At a glance. Insect and disease problems that should be considered this week.

<table>
<thead>
<tr>
<th>PEST/DISEASE/CULTURE</th>
<th>APRIL 25- MAY 2 BLOOM</th>
<th>MAY 2- –MAY 9 FRUIT SET</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUMMY BERRY</td>
<td>Abound, Indar, Quash</td>
<td>No longer active</td>
</tr>
<tr>
<td>ANTHRACNOSE</td>
<td>Abound, Cabrio, Captan, Omega, Ziram</td>
<td>Continue applications throughout bloom and maintain a 7-10 day interval.</td>
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<tr>
<td>PHOMOPSIS</td>
<td></td>
<td>No further action required</td>
</tr>
<tr>
<td>PHYTOPHTHORA ROOT ROT</td>
<td>Phosphite fungicide or Ridomil</td>
<td>Have plants tested for Phytophthora root rot and apply appropriate fungicides for control.</td>
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<tr>
<td>ALTERNARIA FRUIT ROT</td>
<td>Consider applications of Omega if picking intervals are extended</td>
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</tr>
<tr>
<td>Moth Larvae – Leafrollers, Spanworms</td>
<td>Scout flower clusters for “worm” activity.</td>
<td>Treat w/ Bt’s or Intrepid/Confirm if over 1 larva per 100 flower clusters.</td>
</tr>
<tr>
<td>CRANBERRY FRUITWORM (CBFW)</td>
<td>Intrepid/Confirm, Esteem</td>
<td>Monitor with pheromone traps.</td>
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<tr>
<td>PLUM CURCULIO</td>
<td>Avaunt, Guthion, Imidan</td>
<td>Monitor for presence of egg scars on fruit, especially Duke.</td>
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</table>

BLUEBERRY TWILIGHT MEETINGS

TUESDAY, MAY 29, 2012 @ 5:30
PHILIP E. MARUCCI RESEARCH CENTER
125A LAKE OSWEGO RD.
CHATSWORTH, NJ 08019
FOR DIRECTIONS, CALL 609-726-1590
To mulch or not to mulch, that is the question.

Growers who are planting blueberries on heavier soils than those found in the Pine Barrens of New Jersey realize that highbush blueberries require a soil with a high organic matter content. To that end, the standard recommendation to increase the organic matter of the blueberry planting is to put pet moss or some other composted material in the planting hole to get the blueberry plant off to a good start and to apply a mulch around the base of the plants on a yearly basis to increase the organic matter of the soil. This recommendation along with diligent pH monitoring has resulted in successful highbush blueberry plantings in non-traditional blueberry soils. The use of mulch in blueberry culture is a given on these soils, however, there are good mulches and bad mulches, advantages and disadvantages to mulch and the question is being asked, should growers in New Jersey with classic blueberry soils mulch.

Many different materials have been tested as a mulch around the world. In general, suitable mulches include grass clippings, peat moss, buckwheat hulls, shredded leaves, straw, wood chips, and sawdust. Some of these are better than others however. Peat moss and buckwheat hulls are very expensive. The use of grass clippings has occasionally resulted in phytotoxicity due to herbicides in the grass. In addition, fresh clippings can raise the temperature of the root zone as they break down. Straw can release nitrate nitrogen and decrease the ammonium form in the blueberry root zone. Lastly, leguminous hay can be bad because it releases nitrogen in the fall which can delay the blueberry plant from entering dormancy. The result is an increase in winter damage.

There can be other disadvantages to using mulch in a blueberry field. Mulch ties up Nitrogen, and often plants tested for nitrogen levels via leaf analysis show deficiencies. The use of mulch often requires an increase in fertilizer application rates. The problem comes in making a guess as to how much to increase the rate. This largely depends on the kind of mulch used and the degree to which it is decomposed. A leaf analysis should give the grower some indication of the amount needed to provide the optimum level of nitrogen.

In addition to increased nitrogen costs, there are the added costs of the mulch and its’ application. The process can be mechanized however such equipment is costly and may not be cost effective for a small operation.

Other problems which have surfaced with mulching are the increased problems with mice and voles. Both find the mulch a very suitable place to live and they can damage blueberry plants.

Lastly, the problem of scab beetles increases when mulch is used, again because mulch is very suitable for their life cycle. Farms that experience Japanese, Oriental or Asiatic Beetle grub problems must realize that the problem may become worse with the use of mulch.

That’s all the bad news. There are many advantages of using mulch in a blueberry planting. I have already mentioned that mulching increases the organic matter of the soil and blueberries thrive when the organic matter is high. Mulch also lowers the root zone temperature in the summer and keeps the roots warmer in the winter. Both are excellent for healthy roots. The increase in organic matter also results in an increase in soil moisture which is beneficial in times of drought.

I have been skeptical about New Jersey growers using mulch. I really couldn’t see the reason given the added costs and all the disadvantages listed above. After all, our soils have all the characteristics needed by highbush blueberries, low pH, high organic matter, well drained, etc. However, after looking at the soil analysis results over the last 10 years I realize that our soils have changed. We fertilize with 10-10-10 which contains nitrogen in the ammonium sulfate form. Years of using this form drives the pH down. So soils that were
historically 4.5 are now 3.5. The pH must be adjusted to the correct range. In addition, I have noticed that due to our practice of rotating the middles for weed and pest control, we have lowered the organic matter levels in the soils. The use of mulch may very well be a good practice in New Jersey. I would just warn growers to be aware that there are pluses and minuses to mulching.

Sincerely,

Gary C. Paele, Ph.D.
Atlantic South Agricultural Agent
Editor, Blueberry Bulletin  GCP/sp

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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

Cranberry Weevil (CBW): Although the weevil does not really pose a risk at this point, they are still present in our samples. We found them at low numbers in 26% of beating tray samples.

Lepidoptera larvae (Worms): Beating tray samples have shown 25% positive for various species. The most common larvae are several species of green Fruitworm. All levels are under treatment levels. One field was seen with slightly higher numbers of sawfly larvae.

Plum Curculio (PC): About 9% of samples are positive for PC adults. As expected this is an increase since last week, and should increase until insecticide use is resumed after bees are removed.

Thrips: Beating tray samples of blossom clusters have been done at many locations. Thrips are present, but at very low numbers.

Aphids: These are just starting to show up, and are not a concern.

Cranberry Fruitworm (CBFW): The first adult moths were captured on 4/17 in Burlington County. Only a small number of sites are showing early activity.

Life Cycle: Cranberry fruitworm 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. Male moths emerge 3-4 days earlier than females. Adults are brownish gray with a pair of white markings on each forewing (see Picture 1). The eggs are pale-green, flat, and are laid singly, 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. Cranberry fruitworm infestations can be recognized by the presence of webbings filled with excrement in berries (see Picture 2). Infested fruit prematurely drop.

Picture 1. Adult cranberry fruitworm (Photo by Z. Szendrei)
**Scouting and Control:** Time of treatment can be established based on data from pheromone traps. The number of males caught in the traps provides information on the presence and distribution of cranberry fruitworm 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 fruitworm populations 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 a clear indication of infestation.

Cranberry fruitworm 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 start to hatch. 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, Mustang Max, or Imidan), or with newer softer materials such as Assail, Altacor, Avaunt, 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. Broad spectrum insecticides are harmful to beneficial insects, and can only be applied after the removal of honeybee hives.

![Cranberry fruitworm damage to developing fruit](Photo by Z. Szendrei)

**Blueberry Insect Trap Captures**

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<tr>
<th>Atlantic County</th>
<th>CBFW</th>
<th>RBLR</th>
<th>CBLR</th>
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<th>Or. Beetle</th>
<th>BBM</th>
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**Mummy Berry:** No shoot strikes have been seen in scouted fields as of this writing.
**DISEASES:**
*By Peter V. Oudemans, Ph.D.*
*Associate Professor and Extension Specialist*
*Plant Pathology*

Blueberries are rapidly moving 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. Healthy fruit will not have any of the white spongy material in the locules. It is unlikely that we will see much Botrytis blossom blight this year and the anthracnose fungicide program will suppress infections.

For anthracnose management, protectant sprays should be the major emphasis now. Abound, Pristine, Captan, and Ziram can be used to protect the developing fruit. Ziram will provide a longer residual activity than Captan and therefore the interval between applications can be stretched to 14-days. Remember Ziram has a 14-day PHI but it covers the fruit with a whitish residue that is not appealing to consumers. My recommendation is to leave a 20-30-day PHI for Ziram to time to allow the residue to dissipate. I anticipate harvest beginning the week of June 4 and that means no further Ziram applications after May 10 for Dukes and May 20 for Bluecrop.

Phytophthora root rot is becoming more prevalent and you should water carefully making sure you do not irrigate to the point of excessive runoff. Also, use of fungicides such as Ridomil and Phosphites can help reduce the impact of the disease.

**BLUEBERRY SCORCH DISEASE**

The symptoms of Blueberry Scorch have been rare so far 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.

Blueberry scorch has been declining in New Jersey over the past few years. This indicates that you are becoming more aware of the disease and the methods to control it. This disease represents a serious threat to the blueberry industry and we must remain diligent about its control.

Growers and scouts should watch for development of scorch at this time and flag all suspect bushes. Symptoms are easily seen during bloom. You should be aware if this disease is present on the farm and where the infected bushes are located. Mark locations of the disease on a farm map and monitor these areas in subsequent years. When suspect bushes are found they should cut back and removed. Aphid scouting and management should be made high priority in fields with infected plants.

Symptoms of the disease vary depending on the cultivar. In Weymouth, Duke, Elliott, and Chanticleer classic symptoms of scorched blossoms and a *Phomopsis*-like die-back are commonly seen. In other cultivars such as and Bluecrop the blossom scorch is less common and fruit may appear to set but will not develop. The plants may also appear chlorotic (yellowing similar to nitrogen deficiency) and partially defoliate. The disease may be easier to see by standing back from the bushes rather than close inspection. Shortly after bloom the plants will begin to recover. Even though symptom expression may not occur every year, infected bushes remain a source of inoculum in the field increasing the possibility for disease spread.

A virus causes blueberry scorch. For viruses to infect a plant they must enter a living plant cell through a wound. In the case of Blueberry Scorch, aphids can carry the virus on the sucking mouthparts or the stylus and inject the virus into the cell while feeding on plant sap. Once inside the cell the virus begins to multiply and spread to other cells in the plant. Eventually, the entire plant becomes infected and develops symptoms. Once a plant is infected it does not recover. Although infected plants may appear healthy during some years the infection is persistent and will greatly reduce berry production over the long term. Furthermore, the infected plants represent a source of inoculum that can be transmitted to healthy plants. For these
reasons, it is a very good practice to remove infected plants. The virus is easily transmitted from mother plants to rooted cuttings making it critical to obtain cuttings from healthy mother plants only.

The NJ Department of Agriculture continues to certify NJ nurseries. The nurseries now certified to be free of the Scorch virus are clean and should be the ONLY source of planting material. You should avoid purchasing plants from nurseries that are not certified and do not use cuttings taken from production fields. Introduction of scorch on to a farm will increase the risk of spreading the disease to other fields and also increase the cost due to removal and replanting.