RUTGERS
New Jersey Agricultural
Experiment Station

The Blueberry Bulletin

A Weekly Update to Growers

July 25, 2023 **Vol. 39, No. 17**

- *Visit the Blueberry Bulletin webpage at njaes.rutgers.edu/blueberry-bulletin*
- *The 2022 Commercial Blueberry Pest Control Recommendations for New Jersey is available at https://njaes.rutgers.edu/pubs/publication.php?pid=E265*
- *The Blueberry Bulletin will now be emailed to those who request it. We will no longer be mailing hard copies out. If you are not on our current list and would like to receive a copy, please call the office at (609) 625-0056.*

BLUEBERRY CULTURE

Dr. Gary C. Pavlis, Ph.D
Atlantic County Agriculture Agent

Harvest has largely wrapped up with just late picks of Elliott still to be done. Now is a good time to assess any problems in the fields that should be addressed. The first is to look at how well your weed control program has worked. Extreme weed pressure late in the season will rob the blueberry plants of needed water and put the plants into stress. This stress will result in less fruit bud formation which results in lower yields next season. In addition, stressed plants are more likely to be injured by winter low temperatures.

Additionally, farm visits this week have shown that there is a growing problem with oriental beetle grubs. There are chemical as well as mating disruption options available but if you see plants that are week, especially young plants, it is a good idea to pull one out of the ground and look at the roots. If there is an absence of fine roots, it is likely a grub problem and should be addressed.

Lastly, if you see ants around a blueberry plant or a large number of ant hills in the blueberry field, it means you probably have a mealy bug problem on the roots. The ants are basically farming the mealy bugs and spreading them around, so the easy fix is to control the ants. Usually Esteem in used.

Gary C. Pavlis, Ph.D.
Atlantic County Agricultural Agent

Cooperating Agencies: Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and Boards of County Commissioners. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.

PEST MANAGEMENT

Dr. Cesar Rodriguez-Saona, Extension Specialist in Blueberry Entomology, Rutgers University
Ms. Carrie Mansue, Senior Program Coordinator

Spotted-Wing Drosophila (SWD): Numbers for SWD trap counts continue to increase. SWD is the main target for insecticide sprays on later varieties.
Aphids: Aphid numbers have decreased from last week. Percent of aphid-infested terminals was 1.97%, with a high of 18%.
Scale: Scale numbers have decreased from last week. Average infested berries was 0.07, with a high of 2.4.

Insect Sampling Count Summary

	LR Infested Fruit	PC Infested Fruit	Scale Infested Fruit	CBFW Infested Fruit	CFW Infested Fruit
Average	0.01	0	0.07	0	0
High	0.3	0	2.4	0	0
Key: LR = Leafrollers, PC = Plum Curculio; CFW = Cherry Fruitworm, CBFW = Cranberry Fruitworm					

	% LR Shoot Infestation	% Aphid Terminals
Average	0	1.97
High	0	18

	SWD AC	SWD BC	OB AC	OB BC	BBM AC	BBM BC	SNLH AC	SNLH BC
Average	90	109	994	1593	0.07	0.225	0.27	0.176
High	257	340	4050	8100	3	2	2	2
Key: SWD = Spotted-wing Drosophila; OB = Oriental Beetle; BBM = Blueberry Maggot; SNLH = Sharp-nosed Leafhopper								

Seasonal climate effects on the activity of spotted-wing drosophila and blueberry maggot

James Shope, Cesar Rodriguez-Saona, Dean Polk, and Carrie Mansue

Since its invasion in 2011, spotted-wing drosophila (SWD) has become a major pest of blueberries in New Jersey and driving insecticide spray regimes. Each year, its population in New Jersey has increased, and it has been arriving earlier and earlier in New Jersey blueberry fields. Simultaneously, the native blueberry maggot (BBM) population has declined and captured in monitoring traps later each year (Figure 1).

We used BBM and SWD trapping data (2005–2022) from 41 highbush blueberry farms in Burlington and Atlantic counties to determine seasonal climate factors that contributed to these changes in activity (Shope et al., 2023). The arrival date (activity) of SWD in New Jersey blueberry fields is controlled by summer temperatures in the prior year and winter temperatures before emergence. Warmer summers increase population activity during the growing season and more individuals that can overwinter to attack blueberries the following year. Colder winters act as a bottleneck for SWD, with the cold killing many, but not all, overwintering SWD adults. Warmer winter temperatures reduce this bottleneck, resulting in earlier SWD activity the following spring.

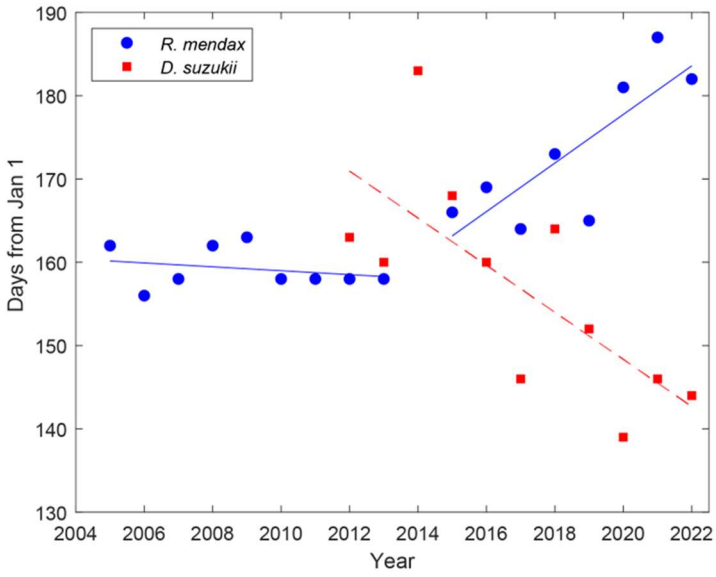

Figure 1. First capture date of blueberry maggot (R. mendax, blue circles) and spotted wing drosophila (D. suzukii, red squares) in Atlantic County blueberry fields. Lines indicate the average trend in capture dates. Before the invasion of spotted wing drosophila, blueberry magot activity was relatively stable, but subsequent has arrived later each year after invasion while spotted wing drosophila has arrived earlier each year on average. The gap in the blueberry maggot data represents 2014, when blueberry maggot first capture data are missing.

BBM, on the other hand, is relatively unaffected by seasonal temperature changes, but its later arrival each year is likely due to annual competition with SWD for resources driven by the biology of the insects. SWD can have multiple generations throughout the fruiting season whereas BBM produces one generation per year, resulting in a larger SWD population. Additionally, BBM only lays a single egg inside a blueberry fruit whereas SWD can lay multiple eggs per fruit. SWD attacks blueberries earlier in the growing season, reducing available berries for BBM, which need to feed for 1–2 weeks after emergence prior to egg-laying in mature fruit.

Annual temperatures in New Jersey (including Hammonton, NJ) have generally warmed in recent decades, resulting in earlier SWD arrivals each year, and with climate change producing warmer summers and milder winters, we anticipate that this trend will continue. In 2020, the first SWD trap capture in New Jersey was on May 18th (139 days since the start of the year). Using a model of SWD arrival in New Jersey blueberry fields based on winter degree days below 32°F and summer growing degree days (base 50°F), we anticipate that first catch would be on average approximately 3.6 ± 10.4

days earlier by 2030 and 9.7 ± 17.7 days earlier by 2050 if warming follows its current trajectory. If we experience a much higher rate of global greenhouse gas emissions (greater warming), this change would be 3.9 ± 11.7 days earlier by 2030 and 14.5 ± 26.3 days earlier by 2050 on average. These changes may be somewhat small but present a strong perspective to how we anticipate SWD to change. Given that SWD activity likely drives BBM capture trends, with continued warming, BBM activity and populations will likely continue to decline.

Reference

Shope J, Polk D, Mansue C, Rodriguez-Saona C (2023) The contrasting role of climate variation on the population dynamics of a native and an invasive insect pest. PLoS ONE 18(4): e0284600. https://doi.org/10.1371/journal.pone.0284600