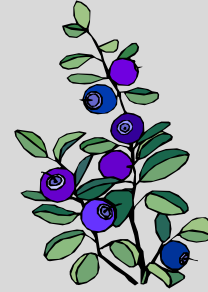


# RUTGERS

New Jersey Agricultural  
Experiment Station



## The BLUEBERRY BULLETIN

A Weekly Update to Growers

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May 19, 2014

Vol. XXX No. 6

### At a Glance.....

PEST/DISEASE/CULTURE	MAY 19- –MAY 26 END OF BLOOM	MAY 26- –JUNE 2 FRUIT SET
CRANBERRY FRUITWORM (CBFW)  Intrepid, Esteem	If CBFW populations are high consider early treatment with Intrepid or Esteem (1 <sup>st</sup> of two sprays).	If bees are out consider use of Assail, Avaunt, Altacor, Delegate, or Imidan
PLUM CURCULIO  Avaunt, Imidan, pyrethroids	Monitor for fresh egg scars.	Monitor for fresh egg scars.  If bees are out, treat in first post pollination spray.
APHIDS Admire, Assail, Actara	Monitor for aphid colonies.	Treat if over 10% of terminals are infested.

### Culture

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

#### Fertigation Guidelines:

Growers have asked me for some guidelines for fertigating blueberries. As you may be aware, our research in New Jersey has shown that fertilizing blueberries a little at a time through the trickle system has shown to be very beneficial. Increases in yield have been seen each year of the research. In addition, increases in fruit firmness have often been seen. Thanks is given to Mary Beth Sorrentino, USDA-CSRS for some of the technical information in this article.

Over the years the following guidelines have been developed:

1. Determine the amount of Nitrogen required/acre/year for each field. Total N should be based on leaf analysis the year before however 60# of Nitrogen/A is a good base recommendation for mature plants if a leaf analysis has not been conducted.
2. Multiply total acres to be fertigated by #/A and convert to total gallons for the season.
3. Fertigation period is 6-8 weeks, starting at ¼ bloom. Fertigate once a week for 1-2 hours during the normal



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- irrigation schedule. Run irrigation a minimum of ½ hour before and ½ hour after fertigation. If travel time from the injection point to the final application point is longer, allow for one hour before and after fertigation time of travel. This will ensure application uniformity to the furthest emitter within the zone. As a rule of thumb, for a scheduled irrigation, irrigate at least 3-4 hours during a 1-2 hour fertigation. Using a 1gph emitter, irrigate 4-6 hours every 3 days, with a .5 gph emitter, irrigate 8-12 hours every 3 days. This is based on no rainfall and ET rates of .2"-.26"/day.
4. Install tensiometers to monitor soil moisture within the 12"-18" root zone depth. For loamy sands and sandy loams irrigate when readings are 20-30 CB on the tensiometers. This will

- supply needed water and fertilizer to the root zones.
5. Injection pump should be sized for maximum acreage/zone that you plan to irrigate/fertigate at one time ( 2 hour injection time, for a 4 hour irrigation per zone). Example- a 10 acre drip system at 60# N requirement/acre will need 600 gallons of liquid 10-10-10. If injection is scheduled for once a week for 8 weeks, 75 gph injection pump is recommended for a one hour injection period. If you inject for 2 hours, the rate is lower (37.5 gph injection rate). If zones are over 10 acres, plan for between 50-100 gph injection rate. A lower injection rate can be used with a longer fertigation/irrigation period.

## *Insects*

**Dr. Cesar Rodriguez-Saona, Extension Specialist in Blueberry Entomology, Rutgers University**

**Mr. Dean Polk, IPM Agent – Fruit**

**Plum Curculio (PC):** Very little PC was found in beating tray samples last week in our sampling. Out of 16 farm sites, one site had adult PC activity of 3 active adults per bush. We are in the peak period of PC activity in tree fruit, so additional activity in blueberries is expected to follow. PC should be one of the main insect targets when growers remove bees late this week and early next week.

*Life Cycle.* In New Jersey, PC completes a single generation a year in blueberries. This insect overwinters as an adult in leaf litter. Adults become active during bloom and feed on young fruit just after bloom, causing feeding scars. We have noticed that in the absence of fruit, PC adults feed on blueberry



**Adult plum curculio and the crescent-shaped scar on fruit caused during oviposition**

flowers (petals). Females lay eggs in the fruit causing crescent-shaped oviposition scars (see photo). White maggot-like larvae develop inside the fruit (one larva per fruit). Feeding by the larvae causes fruit to develop prematurely and fall off the bush. Mature

larvae exit the fruit to pupate in the ground, and become an adult in July and August. If berries are picked before they drop, PC larvae can contaminate harvested fruit.

*Monitoring and Control.* To monitor PC populations, scout for the semi-circular scars on the fruit. Sampling should be biased towards field edges or infields that border woods and hedgerows. PC infestations are more common in weedy fields and those with sod middles. This pest is more of a problem on early maturing varieties. No threshold has been established, so treatment is mainly based on past history and an estimate of damage to fruit.

At this time of the year, control methods target the adult stage. **Although adults can be present during bloom, no chemical controls are recommended at that time.** Chemical controls should be applied soon after bees are removed. Control options include Imidan, Avaunt, Danitol, Brigade, Mustang Max, and Diazinon.

**Aphids:** Very few aphids were seen this past week. About 18% of samples showed some aphids, but in very small colonies.

*Life Cycle.* Aphids are soft bodied, slow moving insects (see photo). 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 6<sup>th</sup> abdominal segment. Nymphs resemble the adults, but are smaller and wingless.

There are four principal species of aphids that attack blueberries. These include: 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 honey dew 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 (BIScV) and its several strains.



**Aphids on blueberries**

*Monitoring and Control.* Since disease transmission is a main concern in commercial blueberry farms, only very low aphid populations is tolerated, especially if BIScV 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. 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.

**Putnam Scale:** No activity has been noted as of May 20.

**Leafrollers and Other Leps:** We are still seeing low levels of worms in beating trays samples, but only in about 5% of sample sites.

**Cranberry Weevil (CBW):** Adult activity has stopped for the most part. We did see a few adults in beating tray samples over the last week.

**Cranberry Fruitworm (CBFW):** Traps have been set, and the first trap captures have been seen, but only at 1 moth per trap at 1 site. There will be more about the timing and treatment for this pest over the next couple of weeks.

**Thrips:** Some thrips were seen again over the past week, but only in 11% of our samples. In those sites that did have thrips, populations were very light, with only 2 thrips per 100 blossom clusters. This fits the degree day model (<http://benedick.rutgers.edu/Blueberryweather/ddcalc2.php>), which is showing a 1% emergence and that 10% emergence is not expected over the next 6 days. Since this will be past the pollination period, thrips **should not** be a problem this year.

### **First Post-Pollination Insecticide Options:**

Growers who wish to use selective insecticides, especially for the control of Lepidopteran pests, are encouraged to do so. These compounds are safer to humans and the environment. Intrepid is an insect growth regulators (IGR) with activity only against caterpillars and have no effect on any other insects. Esteem is also an IGR that is also effective on cranberry fruitworm and scale (at a different timing). IGRs are safe to bees and thus can be used during bloom. Delegate is an insecticide with activity against caterpillars and toxicity to thrips. Assail is a neonicotinoid insecticide active against cranberry fruitworm, aphids, and thrips. Altacor is very effective against caterpillars. Delegate, Assail, and Altacor should be used only after bees are removed (if needed Delegate can be used to control thrips during bloom but applications need to be done at dusk to prevent bee exposure as Delegate is highly toxic to bees).

Here are few guidelines you may consider for choosing appropriate insecticides for the first post-bloom application:

- 1) If **cranberry fruitworm** is your only concern, growers can use Intrepid, Esteem, Delegate, or Assail. IGRs (Intrepid or Esteem) would be a good choice for a first application during or just after bloom, if the population is high. The reason that IGRs should be used for the 1<sup>st</sup> or “early” spray is that they are ovicidal and larvicidal, so to get maximum benefit they should contact the egg before hatch. If a 2<sup>nd</sup> application is needed (after bees are removed), Altacor, Delegate or Assail are good choices.
- 2) If cranberry fruitworm and **thrips** are your primary targets, you may apply Assail, Delegate, or Lannate. Assail and Lannate will also control aphids.

- 3) If **aphids** are your primary concern, and you do not have major caterpillar pressure or plum curculio at this time, then use Assail, Admire Pro, or Actara in your first post-pollination application (late May until early June). Assail will also control cranberry fruitworm and thrips. These compounds are very effective against sucking insects. Alternatively you may use a broad-spectrum insecticide such as Diazinon or Lannate. These broad-spectrum insecticides will also control caterpillars and other pests.
- 4) If you want to use a broad-spectrum material in late May and early June (for caterpillars, aphids, leafhoppers, thrips, **plum curculio**, etc.), you should choose one of Imidan, Diazinon, Lannate, or a pyrethroid (e.g. Danitol).

Imidan will control all pests normally targeted at that time, but will not control aphids. Pyrethroids can also be used but are generally weak on aphids, but control most other pests (see labels). While the pyrethroids will control plum curculio, high rates need to be used to achieve control.

Pyrethroid insecticides are very toxic to natural enemies, and thus will disrupt biological control, especially aphid predators and parasitoids.

- 5) Lannate is not labeled in Canada, and while it has the same tolerance on fruit as in the U.S., use should be minimized or avoided if exporting berries.

## *Worker Protection Inspections*

The New Jersey Department of Environmental Protection Pesticide Control Program (DEP) has announced that there will be federal WPS compliance inspections in New Jersey. These inspections will be conducted by the United States Environmental Protection Agency, although DEP inspectors may accompany them. Please note that these federal inspections will be unannounced, and will begin next week statewide.

Approximately 20 to 30 inspections are slated to be conducted by EPA through the remainder of May and June. We received an update that these federal inspections may possibly continue through the end of July.

Two outstanding resources on complying with the WPS are:

1. [Quick Reference Guide Tri-fold Brochure](#);  
[www.epa.gov/agriculture/quickreferenceguide\\_color.pdf](http://www.epa.gov/agriculture/quickreferenceguide_color.pdf)
2. "How To Comply With the Worker Protection Standard for Agricultural Pesticides: What Employers Need To Know" Manual is available on the Web at:  
[www.epa.gov/agriculture/htc.html](http://www.epa.gov/agriculture/htc.html). [Download full PDF version](#) (PDF) (141 pp, 4MB)

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May 19, 2014

Vol. XXX, No. 6

## ***BLUEBERRY BULLETIN***

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The Blueberry Bulletin  
Weekly Newsletter  
Published By  
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