RUTGERS
New Jersey Agricultural Experiment Station

The Blueberry Bulletin

A Weekly Update to Growers

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- *Visit the Blueberry Bulletin webpage at njaes.rutgers.edu/blueberry-bulletin*
- *The 2022 Commercial Blueberry Pest Control Recommendations for New Jersey is available on njaes.rutgers.edu*

BLUEBERRY CULTURE

Dr. Gary C. Pavlis, PhD.
Atlantic County Agricultural Agent

Harvest will begin soon but before that happens it is a perfect time to address the nutrition deficiencies that exist in the field. It must be understood that every essential nutrient affects plant growth and in the final analysis, yield. It is called the principal of limiting factors. Whatever nutrient is most deficient it is decreasing yield the most. When this deficiency is addressed, the next most deficient nutrient is decreasing yield the most. Our leaf analysis data shows that almost all the fields are deficient in Nitrogen, so whatever level of N you have been applying, it is not enough. Next, 88% of samples were low in Iron. This is a good time to use a foliar application of a chelated iron if you are one of the farms that came up short. Copper was short on 86% of the farms. Zinc was short on 68% of the farms and Magnesium on 46% of the farms. Again, a foliar application will address these problems. Note that on 70% of the farms, Boron was high. That means that many farms should omit Boron in 2022. The picture below shows the negative effect of low and high Boron on the blueberry leaves. In addition, the chart below shows the mode of application for the nutrients mentioned.

Boron – Normal range 30-50 ppm.

0ppm 15ppm 50ppm 60ppm 70 ppm 90pp

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Micro-nutrients sources and rates

Nutrient	Product	Method	Rate
Boron	Solubor20	Foliar	1.5lb./A
Boron	Solubor20	Ground	5lb./A
Boron	Borax11	Ground	10lb./A
Copper	Cu chelate	Foliar	Label Rate
Iron	Fe chelate	Foliar	Label Rate
Mn	Mn chelate	Foliar	Label Rate
Mn	Mn sulfate	Foliar	2 lb./A
Zn	Zn chelate	Foliar	Label Rate

Cooperative Extension of Atlantic County

PEST MANAGEMENT

Blueberry Insects

Dr. Cesar Rodriguez-Saona, Extension Specialist in Blueberry Entomology, Rutgers University
Mr. Dean Polk, IPM Agent – Fruit
Ms. Carrie Mansue Denson, IPM Program Associate – Fruit

Leps (Lepidoptera larva – green fruitworms, leafrollers, spanworms, spongy (= gypsy moth): During this past week's scouting, Lep averages decreased to 0.009 larvae per bush (or 100 blossom clusters), with a high of 0.1. These were primarily green fruitworm. This past week spongy (= gypsy moth) numbers decreased, averaging 0.01 larvae per bush, with a high of 0.5. There was a small amount of fruit feeding, averaging 0.03% injury. Most of these were all very low populations and did not justify any treatments. Now that the bees are out, our attention turns to post-bloom pests, primarily plum curculio, cherry fruitworm then cranberry fruitworm, followed by aphids and spotted-wing drosophila. Please see below:

Plum Curculio (PC): During this past week plum curculio increased, averaging 0.065 PC per bush, with a high of 0.4. This is a critical time for PC control, with Imidan and Avaunt being the two best products for control. These materials will also control cranberry fruitworm. In most cases only a small amount of fruit injury was present at 0.34% clusters injured, but up to 3.2% in one case.

Cranberry Fruitworm (CBFW) and Cherry Fruitworm (CFW) Traps: Trap counts in both Atlantic (AC) and Burlington County (BC) have increased for both CBFW and CFW. CFW traps averaged 19.1 moths per trap with a high of 40 for AC and averaging 14.5 per trap with a high of 20 for BC. If CBFW was not targeted in the first post-bloom treatment, then it should be targeted now, especially if you have appreciable trap counts.

Spotted-Wing Drosophila (SWD): They're back, or maybe never left….. When we have mild winters it is very likely that SWD adults survive through the winter months as a "winter morph." These adults are slightly more robust than the ones we see during the growing season; but the bottom line is the adults are present early and ready to mate and lay eggs on fruit, probably at a higher population than one would find after a very cold winter. We are using red sticky cards (Trecé, Great Lakes IPM), and counting males only. These are baited with either the Trecé SWD lure or the Scentry lure (we have standardized to Scentry). The first adult males were captured on Monday May 23 on traps placed in the fields during the previous week. Therefore, flies were likely active during the week of May 15-21.

See Carrie's photo below with a male circled (Picture 1). This means that even early varieties like Duke are susceptible to injury as they start to color. SWD insecticides include the materials in the SWD Insecticide table below (from 2022 Commercial Blueberry Pest Control Recommendations):

SWD Insecticides and Rotation IRAC Classes

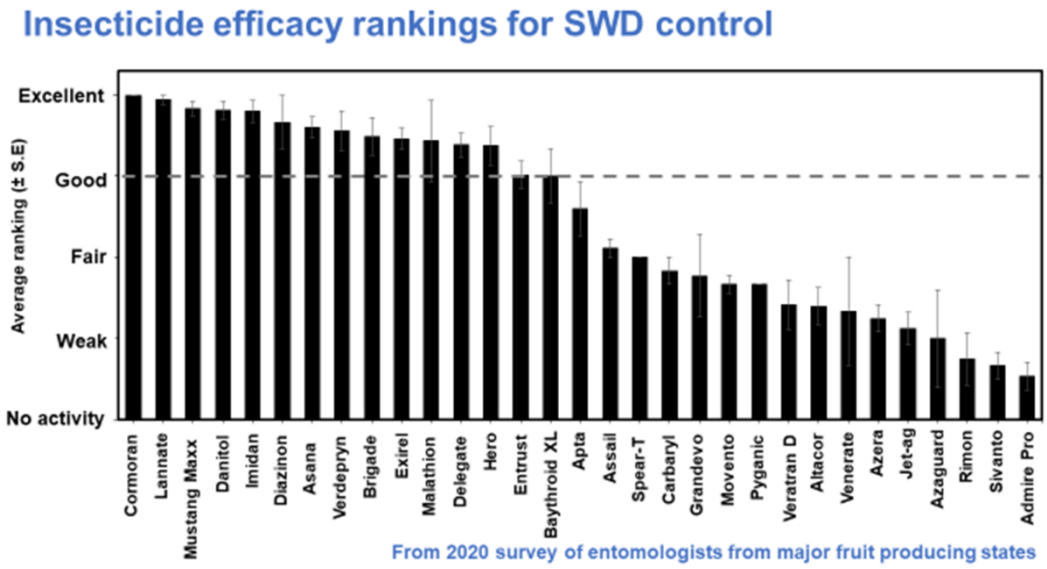
Insecticide	Rate/A	IRAC Class
Asana	9.6 oz	3A
Brigade/Bifenture DF	16 oz	3A
Danitol	16 fl oz	3A
Hero	10.3 oz	3A
Mustang Max	4 oz	3A
Imidan	1.33 lb	1B
Malathion	(see label)	1B
Diazinon 50W	1 lb	1B
Lannate	1lb	1A
Delegate	6 oz	5
Entrust	2 oz	5
Exirel	13.5 to 20.5 oz	28
Verdepryn	8.2 to 11 fl oz	28

Picture 1. SWD adult male on red sticky trap, 5/23/22 (photo by C. Mansue).

Insecticide Efficacy Rating for SWD Control

The graph below provides an insecticide efficacy ranking provided by entomologists from across the country belonging to "The Sustainable Spotted Wing Drosophila" Project (https://swdmanagement.org/), and compiled by Phillip Fanning (University of Maine) and Rufus Isaacs (Michigan State University).

An article summarizing the results and other important points can be found here: https://swdmanagement.org/wp-content/uploads/2021/05/SWD-rankings-document-2021.pdf. Rotating product chemistries is important, as resistance has already been found in some SWD populations. It should be noted that some of the rankings are based on limited data, and sometimes there is variation in the ratings assigned by different entomologists. If no error bar appears on top of the vertical bar indicating efficacy for a particular product means that only one rating was received. If the error bar is large, this is an indication of variability in how well different entomologists thought the product worked. A small error bar means more consensus in the rating.



Aphids: As indicated last week, we were finding a number of Blueberry Scorch symptomatic plants. Over the past few days we are also seeing aphid populations starting to build-up. Since aphids vector/transmit the scorch disease virus, they need to be controlled to the lowest possible numbers. This means: 1) Starting early, 2) Using the best materials, and 3) Getting the best coverage possible. During the 2021 season, we saw Movento and Sivanto give the best aphid control. Another new product effective against aphids is Senstar that contains spirotetramat (Movento) and pyriproxyfen (Esteem) as active ingredients. Note that these materials do little to control SWD (see graph above). Given the presence of SWD adults, it would be prudent to start your aphid control program prior to when SWD materials are needed.

Biology and Life Cycle. Aphids (Picture 2) are soft bodied, slow moving insects. The adults are on average about 2 mm long, light to dark green. They have piercing-sucking mouthparts, and two siphunculi (cornicles) that protrude to the rear from the 6th abdominal segment. Nymphs resemble the adults, but are smaller and wingless. There are four principal species of aphids that attack highbush blueberries: the blueberry aphid, *Illinoia pepperi* (present in Michigan), *I. azaleae* (present in New Jersey), the (western) blueberry aphid, *Ericaphis fimbriata*, and the green peach aphid, *Myzus persicae*. Aphids overwinter as eggs, which are deposited on stems and small shoots. Eggs hatch in the spring. At this time of the year, immatures feed on tender new growth, usually on the undersides of leaves at the top or bottom of blueberry bushes. Males and egg-laying females are produced in the fall. There are several generations per growing season. Aphids suck sap from tender growth and new shoots, especially from developing terminal foliage. Under heavy populations, a sooty mold can develop on the honeydew secreted by the aphids. This is usually of minor importance in blueberries since growers seldom allow aphid populations to build up to high densities. Of more importance is the fact that many aphids function as disease vectors. In blueberries, aphids can transmit Blueberry Scorch Virus and its several strains.

Picture 2. Young aphid colony on leaf (Photo by Carrie Denson).

Monitoring and Control. Since disease transmission is a main concern in commercial blueberry farms, only very low aphid populations are tolerated, especially if Blueberry Scorch Virus is a known problem. Aphids may be present while bushes are in bloom, but populations don't start to build up until after bloom. Monitoring should begin as soon as bees are removed and continue through at least the first picking. Sampling should be biased in new terminal growth, and data recorded as the percent of terminals infested with aphid colonies. Where disease transmission is an issue, a colony should be defined as a minimum of 1-2 aphids, either nymphs or adults.

Treatment is justified if greater than 10% of terminals are infested with live aphids. The neonicotinoids Assail, Actara, and Imidacloprid (e.g. Admire Pro) provide good aphid control. Also, for resistance management, you may want to consider using Sivanto, Movento, or Senstar, three newly registered insecticides in blueberries with novel modes of action. Lady beetles, lacewings, syrphid flies, and other biological controls are often abundant in blueberry farms at this time of the year and may help maintain aphid populations at low levels.

By the Numbers Summary:

	Leafroller/Tray		Spongy (= Gypsy) Moth/Tray		PC		Thrips	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
4/30	0.03	0.2	0	0	0	0	0	0
5/7	0.05	0.4	0.44	5	0.06	0.3	0	0
5/13	0.05	0.2	0.05	0.4	0.04	0.4	0	0
5/21	0.009	0.1	0.01	0.5	0.065	0.4	0	0

	% Leafroller fruit Injury		% PC fruit Injury	
	Avg	Max	Avg	Max
5/21	0.03	0.2	0.34	3.2

	CBFW AC		CBFW BC		CFW AC		CFW BC	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max
4/8	0	0	0	0	0.1	1	0.25	1
4/14	0	0	0	0	0	0	0	0
4/20	0	0	0	0	0.2	1	0	0
4/29	0.1	1	0	0	0.9	3	0.25	1
5/7	0	0	0	0	7.1	15	4.5	15
5/13	0.1	1	0	0	9.1	22	10.25	17
5/21	2.3	14	0	0	19.1	40	14.5	20
Key: PC = plum curculio adults per bush & % injured berries, CBFW = cranberry fruitworm adults per trap, CFW = cherry fruitworm adults per trap.								