



The BLUEBERRY BULLETIN

A Weekly Update to Growers

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

PEST/DISEASE	WEEK OF JUNE 1	WEEK OF JUNE 7
Anthracnose Abound or Ziram	Continue anthracnose schedule on susceptible cultivars.	Continue anthracnose schedule on susceptible cultivars.
Aphids Imidacloprid (Provado etc.), Assail, Actara, or Lannate for suppression of low populations	Monitor and treat if over 10% of terminals infested.	Monitor and treat if needed.
Plum Curculio Guthion, Imidan, Diazinon, or high rates of Danitol	Continue scouting to identify hot spots. Treat if fresh egg scars present.	Scout and treat hot spots if needed.
Putnam Scale Esteem or Diazinon	If crawlers are present, then treat with Esteem	If crawlers are present, then treat with Esteem or Diazinon
Cranberry Fruitworm Assail (high rates), Danitol, Delegate, Asana, Diazinon, Guthion, Imidan, or Lannate	Monitor with pheromone traps, and treat with standard insecticides if needed.	Treatments should have been completed.
Gypsy moth Leafrollers, spanworms Guthion, Lannate, Imidan, or Danitol	Continue scouting for larvae. Use same thresholds.	Treatments should have been completed.

Culture:

Dr. Gary C. Pavlis

County Agricultural Agent

Sick plants: On visits to farms this week I have seen entire blocks of 'Duke' plants that look very sick, even from a distance. Upon closer inspection there are yellow leaves with green veins that look like iron chlorosis and other leaves on the same bush that show a reddening of the leaf with green veins which is the symptom of magnesium deficiency. In addition there are dead canes and entire dead plants scattered throughout the field. The first thought might be these nutrient

deficiencies but rarely do you see entire blocks of plants showing nutrient problems. It is more likely seen in one area of the field. No, when you see an entire block going down the answer lies elsewhere. Since there is no obvious disease or insect problem observed the next step is to pull a few plants out of the ground. Sure enough, after a little digging, there they were, grubs. Every last one of the fine roots were gone. The grubs had stripped all of them. The plant had nutrient

deficiencies because there weren't any roots to uptake the iron, magnesium or anything else. The problem for the farmer is that all of this damage was done last year, after the eggs were laid in the summer. The plants slowly were damaged until the winter and once the spring came the plant does not have the root system to supply the water and nutrients to break bud. Of course the answer is Admire. But for some fields, the damage is done and it is too late. How could this have been prevented? For one thing, this situation is most devastating on young plantings so if I had planted a new field I would be watching for a grub problem very closely. In late summer after planting, and for the following couple of years also, I would watch for any plants showing any discoloration of the leaves. A grub infestation does not normally take out a field in one year but there is accumulated damage over a couple of

years. So, if a plant is seen, and all above ground diseases and insects are ruled out, I would dig the plant out of the ground and inspect the root system. If this is done carefully the plant can be replanted. It is better to dig one plant than to have to replant the entire block the following year. If grubs are found an application of Admire is warranted. Watch this newsletter for application timing.

Sincerely,

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

Editor – Blueberry Bulletin
Blueberry Bulletin – Editor
 GP/sp



INSECTS

Dr. Cesar Rodriguez-Saona,
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Mr. Dean Polk, IPM Agent – Fruit

Aphids: About 81% of samples have been positive for aphids, and 32% are above the 10% infestation level. This is an increase since last week and most of the colonies are being seen low at the crown level. Over the next week to 10 days, aphids become the main insect target for most growers.

Plum Curculio (PC) and PC Damage: Adults are being seen in 11% of samples. Overall we see 0.13 adults per sample. As expected, this is a reduction since last week. This does show, however, that oviposition is still going on, and goes along with the fact that

we are also seeing fresh egg scars. About 35% of fruit samples are positive for injury and 2% are over the 1% damage level. Many of the injured fruit have turned blue; thus, they are easy to find. This is caused from maturing larvae from the earliest eggs deposited during bloom. Some fresh damage is present even where no adults have been seen.

Putnam Scale: The first crawlers were seen in tape traps on May 29. Growers with a history of injury have an opportunity to treat at this time if using Esteem. If you wish to use Diazinon, then you should wait about 7 to 10 days for a heavier crawler emergence.

Cranberry Fruitworm (CBFW): Eggs are being deposited and early larvae are emerging. No damage is visible at this time. Population pressure as indicated by trap counts has been very low, although some late emergence has been seen on some farms. If using standard insecticides (OP's, carbamates, pyrethroids), then those applications should have been made by this week.

Cranberry Weevil: Although not a concern, second generation adults are emerging and

feeding on foliage. In time, foliar feeding may skeletonize leaves, similar to the damage caused by Japanese beetle.

Gypsy Moth (GM): About 17% of tray samples are positive for GM larvae, and none have exceeded the 1/100 cluster level. This is a big decline since last week. In blocks where GM is present, the level of activity / injury is slight. Although no aggressive feeding has been seen in mature plants, growers who have even a few GM should be aware of their presence, since large larvae will pupate on the bushes, and remain there for picking machines to harvest in processing berries.

Leafrollers and Leafroller Larvae: About 5% of tray and shoot samples have been positive for larvae. Only one sample out of 144 was over threshold. Fruit samples overall are not showing any significant injury due to feeding. Trap counts do show an increase in the Obliquebanded Leafroller flight. This is normal for this time of year. These adults will be mating and laying eggs on blueberry leaves. Larvae will emerge and be visible in mid to late June.

Stem Blight: The disease is present in a number of locations.

INSECT TRAP COUNTS

Blueberry Trap Counts – Atlantic County

Week Ending	CBFW	RBLR	OBLR	SNLH	Or. Beetle	BBM
4/5		19.9				
4/12		55.1				
4/19		72.0				
4/25		69.4				
5/2		71.6				
5/9	.009	43.6				
5/16	0.07	7.86	0.00			
5/23	0.15	1.61	0.02			
5/30	0.08	0.27	9.63			

Blueberry Trap Counts – Burlington County

Week Ending	CBFW	RBLR	OBLR	SNLH	Or. Beetle	BBM
4/5		9.3				
4/12		22.6				
4/19		19.2				
4/25		25.1				
5/2		38.0				

5/9	.09	16.2				
5/16	0.1	3.4	0.0			
5/23	0.15	0.40	1.25			
5/30	0.71	0.00	6.50			

INSECT MANAGEMENT FOR ORGANIC Highbush Blueberries

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Rutgers University

Mr. Dean Polk, IPM Agent – Fruit

We provide a list of cultural, behavioral, and chemical insect control strategies approved for organic farming in blueberries.

- 1) Regular pruning to take out old canes will remove potential overwintering sites of Putnam scale. Putnam scale overwinters as adult female under the bark of old canes. Pruning of old canes reduces overwintering population.
- 2) Practice clean cultivation and suppress weeds in and around blueberry fields. Lack of ground cover (weeds) will preclude the availability of suitable overwintering habitats for a number of pests such as cranberry weevil and plum curculio. Regular disking and cultivation of the space between blueberry rows will not only help suppress weed populations, but will also expose both overwintering and active stages of the pests to their natural enemies and high temperatures during summer.
- 3) Use pheromone traps to monitor redbanded leafroller, obliquebanded leafroller, and cranberry fruitworm populations. Pheromone traps are useful in timing the approved insecticide applications.
- 4) Entrust is a formulation of spinosad approved by the Organic Materials Review Institute (OMRI) for use on organic blueberries. This product is expected to have activity against caterpillars (e.g. cranberry fruitworm), blueberry maggot, and thrips.
- 5) GF-120 is a bait formulation containing spinosad registered exclusively for managing blueberry maggot. This formulation has proteins and sugars that are known to enhance feeding by adult blueberry maggots.
- 6) Insecticides based on *Bacillus thuringiensis* (Bts) and azadirachtin (neem plant extract) are effective against caterpillar pests. Azadirachtin-based products (e.g., Aza-Direct, Agroneem, Neemix) are more broad-spectrum and are expected to have efficacy against aphids, leafhoppers, thrips, and caterpillar pests. Rotenone is another botanical product that can also be used for managing caterpillar pests and sucking insects.
- 7) Products containing natural pyrethrum (e.g. Pyganic) are effective against blueberry maggot, the most important pest of highbush blueberries. However, not all products containing natural pyrethrum are approved for organic growing because of the presence of synergist piperonyl butoxide. Pyrethrum products formulated with petroleum-based carriers are also not permitted for organic use. Only products that contain natural pyrethrum alone without petroleum-based carriers are approved for use. Pyganic may be used also for plum curculio control.
- 8) Early maturing varieties such as Weymouth, Bluetta, and Earlyblue can nearly escape blueberry maggot infestations compared to late maturing varieties whose ripening periods synchronize with the flies' egg-laying period. The blueberry maggot flies in New Jersey typically begin laying eggs

around 20-22 June. By this date, these early varieties would have been harvested two or more times, significantly escaping infestation.

- 9) Blueberry scorch and blueberry stunt diseases are caused by blueberry scorch virus and blueberry stunt phytoplasma, respectively. Blueberry scorch is vectored by several species of aphids and blueberry stunt is transmitted by sharpnosed leafhoppers. Effective vector management and aggressive rouging of symptomatic plants are the only viable strategies available to manage these diseases at this time. The botanical pesticide sabadilla and insecticidal soap (e.g. M-Pede) can be effective against leafhoppers. Surround (for processing blueberries only) and Neemix are also registered for leafhopper control in blueberries. Aphids have several natural enemies such as lady beetles, lacewings, syrphid flies, and parasitic wasps. Populations of these natural enemies can keep this as well as other pests below economic thresholds. Insecticidal soap and Pyganic can be effective against aphids.

Shipping Certified Organic Blueberries to Canada

Several growers have asked about shipping organically certified fruit to Canada. Those growers must observe the same protocol as

other 'conventional' growers observe in order to grow and ship to Canada with respect to the control of Blueberry Maggot. Three differences in organic practices are recommended:

- 1) Growers must use specific insecticides such as Pyganic, Entrust, and GF-120 (see above).
- 2) Additional traps should be used, to cover all possible aspects of maggot fly dispersal into blueberry fields.
- 3) Organic growers may wish to stick with exporting early varieties such as Bluetta, Weymouth, and Duke. Early varieties will ripen prior to most blueberry maggot egg laying and infestation, thereby escaping most of the problem.

Additional Information

For information of organic farming visit the Northeast Organic Farming Association website (<http://www.nofa.org/index.php>); for a complete list of organic materials visit the Washington State Department of Agriculture Organic Food Program website (<http://agr.wa.gov/FoodAnimal/Organic/default.htm>).

