RUTGERS
New Jersey Agricultural Experiment Station

The Blueberry Bulletin

A Weekly Update to Growers

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BLUEBERRY CULTURE

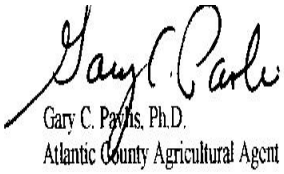
AT A GLANCE. INSECT AND DISEASE PROBLEMS THAT SHOULD BE CONSIDERED THIS WEEK

PEST/DISEASE	WEEK OF MAY 23	WEEK OF MAY 30
GROWTH STAGE	FRUIT DEVELOPMENT	FRUIT DEVELOPMENT
Anthracnose	Maintenance sprays for susceptible cultivars.	
Phytophthora Root Rot	Second application of Phosphite fungicides can begin at this time	
Plum Curculio (PC) Avaunt, Imidan, Guthion, Brigade, Mustang Max, Danitol (use the pyrethroids Brigade, Mustang Max, and Danitol at high rates and in cool conditions, i.e. below 85 ºF)	Monitor using beating trays for adults and visual inspection of oviposition scars on young fruit Treat if PC injury is present	Scout and treat hot spots if needed.
Cranberry Fruitworm (CBFW) Intrepid, Esteem, Imidan, Assail, Danitol, Delegate, Avaunt, Mustang Max, Guthion	Monitor with pheromone traps. Treat near peak flight	Continue to monitor with pheromone traps. Treat if needed, or if early fruit injury is present.
Aphids Lannate (low populations), Imidacloprid (e.g. Provado), Actara, or Assail	Scout and treat if aphids reach over 10% of terminals infested. Lannate used for CBFW will knock down aphid populations.	Treat if needed.
Leafrollers, spanworms, gypsy moth, green fruitworm	Use pheromone traps to monitor adult flight. Scout for larvae. Treat if over 1 larva/100 clusters.	Continue scouting for larvae. Use same threshold.
Brown Marmorated Stink Bug	Scout for Adults, especially near buildings and woods.	Treat is significant populations are present.

CULTURE

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

Last minute checks: It is late May and the reality is that we are only about 3 weeks away from the beginning of the 2021 harvest. We haven't had an extremely cold winter, pollination went relatively well, we have had adequate rain, and the crop load looks to be very good. Once harvest begins I realize that getting berries off the bush, getting them packed and shipped out is the top priority. Until then I would like to suggest that there are numerous things that growers should be looking for in their fields and taken care of before the big push of harvest. Insect and disease scouting is of course important now as discussed by the other articles in this newsletter, however I would like to point out a few other things that a proactive grower should be doing. For example, now is a good time to spot any nutrition deficiency symptoms including iron which would be an indication that the pH is not what it should be. There is still time to give the fields a shot of sulfur if the pH is too high. My office can do a quick pH test for any grower that suspects his/her level has climbed too high. In addition, now is the best time for fertilizer applications as the plant is actively growing and also trying to size up the berries. Please remember that applications of any micro-nutrients should only be made if leaf analysis has indicated a deficiency. Adequate boron levels will in deed increase fruit set and fruit enlargement but excessive levels will damage the plant. It is also a good time to spot stunt in the field, especially on the young canes which have come up this year. If you are not sure of what stunt looks like please call me. There is no treatment for stunt so these plants should be taken out of the planting. Plants with no leaves or very small leaves at this time of the year are an indication of some kind of root problem. Usually it is due to grubs or root rot and the timing to control these problems is critical as is an accurate diagnosis. If you suspect either of these problems, give me a call and we can diagnose the situation and the remedy. Lastly, if growers notice any abnormal leaf coloration in the field now is the time to tag the plant and get it looked at. It could be a virus, herbicide damage, etc. and understanding what the problem is can prevent further problems in the future.



Virtual Blueberry Twilight Meeting

May 27, 2021

6:00 P.M.

Look for email next week for meeting details

INSECTS

Dr. Cesar Rodriguez-Saona, Extension Specialist in Blueberry Entomology, Rutgers University
Mr. Dean Polk, IPM Agent – Fruit
Ms. Carrie Mansue Denson, IPM Program Associate – Fruit

Leps and Other 'Worms': This past week's scouting, Lep larvae averaged 0.04 per bush with a high of 0.5 larvae per bush. Most of these were green fruitworms and spanworm. Some **Gypsy Moth** were still being found in Atlantic and Burlington Counties. Gypsy moth larvae averaged 0.05 larvae per bush with a high of 1.7. The treatment threshold is 1 per bush of any combined lep larvae. With gypsy moth presence the treatment threshold should be slightly less. Overall, there were about 3 times the level of gypsy moth larvae on lower shoots than on higher shoots. Therefore, make sure your spray coverage reaches those lower shoots when treating for gypsy moth.

Plum Curculio: This past week's scouting for plum curculio showed an average of 0.68 with a high of 7.8 injured berries per bush. As the weather warms up, we may see an increase of PC activity in unsprayed fields. In a 'normal' year PC is the main pest to control in the first post pollination spray. Imidan and Avaunt are two of the main insecticide choices.

Aphids: Aphids normally start to appear a little later in the season. However, we started to see aphids starting to build up this past week. Colonies are small, with the average shoot infestation level of 3.6% of shoots infested, with a high of 40% infested. Our provisional treatment threshold is set at 10% of shoots infested with aphid colonies. Given the fact that we have recently seen an increased levels of scorch virus, it is very important to keep aphid levels down. Most aphid colonies are found on the lower shoots. The materials of choice include Actara, Assail, Admire, and Sivanto. If you are having trouble reaching the bottom shoots, then Movento may be an option (should be used with a spreader), since it moves both up and down in the bush.

Cranberry Fruitworm Traps: CBFW average per trap was 0.012 with a high of 4.

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. 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, mostly along the inside rim of the calyx cup. Eggs hatch in 5-7 days and the newly emerged larvae are pale yellowish-green. Upon hatching, larvae bore into the fruit usually near the junction of stem and

Picture 1. CBFW adult. *Photo Taken By: Zsofia Szendrei*

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 (Picture 2). 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

Picture 2. CBFW damage to developing fruit. *Photo Taken By: Zsofia Szendrei*

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 or Esteem) may be used when the first eggs are laid and 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, or Imidan), or with softer materials such as Assail, Avaunt, Altacor, Exirel, 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 should only be applied after the removal of honeybee hives.

Blueberry Trap Counts and Data Summary								
Week Ending	CBW Adults/Bush (Beating Tray)		Leps./Bush (Beating Tray)		PC/Bush (Beating Tray)		Gypsy Moth/Bush (Beating Tray)	
	Avg	Max	Avg	Max	Avg	Max		
4/9	2.1	21	-	-	-	-		

4/16	1.5	6.6	-	-	-	-		
4/23	-	-	0.014	0.1	0	0		
4/30	-	-	0.008	0.1	0.017	0.4	0.014	0.4
5/7	-	-	0.023	0.2	0.061	0.7	0.049	1.5
5/14	-	-	0.04	0.5	0.03	0.6	0.05	1.7

Week Ending	% Leps injury to Berries		% PC injury to Berries	
	Avg	Max	Avg	Max
5/14	0.13	2	0.68	7.8
Key: CBW = cranberry weevil, Leps = Lepidoptera larvae/bush and % injured berries, PC = plum curculio adults per bush & % injured berries, CBFW = Cranberry Fruitworm adults per trap.				

Week Ending	CBFW Traps (AC)	
	Avg	Max
5/7	0.076	1
5/14	0.12	4

DISEASE

Mr. Dean Polk, IPM Agent – Fruit

Fruit IPM for 5/18/21

Peach:

Oriental Fruit Moth: First generation timings are updated below. Growers that have utilized mating disruption for OFM can focus on PC; GPA; and catfacing insect pests as described below. The timings for first generation OFM are over for all regions. Second generation timings will be in about two weeks in southern counties. Overall the adult population is low, but above the treatment threshold of 8 moths per trap on some farms in northern counties.

OFM 1st Generation Timing			
		Insecticide Type	
County/Region	Degree Days by 5/18 base 45	Conventional 1150-1200, 1450-1500	Diamide 1050-1150, 1375-1450
Gloucester – Southern	466	1st – too far off 2nd – too far off	1st – too far off 2nd – too far off
Hunterdon – Northern	393	1st – too far off 2nd – too far off	1st – too far off 2nd – too far off

Plum Curculio (PC): PC activity usually peaks about mid-May and may linger into early June. This year adult PC activity has been light, due to the cooler weather. However, this will change quickly as we move into warmer weather patterns. This may actually extend PC activity slightly later in the season. Preferred materials that offer PC control now are Avaunt, and Imidan. If using high rates of a neonicotinoid (i.e. Actara, Belay, Assail), be aware that there is a synergistic effect when used in tank mixes with DMI materials (i.e. Rally) with regard to bee toxicity. **Neonicotinoids should not be used if there are any flowering weeds in your orchard. Those flowering weeds will attract bees, which will be killed by the insecticide. The use of most of these products when bees are present is off label and therefore not legal.** If pyrethroids are being used, then high rates are advisable, since low rates often do not control PC, especially in hot weather. Where PC is a problem, growers should rotate away from pyrethroid insecticides if possible. Actara and Belay will also control PC (and GPA), but not OFM. Fresh injury and activity was seen this week in both southern and northern counties.

Green Peach Aphids (GPA): GPA colonies remain at very low levels in southern counties, and are well below treatment thresholds. If aphids are at treatment level, and your ground cover is clean of blooming weeds, a good choice that will cover catfacing insects, aphids, and plum curculio is Thiamethoxam (Actara and in VoliamFlexi). Actara will not control OFM. Examine trees for the presence of colonies by standing back and looking at the entire tree. Clusters of curled leaves will define a single colony. Count the number of colonies on ten trees and use a treatment threshold of 2 colonies/tree at petal fall to shuck split for peach, and 1 colony/tree for nectarine. If treating aphids alone then Movento @ 6 oz/A is a good non-neonicotinoid choice. Movento must be combined with a spreader/penetrant spray adjuvant. Used later during late May to early June this will also control scale. Movento will not control PC or catfacing insects. Lannate can also be used, but is not quite as effective and is a weak PC material. To date no aphids have been observed in southern county orchards.

Tarnished Plant Bugs and Other Catfacing Insects: This is the other key insect complex at this time of year. Stink bugs have been found at low levels in beating tray samples. Tarnished plant bugs will become more of an issue as temperatures warm and mowing and other ground cover activities become more common. General spray timing at this time of year should still be targeted for **Oriental Fruit Moth and/or Plum Curculio (PC).** Most OFM materials, except Altacor and Exirel, will have some efficacy for plant bugs.

Scale Insects: White peach scale (WPS) crawlers are very close to emergence in southern counties. San Jose scale (SJS) crawlers usually begin emergence about a week or ten days later,

usually late May/Early June. If you have scale infestations on your trees, it is important to note if crawlers are present, even if you treated with oil in the early spring. If crawlers are present then treatment options include Esteem, Movento, Centaur, Venerate, and Diazinon. Esteem, Centaur, Venerate and Movento should be applied at the beginning of crawler emergence. Venerate needs to be applied at the low rate of 1 qt/A. Diazinon is labeled for only one post bloom or foliar application on stone fruit (Rec = max. of 2 lb/acre of the 50W). The apple label allows up to 2 foliar applications per year as long as a prebloom application ***was not*** made. The peach label allows 1 foliar application per year. Foliar applications may cause russet on apples, but has worked in the field for scale crawlers as long as applications are made 1-2 weeks after the start of crawler emergence and again 2 weeks later. Belay and Assail are also effective against scale crawlers but may need more than one application during the emergence which typically lasts about 4 weeks for WPS and 6 weeks for SJS.

Lesser Peach Tree Borer and Peach Tree Borer: Lesser Borer adults began flying last week in southern counties. If you haven't placed mating disruption dispensers yet there is still time to get them out before the greater peach tree borer flight which usually begins in June.

Bacterial Spot: Maintain tight covers with antibiotics until pit hardening. Typical antibiotics used include various copper and oxytetracycline formulations. Full covers with at least 100 gpa are recommended around wetting periods or severe weather. No bacterial spot cankers or leaf symptoms have been observed in southern county orchards as of yet.

Peach Scab: In addition to Rusty Spot and Bacterial Spot, peach scab requires protective applications starting at petal fall. Peach scab cankers begin to expand at bloom and by shuck split begin to shed spores during wetting periods. Topsin, Topsin/Captan combinations, Flint Extra, Inspire Super, and especially Quadris Top applied at petal fall are the best materials for blocks that had scab last year. Quadris Top, Flint Extra and Topsin should be used at the high rate to suppress overwintering lesions on the wood. Quadris Top contains azoxystrobin which is phytotoxic to many apple varieties. Phytotoxic residues can remain in the tank for long periods after an application is made, even if a tank cleaner is used. ***Do not use Quadris Top or Abound in the same sprayer used for apples.*** Bravo (chlorothalonil) is also a good protectant that may be applied no later than shuck split. Captan is also helpful in cover sprays after shuck split where scab was troublesome last year. Maintain effective scab materials in cover sprays through June.

Rusty Spot: Rusty spot infections are ongoing until pit hardening. If you are using Flint Extra, Inspire Super, or Quadris Top for scab, these materials will also control rusty spot. After petal fall, maintain coverage with effective materials such as Rally, Rhyme, or potassium bicarbonate products.

Apple:

Codling Moth (CM): Biofixes for Codling moth have been set. See the chart below. Timings for codling moth treatments by chemistry are listed below.

	Codling Moth Degree Day Timing							
		Application and Insecticide Type						
County Area	Biofix	Rimon: 75-100DD + 14-17 days later		Intrepid 150 + 450 DD Diamides - Altacor, Voliam mixes: (150-200 DD) + 14-21 days later		Madex, Cyd-X, Carpovirusine, 250 DD + every 7-9 days during brood hatch (later if first spray is an IGR)	Standard Insecticides - Delegate, Avaunt, OP's, carbamates, pyrethroids 250 DD + 550 DD	
DD		75	100	150	450	250	250	550
Southern	May 2	May 6	May 13	May 16	Too far off	May 23	May 23	Too far off
Northern	April 28	May 4	May 8	May 17	Too far off	May 22	May 22	Too far off

European Apple Sawfly (EAS): Sawfly larvae began hatching sometime in the past two weeks. Damage is now visible in apple plantings. This is one of the key pests to control now, especially if you have mixed variety plantings with wooded borders. See photo at right.

Tufted Apple Budmoth (TABM): A biofix was set statewide on May 3. The first alternate middle applications for TABM will be on or about May 28 in all counties. This has been considered a minor pest in recent years. With the exception of Assail and other sucking insect materials, and granulosis virus formulations (e.g. Madex), most materials used for Codling Moth will control TABM.

Diseases: Apple Scab, Powdery Mildew, Cedar Apple Rust, are diseases of concern at this time. The NEWA scab models calculating about 100% ascospore maturity in southern counties and about 95% maturity in northern counties. No immediate infection periods are in the 5 day forecast, but a prolonged wetting period could yield a severe infection period with this many mature spores. Primary apple scab spores are released during any substantial wetting and infection period, and since most ascospores are mature, primary scab season is nearing the end in all counties. Watch the forecast so your orchard can be well covered in the event of a prolonged wetting period. Growers should continue to manage for primary scab through May

since microclimates may affect spore maturity and because it has been dry the next significant wetting may still result in a primary scab infection.

Cedar apple rust infections can occur anytime between pink and 3rd cover. Summer diseases such as rots and sooty botch are beginning to overlap with early season diseases. Most scab materials will control summer diseases. Growers who have had trouble with **bitter rot** may wish to include a phosphonate product (e.g. pro-phyt) with captan. Phosphonates contain potassium and my contribute to bitter pit so avoid the use of phosphonates on Honeycrisp until after cell division is complete, usually sometime after the thinning window has closed.

Grapes:

Diseases: Grape diseases active at this growth stage are phomopsis, powdery mildew and black rot. Disease infection periods can be monitored using the NEWA models. Choose the weather station closest to your vineyard.

Insects: Leafhoppers have been seen in a few spots. This complex is generally not of concern. Potato leafhoppers, which arrive sometime in June, can cause some minor damage. Spotted Lantern Fly nymphs are now hatching in southern counties. These nymphs do little damage and generally don't need special treatments when present. Even so, vineyards should be monitored for SLF presence and if they are found use an insecticide effective for SLF when treating for Grape Berry Moth in late June.

Scouting Calendar Tree Fruit Southern Counties

The following table is intended as an aid for orchard scouting. I t should ***not*** be used to time pesticide applications. Median dates for pest events and crop phenology are displayed. These dates are compiled from observations made since 1995 in Gloucester County. Events in northern New Jersey should occur 7-10 days later.