

2014 Delaware Soybean Board Report

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

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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.

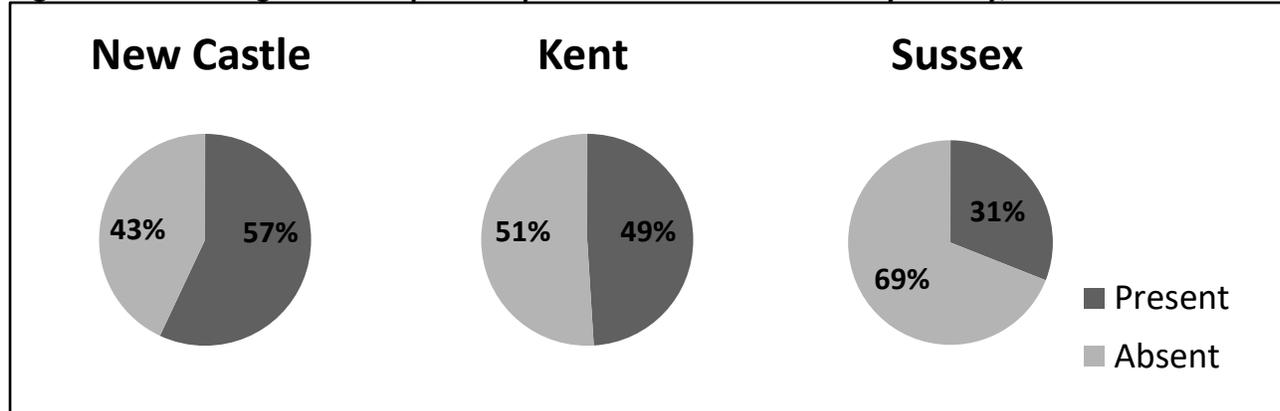
In 2014, two-spotted spider mite populations were detected in 44% of the fields surveyed with the greatest percentage of infested fields occurring in New Castle County followed by Kent and Sussex County (Figure 1). Two-spotted spider mite populations were low throughout the state ranging from 0 to 124 TSM per 50 leaflets. In late June and earl 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

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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

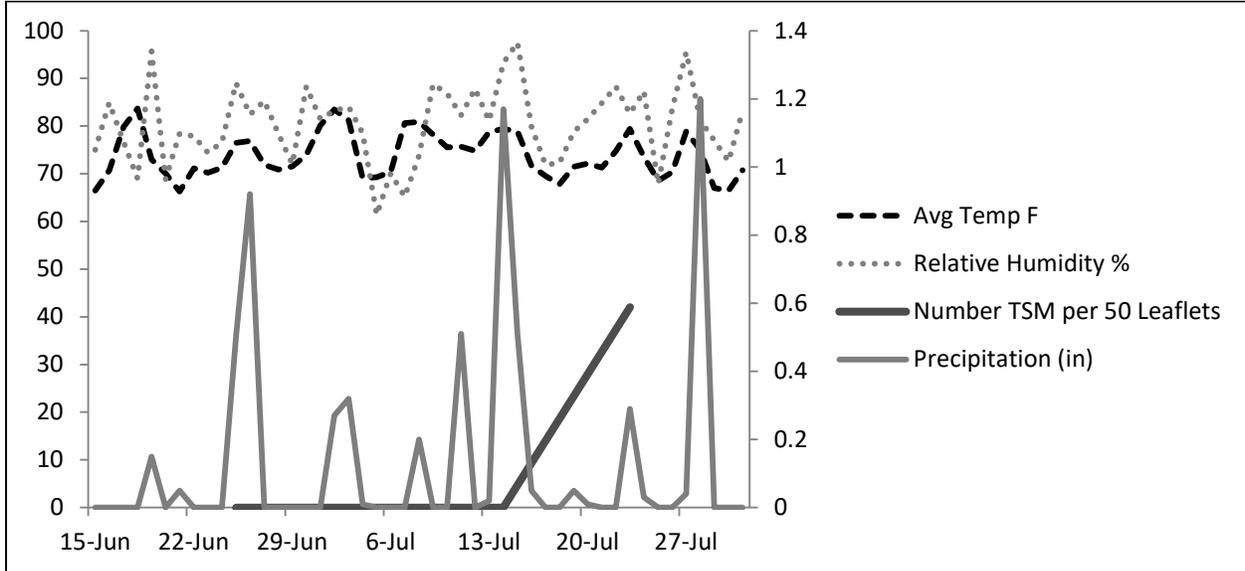
Treatment	Rate/Acre	Mean Number Mites per 20 leaflets ¹	
		July 21	July 28
Lorsban 4E	1 pt	5.50a	1.50a
Dimethoate 4E	1 pt	8.25a	3.00a
Hero EC	10.3 fl oz	13.50a	3.00a
Sniper 2 EC	6.4 fl oz	5.75a	1.75a
Agri-Mek 0.7 SC	2.5 fl oz + NIS 0.25%	17.50a	0.75a
Agri-Mek 0.7 SC	3.0 fl oz+ NIS 0.25%	8.25a	0.00a
Agri-Flex 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 $P=0.05$).

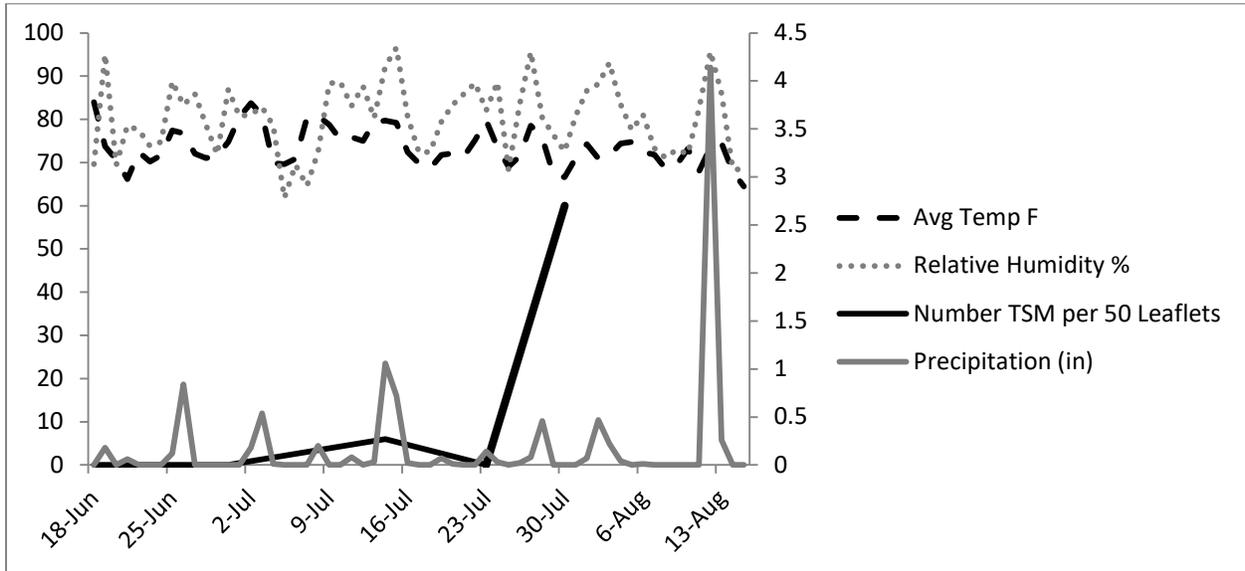
Appendix A. Influence of Weather on Two-Spotted Spider Mite Populations

New Castle County

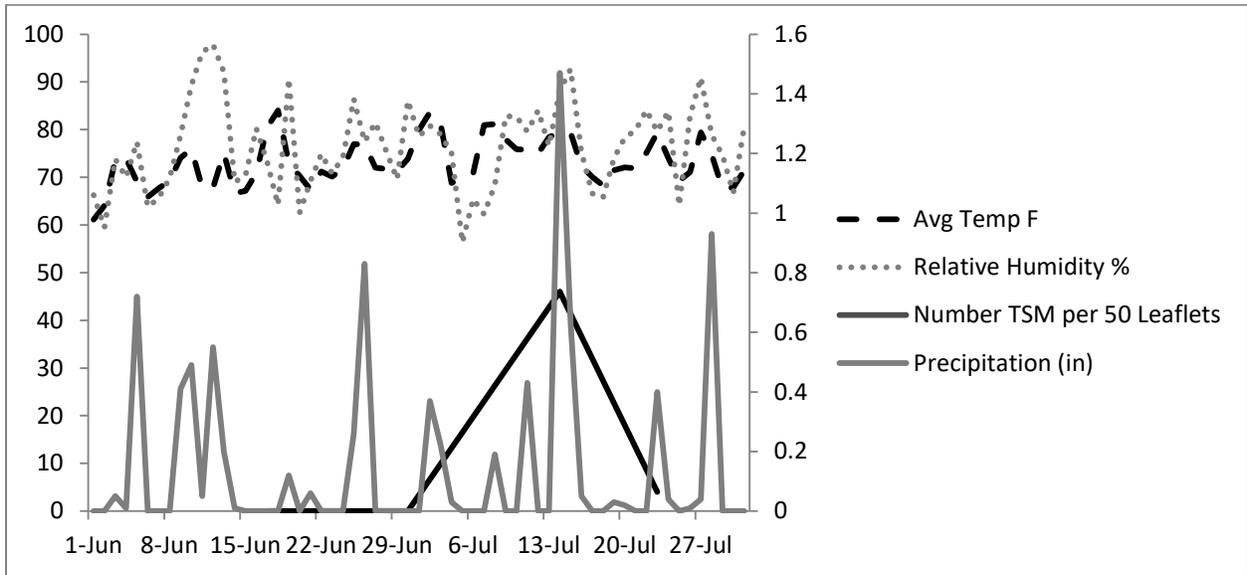
Middletown



Townsend

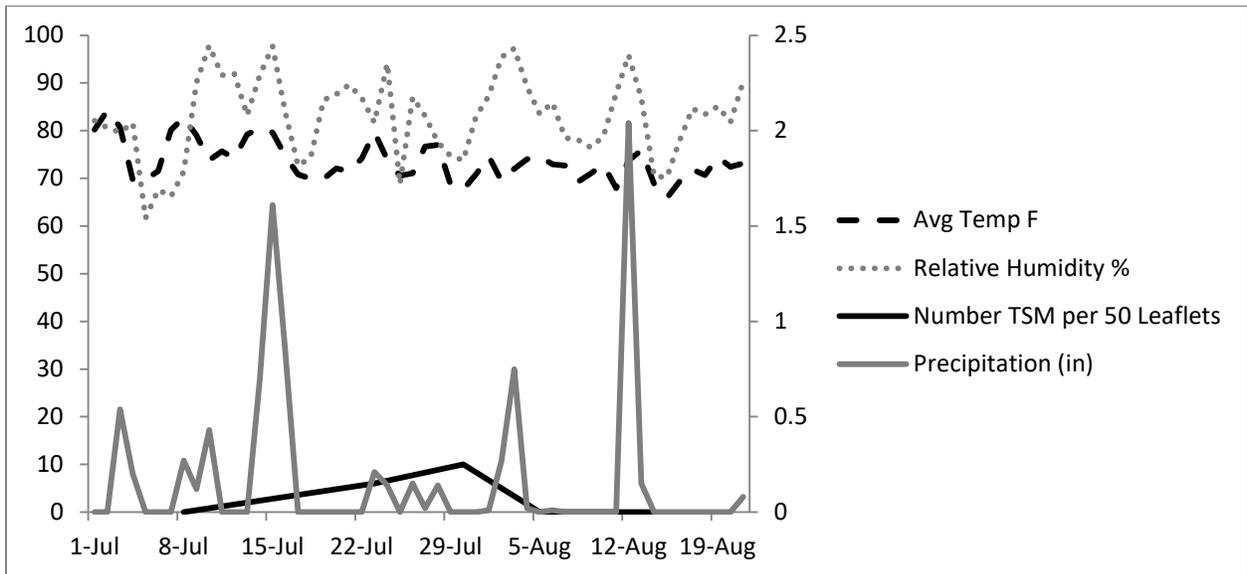


Port Penn

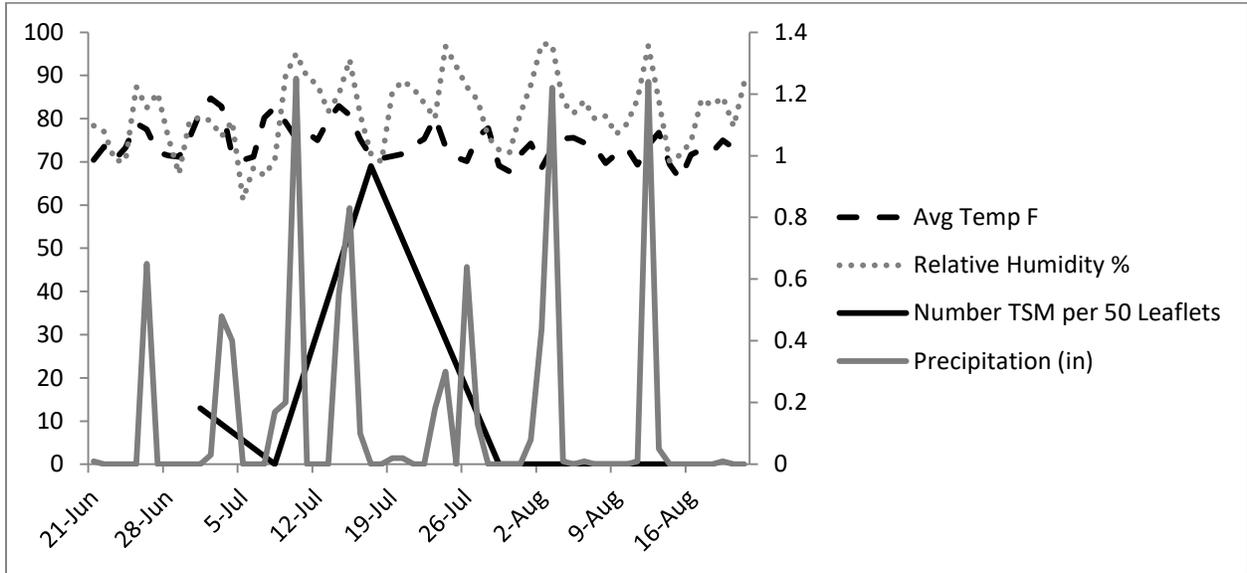


Kent County

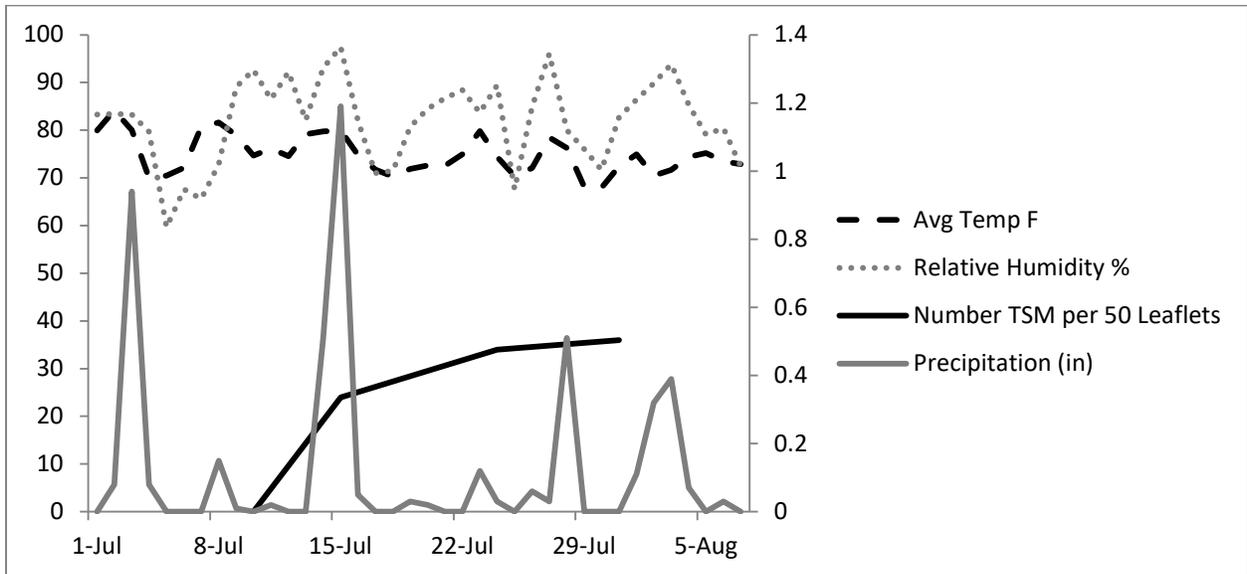
Magnolia



Greenwood

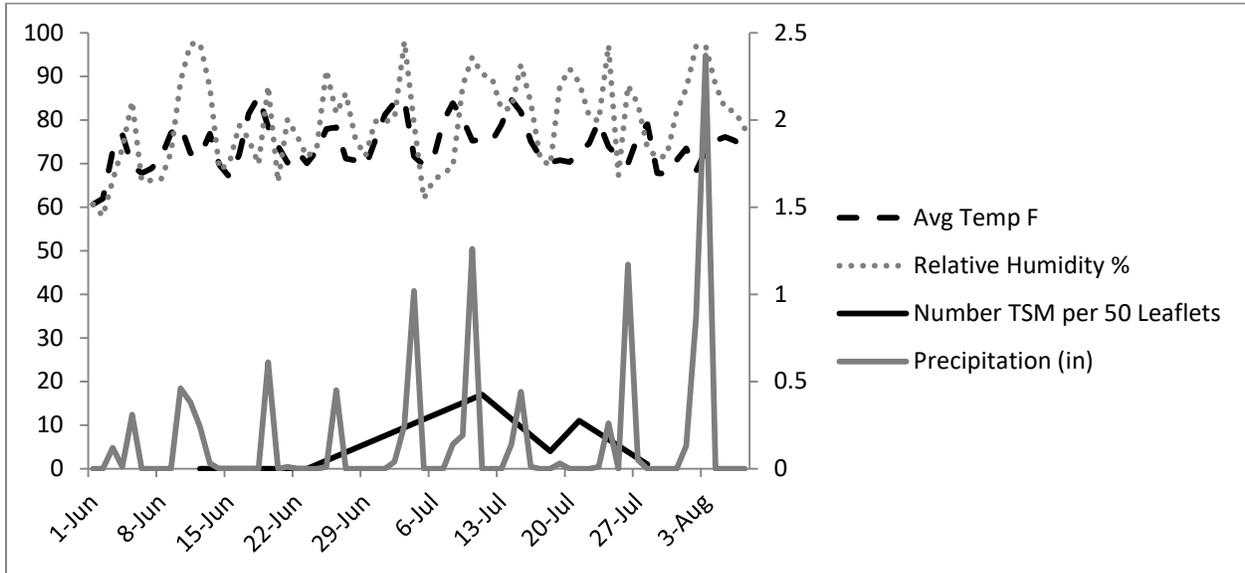


Smyrna

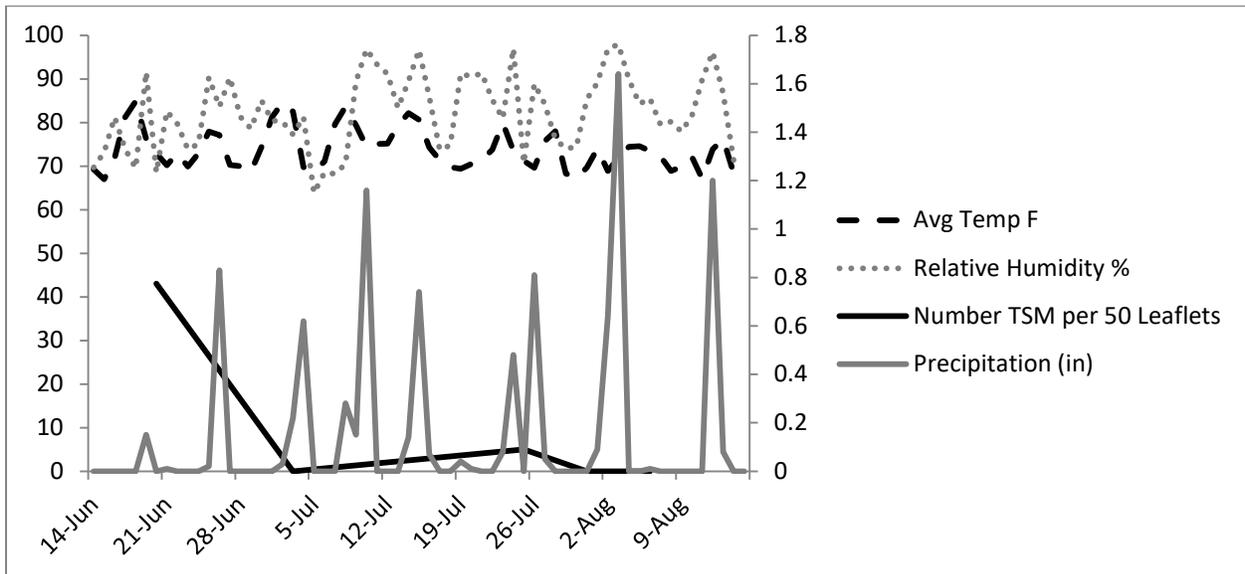


Sussex County

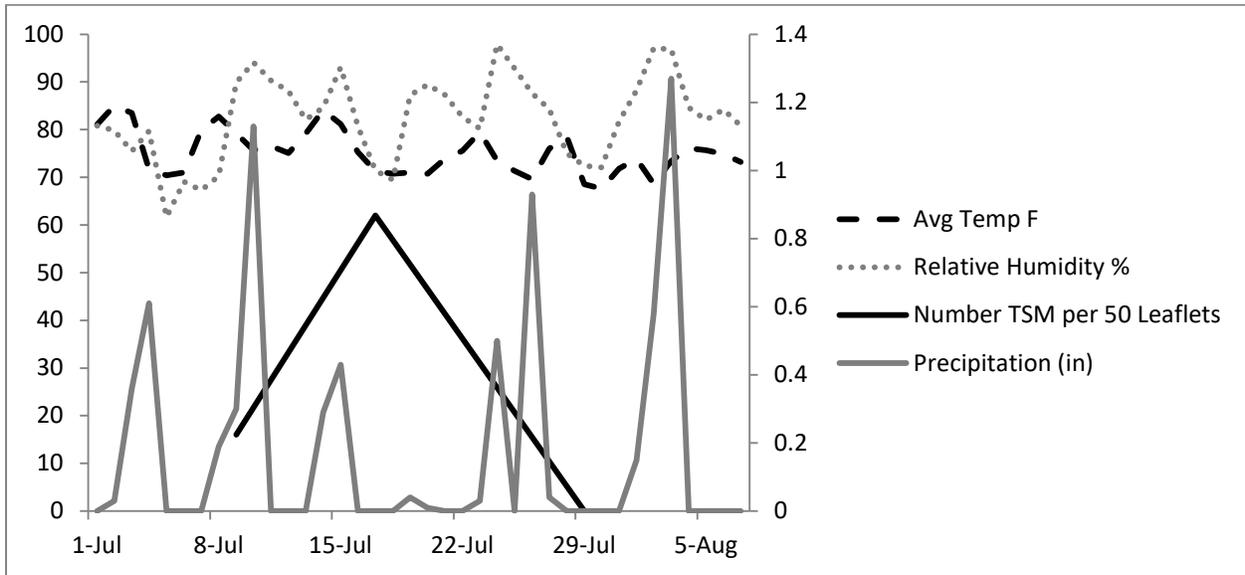
Georgetown



Lincoln



Cannon



Angola

