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

<table>
<thead>
<tr>
<th>PEST/DISEASE/CULTURE</th>
<th>APRIL 19-26 BLOOM</th>
<th>APRIL 27 –MAY 4 BLOOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUMMY BERRY</td>
<td>Blueberries are still susceptible to primary infections. Scout for cups in wet areas. Strikes should start to be visible by April 10.</td>
<td>No longer active</td>
</tr>
<tr>
<td>ANTHRACNOSE</td>
<td>Continue applications throughout bloom and maintain a 7-10 day interval</td>
<td></td>
</tr>
<tr>
<td>PHOMOPSIS</td>
<td></td>
<td>No further action required</td>
</tr>
<tr>
<td>PHYTOPHTHORA ROOT ROT</td>
<td>Have plants tested for Phytophthora root rot and apply appropriate fungicides for control.</td>
<td></td>
</tr>
<tr>
<td>NUTRITION</td>
<td>Make last lime or sulfur application to adjust pH</td>
<td></td>
</tr>
</tbody>
</table>

BLUEBERRY TWILIGHT MEETINGS

TUESDAY, APRIL 24, 2012 @ 5:30
ATLANTIC BLUEBERRY CO
7201 WEYMOUTH RD., HAMMONTON, NJ
FOR DIRECTIONS, CALL 609-561-8600

TUESDAY, MAY 29, 2012 @ 5:30
PHILIP E. MARUCCI RESEARCH CENTER
125A LAKE OSWEGO RD.
CHATSWORTH, NJ
FOR DIRECTIONS, CALL 609-726-1590

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

As the season begins I thought it would be appropriate to re-run a column written by the late Dr. Polavarapu on chemical compatibility. We never want to repeat the problems we had in 1997.

MIXING INSECTICIDES AND FUNGICIDES: POTENTIAL COMPATIBILITY AND PHYTOTOXICITY PROBLEMS IN BLUEBERRIES
By Dr. Sridhar Polavarapu
Insecticides and fungicides are often used in combination to manage insect and disease problems that occur at the same time. Although tank-mixing of insecticides and fungicides is economical and convenient, this approach may cause severe compatibility and phytotoxicity problems if inappropriate chemicals are tank-mixed. It is therefore important to determine if a particular combination of chemicals is compatible and safe prior to large scale application. This is especially necessary for new chemicals and formulations that have not been tested extensively in the field.

Physical compatibility of tank-mix partners can be determined by employing a jar test. Using a gallon jar, add proportionate amounts of each chemical at approximately the same rate as specified on the label to one quart of water. Add wettable powders and water-dispersible granular products first, then liquid flowables and finally emulsifiable concentrates. After thoroughly mixing, allow the mixture to stand for at least 5 minutes. If the combination remains mixed or can be readily remixed with agitation, the products are physically compatible.

Pesticide mixtures that are physically compatible may still cause crop injury. New chemicals and formulations should always be evaluated for crop safety in a small area, prior to spraying on a larger area. Crop safety should be evaluated by mixing small amounts of tank-mix partners at the appropriate rates and spray volumes with spray equipment that is normally used on the farm. If no symptoms of phytotoxicity (such as necrotic spots or dieback) are evident generally within 24-72 hours after the spray, the combination may be considered safe. In some cases, phytotoxicity may take longer than 72 hours for full expression of symptoms. During the 1997 season, severe phytotoxicity was observed with combinations of Diazinon and Captan formulations in blueberries. Symptoms of phytotoxicity were evident within 24 hours of the application of Diazinon and Captan mixtures. The phytotoxic symptoms on berries ranged from deep purple blotches to circular depressions, especially where residues have accumulated near the calyx end of the berries. On leaves, brownish purple spots were seen especially on the underside of the leaf surface.

**Pollination:** Pollination is an important factor in production of the highbush blueberry. Lack of adequate pollination causes reduced yield, small berry size, and a delay in berry maturity. It is chiefly the honey bee which performs this task. While bumble bees are efficient and diligent pollinators (even under more adverse weather condition), their numbers are steadily decreasing. According to MSU Entomologist, Dr. Roger Hoopingarner, "Historically, feral (wild) honey bee colonies have provided more than half of the pollination in Michigan." Wild bee populations are declining. This is due to changes in our own blueberry production practices which remove bee forage and suitable habitat.

What does this mean for blueberry producers? What happens when we lose the free pollination service provided by wild bees? You probably already know - more honey bees.

Blueberries have a tremendous number of blossoms per acre. A single bush may have 2,000 to 3,000 blossoms. At a planting density of 870 bushes per acre, that's 1.75 to 2.6 million flowers! Large-block single-variety plantings make it essential that high numbers of pollinators be available at one time. The number of colonies needed per acre is determined by weather during the bloom period, colony size, variety, and blossom density per acre.

Weather during blossom time affects the honey bee's foraging efficiency. Honey bee activity increases as the temperature increases from 50 to 95°F. Sunshine also increases foraging, especially at lower temperatures.

Cold, wet, windy weather decreases foraging activity. Temperatures above 95°F will also reduce foraging as the bees spend their time cooling the hive.
As a general rule, over-wintered colonies are stronger than package bees. A three pound package may have 12,000 bees, while an over-wintered colony may contain two to three times as many. Honey bee colonies will be smaller in an early bloom year. In essence, the crop has developed faster than the development rate of the forager bees. Are honey bees the answer? Many of you have seen your bees fly out of the hive, past your 'Duke' bushes, and over to your neighbor’s 'Bluecrop' field. This preference for one variety over another is not fully understood. It may be related to the quantity of nectar, pollen, sugar concentration, or flower color. At this time, honey bees are the best bet. For the long term, we need to learn to cultivate the wild pollinators.

The recommended concentration of hives per acre to use are tabulated below: Remember that the number of hives needed per acre depends on the variety you have.

Sincerely,

[Signature]

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

Editor, Blueberry Bulletin GCP/sp

<table>
<thead>
<tr>
<th>VERY ATTRACTIVE TO BEES:</th>
<th>MODERATELY ATTRACTIVE:</th>
<th>POOR ATTRACTIVE:</th>
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<tbody>
<tr>
<td>1 Hive/2 Acres:</td>
<td>1 Hive/Acre:</td>
<td>2 Hives/Acre:</td>
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<tr>
<td>Rancocas</td>
<td>Weymouth</td>
<td>Stanley</td>
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<td>June</td>
<td>Bluetta</td>
<td>Concord</td>
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<td>Rubel</td>
<td>Blu ray</td>
<td>Berkeley</td>
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<td>GN-87</td>
<td>Pemberton</td>
<td>Coville</td>
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<tr>
<td></td>
<td>Darrow</td>
<td>1316-A</td>
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<tr>
<td></td>
<td>Bluecrop</td>
<td>Elliott</td>
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<tr>
<td></td>
<td>Duke</td>
<td>Jersey*</td>
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<td></td>
<td></td>
<td>Earl blue*</td>
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</table>

* Efficiency of pollination poor, add 1/2 hive more per acre.

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

Neonicotinoids and Bees

(Photo provided by R. Isaacs)

Controversy has emerged from recent publications pointing out at possible linkages between neonicotinoid insecticides and honey bee die-offs. Here we would like to comment on our current position on the use of neonicotinoids in blueberries in New Jersey.

First, we need to mention that in general neonicotinoids are highly toxic to honey bees and native bees, and caution needs to be taken when using these insecticides. However, based on the information available so far, we advise growers not to blame bee colony declines and Colony Collapse Disorder (CCD) solely on neonicotinoids. Most researchers agree that the current bee situation is likely caused by a variety of stress factors, including pesticides (insecticides and fungicides), diseases (parasites and pathogens), malnutrition, migratory beekeeping, among others. Thus, it is likely that CCD is due to a combination of these factors.

Neonicotinoids are systemic insecticides, and thus the possibility exists to find residues in the pollen and nectar. These residues can reach
lethal or sub-lethal concentrations under certain circumstances. Neonicotinoids can also persist in the soil for months or years after an application. However, this is strongly influenced by the rate and timing of application. Growers also need to be aware that not all neonicotinoids are equally toxic to bees. For instance, acetamiprid (Assail) is considered safer to non-target beneficials than other neonicotinoids. For blueberries, we recommend not to use neonicotinoid insecticides pre-bloom and never use them during bloom. Neonicotinoids are only recommended post-bloom, i.e., after removal of honey bees. For example, applications of the neonicotinoids thiamethoxam, imidacloprid and acetamiprid for aphid, grub, and leafhopper control can be made only post-bloom.

Recent research and popular press articles have pointed out links between the use of ergosterol inhibiting fungicides (SI’s) and their ability to synergize the toxic effects of some neonicotinoids on bee toxicity. SI fungicides registered for blueberries include Indar, Orbit, and Quash. The toxic effects on bees varies with the neonicotinoids being used, and not all neonicotinoids have been shown to be equally synergized with SI fungicides. Some work has shown that while acetamiprid may be safer to bees than some other neonicotinoids, when used with some SI fungicides, its toxicity is greatly magnified. Therefore if bees are present in a field, it is much safer to stay away from any SI fungicide and neonicotinoid use.

Please contact us if have any further questions by e-mail Cesar Rodriguez-Saona at crodriguez@aesop.rutgers.edu or Dean Polk at polk@AESOP.Rutgers.edu.

Cranberry Weevil (CBW): Beating tray samples over the past week were positive in 25% of our samples, but most positive counts were at very low levels. As expected, since flowers are advanced only 2% of samples were slightly over the threshold of 5/bush.

Plum Curculio (PC): Populations were similar to those found during the previous week. Only 2% of beating tray samples were positive for PC over the last week.

Lepidoptera or worm larvae: A total of 6% of beating tray samples were positive for worm larvae. These included green fruitworm and spanworm. While these levels are slightly more than last week, all fields were well under treatment levels.

Cranberry Fruitworm (CBFW): Adults have just started to emerge, with the first adult caught in a pheromone trap today 4/17. This is about 2 weeks earlier than last year.

### Blueberry Insect Trap Captures

<table>
<thead>
<tr>
<th>Atlantic County</th>
<th>Week Ending</th>
<th>CBFW</th>
<th>RBLR</th>
<th>OBLR</th>
<th>SNLH</th>
<th>Or. Beetle</th>
<th>BBM</th>
<th>BMSP</th>
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<td>4/7</td>
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<td>4/14</td>
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<tr>
<th>Burlington County</th>
<th>Week Ending</th>
<th>CBFW</th>
<th>RBLR</th>
<th>OBLR</th>
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Blueberry Bulletin, Vol. XXVIII, No. 4
Diseases:
By Peter V. Oudemans, Ph.D.
Associate Professor and Extension Specialist
Plant Pathology

Blueberry bloom is progressing nicely and bee activity seems very good. At this time Botrytis does not seem to be developing in blueberry fields and should not pose any risk in the next 7-days. Anthracnose is our biggest disease concern at this point. Hopefully all conventional growers will have made one application of Abound and will be looking at an application of Ziram in the next 7-10 days.

Blueberry Scorch Disease: Symptoms of the Blueberry Scorch Virus will begin to appear this week and next. Begin scouting for development of scorch at this time and flag all suspect bushes. Symptoms are easily seen during bloom and you should be aware that this disease is present on your farm. If it is present, map the locations of infected bushes and flag these bushes. Mapping the locations will make it easy to monitor for the disease in future years. Any scorch infected bushes should cut back and removed. Aphid scouting and management should be made high priority in fields with infected plants.

Phomopsis Twig Blight is no longer active. Fields with symptoms of this disease should be confirmed and targeted for management next season. Phomopsis can be recognized by dead cane tips that can be tracked down to a single point of origin such as an infected bud.

Blueberry Shock Virus has not been reported in New Jersey. If you see symptoms resembling this disease contact Peter Oudemans right away so that it can be diagnosed.
April 16, 2012

BLUEBERRY BULLETIN

If you have any comments about this newsletter, please make them in the space below and mail to:
Dr. Gary C. Pavlis, County Agricultural Agent
Rutgers Cooperative Extension of Atlantic County
6260 Old Harding Highway, Mays Landing, NJ 08330

I would like to see an article on the following subjects:

I would like to comment on the following articles:
Title: ________________________________ Date: ________________________________
Comment: ____________________________________________________________________