



New Jersey Agricultural  
Experiment Station

### *The BLUEBERRY BULLETIN*

*A Weekly Update to Growers*

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**July 18, 2011**

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

PEST/DISEASE	WEEK OF JULY 18	WEEK OF JULY 25
GROWTH STAGE	HARVEST/POST-HARVEST	
Phytophthora Root Rot	Identify declining areas of the field. Identify and correct soil moisture issues and treat with appropriate material. Do not use Ridomil until the harvest is over in the affected field	
Anthraxnose and Alternaria Fruit Rot	This disease affects damaged or ripe and over ripe fruit. Maintain 7-10 day picking interval. Fruit should be cooled after picking.	
Stem Blight	Continue scouting and pruning out symptomatic canes	
Brown Marmorated Stink Bug	Scout edge fields. Treat if adults are easily found or egg masses are present.	Scout for adults, nymphs and egg masses.
Spotted Wing Drosophila	Monitor fields and use effective materials if present.	Monitor fields and use effective materials if SWD is present.
Pyrethroids, Imidan, Malathion, Lannate, Delegate – See List		Concentrate on Elliott and other late varieties.
Blueberry Maggot	Monitor and treat if needed.	Monitor and treat if needed.
Assail, Provado, Imidan, Malathion, Diazinon, Asana, Brigade, Lannate		
Aphids	Scout and treat if over 10% of terminals are infested with live aphids.	Scout and treat if populations are high.
Lannate (low populations), Imidacloprid (e.g. Provado), Actara, or Assail		
Oriental Beetle	Monitor and treat infested areas along planted row now through post harvest, but before the end of July (7 day PHI).	Treatments should be finished by this time.
Admire Pro or generic		
Putnam Scale	Record fields where infestations exist and plan on 2 <sup>nd</sup> gen. trt. in late July to early August.	Start treatments of crawlers are present.
Esteem, Diazinon		
Japanese Beetle	Scout and treat if beetles are present and causing fruit damage. Be aware of PHI's	Scout and treat if needed.
Assail, Danitol, Imidacloprid, Mustang Max or Sevin		

**PLEASE NOTE: DUE TO UNAVOIDABLE PROBLEMS, THE NEWSLETTER WAS NOT PRINTED LAST WEEK. LAST WEEK'S ARTICLES WILL BE PRINTED AS 'PART 1' IN THIS WEEK'S NEWSLETTER.**



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**CULTURE**

*Dr. Gary C. Pavlis, Ph.D.*

*Atlantic County Agricultural Agent*

**Water Management:** Blueberries have shallow root systems that cannot use water stored deep in the soil. As a result, blueberries grow best where the soil has a high water-holding capacity. Water has been very plentiful this spring, however, hot, dry weather is in the forecast. Knowing how to efficiently supply water to blueberries is important to the health of a planting. Information about soil water-holding capacity is generally available in soil surveys. Soil texture is another clue to water-holding capacity (Table 1). In general, sandy soils hold the least amount of water. These soils must be irrigated more frequently and with less water per application than soils with a high percentage of silt and clay.

Crop rooting depth and the soil water-holding capacity are used together to determine the total water-holding capacity of the rooting volume. The capacity of the rooting volume is important in scheduling irrigation.

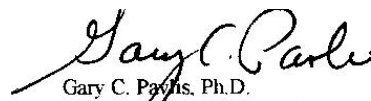
The following example shows how to determine the water-holding capacity of the rooting volume and how to use this information to schedule irrigations. In this example, assume that blueberries are planted on a sandy loam soil. Using a rooting depth of 1.5 feet, the total water-holding capacity of the rooting volume is 18 inches of soil times 0.11 inch of available water per inch of soil depth, which equals 2 inches of total water-holding capacity. The total water available in the rooting volume should not drop below 50% of the total water-holding capacity. This assures easy

access to water by the roots and prevents drought stress. Using this limit in the example, the total water available should not fall below 1 inch, which is half of the 2-inch total water-holding capacity. A blueberry plant growing vigorously in summer can evapotranspire more than 0.25 inch per day. With 1 inch of water available in the rooting volume and approximately 0.25 inch being used per day, it takes 4 days for the blueberry plant to use this stored soil water. Since the average time between rains is 5 days, irrigation is highly desirable for this soil and site under peak use conditions. In general, blueberries grown on light soils with low water-holding capacities will benefit from irrigation most years, even in the humid regions. *Reprinted: Highbush Blueberry Production Guide.*

**Table 1.**  
**Typical Water-holding capacity for various soils.**

<b>Texture</b>	<b>Water-Holding Capacity (inches of water per inch of soil)</b>
Sand	0.05
Fine sand	0.08
Sandy loam	0.11
Loam	0.16
Silt loam	0.18
Clay loam	0.19
Silty clay	0.20
Clay	0.22

Sincerely,



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

**Editor - Blueberry Bulletin**  
**GP/slp**

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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*

**Part 1 -Aphids:** Aphid populations have decreased since the previous week. We are showing 44% of

samples positive and only 11% above the 10% infestation level.

**Putnam Scale:** About 21% of fruit samples show some level of scale. Crawler traps have not started to show second generation crawlers yet, so treatments are not suggested at this time.

**Brown Marmorated Stink Bug (BMSB):** Field samples show that 14% of samples show some presence but most of the time this pest is not being seen on the fruit. Reproduction is going on in the field, and most insects have been young nymphs picked up in tray samples or 3 minute counts.

**Leafrollers and Other Lep:** Sampling shows that 11% of shoot samples are positive for worms but none of the levels were over the 5% threshold. No active fruit feeding was seen in our samples other than some old CBFW injury.

**Scarab Beetles (Japanese Beetles, Oriental Beetles):** About 30% of our samples show beetles present on bushes. There have been more frequent finds of beetle injured fruit this past week, mostly from Japanese Beetle.

**Blueberry Leafminer (BBLM):** The 2nd generation leaf mines are present in many fields but numbers are too low for concern in all locations. BBLM Teepee tents (Figure 1) are present in 22% of our shoot samples. The highest level seen was 12% infestation (12% of shoots show teepees with live larvae). However this level does merit treatment at this time.

The blueberry leafminer is generally not considered an economic pest problem mainly because larvae experience high levels of parasitism in most blueberry fields. Larval parasitism can reach levels up to 80%. Use of broad-spectrum insecticides can have a severe effect on the natural enemy populations of the leafminer. Because of potential contamination, the blueberry leafminer might be a problem if you are processing more blueberries than usual. Blueberry leafminer larvae may become a contaminant, especially in machine-

harvested fruit, as larvae drop from the bushes together with the harvested fruit. Under this special circumstance, treatment may be justified. Otherwise, we do not see the need to treat for this insect.

*Life Cycle-* Adults are small moths. There are two distinct flights: the first flight begins in late April-May and second flight beginning early July. Females lay their eggs on the underside of leaves, often more than one egg is laid per leaf. After hatching, larvae bore through the leaf epidermis and feed on plant sap, creating distinct mines. Later instars will feed on leaf tissue inside or outside the mine. The 4<sup>th</sup> instars exit the mine, fold a leaf into a tent (teepee), and will feed on the leaf tissue inside the tent (Figure 2). When mature, larvae leave the tents and pupate on the underside of the leaf. This insect overwinters on the soil as a mature larvae enclosed inside a cocoon on a senesced leaf.

**Figure 1. Teepee shelters containing blueberry leafminer larvae inside. Only 1 larva is found per leaf.**



**Figure 2. 4<sup>th</sup>-instar larva of the blueberry leafminer feeding inside a teepee.**

(See picture on following page)

**Disease:** Sampling indicates that 16% of fruit samples show some **Mummy Berry** infection, and 23% of field samples show **Anthraco**se infection, although most samples were under .5% of infected fruit clusters. The maximum level seen was at

3.7% of clusters infected. We are also showing that 10% of field samples show some level of **Alternaria** infection. Growers should also be aware of new **Stem Blight** infections, since fresh flagging was visible at a number of new locations this past week.



### Part 2 - Brown Marmorated Stink Bug

**(BMSB):** Field monitoring shows that 14% of samples are positive mostly with nymphs. Less than half of our traps have been catching any insects, and those that are have only low numbers. While most fields show low numbers, one site which was machine picked, showed nymphs being brought in on the picking flats. Most insects were being blown out on the packing line. However, this shows that even perceived small populations may be troublesome. Growers may wish to consider a knockdown material prior to picking if BMSB is present. Hero, Brigade, and Mustang have a 1 day PHI, Danitol – 3 day PHI.

**Spotted Wing Drosophila (SWD):** This is a new invasive pest that we picked up on July 7. Please see the accompanying article on Spotted Wing Drosophila. Any grower with Elliott plantings, or other late varieties, should be aware of this pest. Many growers have asked what materials work best against this insect. The following table is derived from research, primarily at Oregon State University:

Laboratory bioassays done at MSU showed that Asana, Brigade, Danitol and Mustang-Max were all highly active, but that Danitol was slightly slower acting than the other 3 pyrethroids. Imidan and Malathion were also very active (inserted into the table above). Lannate was more effective than Sevin; and the neonicotinoids (Actara, Assail, Provado) were all less active.

Product	Rating
Carbaryl (Sevin)	G
Lannate	E
Imidan	G-E
Diazinon	E
Malathion	E
Delegate	E
Entrust	G-E
Asana	E
Brigade	E
Danitol	E
Mustang	E
The neonicotinoids, Assail, Provado, and Actara were rated as fair (F)	

While we have about 60 SWD traps in blueberries, growers may wish to supplement with additional traps in Elliott plantings. It is always a good idea to make sure you have a specific pest prior to initiating special treatments. But in general, if you have been accustomed to using the neonics (Assail, Actara, Provado) for blueberry maggot control, now may be a good time to move away from those materials in favor of something more active for SWD.

**Blueberry Maggot:** Adult flies are being caught over a wide area at slightly increased numbers. Growers with Elliott should be aware of any fly activity and treat accordingly.

**Putnam Scale:** Fruit sampling indicates that 30% of fruit samples show some level of scale presence. Crawler traps are still inactive but we expect that

the next crawler emergence will start later this month or early in August. Growers who have had berry infestations should plan on a second generation treatment at that time.

**Leafrollers and Other Leps:** Monitoring shows that 9% of beating tray and shoot samples have low levels of worms. None have been close to threshold.

**Blueberry Leafminer (BBLM):** A few sites are showing a sharp increase in tents with live larvae. Overall, 24% of our shoot samples have some tents, and the maximum level seen was at 54% infested shoots.

**Aphids:** Scouting indicates that 26% of shoot samples were positive for aphids, but only 2% of samples were over the 10% infestation level. This is a sharp drop since last week. Overall, aphids should no longer be treated.

**Plum Curculio (PC):** Adults are being seen in beating tray samples, with 4% of samples being

positive. No fresh egg scars are being seen. These are likely a second generation of adults. This should not be an issue in blueberries, but the population may be troublesome on tree fruit.

**Japanese Beetles:** Scouting results show that low levels of feeding are still present. This should not be a concern, since most Bluecrop are being machine harvested for processing, and very little activity has been seen on Elliott.

**Cranberry Fruitworm and CBFW Injury:** We can still find some injury from this pest. On average, 18% of fruit samples show low levels of injury, which is similar to last season. This year, some trap captures extended later into the season, likely resulting in some later egg laying and larval development.

**Disease:** Field sampling shows that 22% of samples with **Anthraco**se, and 9% with **Alternaria**.

## INSECT TRAP COUNTS

### Blueberry Trap Counts – Atlantic County

Week Ending	CBFW	RBLR	OBLR	SNLH	Or. Beetle	BMSB	BBM
4/9		27.3					
4/16		71.2					
4/22	0.0	76.2					
4/30	0.0	70.6					
5/7	0.13	31.7					
5/14	0.4	12.4				0.0	
5/21	1.7	0.1				0.0	
5/28	0.8	0.0	6.7			0.0	
6/4	0.3	20.1	24.9		3.8	0.0	
6/11	0.3	67.6	18.5	0.4	205.1	0.0	0.0
6/18	0.2	61.1	8.9	0.6	538.0	0.0	0.1
6/25	0.1	51.5	2.8	0.8	1145.0	0.0	0.2
7/2	0.0	38.9	1.3	0.7	838.1	0.1	0.4
7/9	0.0	22.0	0.5	0.6	695.0	0.3	0.4
7/16	0.0	17.1	8.2	0.5	291.6	0.4	0.7

### Blueberry Trap Counts – Burlington County

Week Ending	CBFW	RBLR	OBLR	SNLH	Or. Beetle	BMSB	BBM
4/9		6.0					
4/16		22.8					
4/22	0.0	28.2					
4/30	0.0	19.8					
5/7	0.0	12.3					
5/14	0.1	2.5				0.0	
5/21	0.1	0.1				0.0	
5/28	0.1	0.0	5.8			0.0	
6/4	0.4	0.2	29.3		0.0	0.0	
6/11	2.1	8.5	40.7	3.4	28.9	0.0	0.0
6/18	0.5	24.8	25.7	3.0	447.7	0.0	1.1
6/25	0.2	34.2	10.5	2.3	1363.2	0.0	2.3
7/2	0.0	21.0	0.8	1.2	1061.7	0.0	0.4
7/9	0.0	4.4	0.1	0.7	1161.0	1.7	0.3
7/16	0.0	3.3	3.0	0.4	664.2	2.3	0.5

### INVASIVE PEST WARNING

#### SPOTTED WING DROSOPHILA – A *POTENTIAL* PEST OF NEW JERSEY BLUEBERRIES and OTHER SOFT FRUIT

*Dr. Cesar Rodriguez-Saona, Extension Specialist in Blueberry Entomology, Rutgers University*  
*Mr. Dean Polk, IPM Agent – Fruit*

Two weeks ago (7 July), we found the first adults of the Spotted Wing Drosophila in blueberry farms in New Jersey. Spotted Wing Drosophila (*Drosophila suzukii*) is an insect pest of fruit that has spread from California in the past two years to Oregon, Washington, British Columbia, North Carolina, South Carolina, Michigan, Virginia, and Florida. The greatest potential impact is expected to be in blueberry, peach, cherry, strawberry, raspberry, and blackberry crops because soft-fleshed fruit are easier for the flies to lay eggs in and for larvae to develop. This pest has also been reared out of other fruit crops, and from berries of wild plants.

Spotted Wing Drosophila flies are small, around 2.5-3 mm in length, with light brown bodies and darker brown bands on the abdomen. Adults have characteristic bright red eyes, and the males have a prominent dark spot on each wing that can be easily seen with a hand lens (Figure). Females are less distinctive, but their serrated ovipositor is a distinguishing feature. This fly is native to Asia and is also reported in Hawaii.

Currently, the fruit IPM program is monitoring traps placed in several blueberry fields and vineyards. Trapping results and insect identification is being done at the Rutgers P.E. Marucci Center in Chatsworth. Results from these monitoring efforts will be provided in future newsletters and at grower meetings.

Spotted Wing Drosophila is not a true fruit fly like blueberry maggot or cherry fruit fly. It is a vinegar fly similar to the other small flies that infest ripe fruit during the summer, but with some important differences. This species attacks intact fruit, using the saw-like ovipositor to lay eggs under the skin. Also, female flies can lay hundreds of eggs and this species develops quickly, completing a life cycle in about three weeks during our typical summer temperatures, allowing buildup of the populations through the season. Although these facts make the *potential* impact high, our fruit crops are managed already using IPM programs for other pre-harvest insect pests such as blueberry maggot. This, coupled with our cold winters, is expected to provide some level of resilience against Spotted Wing Drosophila.

At this time, we recommend that growers, scouts, consultants, and processors become educated about Spotted Wing Drosophila and what signs to look for in ripe fruit. A good central source for information on this pest has been developed by Oregon State University, available online at [swd.hort.oregonstate.edu](http://swd.hort.oregonstate.edu). If larvae are found in fruit that are suspected of being Spotted Wing Drosophila, samples should be given to the Fruit IPM Program (Dean Polk at 609-902-1134, e-mail: [polk@aesop.rutgers.edu](mailto:polk@aesop.rutgers.edu) or Gene Rizio at 609-313-2406, e-mail: [rizio@aesop.rutgers.edu](mailto:rizio@aesop.rutgers.edu)), or brought to the Rutgers P.E. Marucci Center, 125A Lake Oswego Rd., Chatsworth, New Jersey (attn: Cesar Rodriguez-Saona), or contact Cesar Rodriguez-Saona at (609)-726-1590 ext. 4412 (email: [crodriguez@aesop.rutgers.edu](mailto:crodriguez@aesop.rutgers.edu) ).

We will make further updates on trapping results through the Blueberry Bulletin and the Plant and Pest Advisory-Fruit Edition.

**Photo: Adult male fly of Spotted Wing Drosophila, showing the distinctive wing pattern. Photo: University of California.**



### ***Rutgers IR-4 Minor Use Pesticide Testing Program***

***Dr. Cesar Rodriguez-Saona, Extension Specialist in Blueberry Entomology, Rutgers University***

This year, the IR-4 Food Use Workshop will take place in Raleigh-Durham/Research Triangle, September 13 – 14. For information about the workshop please visit <http://ir4.rutgers.edu/FoodUse/FUWorkshop/index.html>.

New projects can be submitted August 17-30 through the IR-4 website (<http://ir4.rutgers.edu/>). Proposed project needs will be discussed at the workshop in September. If you would like to submit a project, visit the IR-4 website listed above and click on “Submit a Request”.

Let me know if you are submitting a request, and whether you plan to attend the meeting. That way I will be aware of projects submitted and attendees from New Jersey, and be better prepared to support your requests.

Please feel free to contact me if you have any questions at 609-726-1590 x 4412, or e-mail: [crodriguez@aesop.rutgers.edu](mailto:crodriguez@aesop.rutgers.edu)

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## ***BLUEBERRY BULLETIN***

If you have any comments about this newsletter, please make them in the space below and mail to:

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

I would like to comment on the following articles: \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_

Comment: \_\_\_\_\_

\_\_\_\_\_

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