**The BLUEBERRY BULLETIN**
*A Weekly Update to Growers*

**Dr. Gary C. Pavlis, County Agricultural Agent**
6260 Old Harding Highway, NJ 08330

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May 20, 2013                             Vol. XXIV, No. 7

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**PEST/DISEASE/CULTURE** | **MAY 20 – MAY 27 END OF BLOOM** | **MAY 27 – JUNE 3 FRUIT SET**
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CRANBERRY FRUITWORM (CBFW) | If CBFW populations are high consider early treatment with Intrepid or Esteem (1st of two sprays). | If bees are out consider use of Assail, Avaunt, Altacor, Delegate, or Imidan
Intrepid/Confirm, Esteem | | |
PLUM CURCULIO | Monitor for fresh egg scars. | Monitor for fresh egg scars.
Avaunt, Imidan, pyrethroids | | If bees are out, treat in first post pollination spray.
APHIDS | Monitor for aphid colonies. | Treat if over 10% of terminals are infested.
Admire, Assail, Actara | | |
Anthracnose | Continue applications on a 7-10 schedule for all cultivars | |
Phytophthora Root Rot | Scout for symptomatic plants, obtain a diagnosis and recommendation | |
Nutrition | Continue to apply NPK. | |

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**BLUEBERRY TWILIGHT MEETING**
THURSDAY, MAY 30, 2013 @ 5:30
ATLANTIC BLUEBERRY COMPANY
7201 WEYMOUTH RD.
HAMMONTON, NJ
FOR DIRECTIONS, CALL 609-561-8600

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**CULTURE**

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

Bloom is wrapping up and fruit set is progressing and this is typically the time of the year when problems in the field show themselves. Plants with no leaves, poor fruit set, poor plant growth, and a variety of leaf symptoms have all been seen in my recent field visits. Plants with no leaves usually are an indication of a root problem. I mentioned in last weeks’ newsletter that the presence of grubs can easily be determined at this time of year. They are fat and juicy and can’t be killed at this stage but they definitely indicate a problem that must be addressed.
Poor growth in the field in a young planting was observed in a couple of fields and it was the old hard pan issue that I have talked about in past newsletters. Three year old plants could be peeled off the ground because the root system hadn’t gone deeper than 3 inches. A blueberry plant is never going to survive with 3 inches of roots. There is not much that can be done with such a planting. A deep furrow should have been cut before planting but now the only options are to replant or try mulching heavy in an effort to slowly move the root system up from the hardpan. This will work but full production of these plants will be greatly delayed.

Poor fruit set can be due to many things. A lack of adequate bee activity would be first on my list. Nutrient deficiency symptoms will show themselves at this time. If you have a question about leaf symptoms give me a call or e-mail me a picture of the leaf. It is a good time to address nutrient deficiencies because most plant growth is in May and June so if the problem is fixed now growth will not be adversely affected.

Sincerely,

Jay Parli
Editor, Blueberry Bulletin
Gp/sp

INSECTS
Dr. Cesar Rodriguez-Saona, Extension Specialist
in Blueberry Entomology, Rutgers University
Mr. Dean Polk, IPM Agent – Fruit
Mr. Gene Rizio, IPM Program Associate – Fruit

Plum Curculio (PC): About 6% of beating tray samples have been positive for PC adults. Some of our most active sites are catching multiple adults in a single sample. This is about the same frequency as last week, but individual sample levels are higher. As soon as pollination is complete, growers should have bees removed and treatments should be applied. PC should not be ignored since it can result in larval infested fruit. Fruit samples were recently started and we find that 37% of our samples are positive for some level of pc scars. The egg scar injury range of goes from 1 to 26 berries in a 1000 berry sample. Avaunt and Imidan are two of the better insecticides available for PC control. They both control PC, cranberry Fruitworm, and leafrollers, but not aphids. Imidan may be better saved for when we start catching spotted wing drosophila, since Avaunt does not control SWD.

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 flowers (petals). Females lay eggs in the fruit causing crescent-shaped oviposition scars (see photo). White maggot-like larvae develop inside the fruit.
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.

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 as soon as bees are removed. Control options include Imidan, Avaunt, Danitol, Brigade, Mustang Max, and Diazinon. See information below on the use of pyrethroids for plum curculio control.

**Aphids:** About 51% of shoot samples are positive for this pest. This is an increase since last week. They are mostly single aphids with occasional colonies starting to appear. About 10% of our samples were above the 10% shoot infestation level.

**Thrips:** Thrips are present at very low levels in some locations. The highest levels seen were 15-20 thrips per 100 flower clusters. Now that petal fall is almost complete, this pest should pose no concern.

**Leafrollers and Other Leps:** About 1% of beating tray samples have been positive for worm larvae and 6% of shoot samples have been positive. None of these have been over the 5% shoot infestation threshold level.

**Cranberry Fruitworm (CBFW):** Trap captures have increased in Atlantic County, indicating that the adult flight is now underway. Treatment timings should be very soon, depending on the material being used. With high populations 2 applications may be needed, with the first spray being an IGR and a second spray being a standard insecticide. Lower populations may require only one application of a standard insecticide.

**Life Cycle:** CBFW has one generation a year. It overwinters as a fully-grown larva within a cocoon made of silk and soil particles (hibernaculum). Pupation occurs during the early spring and moths begin to emerge during the second-third weeks of May (adults started to emerge last week in Atlantic Co.). Male moths emerge 3-4 days earlier than females. Adults are brownish gray with a pair of white markings on each forewing (see photo). The eggs are pale-green, flat, and are laid singly, mostly along the inside rim of the calyx cup. Eggs hatch in 5-7 days and the newly emerged larva is pale yellowish-green. Upon hatching, larvae bore into the fruit usually near the junction of stem and berry. The larva remains inside a fruit until its content is consumed, and then it moves to another fruit. A larva may feed on as many as 5-8 berries. Infested berries are contaminated with larval excrement which can be seen near the entrance hole. CBFW infestations can be
recognized by the presence of webbings filled with excrement in berries (see photo). Infested fruit prematurely drop. Larvae drop to the ground under blueberry plants beginning the third week of June and build a cocoon.

**Monitoring:** Time of treatment can be established based on data from pheromone traps. Based on a degree-day model from Michigan State University 85 degree-days are required from first male capture –biofix– to egg laying. The number of males caught in the traps provides information on the presence and distribution of CBFW within a field. Traps are usually placed at the wooded borders of fields, where pressure tends to be high. Growers with a history of high CBFW population should especially be aware of the importance of monitoring. In addition, eggs may be scouted for after early fruit set. Larval infestation is difficult to detect early in the season, but as larvae grow, the increasing numbers of fruits affected and frass produced provide clear indication of infestation.

**Control:** CBFW can be controlled by registered insecticides. Either one or two applications may be needed, depending on the population level. If trap counts are high, then an early application of an insect growth regulator (Intrepid, Confirm, or Esteem) may be used when the first eggs are laid and start to hatch. **Timing for this 1st application would be this week.** In New Jersey this may be just prior to the peak flight. This would be followed by a second application soon after bloom. Post-bloom applications with broad spectrum materials (such as Danitol, Asana, Diazinon, or Imidan), or with newer softer materials such as Assail, Avaunt, Altacor, or Delegate can be done 7-10 days following the first application and after bees are removed. If trap counts indicate a lower population, then a single insecticide application may be made post-bloom i.e., 7-10 days after peak flight (expected next week).

### Blueberry Insect Trap Counts - Atlantic County

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<tr>
<th>Week Ending</th>
<th>RBLR</th>
<th>CBFW</th>
<th>CBLR</th>
<th>SNLH</th>
<th>Or. Beetle</th>
<th>BBM</th>
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### Blueberry Insect Trap Counts - Burlington County

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<th>CBLR</th>
<th>SNLH</th>
<th>Or. Beetle</th>
<th>BBM</th>
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**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. Confirm and Intrepid are 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 a newly registered insecticide in blueberries and 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 Confirm, Intrepid, Esteem, Delegate, or Assail (see recommendations above for timing). 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 1st or “early” spray is that they are ovicidal and larvicidal, so to get maximum benefit they should contact the egg before hatch. If a 2nd 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 (see below).

3) If aphids are your primary concern, and you do not have major caterpillar pressure or plum curculio at this time, then use Assail, imidacloprid (e.g. 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 pyrethroids (e.g. Danitol, Brigade, Hero, Asana). 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 (as listed on the label): Asana – cranberry fruitworm, Japanese beetle, leafhoppers, and blueberry maggot; Danitol – plum curculio, cranberry fruitworm, Japanese beetle, obliquebanded leafroller, and blueberry maggot. 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 but it has the same tolerance on fruit as in the U.S.

6) Where PC is an issue, we are suggesting use of Avaunt as a base spray 1st post-pollination (PC and CBFW) with an added or 2nd spray of Actara for aphids, (which also has PC activity) if aphids are a concern.

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**Diseases:**

*By Peter V. Oudemans, Ph.D.*

*Associate Professor and Extension Specialist*

*Plant Pathology*

Blueberries are mostly out of bloom. Mummy berry and Phomopsis twig blight, are no longer active. Fields with symptoms of these diseases should be confirmed and targeted for management next season. To evaluate for mummy berry infections, the berries can be sliced open so that the ovaries are visible in cross section. Some or all of the locules of the infected fruit will be filled with a spongy white material that will eventually become the mummy. These are visible now. Healthy fruit will not have any of the white spongy material in the locules. Phomopsis can be recognized by dead cane tips that can be tracked down to a single point of origin such as an infected bud.

*If Botrytis blossom blight was present in your field it may still spread via infected plant material. If this is the case a botrytis material may still be warranted however, I have not observed any problems with this disease this season. However, I have not seen any of this disease even in frost damaged areas.*

For anthracnose management protectant sprays should be the major emphasis now. Duke plantings that received fungicide applications during bloom will require one or two additional sprays on the 7-10 day interval. Bluecrop may benefit from continued applications however, the most critical timings are past. Ziram, Captan, or Abound may be used to protect the developing fruit. Ziram will
provide a longer residual activity and therefore the interval between applications can be stretched to 14-days.

Remember, Ziram has a 14-day PHI and it covers the fruit with a whitish residue. My recommendation is to leave a 20-30-day PHI for Ziram to time to allow the residue to dissipate. Since we expect to start picking Duke around June 20 this year it would be advised to avoid use Ziram use on that cultivar after next week.

In Season Blueberry Disease Management New Jersey

Fig 1. Disease management considerations for mid-late May. Treatments and diseases that are in gray may be upcoming whereas those in black are current. Please remember to scout for diseases now.

Blueberry Scorch Virus

The symptoms of Blueberry Scorch have been rare this season. The infected bushes have not been cured; the disease is latent (symptoms are not appearing) but the virus can still be transmitted by aphids or via cuttings. Suspect plants should be tested and removed if found to be positive.

Stem Blight

Symptoms are beginning to appear now. Prune out dying branches and try to prevent the disease from entering the crown of the plant. Symptoms will continue to appear throughout the remainder of the season.

Phytophthora Root Rot

Symptoms are beginning to show. Get samples for testing to determine a course of action.