

Insect Management Reports

2014 Season

University of Delaware
Cooperative Extension -- IPM Program

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Brown Marmorated Stink Bug (BMSB) and Native Brown Stink Bug (BSB) Management in Sweet Corn, 2014: Three plantings of “Passion II “ Bt sweet corn were established on May 28, June 20, and July 10 at the University of Delaware’s Research farm located in Newark, DE. All plots were two rows wide planted of 5 ft centers arranged in a RCB design with four replications. For the first two plantings, plots were 25 foot long and for the third planting, plots were 15 foot long. All materials were applied with a CO₂ pressurized back pack sprayer using a two nozzle boom equipped with D2 hollow cone nozzles delivering 38 gpa at 40 psi. BMSB and Native Brown Stink Bug population levels were evaluated by counting the number of adults and nymphs in a 3 minute visual inspections of all plants in the plot. At harvest for all plantings, all the primary ears (top ear) from each plot were husked and evaluated for damage from stink bugs (blemished kernels). No stink bug damage was detected in the second and third plantings. Data were analyzed using Proc GLM and means were separated by Tukey’s mean separation test (P=0.05).

Table 1 . Stink Bug and Sap Beetle Ear Damage Data: First Planting – May 28

Treatment	Rate/Acre	Timing	Application Dates	% Sap Beetle Damaged Ears Aug 6 ¹	% Stink Bug Damaged Ears Aug 6 ¹	Average Number Stink Bug Damaged Kernels Aug 6 ¹
Warrior II	1.92 oz	Start at ear shank, 3-4 day schedule	7/18,7/21,7/24,7/28, 7/31 and 8/4	0.82b	0.00a	0.00b
Warrior II	1.92 oz	Silk, blister and milk	7/18,7/24,7/31	3.49ab	0.00a	0.00b
Warrior II	1.92 oz	Blister and Milk	7/24, 7/31	6.87ab	0.68a	0.25ab
Warrior II	1.92 oz	Milk	7/31	20.24a	1.15a	0.75ab
Hero EC	4.5 fl oz	Start at ear shank, 3-4 day schedule	7/18,7/21,7/24,7/28, 7/31 and 8/4	2.51b	0.00a	0.00b
Hero EC	7 oz	Silk, blister and milk	7/18,7/24,7/31	5.62ab	0.00a	0.00b
Hero EC	7 oz	Blister and Milk	7/24, 7/31	2.17b	0.00a	0.00b
Hero EC	7 oz	Milk	7/31	12.76ab	3.52a	1.00ab
Untreated	--	--	--	17.00ab	3.97a	2.75a

¹ Means in the same columns followed by the same letter are not significantly different (Tukey’s; P=0.05).

Table 2 .BMSB and BSB Population Data: First Planting – May 28

Treatment	Average Number BMSB per 3 Minute Count ¹				Average Number BSB per 3 Minute Count ¹			
	Jul 16	Jul 21	Jul 28	Aug 4	Jul 16	Jul 17	Jul 21	Jul 28
Warrior II	0.00a	0.00a	0.00a	0.00a	0.01a	0.01a	0.00a	0.01a
Warrior II	0.00a	0.00a	0.00a	0.00a	0.01a	0.01a	0.00a	0.00a
Warrior II	0.00a	0.00a	0.00a	0.00a	0.00a	0.00a	0.01a	0.00a
Warrior II	0.01a	0.00a	0.03a	0.00a	0.01a	0.00a	0.01a	0.02a
Hero EC	0.00a	0.00a	0.00a	0.00a	0.02a	0.01a	0.00a	0.00a
Hero EC	0.00a	0.00a	0.00a	0.00a	0.02a	0.01a	0.01a	0.01a
Hero EC	0.00a	0.00a	0.00a	0.01a	0.01a	0.01a	0.01a	0.01a
Hero EC	0.01	0.00a	0.00a	0.00a	0.01a	0.00a	0.01a	0.02a
Untreated	0.00a	0.00a	0.00a	0.00a	0.00a	0.01a	0.00a	0.01a

¹ Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Management of Corn Borer and Corn Earworm in Early Season Snap Beans with Foliar Insecticides, 2014-

'Slenderette' snap beans were planted on June 9 at the University of Delaware's Research and Education Center located near Georgetown, DE. Four row plots 25 ft long planted on 30 inch centers were arranged in a RCB design with four replications. Foliar treatments were applied on July 15 (late bud stage), July 22 (pin stage) and July 29 (6 days from harvest) with a CO₂ pressurized backpack sprayer equipped with a six nozzle boom delivering 17 gpa @ 40 psi. Plots were harvested on Aug 4 from a 6 ft row section and all the beans were evaluated for corn borer and corn earworm injury. Data were analyzed using Proc GLM and means were separated by Tukey's means separation test (P=0.05).

Corn borer and corn earworm pressure was light. No phytotoxicity was observed.

Treatment	Rate/Acre	Treatment Dates	Percent ECB Damaged Beans Aug 4 ¹	Percent CEW Damaged Beans Aug 4 ¹
Besiege Warrior II	10 fl oz 1.92 fl oz	July 15, 22 July 29	0.00a	0.00a
Belt SC	2 fl oz	July 15,22,29	0.00a	0.00a
Belt SC	3 fl oz	July 15,22,29	0.00a	0.00a
Acephate 97 Warrior II	1 lb 1.92 fl oz	July 15, 22 July 29	0.00a	0.00a
Blackhawk 36WG	3.3 oz	July 15,22,29	0.00a	0.22a
Warrior II	1.92 fl oz	July 15,22,29	0.00a	0.00a
Sniper 2EC	4 fl oz	July 15,22,29	0.00a	0.00a
Exirel	16 oz	July 15,22,29	0.00a	0.17a
Coragen 1.67 SC	5 fl oz	July 15,22,29	0.00a	0.00a
Untreated	-----	----	0.00a	0.00a

¹Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Eggplant Two Spotted Spider Mite Management Trial, 2014: ‘Santana’ eggplant were transplanted on June 13 at the University of Delaware's Research and Education Center located near Georgetown, DE. One row plots were 15 ft long planted on 7 ft centers. Each treatment was replicated four times and arranged in a RCB design. Foliar treatments for two spotted spider mites were applied on July 17 with a CO₂ pressurized backpack sprayer with a single-row boom, equipped with 3 hollow cone nozzles per row (one over the top and one drop nozzle on each side) delivering 47 gpa at 40psi. Two-spotted spider mite populations were evaluated by counting the number of mites on 5 randomly selected leaves on each plant. Data were analyzed using Proc GLM and means were separated by Tukey's mean separation test (P=0.05).

Spider mite populations were low. No phytotoxicity was observed.

Treatment ¹	Rate/A	Average Number of mites per leaf ²			
		July 14 Pre-Trt	July 21 4 DAT	July 28 11 DAT	Aug 4 18 DAT
GWN 1708 1.6SC	16 fl oz	0.51a	0.85a	0.43a	0.08a
GWN 1708 1.6SC	24 fl oz	0.81a	0.79a	0.26a	0.02a
GWN 1708 1.6SC	32 fl oz	0.77a	0.56a	0.23a	0.08a
Oberon 2SC	8.5 fl oz/A	1.31a	1.15a	0.22a	0.07a
Untreated	--	2.16a	2.55a	0.76a	1.24a

¹ Belay 2.13SC was added to all treatments at a rate of 4 fl oz/A for Colorado potato beetle control. An NIS at 0.25% V/V was also added to all treatments.

² Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Management of Corn Earworm in Late Season Snap Beans with Foliar Insecticides, 2014- 'Slenderette' snap beans were planted on July 18 at the University of Delaware's Research and Education Center located near Georgetown, DE. Four row plots 25 ft long planted on 30 inch centers were arranged in a RCB design with four replications. Foliar treatments were applied on Aug 27 (pin stage) and Sep 3 (6 days from harvest) with a CO₂ pressurized backpack sprayer equipped with a six nozzle boom delivering 17 gpa @ 40 psi. Plots were harvested on Sep 9 from a 6 ft row section and all the beans were evaluated for corn borer and corn earworm injury. Data were analyzed using Proc GLM and means were separated by Tukey's means separation test (P=0.05).

Corn borer and corn earworm pressure was light. No phytotoxicity was observed.

Treatment	Rate/Acre	Percent CEW Damaged Beans Sept 9 ¹
Besiege SC	10 fl oz	0.16a
Belt SC	2 fl oz	1.26a
Belt SC	3 fl oz	0.26a
Acephate 97	1 lb	0.27a
Blackhawk 36WG	3.3 oz	1.39a
Warrior II	1.92 fl oz	0.85a
Sniper 2EC	4 fl oz	0.53a
Exirel	16 oz	0.63a
Coragen 1.67 SC	5 fl oz	0.88a
Untreated	---	0.53a

¹Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Soybean Spider Mite Management Trial, 2014 – Dyna-Gro ‘39RY43’ soybeans were planted on May 21 at the University of Delaware's Research and Education Center located near Georgetown, DE. Plots consisted of four 25 ft. long rows planted on 30 inch centers. Each treatment was replicated four times and arranged in a RCB design. Foliar treatments were applied on Jul 23 as a broadcast spray using a CO₂ pressurized back pack sprayer delivering 17 gpa @ 40 psi. Two-spotted spider mite populations were evaluated on a weekly basis from June 12 through July 28 by counting the number of mites per 20 leaflets per plot. Data were analyzed using Proc GLM and means were separated by Tukey's mean separation test (P=0.05).

Spider mite populations were low. No phytotoxicity was observed.

Treatment	Rate/Acre	Mean Number Mites per 20 leaflets ¹	
		July 21 Pre-Trt	July 28 5 DAT
Lorsban 4E	1 pt	5.50a	1.50a
Dimethoate 4E	1 pt	8.25a	3.00a
Hero EC	10.3 fl oz	13.50a	3.00a
Sniper 2 EC	6.4 fl oz	5.75a	1.75a
Agri-Mek 0.7 SC	2.5 fl oz + NIS 0.25%	17.50a	0.75a
Agri-Mek 0.7 SC	3.0 fl oz+ NIS 0.25%	8.25a	0.00a
Agri-Flex 1.55 SC	7.0 fl oz + NIS 0.25%	6.50a	0.25a
Agri-Flex 1.55SC	8.5 fl oz+ NIS 0.25%	5.75a	1.00a
Cobalt Advanced	20 fl oz/A	6.50a	0.75a
GWN 1708 1.6 SC	16 fl oz + NIS 0.25%	7.75a	0.00a
GWN 1708 1.6SC	20 fl oz + NIS 0.25%	18.75a	0.25a
GWN 1708 1.6SC	24 fl oz + NIS 0.25%	8.75a	0.00a
Zeal WSP	1 oz	8.00a	4.50a
Zeal WSP	2 oz	10.25a	0.75a
Untreated	--	4.25a	0.50a

¹ Means within a column followed by the same letter are not significantly different (Tukey's; P=0.05).

Management of Thrips in Early Season Snap Beans with Foliar Insecticides, 2014- 'Slenderette' snap beans were planted on June 13 at the University of Delaware's Research and Education Center located near Georgetown, DE. Four row plots, 25 ft long were planted on 30-inch centers and replicated four times in a RCB design. Foliar treatments were applied on July 3 with a CO₂ pressurized backpack boom sprayer delivering 17 gpa @ 40 psi. Twenty snap bean leaflets were collected per plot pre-treatment (June 27 and July 2) and post treatment (July 7 and 14) to evaluate the thrips population levels. The total number of thrips present on the leaflets were counted and recorded. Data were analyzed using Proc GLM and means were separated by Tukey's means separation test (P=0.05).

Thrips pressure was light. No phytotoxicity was observed. A mixture of soybean and onion thrips were present in the plots.

Treatment	Rate/Acre	Pre-Treatment Mean Number Thrips/ 20 leaflets		Post Treatment Mean Number Thrips/ 20 leaflets	
		June 27	July 2	July 7 4 DAT	July 14 11 DAT
Acephate 97	1 lb	20.00a	16.00a	0.25a	1.75a
Blackhawk 36 WG	3.3 oz	14.75a	13.50a	1.25a	9.75a
Warrior II	1.92 fl oz	13.25a	16.75a	1.75a	9.00a
Sniper 2 EC	4 fl oz	12.75a	15.75a	2.25a	11.50a
Radiant SC	8 fl oz	13.25a	17.25a	0.75a	8.50a
Requiem	32 fl oz	10.00a	21.25a	3.75a	7.00a
Requiem + NIS	32 fl oz+ 0.5% V/V	11.75a	17.00a	3.50a	10.00a
Requiem	96 fl oz	10.50a	21.75a	2.75a	9.25a
Requiem + NIS	96 fl oz+0.5 % V/V	10.75a	14.50a	0.75a	8.50a
Untreated	-----	10.75a	24.25a	7.50a	8.25a

¹Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Management of Thrips in Late Season Snap Beans with Foliar Insecticides, 2014- ‘Slenderette’ snap beans were planted on July 18 at the University of Delaware's Research and Education Center located near Georgetown, DE. Four row plots, 25 ft long were planted on 30-inch centers and replicated four times in a RCB design. Foliar treatments were applied on Aug 19 with a CO₂ pressurized backpack boom sprayer delivering 17 gpa @ 40 psi. Twenty snap bean leaflets were collected per plot pre-treatment (Aug 18) and 10 leaflets were collected post treatment (Aug 22) to evaluate thrips population levels. The total number of thrips present on the leaflets were counted and recorded. Data were analyzed using Proc GLM and means were separated by Tukey's means separation test (P=0.05).

Thrips pressure was light. No phytotoxicity was observed. The predominant species was soybean thrips.

Treatment	Rate/Acre	Pre-Treatment Aug 18 Mean Number Thrips per Leaflet	Post Treatment Aug 22 Mean Number Thrips per Leaflet
Acephate 97	1 lb	0.36a	0.15b
Blackhawk 36 WG	3.3 oz	0.40a	0.35ab
Warrior II	1.92 fl oz	0.38a	0.50ab
Sniper 2 EC	4 fl oz	0.19a	0.55ab
Radiant SC	8 fl oz	0.50a	0.18b
Requiem	32 fl oz	0.49a	0.43ab
Requiem + NIS	32 fl oz+ 0.5% V/V	0.31a	0.33ab
Requiem	96 fl oz	0.45a	0.25b
Requiem + NIS	96 fl oz+0.5 % V/V	0.53a	0.33ab
Untreated	-----	0.49a	1.20a

¹Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Watermelon Spider Mite Management Trial, 2014 – Two plantings of ‘Sugar Red’ seedless watermelons and the pollinizer variety ‘Accomplice’ were planted on May 20 and 23 at the University of Delaware's Research and Education Center located near Georgetown, DE. Plots consisted of two 20 ft. long rows on 7ft centers. Each treatment was replicated four times and arranged in a RCB design. (a) **First Planting – May 20:** Foliar miticides were applied on June 26 and July 10 using a CO₂ pressurized back pack sprayer delivering 24 gpa @ 40 psi on June 26 and 17 gpa @ 40 psi on July 10. Two-spotted spider mite populations were evaluated by counting the number of mites per 50 leaves and examining 10 plants to calculate the percent infested plants. (b) **Second Planting – May 23:** Foliar miticides were applied on July 10 using a CO₂ pressurized back pack sprayer delivering 17 gpa @ 40 psi. Two-spotted spider mite populations were evaluated by counting the number of mites per 20 leaves. Data were analyzed using Proc GLM and means were separated by Tukey's mean separation test (P=0.05).

Spider mite populations were moderate. No phytotoxicity was observed.

Table 1. First Planting May 20 : Pre and Post Treatment Evaluations – first treatment date (June 26)

Treatment ¹	Rate/Acre	Mean Number Mites per 50 Leaves ²			Mean Percent Infested Plants ²		
		June 23 Pre-trt	July 30 4 DAT	July 7 11 DAT	June 23 Pre-trt	July 30 4 DAT	July 7 11 DAT
Oberon 2SC	8.5 fl oz	44.25a	25.75a	26.50a	35.00a	32.50a	22.50a
Zeal WSP	3 oz	102.75a	10.25a	56.25a	20.00a	15.00a	37.50a
Agri-Mek 0.7 SC	16 fl oz	14.50a	3.75a	17.50a	12.50a	5.00a	17.50a
Portal	32 fl oz	89.25a	25.75a	73.50a	27.50a	12.50a	30.00a
GWN 1708 1.6 SC	16 fl oz	6.00a	19.00a	98.50a	7.50a	15.00a	27.50a
GWN 1708 1.6 SC	24 fl oz	22.75a	11.00a	144.25a	22.50a	25.00a	37.50a
GWN 1708 1.6 SC	32 fl oz	14.75a	26.75a	146.25a	12.50a	15.00a	45.00a
Movento SC	4 fl oz	8.00a	53.00a	116.25a	7.50a	32.50a	47.50a
Movento SC	5 fl oz	35.25a	16.25a	98.25a	30.00a	22.50a	35.00a
Untreated	-----	3.00a	28.50a	250.75a	10.00	27.50a	60.00a

¹ All treatments except Portal were combined with a NIS at 0.25 % V/V

² Means within a column followed by the same letter are not significantly different (Tukey's; P=0.05).

Table 2. First Planting May 20 : Pre and Post Treatment Evaluations – second treatment date (July 10)

Treatment ¹	Rate/Acre	Mean Number Mites per 50 Leaves ²		
		July 14 4 DAT	July 21 11 DAT	July 28 18 DAT
Oberon 2SC	8.5 fl oz	50.75ab	8.75a	10.25a
Zeal WSP	3 oz	2.50b	1.25a	0.50a
Agri-Mek 0.7 SC	16 fl oz	4.25b	3.00a	5.25a
Portal	32 fl oz	3.50b	0.50a	15.25a
GWN 1708 1.6 SC	16 fl oz	88.75ab	14.25a	11.75a
GWN 1708 1.6 SC	24 fl oz	56.75ab	36.75a	12.75a
GWN 1708 1.6 SC	32 fl oz	69.25ab	35.75a	2.25a
Movento SC	4 fl oz	90.25ab	176.25a	75.75a
Movento SC	5 fl oz	158.00ab	63.00a	98.25a
Untreated	-----	172.75a	152.75a	79.75a

¹ All treatments except the Portal were combined with a NIS at 0.25% V/V.

² Means within a column followed by the same letter are not significantly different (Tukey's; P=0.05).

Table 3. Second Planting May 23 : Pre and Post Treatment Evaluations

Treatment ¹	Rate/Acre	Mean Number Mites per 20 Leaves ²		
		Jul 7 Pre-Trt	July 14 4 DAT	July 22 12 DAT
Oberon 2SC	8.5 fl oz	37.25a	12.25a	0.00b
Zeal WSP	3 oz	11.25a	2.00a	1.50b
Agri-Mek 0.7 SC	16 fl oz	36.00a	24.25a	0.00b
Portal	32 fl oz	70.50a	35.75a	5.25b
GWN 1708 1.6SC	16 fl oz	60.25a	13.25a	22.00ab
GWN 1708 1.6SC	24 fl oz	36.75a	13.00a	11.00ab
GWN 1708 1.6SC	32 fl oz	39.75a	28.25a	10.00ab
Movento SC	4 fl oz	31.75a	23.25a	22.50ab
Movento SC	5 fl oz	19.75a	24.50a	27.75ab
Untreated	-----	41.25a	22.50a	70.00a

¹ All treatments except the Portal were combined with a NIS at 0.25% V/V.

² Means within a column followed by the same letter are not significantly different (Tukey's; P=0.05).

2014 Delaware Soybean Board Report

Title: Management of Two-Spotted Spider Mite in Delaware Soybean Fields

Personnel: Bill Cissel, Extension IPM Agent
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Objectives:

1. Document the economic loss caused by two-spotted spider mites in Delaware soybean fields.
2. Evaluate the effectiveness of labeled and non-labeled insecticides and miticides for two-spotted spider mite management in soybeans.

Economic Losses Caused by Two-Spotted Spider Mites in Soybeans

A state-wide survey was conducted in 58 soybean fields in 2013 and in 88 soybean field in 2014 to monitor two-spotted spider mite (TSM) populations throughout the state and to identify fields with potential TSM problems. Both full season and double crop soybean fields were sampled on a weekly basis from June to mid-August. Fields were sampled by examining five leaflets in ten randomly selected locations per field.

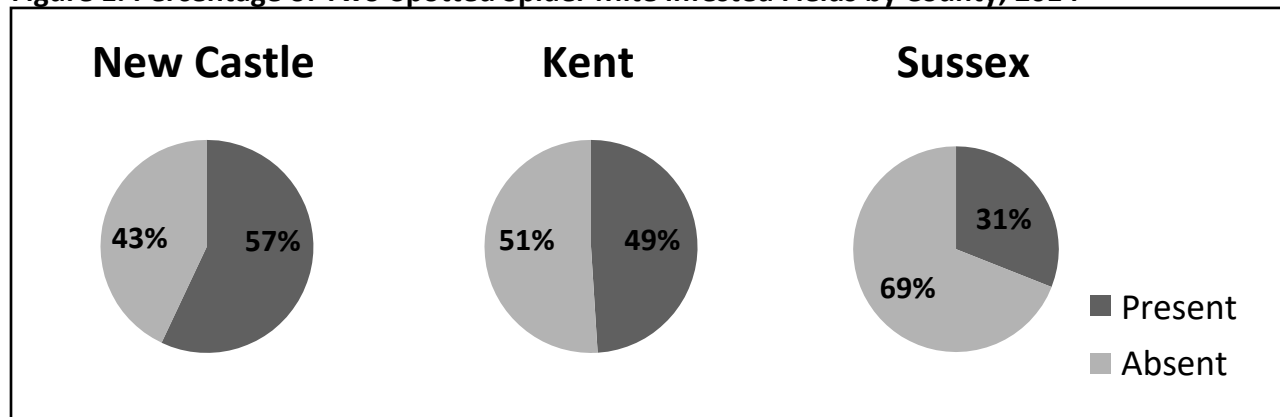
In 2013, two-spotted spider mite populations remained low across the state because of the unusually cool and wet weather conditions experienced during the growing season. In 38% of the fields sampled, no TSM were detected. When mites were present in fields, the density ranged from 1 to 144 mites per 50 leaflets. The highest level was encountered in one field in New Castle County and populations crashed to 36 per 50 leaflets within one week. TSM populations never reached the action threshold of 20-30 TSM per leaflet in any of the fields surveyed and none of the growers participating in the survey experienced yield losses. Therefore, we were unable to document losses from TSM in soybeans in 2013.

In 2014, two-spotted spider mite populations were detected in 44% of the fields surveyed with the greatest percentage of infested fields occurring in New Castle County followed by Kent and Sussex County (Figure 1). Two-spotted spider mite populations were low throughout the state ranging from 0 to 124 TSM per 50 leaflets. In late June and early July, two grower fields were treated for TSM, however, mite populations decreased across the state shortly after due to the weather conditions. Therefore, no economic yield losses were documented and none of the growers participating in the survey experienced economic losses due to TSM.

Weather data was obtained from Sky Bit for ten fields distributed throughout the state to determine if a correlation could be made between TSM population densities and site-specific

weather conditions. Unfortunately, TSM populations were so low that making any conclusions about the influence of weather on TSM could not be made aside from the fact that the cooler summer temperatures along with the high relative humidity and periodic rainfall is not conducive for TSM (Appendix A).

Figure 1. Percentage of Two-Spotted Spider Mite Infested Fields by County, 2014



Evaluation of Labeled and Non-labeled Insecticides and Miticides to Manage Two-Spotted Spider Mites in Soybeans

Soybean Spider Mite Management Trial, 2013

A replicated research plot was established at the University of Delaware's Research and Education Center on June 5 located near Georgetown, DE to evaluate labeled and non-labeled insecticides and miticides to manage TSM on soybeans. Plots were 10 ft wide x 20 ft long, arranged in a randomized complete block design with four replications. Plots were sampled on a weekly basis by examining 20 leaflets per plot for TSM from July 8 through Aug 5. No TSM were encountered in the plots during the entire sampling period as a result of the cool, wet growing season. Therefore, no treatments were applied to the plot in 2013.

Soybean Spider Mite Management Trial, 2014

Dyna-Gro '39RY43' soybeans were planted on May 21 at the University of Delaware's Research and Education Center located near Georgetown, DE to evaluate labeled and non-labeled insecticides and miticides to manage TSM on soybeans. Plots consisted of four 25 ft long rows planted on 30 inch centers. Each treatment was replicated four times and arranged in a RCB design. Foliar treatments were applied on Jul 23 using a CO₂ pressurized back pack sprayer equipped with a 6 nozzle broadcast boom delivering 17 gpa @ 40 psi. Two-spotted spider mite populations were evaluated on a weekly basis from June 12 through July 28 by counting the number of mites per 20 leaflets per plot. Data were analyzed using Proc GLM and means were separated by Tukey's mean separation test (P=0.05). Spider mite populations were low. No phytotoxicity was observed.

Table 1. Mean Number of Two-Spotted Spider Mites per 20 Leaflets Pre and Post Treatment

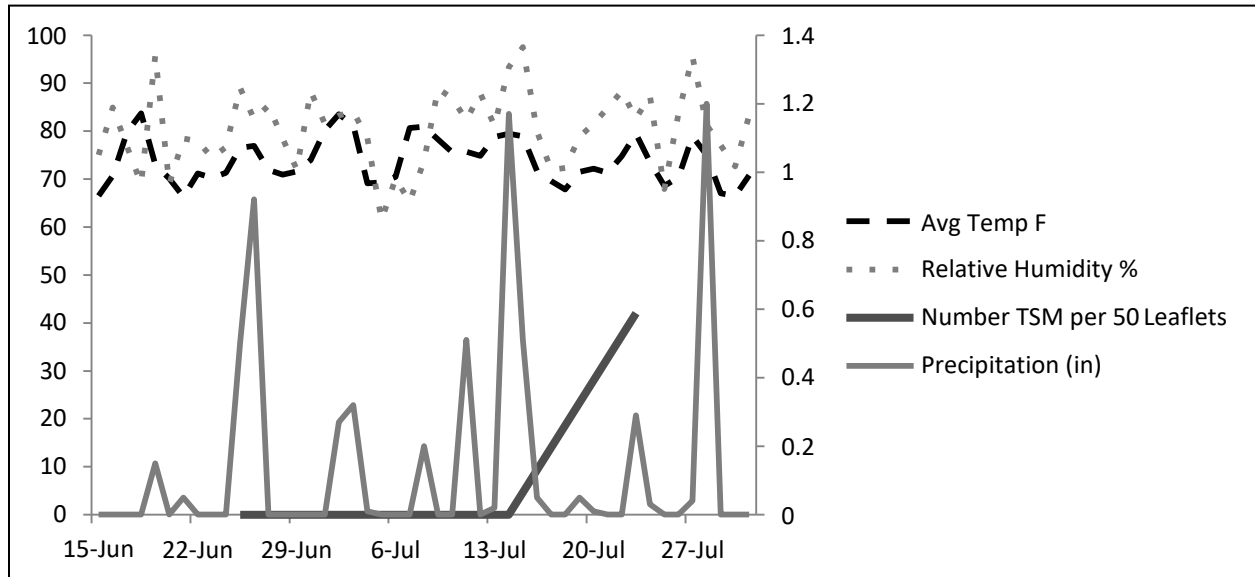
		Mean Number Mites per 20 leaflets ¹	
		July 21	July 28
Treatment	Rate/Acre	Pre-Trt	5 DAT
Lorsban 4E	1 pt	5.50a	1.50a
Dimethoate 4E	1 pt	8.25a	3.00a
Hero EC	10.3 fl oz	13.50a	3.00a
Sniper 2 EC	6.4 fl oz	5.75a	1.75a
Agri-Mek 0.7 SC	2.5 fl oz + NIS 0.25%	17.50a	0.75a
Agri-Mek 0.7 SC	3.0 fl oz+ NIS 0.25%	8.25a	0.00a
Agri-Flex 1.55 SC	7.0 fl oz + NIS 0.25%	6.50a	0.25a
Agri-Flex 1.55SC	8.5 fl oz+ NIS 0.25%	5.75a	1.00a
Cobalt Advanced	20 fl oz/A	6.50a	0.75a
GWN 1708 1.6 SC	16 fl oz + NIS 0.25%	7.75a	0.00a
GWN 1708 1.6SC	20 fl oz + NIS 0.25%	18.75a	0.25a
GWN 1708 1.6SC	24 fl oz + NIS 0.25%	8.75a	0.00a
Zeal WSP	1 oz	8.00a	4.50a
Zeal WSP	2 oz	10.25a	0.75a
Untreated	--	4.25a	0.50a

¹ Means within a column followed by the same letter are not significantly different (Tukey's; P=0.05).

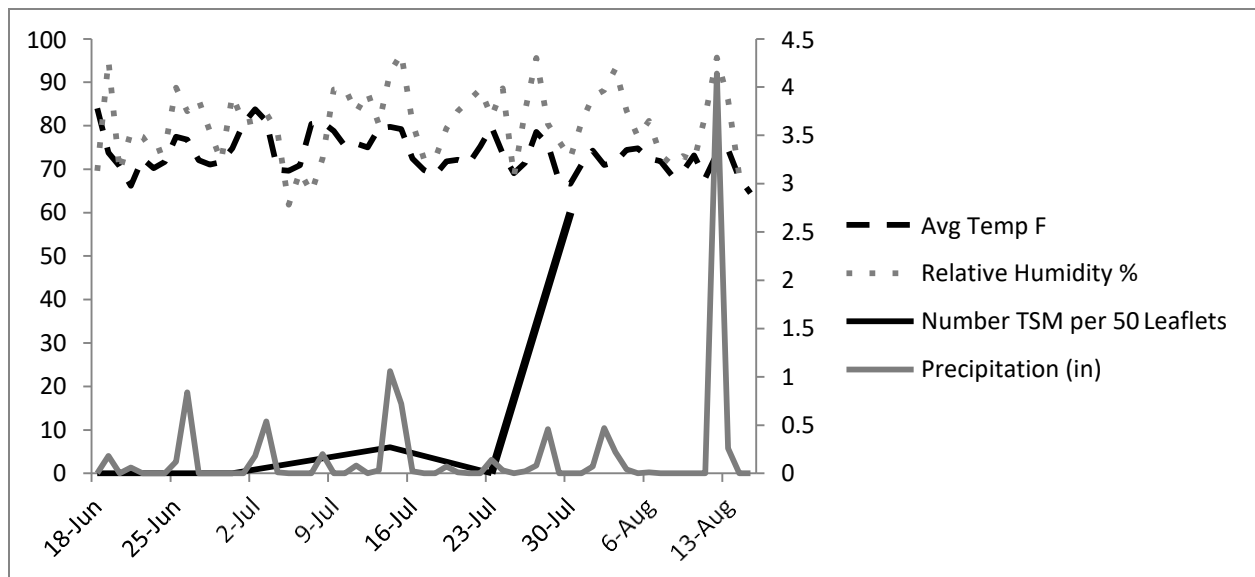
Appendix A. Influence of Weather on Two-Spotted Spider Mite Populations

New Castle County

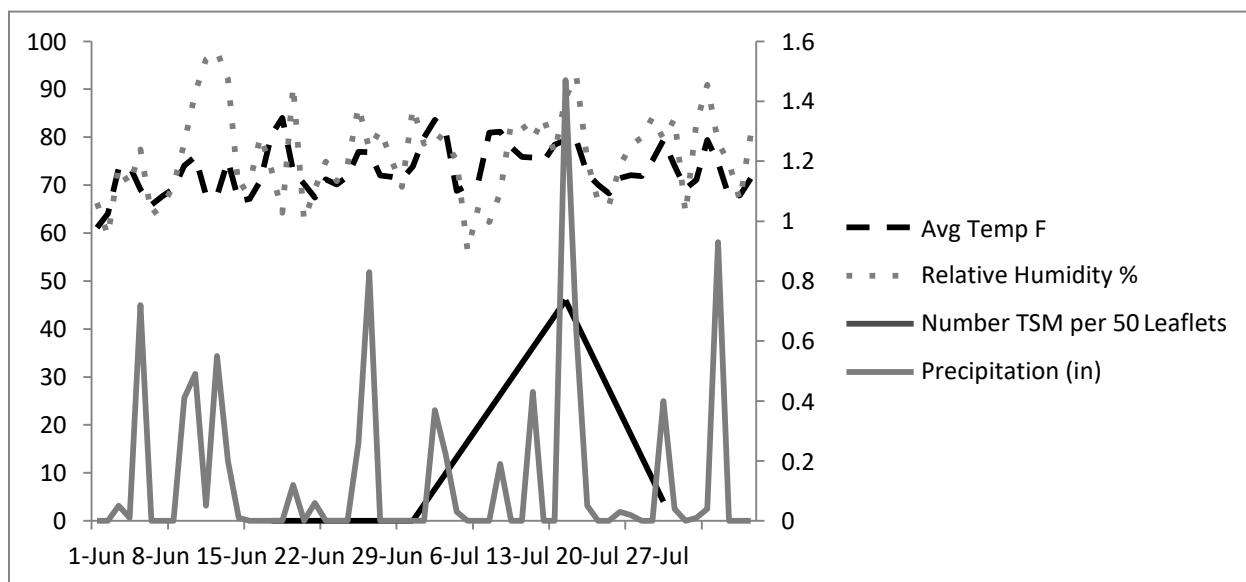
Middletown



Townsend

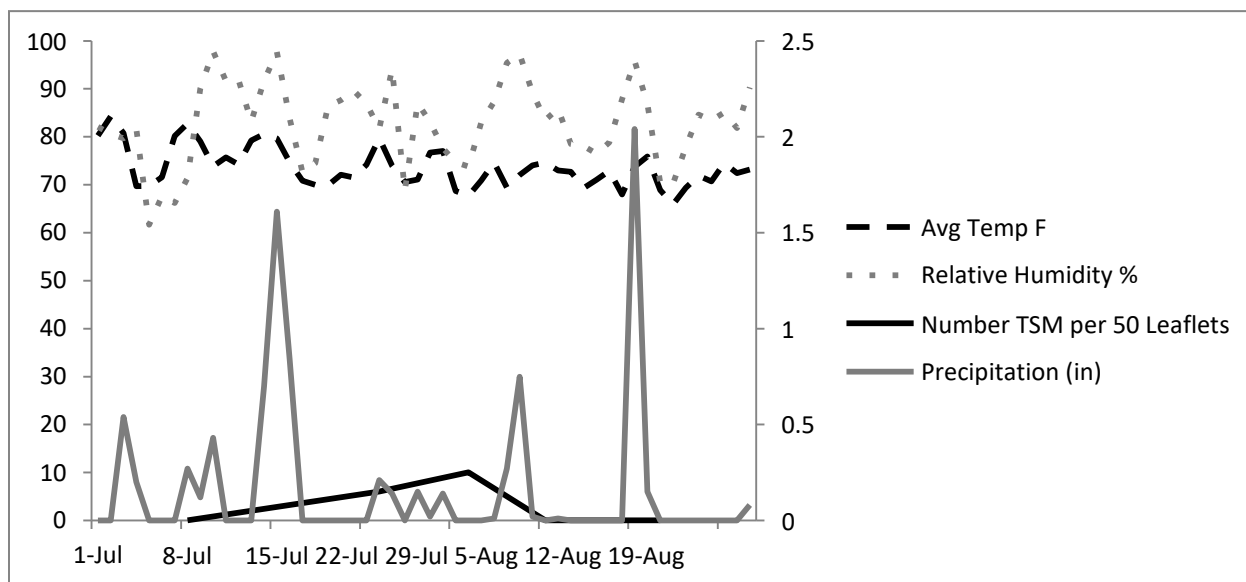


Port Penn

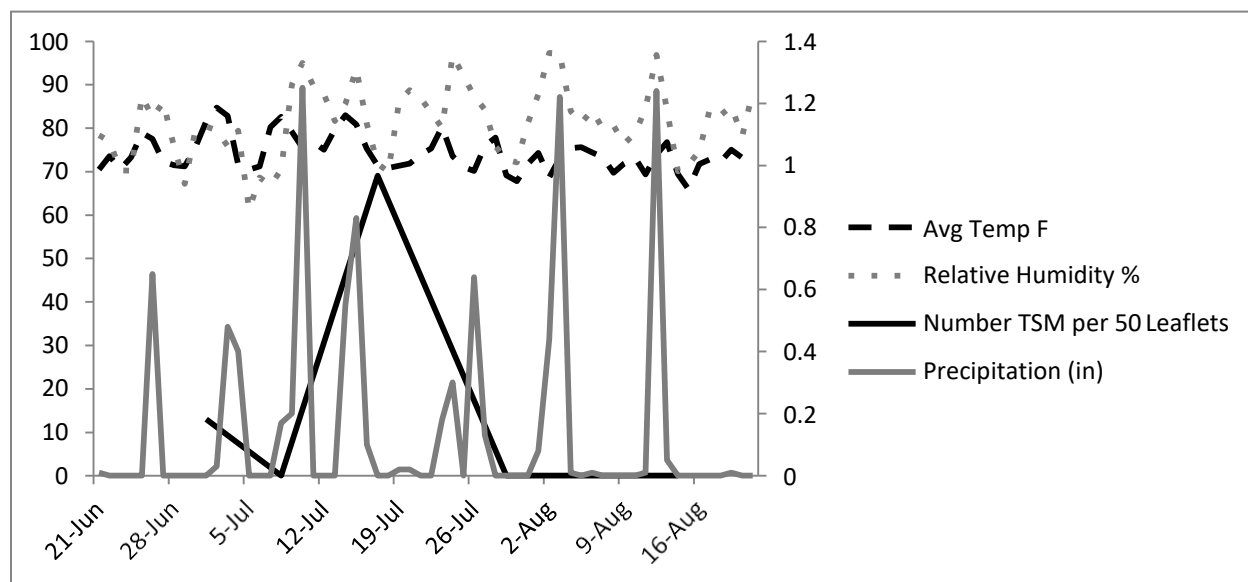


Kent County

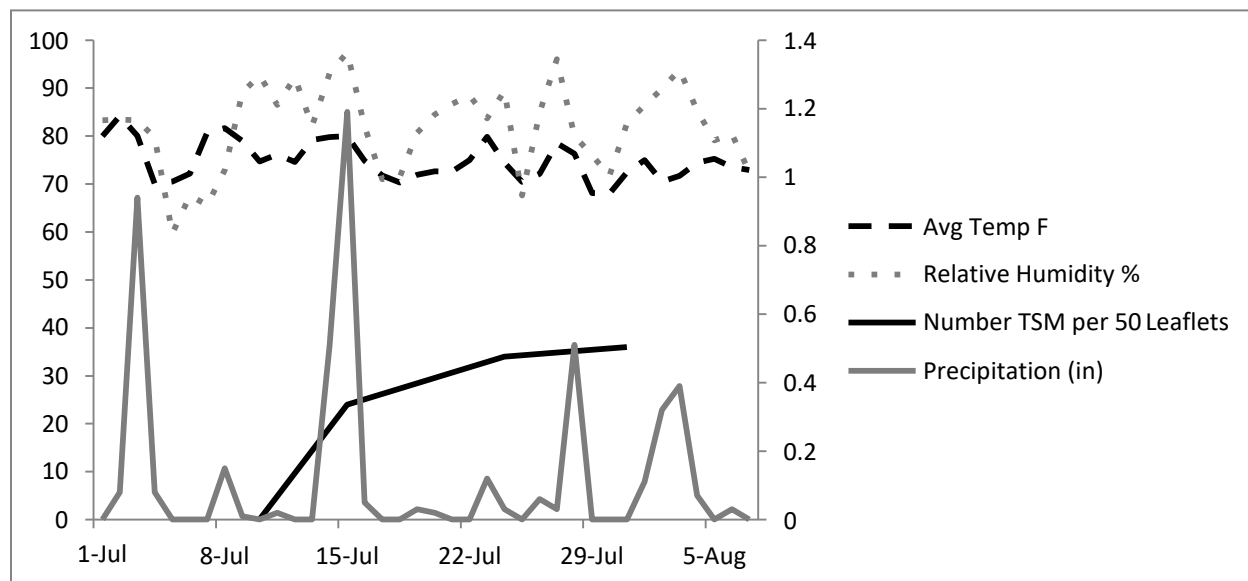
Magnolia



Greenwood

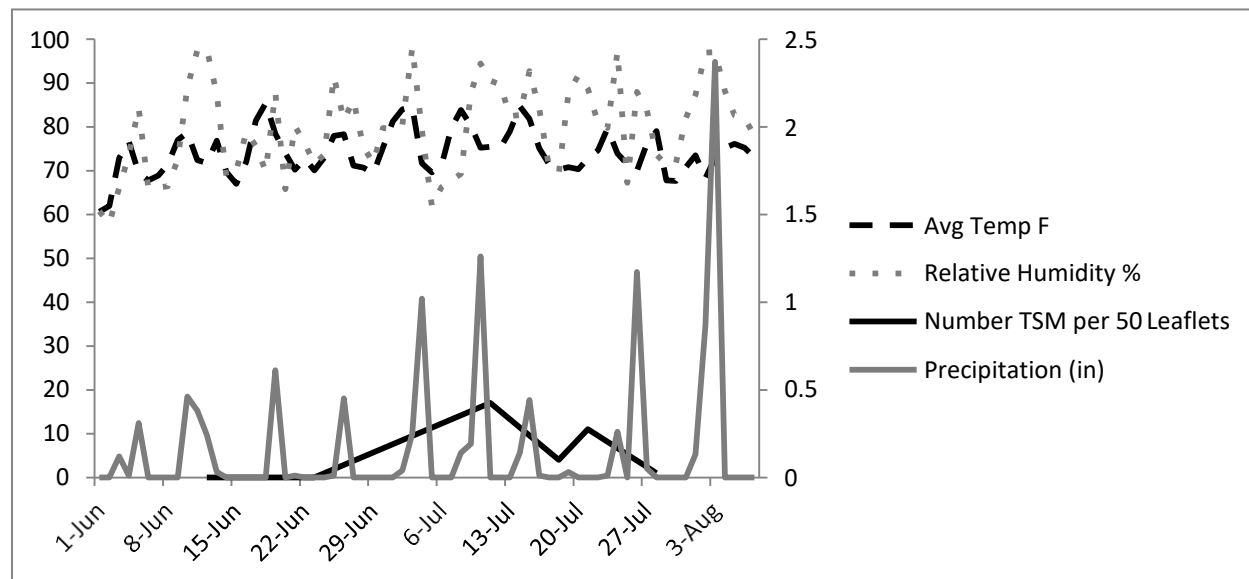


Smyrna

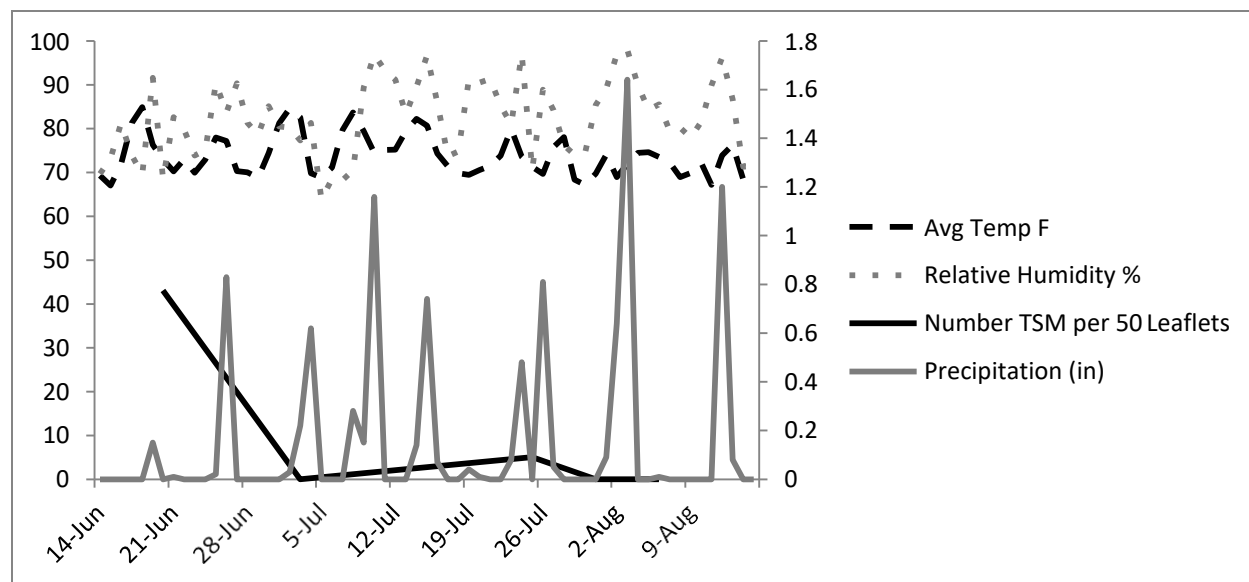


Sussex County

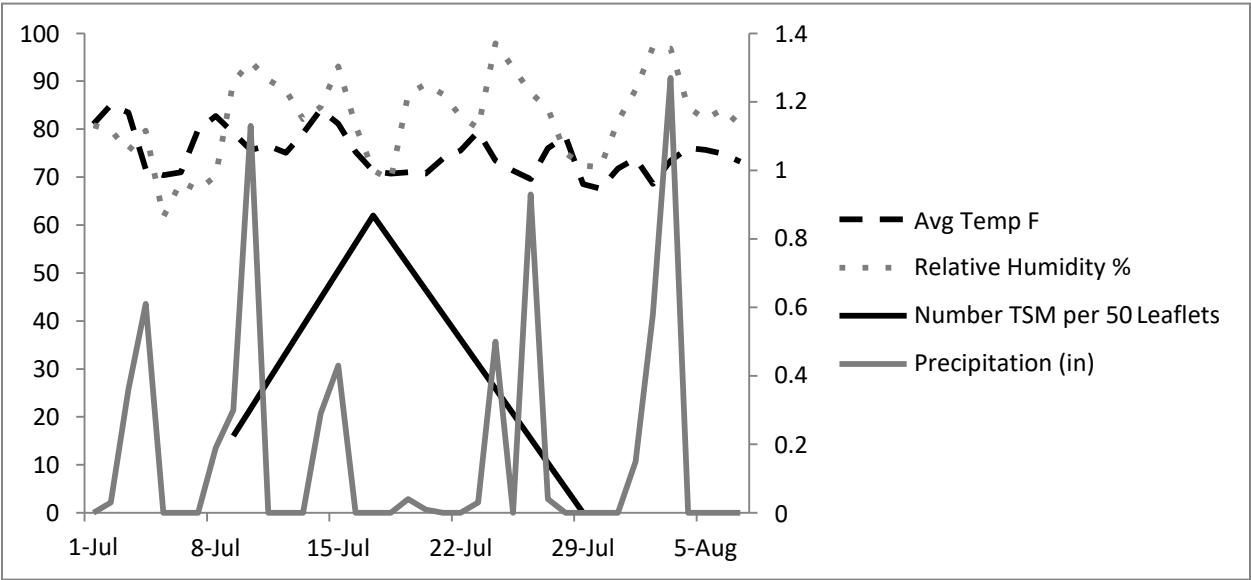
Georgetown



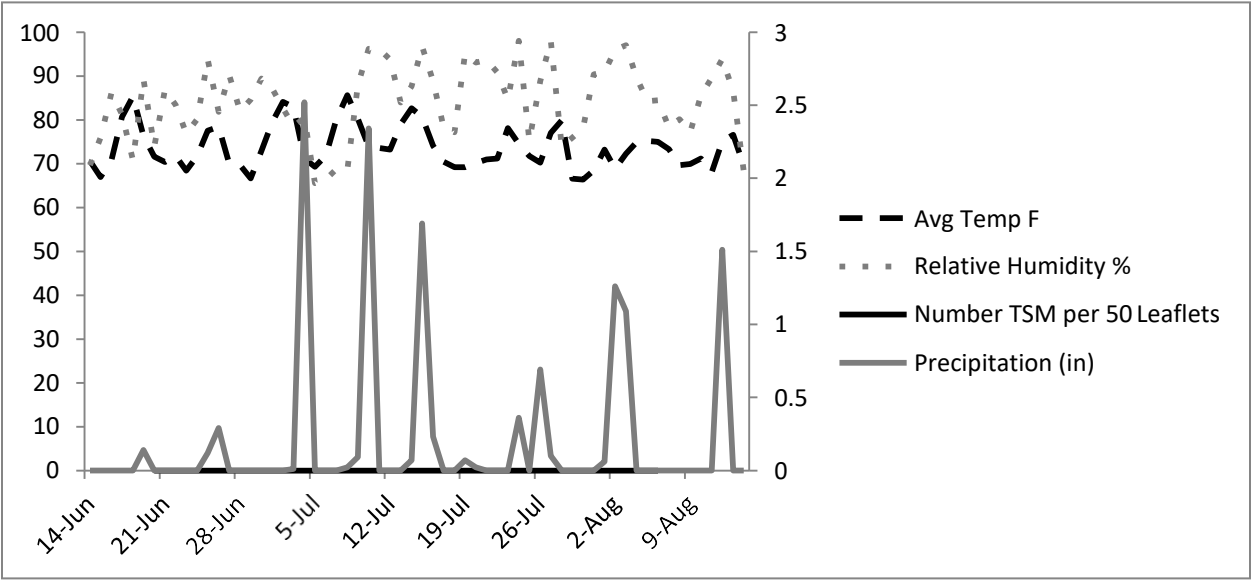
Lincoln



Cannon



Angola



Field Corn Seed Treatment Trial 2014

Location: Selbyville, DE

Planting Date: May 9 (50% emerged May 16)

Harvest Date: October 1

Plot size: 4 row wide x 25 ft long ; 30 inch row spacing; 4 reps in a RCB design

Vigor Rating at 7, 14, 21 and 28 days after emergence (DAE) for all treatments - 5

Treatment	Rate/Unit	Stand Count per 2 rows (50 ft of row) ¹				
		May 19 3 DAE	May 23 7 DAE	May 30 14 DAE	June 6 21 DAE	June 13 28 DAE
DPX E2Y45	250/UAT	65.75a	66.75a	65.00a	65.00a	61.75a
DPX E2Y45	500/UAT	64.50a	66.50a	65.50a	64.75a	63.00a
DPX E2Y45	750/UAT	65.00a	65.25a	64.25a	64.50a	61.75a
DPX E2Y45 + Cruiser	250/UAT+ 250/UAT	64.25a	64.00a	63.50a	63.75a	61.75a
DPX E2Y45 + Cruiser	500 UAT + Cruiser	65.00a	65.75a	65.25a	64.25a	62.50a
Poncho Votivo	1250/UAT	66.50a	66.00a	66.75a	65.75a	64.75a
Poncho	500/UAT	63.50a	63.75a	63.50a	63.25a	61.50a
Cruiser	250/UAT	65.25a	65.75a	65.25a	62.50a	60.25a
Untreated	-----	66.00a	67.50a	65.00a	65.50a	63.00a

¹ Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Treatment	Rate/Unit	Yield Oct 1 BU/A	Percent Wireworm Damaged Plants ¹			
			May 23 7 DAE	May 30 14 DAE	June 6 21 DAE	June 13 28 DAE
DPX E2Y45	250/UAT	246.16a	0.75a	3.86a	8.10a	2.43a
DPX E2Y45	500/UAT	296.80a	2.26a	1.92a	3.53ab	2.00a
DPX E2Y45	750/UAT	269.24a	0.39a	1.57a	3.11ab	1.98a
DPX E2Y45 + Cruiser	250/UAT+ 250/UAT	279.38a	0.00a	1.19a	4.70ab	4.75a
DPX E2Y45 + Cruiser	500 UAT + 250/UAT	285.18a	0.39a	0.39a	4.00ab	3.52a
Poncho Votivo	1250/UAT	299.49a	0.00a	0.00a	0.81ab	0.36a
Poncho	500/UAT	276.41a	0.00a	1.16a	0.39b	0.81a
Cruiser	250/UAT	274.79a	0.00a	0.00a	7.19ab	7.12a
Untreated	-----	252.20a	0.00a	0.79a	3.79ab	2.62a

¹ Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Treatment	Rate/Unit	Number Wireworm Larvae per 10 Plants		
		May 30 14 DAE	June 6 21 DAE	June 13 28 DAE
DPX E2Y45	250/UAT	1.50a	3.00a	0.50a
DPX E2Y45	500/UAT	1.00a	3.50a	1.00a
DPX E2Y45	750/UAT	1.00a	1.25a	0.75a
DPX E2Y45 + Cruiser	250/UAT+ 250/UAT	0.25a	3.50a	0.50a
DPX E2Y45 + Cruiser	500 UAT + 250/UAT	1.75a	2.75a	0.25a
Poncho Votivo	1250/UAT	0.00a	0.25a	0.00a
Poncho	500/UAT	0.25a	0.25a	0.00a
Cruiser	250/UAT	0.50a	1.50a	0.00a
Untreated	-----	1.50a	1.75a	0.25a

¹ Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).

Mid- Season Evaluation of Foliar Insecticides for Control of Insects on Sweet Corn, 2014: 'Xtra Tender 3473' sweet corn was planted on May 29 at the University of Delaware Research and Education Center located near Georgetown, Delaware. Plots were 25 ft long and two rows wide, planted on 5 ft centers. Each treatment was replicated 4 times and arranged in a RCB design. Silk sprays began at ear shank emergence. All applications were made using a CO₂ pressurized back pack sprayer delivering 38 gpa @ 40 psi. At harvest (Aug 1), all the ears from each plot were husked and evaluated for damage as percent clean ears (fresh market) and percent clean plus tip damaged ears (less than 1.0 inches from the tip- processing ears). Sap beetle damage was also evaluated on all husked ears. The total number of live larvae of each species were identified and counted. Data were analyzed using Proc GLM and means were separated by Tukey's mean separation test (P=0.05).

Trt #	Treatment	Application Date	Rate/A
1	A,C,E – Besiege	A – Jul 11, C – Jul 18, E – Jul 25	9 fl. oz
	B,D,F - Lannate LV + Warrior II	B- Jul 15, D – Jul 22, F – Jul 29	24 fl. oz + 1.92 fl. oz.
2	A,B,C – Besiege	A – Jul 11, B – Jul 15, C – Jul 18	9 fl. oz.
	D, E, F – Lannate LV + Warrior II	D – Jul 22, E – Jul 25, F – Jul 29	24 fl.oz. + 1.92 fl.oz.
3	A – F - Lannate LV + Warrior II	A- Jul 11, B- Jul 15, C- Jul 18 D – Jul 22, E – Jul 25, F – Jul 29	24 fl. oz + 1.92 fl. oz.
4	A – F – Warrior II	A- Jul 11, B- Jul 15, C- Jul 18 22, E – Jul 25, F – Jul 29	1.92 fl. oz.
5	A, B,C – Hero EC	A- Jul 11, B- Jul 15, C- Jul 18	9 fl. oz.
	D,E,F –Lannate LV + Warrior II	D - Jul 22, E – Jul 25, F – Jul 29	24 fl. oz + 1.92 fl. oz
6	A- F – Hero EC	A- Jul 11, B- Jul 15, C- Jul 18 D – Jul 22, E – Jul 25, F – Jul 29	4.5 fl. oz.
7	A,B,C – Sniper 2 EC	A- Jul 11, B- Jul 15, C- Jul 18	4 fl. oz.
	D,E,F – Lannate LV + Warrior II	D - Jul 22, E – Jul 25, F – Jul 29	24 fl. oz + 1.92 fl. oz.
8	A,C,E – Blackhawk 36 WG	A – Jul 11, C – Jul 18, E – Jul 25	3.3 oz
	B,D,F – Warrior II	B- Jul 15, D – Jul 22, F – Jul 29	1.92 fl. oz.
9	A,C,E – Exirel	A – Jul 11, C – Jul 18, E – Jul 25	16 oz
	B,D,F – Hero EC	B- Jul 15, D – Jul 22, F – Jul 29	7 fl. oz.
10	Untreated	----	----

Trt #	% Clean Ears (Fresh Market) ¹	% Clean + Tip Damaged Ears (Processing) ¹	Percent Damaged Ears ¹	
			CEW	Sap Beetles
1	99.38a	100.00a	0.63b	0.00a
2	100.00a	100.00a	0.00b	0.00a
3	98.13a	100.00a	1.88b	0.00a
4	98.13a	99.38a	1.25b	0.63a
5	98.75a	100.00a	1.25b	0.00a
6	98.13a	100.00a	1.88b	0.00a
7	98.13a	98.75a	0.63b	1.25a
8	96.88a	98.75a	1.25b	1.88a
9	99.38a	99.38a	0.00b	0.63a
10	77.50b	85.00a	18.13a	3.13a

¹Means in the same columns followed by the same letter are not significantly different (Tukey's; P=0.05).