

Could not calculate LSD (% mean diff) for columns 12,17 because error mean square = 0.

Pest Code						
Pest Name						
Crop Type, Code						
Crop Name						
Rating Type						
Rating Unit						
Rating Date						
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing Code
1	Curbit	3 EC	1.13 lb	ai/a	PRE	A
2	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a	PRE	A
3	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a	PRE	A
4	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 0.714 lb	ai/a	PRE	A
5	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a	PRE	A
6	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a	PRE	A
7	Curbit Dual Magnum	3 EC 7.62 EC	1.13 lb 1.19 lb	ai/a	PRE	A
8	Reflex	2 EC	0.375 lb	ai/a	PRE	A
9	Weed Free					
10	untreated					
LSD P=.05						1.63879072409
Standard Deviation						1.12952802353
CV						11.41
Replicate F						1.037
Replicate Prob(F)						0.3920
Treatment F						1.497
Treatment Prob(F)						0.1994

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.

Could not calculate LSD (% mean diff) for columns 12,17 because error mean square = 0.

Pumpkin Response to Multiple POST Applications of Dual Magnum  
 Trial ID: Pmpkn 5a-18 Location: Field #22 Trial Year: 2017  
 Protocol ID: Pmpkn 5-18 Investigator: Kurt Vollmer  
 Study Director: Kurt Vollmer  
 Sponsor Contact:

**General Trial Information**

Study Director: Kurt Vollmer  
 Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/31/18  
 Completion Date: 09/30/18

**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: 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 CUUMA Cucurbita maxima Pumpkin	BBCH Scale: BVVT
Variety: Gladiator	
Planting Date: 06/21/18	Planting Rate: 2 P/FT
Depth: 1 in	
Row Spacing: 7.5 FT	Planting Method: SEEDHA seeded by hand
Spacing within Row: 2 FT	
Soil Temperature: 76 F	Soil Moisture: NORMAL normal, adequate
Emergence Date: 06/26/18	

**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>	Tillage Type: NOTILL no-till
Treatments: 7	Replications: 4
Study Design: RACOBL Randomized Complete Block (RCB)	

**Field Prep./Maintenance:**

Total Postemergence application of Select Max at 1 pt/A + NIS on 7-27-18.

**Soil Description**

Description Name: Field 22B			
% Sand: 81	% OM: 1.1	Texture: LS	loamy sand
% Silt: 12	pH: 6.6	Soil Name: Klej loamy sand, 0-2% slopes	
% Clay: 7	CEC: 4.1	Fert. Level: E	excellent
Soil Drainage: F	fair		

**Application Description**

	A	B	C	D
Application Date	06/21/18	07/11/18	07/27/18	08/03/18
Appl. Stop Time	03:00 PM	08:30 AM	08:45 AM	
Interval to Prev. Appl.		20 DAYS	16 DAYS	7 DAYS
Application Method	SPRAY	SPRAY	SPRAY	SPRAY
Application Timing	PREPRE	PREPRE	POSPOS	POSPOS
Application Placement	BROSOI	BROFOL	BROFOL	BROFOL
Applied By	Johnson, Q.	Vollmer, K.	Vollmer, K.	Vollmer, K.
Air Temperature Start, Stop	79 F	81 F	81 F	83 F
% Relative Humidity Start, Stop	74	65	84	82
Wind Velocity+Dir. Start	10.4 MPH NE	7 MPH N	4 MPH SSW	12 MPH SSW
Wet Leaves (Y/N)	N no	N no	N no	N no
Soil Temperature	79 F	81 F	81 F	83 F
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL
% Cloud Cover	100	45	10	80
Next Moisture Occurred On	06/22/18			08/03/18

**Crop Stage At Each Application**

	A	B	C	D
Crop 1 Code, BBCH Scale	CUUMA BVVT	CUUMA BVVT	CUUMA BVVT	CUUMA BVVT
Stage Scale Used	BBCH	BBCH	BBCH	

**Application Equipment**

	A	B	C	D
Appl. Equipment	Tractor	Backpack	Backpack	Backpack
Equipment Type	TRMOSP	SPRBAC	SPRBAC	SPRBAC
Operation Pressure	40 psi	31 psi	31 psi	31 psi
Nozzle Type	AIRMIX	AIRMIX	AIRMIX	AIRMIX
Nozzle Size	11002	11002	11002	11002
Nozzle Spacing	20 in	18 in	18 in	18 in
Boom Length	6.7 ft	6 ft	6 ft	6 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
Minimum Mix/Treatment	0.4744 GAL	0.4744 GAL	0.4744 GAL	0.4744 GAL
Propellant	COMAIR	COMCO2	COMCO2	COMCO2

Date	By	Notes
07/27/18	Vollmer, K.	Application timings changed to 20, 36, and 43 DAP

Trial Comments

Pumpkin Response to Multiple POST Applications of Dual Magnum  
 Trial ID: Pmpkn 5a-18 Location: Field #22 Trial Year: 2017  
 Protocol ID: Pmpkn 5-18 Investigator: Kurt Vollmer  
 Study Director: Kurt Vollmer  
 Sponsor Contact:

Pest Code Crop Type, Code	AMAPA C - PalmerAm	AMAPA C - PalmerAm	C CUUMA Pumpkin	C CUUMA Pumpkin	AMAPA C - PalmerAm
Description	control % 07/05/18	counts #/m2 06/30/18	injry % 07/13/18	biomass Red % 07/20/18	counts #/m2 07/20/18
Trt No. Treatment Name	Form Conc Type Rate	Form Type Rate	Appl Unit Timing	Appl Code	
1 Curbit	3 EC	1.13 lb ai/a	PRE	A	96.3 abc
2 Curbit	3 EC	1.13 lb ai/a	PRE	A	93.3 c
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D	
3 Curbit	3 EC	1.13 lb ai/a	PRE	A	95.8 abc
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
Dual Magnum	7.62 EC	0.476 lb ai/a	9 WAP	D	
4 Curbit	3 EC	1.13 lb ai/a	PRE	A	94.8 bc
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
Dual Magnum	7.62 EC	0.476 lb ai/a	6 WAP	C	
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D	
5 Curbit	3 EC	1.13 lb ai/a	PRE	A	98.8 ab
Dual Magnum	7.62 EC	0.476 lb ai/a	3 WAP	B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D	
6 Weed Free		100.0 a	0.0 b	0.0 a	3.8 c
7 untreated		0.0 d	7.8 a	0.0 a	7.5 bc
LSD P=.05		4.33	2.16	.	15.15
Standard Deviation		2.92	1.46	0.00	10.20
CV		3.53	88.61	0.0	75.17
Replicate F		4.495	0.921	0.000	0.847
Replicate Prob(F)		0.0160	0.4505	1.0000	0.4863
Treatment F		627.675	14.191	0.000	4.333
Treatment Prob(F)		0.0001	0.0001	1.0000	0.0071
					1.765
					0.1633

Means followed by same letter 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 3 because error mean square = 0.

Pest Code Crop Type, Code	CHEAL C - C.lmsqtr	MOLVE C - Carpetwd	DIGSA C - L.crbgrs	AMAPA C I PalmerAm	DIGSA C - L.crbgrs	AMAPA C - PalmerAm
Description	counts #/m2 07/20/18	counts #/m2 07/20/18	counts #/m2 07/20/18	counts #/m2 07/13/18	counts #/m2 07/13/18	counts #/m2 07/26/18
Trt No. Treatment Name	Form Conc Type Rate	Form Type Rate	Rate Unit	Appl Timing	Appl Code	
1 Curbit	3 EC	1.13 lb ai/a	PRE	A	0.8 a	1.5 a
2 Curbit	3 EC	1.13 lb ai/a	PRE	A	1.3 a	0.8 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D		
3 Curbit	3 EC	1.13 lb ai/a	PRE	A	0.8 a	0.3 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
Dual Magnum	7.62 EC	0.476 lb ai/a	9 WAP	D		
4 Curbit	3 EC	1.13 lb ai/a	PRE	A	0.8 a	0.3 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.476 lb ai/a	6 WAP	C		
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D		
5 Curbit	3 EC	1.13 lb ai/a	PRE	A	0.3 a	0.8 a
Dual Magnum	7.62 EC	0.476 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D		
6 Weed Free					0.0 a	0.0 a
7 untreated					0.0 a	1.8 a
LSD P=.05		1.59	2.09	11.91	4.77	11.59
Standard Deviation		1.07	1.40	8.02	3.21	7.80
CV		199.21	187.25	178.15	115.15	150.71
Replicate F		2.122	0.211	1.601	1.467	1.159
Replicate Prob(F)		0.1331	0.8873	0.2241	0.2569	0.3526
Treatment F		0.763	0.887	1.970	1.073	2.758
Treatment Prob(F)		0.6082	0.5243	0.1239	0.4146	0.0443

Means followed by same letter 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 3 because error mean square = 0.

Pest Code Crop Type, Code	CHEAL C - C.lmsqtr	MOLVE C - Carpetwd	DIGSA C - L.crbgrs	C CUUMA Pumpkin	C CUUMA Pumpkin	AMAPA C - PalmerAm
Description	counts #/m2 07/26/18	counts #/m2 07/26/18	counts #/m2 07/26/18	injury % 08/01/18	injury % 08/06/18	control % 08/06/18
Trt No. Treatment Name	Form Conc Type Rate	Form Type Rate	Rate Unit	Appl Timing	Appl Code	
1 Curbit	3 EC	1.13 lb ai/a	PRE	A	0.8 a	4.5 a
2 Curbit	3 EC	1.13 lb ai/a	PRE	A	0.0 a	4.0 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D		
3 Curbit	3 EC	1.13 lb ai/a	PRE	A	0.0 a	4.0 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
Dual Magnum	7.62 EC	0.476 lb ai/a	9 WAP	D		
4 Curbit	3 EC	1.13 lb ai/a	PRE	A	1.3 a	0.5 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.476 lb ai/a	6 WAP	C		
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D		
5 Curbit	3 EC	1.13 lb ai/a	PRE	A	0.5 a	2.5 a
Dual Magnum	7.62 EC	0.476 lb ai/a	3 WAP	B		
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C		
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D		
6 Weed Free					0.0 a	0.0 a
7 untreated					2.3 a	2.3 a
LSD P=.05		1.61	4.63	9.15	1.78	0.84
Standard Deviation		1.08	3.11	6.16	1.20	0.57
CV		159.72	122.79	112.77	223.11	529.15
Replicate F		1.733	1.281	1.825	0.825	1.000
Replicate Prob(F)		0.1960	0.3111	0.1788	0.4971	0.4155
Treatment F		2.392	1.293	1.614	0.900	1.000
Treatment Prob(F)		0.0708	0.3097	0.2005	0.5161	0.4552
Means followed by same letter 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 3 because error mean square = 0.						

Means followed by same letter 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 3 because error mean square = 0.

Pest Code Crop Type, Code	AMBEL C - C.ragwd control %	CHEAL C - C.lmsqtr control %	C CUUMA Pumpkin FulOrange # 09/11/18	C CUUMA Pumpkin NtFIOrang # 09/11/18	C CUUMA Pumpkin FulGreen # 09/11/18
Trt Treatment No. Name	Form Conc Rate	Form Type Unit	Rate Appl Timing	Appl Code	
1 Curbit	3 EC	1.13 lb ai/a	PRE	A	75.0 a
2 Curbit	3 EC	1.13 lb ai/a	PRE	A	95.0 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D	
3 Curbit	3 EC	1.13 lb ai/a	PRE	A	90.0 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
Dual Magnum	7.62 EC	0.476 lb ai/a	9 WAP	D	
4 Curbit	3 EC	1.13 lb ai/a	PRE	A	100.0 a
Dual Magnum	7.62 EC	0.714 lb ai/a	3 WAP	B	
Dual Magnum	7.62 EC	0.476 lb ai/a	6 WAP	C	
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D	
5 Curbit	3 EC	1.13 lb ai/a	PRE	A	95.0 a
Dual Magnum	7.62 EC	0.476 lb ai/a	3 WAP	B	
Dual Magnum	7.62 EC	0.714 lb ai/a	6 WAP	C	
Dual Magnum	7.62 EC	0.714 lb ai/a	9 WAP	D	
6 Weed Free		100.0 a	90.0 ab	11.8 a	0.3 a
7 untreated		0.0 b	0.0 c	10.3 a	0.5 a
LSD P=.05		31.09	26.76	3.27	1.06
Standard Deviation		20.93	18.01	2.20	0.72
CV		26.4	23.92	20.83	166.94
Replicate F		0.467	1.349	1.768	0.186
Replicate Prob(F)		0.7087	0.2901	0.1894	0.9045
Treatment F		11.826	14.986	1.645	1.093
Treatment Prob(F)		0.0001	0.0001	0.1923	0.4037
					0.864
					0.5392

Means followed by same letter 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 3 because error mean square = 0.

Pest Code Crop Type, Code		C	CUUMA	C	CUUMA				
Description		Pumpkin	Total	Pumpkin	Avg. Wt.				
Rating Type		#	09/11/18	lbs.	09/11/18				
Rating Unit									
Rating Date									
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code		
1	Curbit	3 EC	1.13 lb	ai/a	PRE	A		13.3 a	8.2036119316 a
2	Curbit	3 EC	1.13 lb	ai/a	PRE	A		10.8 a	8.7269314284 a
	Dual Magnum	7.62 EC	0.714 lb	ai/a	3	WAP B			
	Dual Magnum	7.62 EC	0.714 lb	ai/a	6	WAP C			
	Dual Magnum	7.62 EC	0.714 lb	ai/a	9	WAP D			
3	Curbit	3 EC	1.13 lb	ai/a	PRE	A		9.5 a	8.8467334022 a
	Dual Magnum	7.62 EC	0.714 lb	ai/a	3	WAP B			
	Dual Magnum	7.62 EC	0.714 lb	ai/a	6	WAP C			
	Dual Magnum	7.62 EC	0.476 lb	ai/a	9	WAP D			
4	Curbit	3 EC	1.13 lb	ai/a	PRE	A		12.3 a	9.0476543138 a
	Dual Magnum	7.62 EC	0.714 lb	ai/a	3	WAP B			
	Dual Magnum	7.62 EC	0.476 lb	ai/a	6	WAP C			
	Dual Magnum	7.62 EC	0.714 lb	ai/a	9	WAP D			
5	Curbit	3 EC	1.13 lb	ai/a	PRE	A		10.8 a	9.3041549707 a
	Dual Magnum	7.62 EC	0.476 lb	ai/a	3	WAP B			
	Dual Magnum	7.62 EC	0.714 lb	ai/a	6	WAP C			
	Dual Magnum	7.62 EC	0.714 lb	ai/a	9	WAP D			
6	Weed Free							12.0 a	9.0016355157 a
7	untreated							11.0 a	8.2845008285 a
LSD P=.05								3.86	0.94994336631
Standard Deviation								2.60	0.63944438032
CV								22.86	7.29
Replicate F								1.618	2.851
Replicate Prob(F)								0.2202	0.0663
Treatment F								0.901	1.598
Treatment Prob(F)								0.5155	0.2049

Means followed by same letter 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 3 because error mean square = 0.

**Bicyclopyprome Crop Tolerance and Efficacy in Sweet Potato**

Trial ID: SwPot2-18

Location: Field #4

Protocol ID: SwPot2-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Syngenta

Trial Year: 2018

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 03/01/18

Completion Date: 09/30/18

**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

Variety: Covington

Planting Date: 06/06/18

Planting Rate: 1 FT

Rows per Plot: 2

Planting Method: TRAHAN transplanted - hand

Row Spacing: 5 FT

Seed Bed: SMOOTH smooth

Spacing within Row: 1 FT

Soil Moisture: ABONOR above normal, excessive

Soil Temperature: 70 F

Harvest Equipment: Hand harvested

Harvest Date: 09/18/18

Harvested Width: 5 FT

Harvested Length: 20 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth

**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: CONTIL conventional-till

Replications: 3

Study Design: RACOBL Randomized Complete Block (RCB)

**Field Prep./Maintenance:**

Hilling occurred on 6/26/17. Cultivation occurred on 7/2/18.

**Soil Description**

Description Name: Field 4

% Sand: 79

% OM: 1.1 Texture: LS

loamy sand

% Silt: 13

pH: 6.7

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

% Clay: 8

CEC: 6.0

Fert. Level: G good

Soil Drainage: F

fair

**Application Description**

	A	B	C
Application Date	06/05/18	06/08/18	07/05/18
Appl. Stop Time	11:00 AM	09:30 AM	08:00 AM
Application Method	SPRAY	SPRAY	SPRAYDIR
Application Timing	PRETRA	POSTTRA	POST
Application Placement	BRDCST	BRDCST	DIR
Applied By	Matt	Matt	Matt
Air Temperature Start, Stop	72 F	70 F	80 F
% Relative Humidity Start, Stop	50	79	87
Wind Velocity+Dir. Start	9 MPH WSW	5 MPH WNW	5 MPH SE
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	72 F	70 F	80 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	0	5	75
Next Moisture Occurred On	06/07/18	06/09/18	

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	IPOBA BVPP	IPOBA BVPP	IPOBA BVPP
Stage Scale Used		BBCH	BBCH
Stage Majority, Percent		Fair	10inDiam
Stage Minimum, Percent			4inDiam
Stage Maximum, Percent			24inVine
Average Diameter			10 IN
Height Average		5 IN	5 IN
Height Minimum, Maximum			3 6
Crop Coverage (%)		100	7

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Density Average	0 m2	0 m2	0 m2

**Application Equipment**

	A	B	C
Appl. Equipment	Backpack	Backpack	Backpack
Equipment Type	SPRBAC	SPRBAC	2 NOZL
Operation Pressure	30 psi	30 psi	26 psi
Nozzle Type	AIRMIX	AIRMIX	TeeJet
Nozzle Size	11002	11002	11002EVS
Nozzle Spacing	18 in	18 in	16 in
Boom Length	9 ft	9 ft	32 in
Boom Height	18 in	18 in	16 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac	20 gal/A
Propellant	COMCO2	COMCO2	COMCO2

**Bicyclopyrone Crop Tolerance and Efficacy in Sweet Potato**

Trial ID: SwPot2-18

Location: Field #4

Trial Year: 2018

Protocol ID: SwPot2-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: Syngenta

**Trial Comments**

06/07/18: Drip irrigation run and plant roots sealed.

06/09- 06/10/18: Five inches of rainfall received.

06/26/18: Plot 209 untreated only has 3 Palmer. Plot 308 untreated only has 4 Palmer. Right side of trial is low spot. Plots 105, 110, 209, 210, 304, 305 had water ponding.

07/10/18: Plot 209 has 4 Palmer. Plot 308 has 1 Palmer after cultivation.

07/31/18: Weeds are still sparse in 2nd and 3rd reps. Grass is Goosegrass (ELEIN) and Large crabgrass (DIGSA). No grass in the 3rd rep of untreated.

09/07/18: Plots along main road and local complaints made, also farm field day upcoming, plots were hand roaged in August for large Palmer amaranth.

thus weed control ratings were for presence - 1 or absence - 0 of weed species.

09/17/18: Sixth range is dryer than other ranges (plots 306-310).

Bicyclopyprone Crop Tolerance and Efficacy in Sweet Potato		Trial ID: SwPot2-18 Location: Field #4		Trial Year: 2018						
Protocol ID: SwPot2-18		Investigator: Mark VanGessel								
Study Director:										
Sponsor Contact: Syngenta										
Pest Code										
Pest Name										
Crop Type, Code				C IPOBA	C IPOBA					
Crop Name				SwtPotato	SwtPotato					
Rating Type				LfNecrs	Stunting					
Rating Unit			%							
Rating Date			06/19/18	06/19/18	06/26/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check							0.0 d	0.0 e	0.0 d
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A	14.0 bc	13.3 d	10.7 cd
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A	16.7 bc	21.7 bcd	26.0 abc
4	A16003 Valor SX.....flumioxazin	1.67	SL	0.0446	lb ai/a	PRETrplt	A	18.3 bc	20.7 bcd	30.0 abc
5	A16003 Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	26.0 b	28.7 b	32.7 ab
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096	lb ai/a	PRETrplt	A	16.0 bc	26.0 bc	24.0 abc
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	46.7 a	41.7 a	43.3 a
		1.67	SL	0.0446	lb ai/a	POSTWE	C			
				0.25	% v/v	POSTWE	C			
8	Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	16.3 bc	11.7 d	16.0 bcd
		1.67	SL	0.0446	lb ai/a	POSTWE	C			
				0.25	% v/v	POSTWE	C			
9	Command.....clomazone Dual Magnum....s-metolachlor	3	ME	0.75	lb ai/a	PRETrplt	A	13.3 c	20.0 bcd	27.7 abc
		7.62	E	1.24	lb ai/a	PRE 2DATrns	B			
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS	51	WG	0.08	lb ai/a	PRETrplt	A	14.3 bc	15.0 cd	20.0 bcd
		1	EC	0.125	lb ai/a	3-4"grass	D			
		100	SL	0.25	% v/v	3-4"grass	D			
LSD P=.05								12.21	11.02	20.20
Standard Deviation								7.12	6.42	11.78
CV								39.18	32.32	51.12
Replicate F								2.293	0.990	2.643
Replicate Prob(F)								0.1297	0.3909	0.0986
Treatment F								8.354	9.073	3.190
Treatment Prob(F)								0.0001	0.0001	0.0173

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.

Due to missing data, larger LSD values (col. 22: >=-99998.01 and <=0.00) are used for mean comparisons of treatment pairs with missing data.

Could not calculate LSD (% mean diff) for columns 10,16,17,20,21,22,23 because error mean square = 0.

Pest Code							AMAPA
Pest Name							PalmerAm
Crop Type, Code				C IPOBA	C IPOBA		C -
Crop Name				SwtPotato	SwtPotato		
Rating Type				StandCts	>70%Injury		Control
Rating Unit				#/plot	#/plot		%
Rating Date				06/26/18	06/26/18		06/26/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code
1	Untreated Check						
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A
4	A16003 Valor SX.....flumioxazin	1.67	SL	0.0446	lb ai/a	PRETrplt	A
		51	WG	0.096	lb ai/a	PRETrplt	A
5	A16003 Dual Magnum....s-metolachlor	1.67	SL	0.0446	lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096	lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096	lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
	A16003	1.67	SL	0.0446	lb ai/a	POSTWE	C
	NIS			0.25	% v/v	POSTWE	C
8	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
	A16003	1.67	SL	0.0446	lb ai/a	POSTWE	C
	NIS			0.25	% v/v	POSTWE	C
9	Command.....clomazone Dual Magnum....s-metolachlor	3	ME	0.75	lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS	51	WG	0.08	lb ai/a	PRETrplt	A
	Select Max.....clethodim	1	EC	0.125	lb ai/a	3-4"grass	D
	NIS	100	SL	0.25	% v/v	3-4"grass	D
LSD P=.05					4.73	8.01	4.98
Standard Deviation					2.76	4.67	2.90
CV					5.91	32.13	3.34
Replicate F					1.194	6.303	2.007
Replicate Prob(F)					0.3258	0.0084	0.1633
Treatment F					1.327	5.525	346.362
Treatment Prob(F)					0.2905	0.0010	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.

Due to missing data, larger LSD values (col. 22:  $\geq -99998.01$  and  $\leq 0.00$ ) are used for mean comparisons of treatment pairs with missing data.

Could not calculate LSD (% mean diff) for columns 10,16,17,20,21,22,23 because error mean square = 0.

Pest Code		MOLVE								
Pest Name		Carpetwd								
Crop Type, Code		C -	C IPOBA	C IPOBA						
Crop Name		Control	SwtPotato	SwtPotato						
Rating Type			BiomRed	BiomRed						
Rating Unit		%	%	%						
Rating Date	06/26/18	07/03/18	07/10/18							
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check							0.0 c	0.0 d	0.0 e
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A	63.3 b	12.7 cd	13.3 de
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A	98.3 a	31.7 ab	36.7 abc
4	A16003 Valor SX.....flumioxazin	1.67 51	SL WG	0.0446 0.096	lb ai/a	PRETrplt PRETrplt	A A	96.7 a	32.0 ab	37.7 abc
5	A16003 Dual Magnum....s-metolachlor	1.67 7.62	SL E	0.0446 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	100.0 a	44.3 a	42.7 ab
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51 7.62	WG E	0.096 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	100.0 a	24.3 bc	32.7 a-d
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	51 7.62 1.67	WG E SL	0.096 1.24 0.0446	lb ai/a	PRETrplt PRE 2DATrns POSTWE 0.25 % v/v POSTWE	A B C C	100.0 a	43.7 a	51.7 a
8	Dual Magnum....s-metolachlor A16003 NIS	7.62 1.67	E SL	1.24 0.0446	lb ai/a	PRE 2DATrns POSTWE 0.25 % v/v POSTWE	B C C	93.3 a	28.3 abc	26.7 bcd
9	Command.....clomazone Dual Magnum....s-metolachlor	3 7.62	ME E	0.75 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	92.7 a	23.3 bc	22.7 bcd
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS							99.3 a	20.3 bc	21.0 cd
	LSD P=.05							17.31	17.49	20.48
	Standard Deviation							10.09	10.19	11.94
	CV							11.96	39.11	41.89
	Replicate F							0.291	1.572	1.176
	Replicate Prob(F)							0.7509	0.2349	0.3310
	Treatment F							29.507	5.188	4.773
	Treatment Prob(F)							0.0001	0.0015	0.0024

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Could not calculate LSD (% mean diff) for columns 10,16,17,20,21,22,23 because error mean square = 0.

Pest Code						AMAPA				
Pest Name						PalmerAm				
Crop Type, Code			C IPOBA	C IPOBA		C -				
Crop Name	SwtPotato	SwtPotato								
Rating Type	ChlrCrwn	ChlrTips				Control				
Rating Unit	%	%				%				
Rating Date	07/10/18	07/10/18				07/10/18				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
1	Untreated Check							0.0 a	0.0 b	0.0 c
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A	0.0 a	0.0 b	66.7 b
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A	0.0 a	0.0 b	100.0 a
4	A16003 Valor SX.....flumioxazin	1.67	SL	0.0446	lb ai/a	PRETrplt	A	0.0 a	0.0 b	100.0 a
5	A16003 Dual Magnum....s-metolachlor	7.62	E	1.67	lb ai/a	PRE Trplt	A	0.0 a	0.0 b	100.0 a
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096	lb ai/a	PRETrplt	A	0.0 a	0.0 b	100.0 a
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.67	lb ai/a	PRE 2DATrns	B	0.0 a	2.3 b	100.0 a
8	Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.67	lb ai/a	PRE 2DATrns	B	0.0 a	6.7 a	83.3 ab
9	Command.....clomazone Dual Magnum....s-metolachlor	3	ME	0.75	lb ai/a	PRETrplt	A	0.0 a	0.0 b	100.0 a
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	0.0 a	0.0 b	100.0 a
LSD P=.05								.	2.76	23.34
Standard Deviation								0.00	1.61	13.61
CV								0.0	179.03	16.01
Replicate F								0.000	0.501	0.000
Replicate Prob(F)								1.0000	0.6143	1.0000
Treatment F								0.000	5.365	16.450
Treatment Prob(F)								1.0000	0.0012	0.0001

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Pest Code		MOLVE								
Pest Name		Carpetwd								
Crop Type, Code		C -	C IPOBA	C IPOBA						
Crop Name		Control	SwtPotato	SwtPotato						
Rating Type			StandCts	BiomRed						
Rating Unit		%	#/plot	%						
Rating Date	07/10/18	07/13/18		07/19/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check							0.0 c	48.3 a	0.0 d
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A	88.7 b	42.7 a-d	9.3 cd
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A	100.0 a	38.3 d	26.7 abc
4	A16003 Valor SX.....flumioxazin	1.67	SL	0.0446	lb ai/a	PRETrplt	A	100.0 a	41.3 bcd	30.7 abc
5	A16003 Dual Magnum....s-metolachlor	7.62	E	1.67	lb ai/a	PRETrplt	A	100.0 a	40.0 cd	36.7 ab
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096	lb ai/a	PRETrplt	A	100.0 a	43.3 a-d	24.3 abc
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	100.0 a	39.7 cd	41.7 a
8	Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	100.0 a	45.3 abc	20.7 a-d
9	Command.....clomazone Dual Magnum....s-metolachlor	3	ME	0.75	lb ai/a	PRETrplt	A	100.0 a	41.7 bcd	16.7 bcd
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS	100	SL	0.08	lb ai/a	PRETrplt	A	100.0 a	46.0 ab	14.0 cd
LSD P=.05								5.98	5.81	21.59
Standard Deviation								3.48	3.39	12.58
CV								3.92	7.94	57.03
Replicate F								1.000	2.566	1.239
Replicate Prob(F)								0.3874	0.1046	0.3132
Treatment F								244.201	2.570	3.037
Treatment Prob(F)								0.0001	0.0422	0.0215

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Pest Code						AMAPA				
Pest Name						PalmerAm				
Crop Type, Code			C IPOBA	C IPOBA		C -				
Crop Name			SwtPotato	SwtPotato						
Rating Type			ChlrCrwn	ChlrTips		Control				
Rating Unit			%	%		%				
Rating Date			07/19/18	07/19/18		07/19/18				
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
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A	0.0 a	0.0 a	58.3 b
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A	0.0 a	0.0 a	93.3 a
4	A16003 Valor SX.....flumioxazin	1.67	SL	0.0446	lb ai/a	PRETrplt	A	0.0 a	0.0 a	93.3 a
5	A16003 Dual Magnum....s-metolachlor	7.62	E	1.67	lb ai/a	PRETrplt	A	0.0 a	0.0 a	100.0 a
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096	lb ai/a	PRETrplt	A	0.0 a	0.0 a	100.0 a
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	0.0 a	0.0 a	100.0 a
8	Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	0.0 a	0.0 a	100.0 a
9	Command.....clomazone Dual Magnum....s-metolachlor	3	ME	0.75	lb ai/a	PRETrplt	A	0.0 a	0.0 a	91.7 a
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS	7.62	E	1.24	lb ai/a	PRE 2DATrns	B	0.0 a	0.0 a	100.0 a
LSD P=.05								.	.	15.74
Standard Deviation								0.00	0.00	9.17
CV								0.0	0.0	10.97
Replicate F								0.000	0.000	0.901
Replicate Prob(F)								1.0000	1.0000	0.4237
Treatment F								0.000	0.000	36.541
Treatment Prob(F)								1.0000	1.0000	0.0001

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Pest Code						
Pest Name						
Crop Type, Code				C IPOBA	C IPOBA	C IPOBA
Crop Name				SwtPotato	SwtPotato	SwtPotato
Rating Type				BiomRed	ChlrCrwn	ChlrTips
Rating Unit			%			
Rating Date			07/31/18		07/31/18	07/31/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing
1	Untreated Check				0.0 a	0.0 a
2	A16003	1.67	SL	0.0446 lb ai/a	PRETrplt	A
3	Valor SX.....flumioxazin	51	WG	0.096 lb ai/a	PRETrplt	A
4	A16003 Valor SX.....flumioxazin	1.67	SL	0.0446 lb ai/a	PRETrplt	A
		51	WG	0.096 lb ai/a	PRETrplt	A
5	A16003 Dual Magnum....s-metolachlor	1.67	SL	0.0446 lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24 lb ai/a	PRE 2DATrns	B
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096 lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24 lb ai/a	PRE 2DATrns	B
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	51	WG	0.096 lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24 lb ai/a	PRE 2DATrns	B
	A16003	1.67	SL	0.0446 lb ai/a	POSTWE	C
	NIS			0.25 % v/v	POSTWE	C
8	Dual Magnum....s-metolachlor A16003 NIS	7.62	E	1.24 lb ai/a	PRE 2DATrns	B
	A16003	1.67	SL	0.0446 lb ai/a	POSTWE	C
	NIS			0.25 % v/v	POSTWE	C
9	Command.....clomazone Dual Magnum....s-metolachlor	3	ME	0.75 lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24 lb ai/a	PRE 2DATrns	B
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS	51	WG	0.08 lb ai/a	PRETrplt	A
	Select Max.....clethodim	1	EC	0.125 lb ai/a	3-4"grass	D
	NIS	100	SL	0.25 % v/v	3-4"grass	D
LSD P=.05				18.07	.	.
Standard Deviation				10.53	0.00	0.00
CV				75.07	0.0	0.0
Replicate F				1.162	0.000	0.000
Replicate Prob(F)				0.3353	1.0000	1.0000
Treatment F				2.158	0.000	0.000
Treatment Prob(F)				0.0788	1.0000	1.0000

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Pest Code							AMAPA
Pest Name							PalmerAm
Crop Type, Code				C IPOBA	C IPOBA		C -
Crop Name				SwtPotato	SwtPotato		
Rating Type				BR LftRw	BR RtRw		Control
Rating Unit			%			%	%
Rating Date			07/31/18		07/31/18		07/31/18
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
1	Untreated Check						0.0 d
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A
4	A16003 Valor SX.....flumioxazin	1.67	SL	0.0446	lb ai/a	PRETrplt	A
		51	WG	0.096	lb ai/a	PRETrplt	A
5	A16003 Dual Magnum....s-metolachlor	1.67	SL	0.0446	lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096	lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51	WG	0.096	lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
	A16003	1.67	SL	0.0446	lb ai/a	POSTWE	C
	NIS			0.25	% v/v	POSTWE	C
8	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
	A16003	1.67	SL	0.0446	lb ai/a	POSTWE	C
	NIS			0.25	% v/v	POSTWE	C
9	Command.....clomazone Dual Magnum....s-metolachlor	3	ME	0.75	lb ai/a	PRETrplt	A
	Dual Magnum....s-metolachlor	7.62	E	1.24	lb ai/a	PRE 2DATrns	B
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS	51	WG	0.08	lb ai/a	PRETrplt	A
	Select Max.....clethodim	1	EC	0.125	lb ai/a	3-4"grass	D
	NIS	100	SL	0.25	% v/v	3-4"grass	D
LSD P=.05					.	.	18.36
Standard Deviation					.	.	10.70
CV					.	.	14.06
Replicate F							2.712
Replicate Prob(F)							0.0935
Treatment F							26.855
Treatment Prob(F)							0.0001

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Pest Code		GGGAN		AMAPA						
Pest Name		AnnGrass		PalmerAm						
Crop Type, Code		C -	C IPOBA	C -						
Crop Name			SwtPotato							
Rating Type		Control	BiomRed	pres/abs						
Rating Unit	%		%	1/0						
Rating Date	07/31/18		09/07/18	09/07/18						
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	0.7 ab
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A	58.3 b	9.3 a	1.0 a
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A	76.7 ab	7.7 a	0.3 ab
4	A16003 Valor SX.....flumioxazin	1.67 51	SL WG	0.0446 0.096	lb ai/a	PRETrplt PRETrplt	A A	90.0 a	13.3 a	0.3 ab
5	A16003 Dual Magnum....s-metolachlor	1.67 7.62	SL E	0.0446 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	98.0 a	22.0 a	1.0 a
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51 7.62	WG E	0.096 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	100.0 a	5.3 a	0.0 b
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	51 7.62 1.67	WG E SL	0.096 1.24 0.0446	lb ai/a	PRETrplt PRE 2DATrns POSTWE 0.25 % v/v POSTWE	A B C C	100.0 a	17.7 a	0.0 b
8	Dual Magnum....s-metolachlor A16003 NIS	7.62 1.67	E SL	1.24 0.0446	lb ai/a	PRE 2DATrns POSTWE 0.25 % v/v POSTWE	B C C	100.0 a	8.3 a	0.3 ab
9	Command.....clomazone Dual Magnum....s-metolachlor	3 7.62	ME E	0.75 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	100.0 a	0.0 a	0.7 ab
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS							100.0 a	7.3 a	0.3 ab
	LSD P=.05							31.06	13.46	0.67
	Standard Deviation							18.11	7.84	0.39
	CV							22.0	86.2	83.5
	Replicate F							2.980	2.966	4.171
	Replicate Prob(F)							0.0762	0.0770	0.0325
	Treatment F							9.404	2.402	2.537
	Treatment Prob(F)							0.0001	0.0543	0.0443

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Pest Code		CHEAL	GGGAN							
Pest Name		C.lmsqtr	AnnGrass							
Crop Type, Code		C -	C -	C IPOBA						
Crop Name				SwtPotato						
Rating Type		pres/abs	pres/abs	YldJumbo						
Rating Unit			1/0	#/20ft						
Rating Date		09/07/18	09/07/18	09/18/18						
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check							0.7 a	0.3 a	0.6 a
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A	0.0 b	0.7 a	0.8 a
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A	0.0 b	0.3 a	3.2 a
4	A16003 Valor SX.....flumioxazin	1.67 51	SL WG	0.0446 0.096	lb ai/a	PRETrplt PRETrplt	A A	0.0 b	0.3 a	3.4 a
5	A16003 Dual Magnum....s-metolachlor	1.67 7.62	SL E	0.0446 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	0.0 b	0.3 a	1.4 a
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51 7.62	WG E	0.096 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	0.0 b	0.0 a	1.5 a
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	51 7.62 1.67	WG E SL	0.096 1.24 0.0446	lb ai/a	PRETrplt PRE 2DATrns POSTWE 0.25 % v/v POSTWE	A B C C	0.0 b	0.0 a	2.6 a
8	Dual Magnum....s-metolachlor A16003 NIS	7.62 1.67	E SL	1.24 0.0446	lb ai/a	PRE 2DATrns POSTWE 0.25 % v/v POSTWE	B C C	0.0 b	0.0 a	3.2 a
9	Command.....clomazone Dual Magnum....s-metolachlor	3 7.62	ME E	0.75 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	0.0 b	0.0 a	3.0 a
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS							0.7 a	0.0 a	2.3 a
	LSD P=.05							0.42	0.56	3.03 - 3.56
	Standard Deviation							0.24	0.33	0.30t
	CV							182.57	163.87	62.25t
	Replicate F							2.250	6.517	0.528
	Replicate Prob(F)							0.1342	0.0074	0.5988
	Treatment F							4.000	1.517	0.865
	Treatment Prob(F)							0.0060	0.2156	0.5713

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Pest Code	Pest Name	Crop Type, Code	C IPOBA	C IPOBA	C IPOBA					
Crop Name	Rating Type		SwtPotato Yld #1's	SwtPotato YldCanner	SwtPotato Jum+#1's					
Rating Unit	Rating Date		#/20ft 09/18/18	Wght lbs 09/18/18	lbs 20'					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code			
1	Untreated Check							89.7 a	4.273 a	53.62 a
2	A16003	1.67	SL	0.0446	lb ai/a	PRETrplt	A	78.0 a	4.433 a	50.21 a
3	Valor SX.....flumioxazin	51	WG	0.096	lb ai/a	PRETrplt	A	47.3 a	3.753 a	37.21 abc
4	A16003 Valor SX.....flumioxazin	1.67 51	SL WG	0.0446 0.096	lb ai/a	PRETrplt PRETrplt	A A	58.3 a	5.207 a	39.04 abc
5	A16003 Dual Magnum....s-metolachlor	1.67 7.62	SL E	0.0446 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	59.7 a	7.293 a	25.73 bc
6	Valor SX.....flumioxazin Dual Magnum....s-metolachlor	51 7.62	WG E	0.096 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	45.7 a	7.240 a	23.33 c
7	Valor SX.....flumioxazin Dual Magnum....s-metolachlor A16003 NIS	51 7.62 1.67	WG E SL	0.096 1.24 0.0446	lb ai/a	PRETrplt PRE 2DATrns POSTWE	A B C	50.7 a	7.733 a	27.31 bc
8	Dual Magnum....s-metolachlor A16003 NIS	7.62 1.67	E SL	1.24 0.0446 0.25 % v/v	lb ai/a	PRE 2DATrns POSTWE	B C	71.3 a	6.360 a	37.37 abc
9	Command.....clomazone Dual Magnum....s-metolachlor	3 7.62	ME E	0.75 1.24	lb ai/a	PRETrplt PRE 2DATrns	A B	54.3 a	4.980 a	31.71 bc
10	Maintain weed free Valor SX.....flumioxazin Select Max.....clethodim NIS							64.3 a	8.080 a	41.40 ab
	LSD P=.05							26.94	3.3547	17.324
	Standard Deviation							15.70	1.9556	10.099
	CV							25.36	32.95	27.52
	Replicate F							4.542	2.073	2.145
	Replicate Prob(F)							0.0253	0.1548	0.1461
	Treatment F							2.435	1.986	2.972
	Treatment Prob(F)							0.0516	0.1030	0.0235

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.

Due to missing data, larger LSD values (col. 22: >=-99998.01 and <=0.00) are used for mean comparisons of treatment pairs with missing data.

Could not calculate LSD (% mean diff) for columns 10,16,17,20,21,22,23 because error mean square = 0.

**Sweet Potato in Plastic Mulch with Avenger and Carfentrazone**

Trial ID: SwPot3-18      Location: Field 4      Trial Year: 2018  
 Protocol ID: SwPot3-18      Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact: IR4

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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  
 Variety: Beauregard  
 Planting Date: 06/06/18      Planting Rate: 1 ft  
 Rows per Plot: 1      Planting Method: TRAHAN transplanted - hand  
 Row Spacing: 6 ft  
 Soil Temperature: 70 F      Seed Bed: SMOOTH smooth  
 Harvest Date: 09/20/18      Soil Moisture: ABONOR above normal, excessive  
 Harvest Equipment: Hand harvested  
 Harvested Width: 6 ft  
 Harvested Length: 20 ft

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri  
 Common Name: Palmer amaranth

Pest 2 Type: W Code: DIGSA Digitaria sanguinalis  
 Common Name: large crabgrass

Pest 3 Type: W Code: ELEIN Eleusine indica  
 Common Name: Goosegrass

**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: 4      Study Design: RACOBL Randomized Complete Block (RCB)

**Soil Description**

Description Name: Field 4  
 % Sand: 79      % OM: 1.1      Texture: LS      loamy sand  
 % Silt: 13      pH: 6.7      Soil Name: Hurlock loamy sand, 0-2% slopes  
 % Clay: 8      CEC: 6.0      Fert. Level: F      fair  
 Soil Drainage: F      fair

**Application Description**

	A	B	C
Application Date	06/18/18	06/26/18	07/03/18
Appl. Stop Time	01:45 PM	12:00 PM	12:00 PM
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	POST	POST	POST
Application Placement	POST-DIR	POST-DIR	POST-DIR
Applied By	Donny	Donny	Donny
Air Temperature Start, Stop	88 F	77 F	91 F
% Relative Humidity Start, Stop	50	60	60
Wind Velocity+Dir. Start	3 MPH WSW	13 MPH ESE	4 MPH SSE
Wet Leaves (Y/N)	N no	N no	N no
Soil Temperature	88 F	77 F	91 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	20	25	20

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	IPOBA BVPP	IPOBA BVPP	IPOBA BVPP
Stage Scale Used	DESC	DESC	DESC
Stage Majority, Percent	upright 100	upright 65	vining 100
Stage Minimum, Percent		upright 60	
Stage Maximum, Percent		vining 35	
Height Average	8 IN	12 IN	16 in

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Stage Minimum, Percent	2lvs	8lvs	
Stage Maximum, Percent	6lvs	12lvs	
Height Average	1 IN	8 IN	
Height Minimum, Maximum		6 10	
Density Average	8 FT2		
Pest 2 Code, Type, Scale	DIGSA W	DIGSA W	DIGSA W
Height Average	1.5 IN	2 IN	
Density Average	1 FT2		
Pest 3 Code, Type, Scale	ELEIN W	ELEIN W	ELEIN W
Height Average	1.5 IN	2 IN	
Density Average	1 FT2		

**Application Equipment**

	A	B	C
Appl. Equipment	Backpack	Backpack	Backpack
Equipment Type	2 NOZL	2 NOZL	2 NOZL
Operation Pressure	26 psi	26 psi	26 psi
Nozzle Type	Teejet	Teejet	Teejet
Nozzle Size	8002E	8002E	8002E
Nozzle Spacing	16 in	16 in	16 in
Boom Length	32 in	32 in	32 in
Boom Height	16 in	16 in	16 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/A	20 gal/A	20 gal/A
Propellant	COMCO2	COMCO2	COMCO2

**Trial Comments**

07/05/18: No injury was observed on sweet potatoes.

07/12/18: Goosegrass control was very poor with treatments 5 and 6. Sweet potato vines in untreated check were about 50 to 60% shorter and less vigorous than treated plots.

## Sweet Potato in Plastic Mulch with Avenger and Carfentrazone

Trial ID: SwPot3-18

Location: Field 4

Trial Year: 2018

Protocol ID: SwPot3-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: IR4

Pest Code	AMAPA PalmerAm C -	DIGSA L.crbgrs C -	AMAPA PalmerAm C -	DIGSA L.crbgrs C -	C IPOBA SwtPotato YldJumbo #/20'row 09/20/18
Trt Treatment No. Name	Form Conc Form Type	Rate Rate Unit			
1 Untreated Check		0.0 c	0.0 c	0.0 d	0.0 e
2 Avenger Biolink	2wks + 10d 100 L	70 L 50 % v/v 100 L 5 % v/v	77.5 a	87.5 a	75.0 ab 57.5 bc
3 Avenger Biolink	3wks + 10d 100 L	70 L 50 % v/v 100 L 5 % v/v	57.5 b	72.5 b	60.0 c 60.0 ab
4 Avenger Biolink	2wks+10d+10d 100 L	2 EC 50 % v/v 100 L 5 % v/v	70.0 ab	92.5 a	72.5 b 78.8 a
5 Aim Crop Oil Concentrate	2wks + 10d 100 L	2 EC 0.0234 lb ai/a 100 L 1.25 % v/v	83.0 a	0.0 c	81.3 a 25.0 d
6 Aim Crop Oil Concentrate	3wks + 10d 100 L	2 EC 0.0234 lb ai/a 100 L 1.25 % v/v	74.3 a	0.0 c	68.8 b 37.5 cd
LSD P=.05		15.01	7.98	7.54	20.89 1.12 - 99999.38
Standard Deviation		9.96	5.30	5.00	13.86 2.90t
CV		16.5	12.59	8.39	32.14 207.86t
Replicate F		0.124	0.644	1.167	1.885 0.292
Replicate Prob(F)		0.9447	0.5989	0.3552	0.1755 0.8307
Treatment F		38.257	309.178	144.267	16.572 1.210
Treatment Prob(F)		0.0001	0.0001	0.0001	0.0001 0.3516

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.

Pest Code		C IPOBA	C IPOBA		
Pest Name		SwtPotato	SwtPotato		
Crop Type, Code		Yld #1's	YldTotal		
Crop Name		#/20'row	lb/20'rw		
Rating Type			09/20/18		
Rating Unit			09/20/18		
Rating Date					
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Unit Unit
1	Untreated Check			28.8	c 20.515 d
2	Avenger Biolink	2wks + 10d 100 L	70 L 100 L	50 % v/v 5 % v/v	70.3 a 58.040 a
3	Avenger Biolink	3wks + 10d 100 L	70 L 100 L	50 % v/v 5 % v/v	49.3 b 36.435 c
4	Avenger Biolink	2wks+10d+10d 100 L	2 EC 100 L	50 % v/v 5 % v/v	56.0 ab 44.495 bc
5	Aim Crop Oil Concentrate	2wks + 10d 100 L	2 EC 100 L	0.0234 lb ai/a 1.25 % v/v	64.5 ab 50.805 ab
6	Aim Crop Oil Concentrate	3wks + 10d 100 L	2 EC 100 L	0.0234 lb ai/a 1.25 % v/v	61.8 ab 45.730 abc
LSD P=.05				15.82	13.3796
Standard Deviation				10.49	8.8774
CV				19.05	20.8
Replicate F				0.696	0.385
Replicate Prob(F)				0.5690	0.7656
Treatment F				7.927	8.576
Treatment Prob(F)				0.0008	0.0005

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.

Enhancing Authority MTZ Safety for Processing Tomatoes

Trial ID: Tom2-18

Location: Field 12

Trial Year: 2018

Protocol ID: Tom2-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: PVGA

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide

Initiation Date: 03/01/18

Completion Date: 09/30/18

**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 BBCH Scale: BVSO

Variety: Heinz 3402

Attributes: Processing 10 wk old transplant

Planting Date: 05/31/18

Planting Rate: 50 plot

Depth: 3 IN

Rows per Plot: 4

Planting Method: TRAHAN transplanted - hand

Spacing within Row: 18 IN

Seed Bed: SMOOTH smooth

Soil Temperature: 82 F

Soil Moisture: ABONOR above normal, excessive

Harvest Date: 08/28/18

Harvest Equipment: Hand

Harvested Length: 12 FT

**Pest Description**

Pest 1 Type: W Code: AMAPA Amaranthus palmeri

Common Name: Palmer amaranth

Pest 2 Type: W Code: MOLVE Mollugo verticillata

Common Name: Carpetweed

**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)

**Maintenance**

No.	Date	Type	Maintenance Product Name	Form Conc	Form Unit	Form Type	Re-Entry Interval	Rate	Rate Unit
1.	06/26/18	HERB	Matrix.....rimsulfuron	25	%	WG	4	2	OZ WT/A
2.	06/26/18	HERB	Metribuzin.....metribuzin	75	%	DF	12	3	OZ WT/A
3.	06/26/18	ADJ	NIS					0.25	% V/V

Comment: Sprayed on 6/26/18, 9:30 am. Winds at 7 mph ESE. 76°F and 54% Rh. Cloud cover 15%. 6 nozl, 11002 tips at 30 psi.

Tomato avg hght = 10 in (range 7-14") Good condition. Palmer avg 5 " (range 2-8") and 8-32 m2. Carpetweed avg 5 " (range 1-6") and 8-80 m2.

**Soil Description**

Description Name: Field 4  
 % Sand: 79 % OM: 1.1 Texture: LS loamy sand  
 % Silt: 13 pH: 6.7 Soil Name: Hurlock loamy sand, 0-2% slopes  
 % Clay: 8 CEC: 6.0 Fert. Level: G good  
 Soil Drainage: F fair

**Application Description**

	A	B
Application Date	05/29/18	05/29/18
Appl. Stop Time	02:15 PM	03:30 PM
Interval to Prev. Appl.		1 HOURS
Application Method	SPRAY	SPRAY
Application Timing	PPI	PRETRA
Application Placement	BRDCST	BRDCST
Applied By	Matt	Matt
Air Temperature Start, Stop	78 F	78 F
% Relative Humidity Start, Stop	74	75
Wind Velocity+Dir. Start	1 MPH W	1 MPH W
Wet Leaves (Y/N)	N no	N no
Soil Temperature	78 F	78 F
Soil Moisture	NORMAL	NORMAL
% Cloud Cover	100	100

**Application Equipment**

	A	B
Appl. Equipment	Backpack	Backpack
Equipment Type	SPRBAC	SPRBAC
Operation Pressure	30 psi	30 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	18 in
Ground Speed	3 mph	3 mph
Carrier	WATER	WATER
Application Amount	20 gal/ac	20 gal/ac
Propellant	COMCO2	COMCO2

**Trial Comments**

05/29/18: Plot 112 had mispray. First 10 ft of plot will be excluded from ratings and yield.

06/05/18: One WATrnsplt - crop has not recovered from transplanting - little change in size. No ratings.

07/10/18 and 07/18 ratings: plots 206 and 212 ZERO biomass reduction for single best center row.

08/01/18: Palmer amaranth and Annual grasses (predominately goosegrass (ELEIN) rated for control as seen at or above crop canopy.

08/28/18: Four consecutive plants picked from left row and 4 consecutive plants picked from right row. All tomatoes pulled, graded by color and size and weighed. Heavy Palmer amaranth in plot 101 and moderate Palmer densities in 308. Low to extremely low densities in all other plots. Entire trial was hand rogued on Aug 14 to clean up for REC field day and satisfy local farmers complaining of our Palmer going to seed. Trial was located along Rt 9.

## Enhancing Authority MTZ Safety for Processing Tomatoes

Trial ID: Tom2-18

Location: Field 12

Trial Year: 2018

Protocol ID: Tom2-18

Investigator: Mark VanGessel

Study Director:

Sponsor Contact: PVGA

Pest Code Crop Type, Code	C LYPES Tomato	C LYPES Chlr/LfBrn	C LYPES Stunting %	C LYPES Tomato
Description				
Rating Type Rating Unit Rating Date	Stunting % 06/14/18	Chlr/LfBrn % 06/14/18	Stunting % 06/21/18	Stunting % 06/26/18
Trt Treatment No. Name	Form Conc Form Type	Rate Rate	Appl Unit Appl Timing	Appl Code
1 Untreated check			0.0 d	0.0 d
2 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.169 lb ai/a 0.0676 0.101	PPI A	4.0 cd
3 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a 0.09 0.135	PPI A	9.0 bc
4 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.28 lb ai/a 0.112 0.168	PPI A	10.0 bc
5 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a 0.135 0.203	PPI A	12.3 ab
6 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.45 lb ai/a 0.18 0.27	PPI A	11.7 ab
7 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a 0.09 0.135	PRE B	8.0 bc
8 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a 0.135 0.203	PRE B	12.3 ab
9 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.136 lb ai/a 0.101 lb ai/a 0.0101 0.091	PPI B	10.0 bc
10 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.202 lb ai/a 0.15 lb ai/a 0.015 0.135	PPI B	13.3 ab
11 Authority Elite Premix ----sulfentrazone ----s-metolachlor	7 EC 0.7 6.3	1.31 lb ai/a 0.131 1.18	PRE B	17.3 a
			20.3 a	41.7 a
				46.7 a

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.

Pest Code Crop Type, Code		AMAPA C - PalmerAm	MOLVE C - C Carpetwd	LYPES Tomato
Description		Control % 06/27/18	Control % 06/27/18	Stnt 1rw BestCtr% 06/27/18
Trt No. Treatment Name	Form Conc Type Rate	Rate Unit Appl Timing	Appl Code	
1 Untreated check			0.0 c	0.0 g
2 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.169 lb ai/a PPI 0.0676 0.101	A	85.9 ab
3 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a PPI 0.09 0.135	A	84.5 ab
4 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.28 lb ai/a PPI 0.112 0.168	A	84.9 ab
5 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a PPI 0.135 0.203	A	84.9 ab
6 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.45 lb ai/a PPI 0.18 0.27	A	83.2 ab
7 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a PRE 0.09 0.135	B	83.8 ab
8 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a PRE 0.135 0.203	B	98.9 a
9 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.136 lb ai/a PPI 0.101 lb ai/a PRE 0.0101 0.091	A B	96.3 a
10 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.202 lb ai/a PPI 0.15 lb ai/a PRE 0.015 0.135	A B	96.0 a
11 Authority Elite Premix ----sulfentrazone ----s-metolachlor	7 EC 0.7 6.3	1.31 lb ai/a PRE 0.131 1.18	B	97.3 a
				96.9 abc
				37.7 a

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.

Pest Code Crop Type, Code	C LYPES Tomato	AMAPA C - PalmerAm	MOLVE C - Carpetwd	C LYPES Tomato
Description	Stunting % 07/03/18	Control % 07/03/18	Control % 07/03/18	BiomRed 07/10/18
Trt Treatment No. Name	Form Conc Form Type Rate Rate	Appl Unit Appl Timing		
1 Untreated check		0.0 b	82.3 b	90.0 c
2 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.169 lb ai/a PPI 0.0676 0.101	A A	2.4 b 96.0 a
3 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a PPI 0.09 0.135	A A	17.9 a 96.7 a
4 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.28 lb ai/a PPI 0.112 0.168	A A	21.3 a 96.0 a
5 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a PPI 0.135 0.203	A A	26.1 a 96.7 a
6 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.45 lb ai/a PPI 0.18 0.27	A A	37.7 a 100.0 a
7 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a PRE 0.09 0.135	B B	18.7 a 100.0 a
8 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a PRE 0.135 0.203	B B	35.9 a 100.0 a
9 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.136 lb ai/a PPI 0.101 lb ai/a PRE 0.0101 0.091	A B	33.7 a 100.0 a
10 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.202 lb ai/a PPI 0.15 lb ai/a PRE 0.015 0.135	A B	37.4 a 100.0 a
11 Authority Elite Premix ----sulfentrazone ----s-metolachlor	7 EC 0.7 6.3	1.31 lb ai/a PRE 0.131 1.18	B	36.2 a 100.0 a
				34.3 a

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.

Pest Code Crop Type, Code	C LYPES	C LYPES	AMAPA C -	C -					
Description	Tomato BiomRed	Tomato BiomRed	PalmerAm Control %	AnnGrass Control %					
Rating Type			08/01/18	08/01/18					
Rating Unit									
Rating Date									
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code				
1 Untreated check						0.0 e	0.0 d	0.0 c	0.0 b
2 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.169 lb ai/a 0.0676 0.101	0.169 lb ai/a PPI	A		5.0 cde	0.0 d	97.6 a	93.3 a
3 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a 0.09 0.135	0.225 lb ai/a PPI	A		6.7 b-e	6.0 a-d	85.3 ab	94.9 a
4 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.28 lb ai/a 0.112 0.168	0.28 lb ai/a PPI	A		7.7 b-e	0.0 d	61.5 b	98.9 a
5 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a 0.135 0.203	0.338 lb ai/a PPI	A		17.3 a-d	10.0 abc	95.9 ab	98.9 a
6 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.45 lb ai/a 0.18 0.27	0.45 lb ai/a PPI	A		21.0 ab	15.0 a	95.0 ab	98.9 a
7 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a 0.09 0.135	0.225 lb ai/a PRE	B		5.0 cde	2.3 cd	99.1 a	100.0 a
8 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a 0.135 0.203	0.338 lb ai/a PRE	B		21.7 ab	5.7 bcd	100.0 a	100.0 a
9 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.136 lb ai/a 0.101 lb ai/a 0.0101 0.091	0.136 lb ai/a PPI 0.101 lb ai/a PRE	A B		14.3 a-e	6.7 a-d	100.0 a	100.0 a
10 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.202 lb ai/a 0.15 lb ai/a 0.015 0.135	0.202 lb ai/a PPI 0.15 lb ai/a PRE	A B		20.3 abc	3.3 bcd	100.0 a	98.9 a
11 Authority Elite Premix ----sulfentrazone ----s-metolachlor	7 EC 0.7 6.3	1.31 lb ai/a 0.131 1.18	1.31 lb ai/a PRE	B		24.7 a	12.3 ab	100.0 a	100.0 a

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

Pest Code Crop Type, Code		C LYPES	C LYPES	C LYPES	C LYPES				
Description		Tomato	Tomato	Tomato	Tomato				
Rating Type		BiomRed	YldLftSml	YldRtSml	YldTtlRed				
Rating Unit		%	lbs	lbs	lbs/plot				
Rating Date		08/28/18	08/28/18	08/28/18	08/28/18				
Trt No.	Treatment Name	Form Conc	Form Type	Rate Unit	Appl Timing				
					Appl Code				
1	Untreated check			0.0 d	0.240 a	0.467 a	28.26 ab		
2	Authority MTZ Premix	45 DF	0.169 lb ai/a	PPI	A	0.0 d	0.587 a	0.407 a	25.82 abc
	----sulfentrazone	18	0.0676						
	----metribuzin	27	0.101						
3	Authority MTZ Premix	45 DF	0.225 lb ai/a	PPI	A	0.0 d	0.580 a	0.640 a	28.73 a
	----sulfentrazone	18	0.09						
	----metribuzin	27	0.135						
4	Authority MTZ Premix	45 DF	0.28 lb ai/a	PPI	A	6.0 a-d	0.940 a	1.293 a	24.11 abc
	----sulfentrazone	18	0.112						
	----metribuzin	27	0.168						
5	Authority MTZ Premix	45 DF	0.338 lb ai/a	PPI	A	7.3 abc	0.693 a	0.673 a	28.14 ab
	----sulfentrazone	18	0.135						
	----metribuzin	27	0.203						
6	Authority MTZ Premix	45 DF	0.45 lb ai/a	PPI	A	11.7 a	0.933 a	0.627 a	19.34 c
	----sulfentrazone	18	0.18						
	----metribuzin	27	0.27						
7	Authority MTZ Premix	45 DF	0.225 lb ai/a	PRE	B	0.0 d	0.427 a	0.653 a	24.07 abc
	----sulfentrazone	18	0.09						
	----metribuzin	27	0.135						
8	Authority MTZ Premix	45 DF	0.338 lb ai/a	PRE	B	3.3 bcd	1.353 a	0.873 a	21.30 bc
	----sulfentrazone	18	0.135						
	----metribuzin	27	0.203						
9	Metribuzin.....metribuzin	75 DF	0.136 lb ai/a	PPI	A	2.7 cd	1.680 a	1.647 a	22.14 abc
	Spartan Charge Premix	3.5 F	0.101 lb ai/a	PRE	B				
	----carfentrazone	0.35	0.0101						
	----sulfentrazone	3.15	0.091						
10	Metribuzin.....metribuzin	75 DF	0.202 lb ai/a	PPI	A	10.0 ab	1.133 a	1.700 a	19.29 c
	Spartan Charge Premix	3.5 F	0.15 lb ai/a	PRE	B				
	----carfentrazone	0.35	0.015						
	----sulfentrazone	3.15	0.135						
11	Authority Elite Premix	7 EC	1.31 lb ai/a	PRE	B	10.0 ab	2.007 a	1.467 a	22.77 abc
	----sulfentrazone	0.7	0.131						
	----s-metolachlor	6.3	1.18						

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

Pest Code Crop Type, Code		C LYPES	C LYPES	C LYPES	C LYPES
Description		Tomato YldTtlYel lbs/plot 08/28/18	Tomato YldTtlGrn lbs/plot 08/28/18	Tomato TtlTotal lbs/plot 08/28/18	Tomato %ripe % 08/28/18
Rating Type					
Rating Unit					
Rating Date					
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Unit	Appl Timing	Appl Code	
1 Untreated check					6.07 a
2 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.169 lb ai/a 0.0676 0.101	PPI	A	3.81 e
3 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a 0.09 0.135	PPI	A	5.65 a
4 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.28 lb ai/a 0.112 0.168	PPI	A	5.93 a
5 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a 0.135 0.203	PPI	A	7.03 cde
6 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.45 lb ai/a 0.18 0.27	PPI	A	8.53 a
7 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a 0.09 0.135	PRE	B	9.13 a
8 Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a 0.135 0.203	PRE	B	7.72 a
9 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.136 lb ai/a 0.101 lb ai/a 0.0101 0.091	PPI	A	6.17 a
10 Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.202 lb ai/a 0.15 lb ai/a 0.015 0.135	PPI	A	6.44 a
11 Authority Elite Premix ----sulfentrazone ----s-metolachlor	7 EC 0.7 6.3	1.31 lb ai/a 0.131 1.18	PRE	B	8.93 a
					11.71 a
					40.11 a
					49 e
					39.35 a
					59 cde

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

Pest Code Crop Type, Code		C LYPES					
Description		Tomato					
Rating Type		%green					
Rating Unit		%					
Rating Date		08/28/18					
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Code
1	Untreated check						10 f
2	Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.169 lb ai/a 0.0676 0.101		PPI	A	17 cde
3	Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a 0.09 0.135		PPI	A	12 ef
4	Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.28 lb ai/a 0.112 0.168		PPI	A	14 def
5	Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a 0.135 0.203		PPI	A	17 cde
6	Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.45 lb ai/a 0.18 0.27		PPI	A	24 ab
7	Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.225 lb ai/a 0.09 0.135		PRE	B	23 abc
8	Authority MTZ Premix ----sulfentrazone ----metribuzin	45 DF 18 27	0.338 lb ai/a 0.135 0.203		PRE	B	23 abc
9	Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.136 lb ai/a 0.101 lb ai/a 0.0101 0.091		PPI	A	20 bcd
10	Metribuzin.....metribuzin Spartan Charge Premix ----carfentrazone ----sulfentrazone	75 DF 3.5 F 0.35 3.15	0.202 lb ai/a 0.15 lb ai/a 0.015 0.135		PPI	A	28 a
11	Authority Elite Premix ----sulfentrazone ----s-metolachlor	7 EC 0.7 6.3	1.31 lb ai/a 0.131 1.18		PRE	B	24 ab

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## University of Delaware

Pest Code Crop Type, Code	C LYPES	C LYPES	C LYPES	C LYPES
Description	Tomato	Tomato	Tomato	Tomato
Rating Type	Stunting %	Chlr/LfBrn %	Stunting %	Stunting %
Rating Unit	06/14/18	06/14/18	06/21/18	06/26/18
Rating Date				
Trt No. Name	Form Conc	Form Type	Rate Unit	Appl Timing
				Appl Code
12 Weed-free check				
Devrinol 2-XT...napropamide	2 EC	1 lb ai/a	PPI	A
Metribuzin.....metribuzin	75 DF	0.164 lb ai/a	PPI	A
Authority Elite Premix	7 EC	1.37 lb ai/a		
----sulfentrazone	0.7	0.137		
----s-metolachlor	6.3	1.23		
LSD P=.05		6.57	8.81	14.83
Standard Deviation		3.88	5.20	8.76
CV		40.5	42.75	30.64
Replicate F		0.266	2.246	1.783
Replicate Prob(F)		0.7692	0.1296	0.1916
Treatment F		4.101	3.288	6.513
Treatment Prob(F)		0.0024	0.0084	0.0001

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## University of Delaware

Pest Code Crop Type, Code		AMAPA C - PalmerAm	MOLVE C - C Carpetwd	LYPES Tomato						
Description		Control % 06/27/18	Control % 06/27/18	Stnt 1rw BestCtr% 06/27/18						
Rating Type										
Rating Unit										
Rating Date										
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code			
12	Weed-free check							61.5 b	74.5 f	0.0 e
	Devrinol 2-XT...napropamide	2 EC		1 lb ai/a	PPI	A				
	Metribuzin.....metribuzin	75 DF		0.164 lb ai/a	PPI	A				
	Authority Elite Premix	7 EC		1.37 lb ai/a						
	----sulfentrazone	0.7		0.137						
	----s-metolachlor	6.3		1.23						
LSD P=.05				16.68 - 27.34		4.78 - 11.46		14.11		
Standard Deviation					11.12t		4.92t		8.33	
CV					17.23t		7.34t		42.55	
Replicate F					0.842		10.509		1.393	
Replicate Prob(F)					0.4441		0.0006		0.2694	
Treatment F					11.901		62.516		8.419	
Treatment Prob(F)					0.0001		0.0001		0.0001	

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

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

## University of Delaware

Pest Code Crop Type, Code	C LYPES	AMAPA C -	MOLVE C -	C LYPES						
Description	Tomato	PalmerAm	Carpetwd	Tomato						
Rating Type	Stunting %	Control %	Control %	BiomRed						
Rating Unit	07/03/18	07/03/18	07/03/18	07/10/18						
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
12 Weed-free check										
Devrinol 2-XT...napropamide	2 EC		1 lb ai/a	PPI	A		0.8 b	100.0 a	98.3 ab	2.7 cd
Metribuzin.....metribuzin	75 DF		0.164 lb	ai/a	PPI	A				
Authority Elite Premix	7 EC		1.37 lb	ai/a						
----sulfentrazone	0.7		0.137							
----s-metolachlor	6.3		1.23							
LSD P=.05			9.54 - 20.85				6.80	3.26	15.12	
Standard Deviation				8.06t			4.02	1.93	8.93	
CV				31.42t			4.13	1.95	45.02	
Replicate F				0.336			1.942	0.592	0.710	
Replicate Prob(F)				0.7182			0.1672	0.5620	0.5027	
Treatment F				8.555			4.715	6.902	5.865	
Treatment Prob(F)				0.0001			0.0010	0.0001	0.0002	

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## University of Delaware

Pest Code Crop Type, Code	C LYPES	C LYPES	AMAPA C -	C -						
Description	Tomato BiomRed	Tomato BiomRed	PalmerAm Control %	AnnGrass Control %						
Rating Type										
Rating Unit										
Rating Date	07/18/18	08/01/18	08/01/18	08/01/18						
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code				
12 Weed-free check										
Devrinol 2-XT...napropamide	2 EC	1 lb ai/a	PPI	A						
Metribuzin.....metribuzin	75 DF	0.164 lb ai/a	PPI	A						
Authority Elite Premix	7 EC	1.37 lb ai/a								
----sulfentrazone	0.7	0.137								
----s-metolachlor	6.3	1.23								
LSD P=.05							15.67	9.20	22.53 - 35.49	6.70 - 8.95
Standard Deviation							9.26	5.43	16.73t	10.28t
CV							75.9	100.85	22.56t	13.16t
Replicate F							0.646	1.358	0.041	4.532
Replicate Prob(F)							0.5337	0.2779	0.9595	0.0225
Treatment F							2.592	2.483	7.294	17.941
Treatment Prob(F)							0.0275	0.0334	0.0001	0.0001

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## University of Delaware

Pest Code Crop Type, Code	C LYPES Tomato BiomRed % 08/28/18	C LYPES Tomato YldLftSml lbs 08/28/18	C LYPES Tomato YldRtSml lbs 08/28/18	C LYPES Tomato YldTtlRed lbs/plot 08/28/18
Trt Treatment No. Name	Form Form Conc Type Rate	Rate Appl Unit Timing	Appl Code	
12 Weed-free check				
Devrinol 2-XT...napropamide	2 EC	1 lb ai/a	PPI	A
Metribuzin.....metribuzin	75 DF	0.164 lb ai/a	PPI	A
Authority Elite Premix	7 EC	1.37 lb ai/a		
----sulfentrazone	0.7	0.137		
----s-metolachlor	6.3	1.23		
LSD P=.05		6.94	1.0792	1.0658
Standard Deviation		4.10	0.6373	0.6294
CV		96.43	68.04	66.96
Replicate F		1.345	3.794	5.953
Replicate Prob(F)		0.2812	0.0384	0.0086
Treatment F		3.692	2.039	1.614
Treatment Prob(F)		0.0044	0.0746	0.1631

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## University of Delaware

Pest Code Crop Type, Code	C LYPES	C LYPES	C LYPES	C LYPES		
Description	Tomato YldTtlYel lbs/plot 08/28/18	Tomato YldTtlGrn lbs/plot 08/28/18	Tomato TtlTotal lbs/plot 08/28/18	Tomato %ripe % 08/28/18		
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Code
12 Weed-free check						
Devrinol 2-XT...napropamide	2 EC	1 lb ai/a	PPI	A		
Metribuzin.....metribuzin	75 DF	0.164 lb ai/a	PPI	A		
Authority Elite Premix	7 EC	1.37 lb ai/a				
----sulfentrazone	0.7	0.137				
----s-metolachlor	6.3	1.23				
LSD P=.05			3.812	3.240	9.850	11.0
Standard Deviation			2.251	1.914	5.817	6.5
CV			30.25	24.33	14.28	10.44
Replicate F			1.836	57.443	45.442	2.890
Replicate Prob(F)			0.1830	0.0001	0.0001	0.0769
Treatment F			1.386	4.224	0.956	3.824
Treatment Prob(F)			0.2470	0.0020	0.5106	0.0036

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## University of Delaware

Pest Code Crop Type, Code	C LYPES Tomato %green %
Description	08/28/18
Rating Type	
Rating Unit	
Rating Date	
Trt Treatment No. Name	Form Form Conc Type Rate Rate Appl Unit Appl Timing Code
12 Weed-free check	13 ef
Devrinol 2-XT...napropamide	2 EC 1 lb ai/a PPI A
Metribuzin.....metribuzin	75 DF 0.164 lb ai/a PPI A
Authority Elite Premix	7 EC 1.37 lb ai/a
----sulfentrazone	0.7 0.137
----s-metolachlor	6.3 1.23
LSD P=.05	6.9
Standard Deviation	4.1
CV	21.69
Replicate F	20.970
Replicate Prob(F)	0.0001
Treatment F	6.235
Treatment Prob(F)	0.0001

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

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Performance of Glufosinate on Fruiting Vegetables (Tomato and Pepper)  
 Trial ID: Veg3-18 Location: Field 9 Trial Year: 2018  
 Protocol ID: Veg3-18 Investigator: Mark VanGessel  
 Study Director:  
 Sponsor Contact:

**General Trial Information**

Investigator: Mark VanGessel Title: Extension Weed Specialist

Discipline: H herbicide  
 Initiation Date: 03/01/18  
 Completion Date: 09/30/18

**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 CPSAN Capsicum annuum	Bell pepper	BBCH Scale: BVSO
Variety: Aristotle		
Attributes: bell		
Planting Date: 05/29/18	Planting Rate: 10 plot	
Rows per Plot: 2	Planting Method: TRAHAN transplanted - hand	
Row Spacing: 7 ft		
Spacing within Row: 18 in	Seed Bed: SMOOTH smooth	
Soil Temperature: 79 F	Soil Moisture: ABONOR above normal, excessive	
	Harvest Equipment: Hand harvested	
	Harvested Length: 10 plot	
Crop 2: C LYPES Solanum lycopersicum Tomato		BBCH Scale: BVSO
Variety: Mountain Glory		
Attributes: Slicer		
Planting Date: 05/29/18	Planting Rate: 10 plot	
Rows per Plot: 2	Planting Method: TRAHAN transplanted - hand	
Row Spacing: 7 ft		
Spacing within Row: 24 in	Seed Bed: SMOOTH smooth	
Soil Temperature: 79 F	Soil Moisture: ABONOR above normal, excessive	
	Harvest Equipment: Hand harvested	
	Harvested Length: 4 plot	

**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

**Site and Design**

Treated Plot Width: 6 FT	Site Type: FIELD field
Treated Plot Length: 35 FT	
Treated Plot Area: 210 FT <sup>2</sup>	Tillage Type: CONTIL conventional-till
Treatments: 5	Study Design: RACOBL Randomized Complete Block (RCB)
Replications: 3	

Trial Initiation Comments:  
 on black plastic.

**Maintenance**

No.	Type	Maintenance Product Name	Form Conc	Form Type	Re-Entry Interval	Rate	Rate Unit
1.	MAINT	Reflex.....fomesafen	2	L	24	0.5	PT/A
2.	MAINT	Prowl H2O.....pendimethalin	3.8	CS		1	PT/A
3.	MAINT	Dual EC	8	EC		1	PT/A
4.	MAINT	Gramoxone 2 SL	2	SL		2.4	PT/A
5.	ADJ	NIS	100	SL		0.25	% V/V

**Soil Description**

Description Name: Field 9

% Sand: 83 % OM: 1 Texture: LS loamy sand

% Silt: 9 pH: 6.1 Soil Name: Pepperbox loamy sand, 0-2% slopes

% Clay: 8 CEC: 3.8 Fert. Level: G good

Soil Drainage: F fair

**Application Description**

	A	B	C
Application Date	05/25/18	06/14/18	06/26/18
Appl. Stop Time	12:15 PM	07:30 AM	07:45 AM
Interval to Prev. Appl.		20 DAYS	12 DAYS
Application Method	SPRAY	SPRAY	SPRAY
Application Timing	PreTrns	PostTrns	PostTrns
Application Placement	BROADC	BRODIR	BRODIR
Applied By	Matt	Matt	Matt
Air Temperature Start, Stop	80 F	75 F	72 F
% Relative Humidity Start, Stop	55	80	60
Wind Velocity+Dir. Start	8 MPH SSW	6 MPH NNW	3 MPH ESE
Wet Leaves (Y/N)	N no	Y yes	Y yes
Soil Temperature	78 F	75 F	72 F
Soil Moisture	NORMAL	NORMAL	NORMAL
% Cloud Cover	20	60	20
Next Moisture Occurred On	05/27/18		
Time to Next Moisture	42 hrs		

**Crop Stage At Each Application**

	A	B	C
Crop 1 Code, BBCH Scale	CPSAN BVSO	CPSAN BVSO	CPSAN BVSO
Height Average		7 in	12 in
Height Minimum, Maximum		6 8	8 14
Crop Coverage (%)		0	0
Crop 2 Code, BBCH Scale	LYPES BVSO	LYPES BVSO	LYPES BVSO
Height Average		12 in	26 in
Height Minimum, Maximum		10 14	24 30
Crop Coverage (%)		0	0

**Pest Stage At Each Application**

	A	B	C
Pest 1 Code, Type, Scale	AMAPA W	AMAPA W	AMAPA W
Stage Majority, Percent		none	
Height Average			4 in
Height Minimum, Maximum			2 6
Density Average			6 m <sup>2</sup>
Pest 2 Code, Type, Scale	IPOSS W	IPOSS W	IPOSS W
Stage Majority, Percent		none	run 60
Stage Minimum, Percent			veg 40
Stage Maximum, Percent			run 60
Height Average			8 in
Height Minimum, Maximum			2 12
Density Average			4 m <sup>2</sup>

**Application Equipment**

	A	B	C
Appl. Equipment	Backpack	Backpack	Backpack
Equipment Type	SPRBAC	2 NOZL	2 NOZL
Operation Pressure	29 psi	26 psi	26 psi
Nozzle Type	AIRMIX	Teejet	Teejet
Nozzle Size	11002	8002E	8002E
Nozzle Spacing	18 in	16 in	16 in
Boom Length	6 ft	32 in	32 in
Boom Height	18 in	16 in	16 in
Ground Speed	3 mph	3 mph	3 mph
Carrier	WATER	WATER	WATER
Application Amount	20 gal/ac	20 gal/A	20 gal/A
Propellant	COMCO2	COMCO2	COMCO2

**Trial Comments**

Reps were situated by column. vegetables in ranges 4 and especially 5 for each rep exhibited stunting NOT due to treatment but field conditions.

06/28/18: PEPPERS: stunting due to field conditions, NOT glufosinate treatments:

105 30	205 40	305 50
104 20	204 22	304 25
103 10	203 15	303 15
102 0	202 7	302 18
101 0	201 15	301 30

06/28/18: TOMATOES: stunting due to field conditions, NOT glyphosate treatments:

105 33	205 35	305 50
104 20	204 30	304 40
103 10	203 15	303 20
102 0	202 10	302 18
101 0	201 10	301 15

Performance of Glufosinate on Fruiting Vegetables (Tomato and Pepper)			
Trial ID: Veg3-18	Location: Field 9	Trial Year: 2018	
Protocol ID: Veg3-18	Investigator: Mark VanGessel		
Study Director:			
Sponsor Contact:			

Pest Code	C LYPES	C CPSAN	C LYPES	C CPSAN					
Pest Name									
Crop Type, Code									
Crop Name	Tomato	Bell pepper	Tomato	Bell pepper					
Rating Type	LeafBurn %	LeafBurn %	Injury %	Injury %					
Rating Unit	06/07/18	06/07/18	06/12/18	06/12/18					
Rating Date									
Trt Treatment No. Name	Form Conc	Form Type	Rate Unit	Appl Timing	Appl Code				
1 Untreated Weed-Free Check						0.0 a	0.0 a	0.0 a	0.0 a
2 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.44 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A		0.0 a	0.0 a	0.0 a	0.0 a
3 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A		0.0 a	0.0 a	0.0 a	0.0 a
4 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	1.17 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A		0.0 a	0.0 a	0.0 a	0.0 a
5 Rely 280 Ammonium Sulfate Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	14DApltDIR B 14DApltDIR B			0.0 a	0.0 a	0.0 a	0.0 a
	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	28DApltDIR C 28DApltDIR C						
LSD P=.05						.	.	.	.
Standard Deviation						0.00	0.00	0.00	0.00
CV						0.0	0.0	0.0	0.0
Replicate F						0.000	0.000	0.000	0.000
Replicate Prob(F)						1.0000	1.0000	1.0000	1.0000
Treatment F						0.000	0.000	0.000	0.000
Treatment Prob(F)						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.

Could not calculate LSD (% mean diff) for columns 1,2,3,4,5,6,7,8,9,10,11,12,25,26 because error mean square = 0.

Pest Code	C LYPES	C CPSAN	C LYPES	C CPSAN						
Pest Name	Tomato	Bell pepper	Tomato	Bell pepper						
Crop Type, Code	Stunting %	Stunting %	Stunting %	Stunting %						
Crop Name	06/18/18	06/18/18	06/21/18	06/21/18						
Rating Type										
Rating Unit										
Rating Date										
Trt Treatment No.	Form Conc	Form Type	Rate	Appl Unit	Appl Timing	Appl Code				
1 Untreated							0.0 a	0.0 a	0.0 a	0.0 a
Weed-Free Check										
2 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.44 lb ai/a 3 lb ai/a	PREplt72	A			0.0 a	0.0 a	0.0 a	0.0 a
3 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	PREplt72	A			0.0 a	0.0 a	0.0 a	0.0 a
4 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	1.17 lb ai/a 3 lb ai/a	PREplt72	A			0.0 a	0.0 a	0.0 a	0.0 a
5 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	14DApltDIR B				0.0 a	0.0 a	0.0 a	0.0 a
Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	14DApltDIR C							
LSD P=.05							.	.	.	.
Standard Deviation							0.00	0.00	0.00	0.00
CV							0.0	0.0	0.0	0.0
Replicate F							0.000	0.000	0.000	0.000
Replicate Prob(F)							1.0000	1.0000	1.0000	1.0000
Treatment F							0.000	0.000	0.000	0.000
Treatment Prob(F)							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.

Could not calculate LSD (% mean diff) for columns 1,2,3,4,5,6,7,8,9,10,11,12,25,26 because error mean square = 0.

Pest Code	C LYPES	C CPSAN	C LYPES	C CPSAN						
Pest Name	Tomato	Bell pepper	Tomato	Bell pepper						
Crop Type, Code	Injury %	Injury %	Injury %	Injury %						
Crop Name	07/10/18	07/10/18	07/25/18	07/25/18						
Rating Type										
Rating Unit										
Rating Date										
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1 Untreated Weed-Free Check							0.0 a	0.0 a	0.0 a	0.0 a
2 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.44 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A			0.0 a	0.0 a	0.0 a	0.0 a
3 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A			0.0 a	0.0 a	0.0 a	0.0 a
4 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	1.17 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A			0.0 a	0.0 a	0.0 a	0.0 a
5 Rely 280 Ammonium Sulfate Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	14DApltDIR B 14DApltDIR B				0.0 a	0.0 a	0.0 a	0.0 a
Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	28DApltDIR C 28DApltDIR C							
LSD P=.05							.	.	.	.
Standard Deviation							0.00	0.00	0.00	0.00
CV							0.0	0.0	0.0	0.0
Replicate F							0.000	0.000	0.000	0.000
Replicate Prob(F)							1.0000	1.0000	1.0000	1.0000
Treatment F							0.000	0.000	0.000	0.000
Treatment Prob(F)							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.

Could not calculate LSD (% mean diff) for columns 1,2,3,4,5,6,7,8,9,10,11,12,25,26 because error mean square = 0.

Pest Code		C CPSAN	C CPSAN	C LYPES							
Pest Name		Bell pepper	Bell pepper	Tomato							
Crop Type, Code		YldTotCt #/plot	YldTotWt lb/plot	InjAtYld %							
Crop Name				08/30/18							
Rating Type											
Rating Unit											
Rating Date											
Trt No.	Treatment Name	Form Conc	Form Type	Rate Rate	Appl Unit	Appl Timing	Appl Code				
1	Untreated							58.7 a	13.40 a	0.0 a	
2	Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.44 lb ai/a 3 lb ai/a	PREplt72	A			59.3 a	13.05 a	0.0 a	
3	Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	PREplt72	A			70.7 a	15.03 a	0.0 a	
4	Rely 280 Ammonium Sulfate	2.34 SL 100 SG	1.17 lb ai/a 3 lb ai/a	PREplt72	A			57.3 a	12.45 a	0.0 a	
5	Rely 280 Ammonium Sulfate Rely 280 Ammonium Sulfate	2.34 SL 100 SG 2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a 0.88 lb ai/a 3 lb ai/a	14DApltDIR B 14DApltDIR B 28DApltDIR C 28DApltDIR C				69.0 a	14.89 a	0.0 a	
LSD P=.05								68.16	16.026	.	.
Standard Deviation								36.20	8.512	.	0.00
CV								57.46	61.85	.	0.0
Replicate F								0.035	0.095	0.000	
Replicate Prob(F)								0.9658	0.9101	1.0000	
Treatment F								0.091	0.054	0.000	
Treatment Prob(F)								0.9826	0.9934	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 1,2,3,4,5,6,7,8,9,10,11,12,25,26 because error mean square = 0.

Pest Code	C LYPES	C LYPES	C LYPES	C LYPES				
Pest Name	Tomato YldRotnCt #/plot	Tomato YldRotnCt #/plot	Tomato YldRotnCt #/plot	Tomato YldGrnCt #/plot				
Crop Type, Code	08/14/18	08/22/18	08/30/18	09/07/18				
Trt Treatment No. Name	Form Conc Form Type Rate Rate Appl Unit Timing	Appl Code						
1 Untreated Weed-Free Check		12.7 a	10.3 a	4.3 a	63.0 a			
2 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.44 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A	10.7 a	9.7 ab	4.0 a	70.3 a
3 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A	12.0 a	3.7 c	4.7 a	49.3 a
4 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	1.17 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A	8.0 a	5.3 bc	6.0 a	63.0 a
5 Rely 280 Ammonium Sulfate Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	14DApltDIR B 14DApltDIR B		14.7 a	11.0 a	5.3 a	57.0 a
2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	28DApltDIR C 28DApltDIR C						
LSD P=.05		9.66	4.87	5.48	41.27			
Standard Deviation		5.13	2.59	2.91	21.92			
CV		44.21	32.32	59.85	36.21			
Replicate F		0.373	1.885	1.658	0.093			
Replicate Prob(F)		0.7003	0.2134	0.2498	0.9118			
Treatment F		0.700	4.838	0.228	0.384			
Treatment Prob(F)		0.6135	0.0280	0.9152	0.8143			

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

Could not calculate LSD (% mean diff) for columns 1,2,3,4,5,6,7,8,9,10,11,12,25,26 because error mean square = 0.

Pest Code	C LYPES	C LYPES	C LYPES	C LYPES
Pest Name	Tomato YldGrnWt lb/plot 09/07/18	Tomato YldRotnCt #/plot 09/07/18	Tomato YldTtlRipe lb/plot	Tomato YldTtlRipe #/plot
Crop Type, Code				
Crop Name				
Rating Type				
Rating Unit				
Rating Date				
Trt Treatment No. Name	Form Conc	Form Type	Rate Rate	Appl Unit Appl Timing Code
1 Untreated Weed-Free Check				
2 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.44 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A
3 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A
4 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	1.17 lb ai/a 3 lb ai/a	PREplt72 PREplt72	A A
5 Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	14DApltDIR B 14DApltDIR B	
Rely 280 Ammonium Sulfate	2.34 SL 100 SG	0.88 lb ai/a 3 lb ai/a	28DApltDIR C 28DApltDIR C	
LSD P=.05		11.3566	3.84	25.642
Standard Deviation		6.0316	2.04	13.619
CV		62.09	71.06	29.47
Replicate F		0.110	0.980	0.088
Replicate Prob(F)		0.8967	0.4162	0.9163
Treatment F		0.303	1.470	0.526
Treatment Prob(F)		0.8682	0.2974	0.7206
				0.4292

Means followed by same letter 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 1,2,3,4,5,6,7,8,9,10,11,12,25,26 because error mean square = 0.