RUTGERS
New Jersey Agricultural Experiment Station

The Blueberry Bulletin

A Weekly Update to Growers

June 18, 2020 **Vol. 36, No. 13**

- *Visit the Blueberry Bulletin webpage at njaes.rutgers.edu/blueberry-bulletin*
- *The 2020 Commercial Blueberry Pest Control Recommendations for New Jersey is available on njaes.rutgers.edu*

BLUEBERRY 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. 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.

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

Texture	Water-Holding Capacity (inches of water per inch of soil)
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

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.*

BLUEBERRY INSECT

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

Spotted Wing Drosophila (SWD): Trap captures are starting to increase as 'Duke' starts to harvest and 'Bluecrop' starts to turn. The best insecticide choices include any pyrethroid (Asana, Brigade/Bifenture, Danitol, Mustang Maxx, Hero), Imidan, Delegate, Assail but not other neonics, Lannate, Malathion, Exirel and Verdepryn. Assail **is not** suggested as populations increase.

Recent Rain Patterns and Insecticide Use
Given our recent periods of rainy weather, many growers are questioning the need for repeated applications, and the weatherability of the materials already applied. Dr. John Wise at MSU has been studying the residual properties of insecticides for a number of years. In 2018, Dr. Wise published an update on his work on the MSU blog. As noted in the article "rainfastness" of insecticides is influenced by the crop type and time between application and rainfall, in addition to other factors. Below we have reproduced the charts for various fruit crops. We encourage the reader to visit the site and read the full article.

Rainfastness rating chart: General characteristics for insecticide chemical classes						
Insecticide class	**Rainfastness ≤ 0.5 inch**		**Rainfastness ≤ 1.0 inch**		**Rainfastness ≤ 2.0 inches**	
	Fruit	**Leaves**	**Fruit**	**Leaves**	**Fruit**	**Leaves**
Organophosphates	Low	Moderate	Low	Moderate	Low	Low
Pyrethroids	Moderate/High	Moderate/High	Moderate	Moderate	Low	Low
Carbamates	Moderate	Moderate/High	Moderate	Moderate	Low	Low
IGRs	Moderate	Moderate/High	Moderate	Moderate	Low	Low
Oxadiazines	Moderate	Moderate/High	Moderate	Moderate	Low	Low
Neonicotinoids	Moderate, Systemic	High, Systemic	Low, Systemic	Low, Systemic	Low, Systemic	Low, Systemic
Spinosyns	High	High	High	Moderate	Moderate	Low
Diamides	High	High	High	Moderate	Moderate	Low
Avermectins	Moderate, Systemic	High, Systemic	Low,Systemic	Moderate, Systemic	Low	Low

Highly rainfast = ≤ 30% residue wash-off
Moderately rainfast = ≤ 50% residue wash-off
Low rainfast = ≤ 70% residue wash-off
Systemic = Systemic residues remain within plant tissue

Blueberry insecticide precipitation wash-off re-application decision chart. Expected spotted wing Drosophila control in blueberries, based on each compound's inherent toxicity to SWD, maximum residual and wash-off potential from rainfall.						
Insecticides	**Rainfall = 0.5 inch**		**Rainfall = 1.0 inch**		**Rainfall = 2.0 inches**	
	***1 day**	***7 days**	***1 day**	***7 days**	***1 day**	***7 days**
Imidan	Sufficient insecticide residue	Insufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Mustang Max	Sufficient insecticide residue	Insufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Lannate	Sufficient insecticide residue	Insufficient insecticide residue	Sufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Malathion	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Delegate	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue
Assail	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue	Insufficient insecticide residue

**** Number of days after insecticide application that the precipitation event occurred.***
Insufficient insecticide residue = Insufficient insecticide residue remains to provide significant activity on the target pest, and thus an immediate re-application is recommended.
Sufficient insecticide residue = Sufficient insecticide residue remaining to provide significant activity on the target pest, although residual activity may be reduced.

Insecticide persistence, plant penetration and rainfastness rating			
Compound class	**Persistence (residual on plant)**	**Plant penetration characteristics**	**Rainfast rating**
Organophosphates	Medium - Long	Surface	Low
Carbamates	Short	Cuticle Penetration	Moderate
Pyrethroids	Short	Cuticle Penetration	Moderate - High
Neonicotinoids	Medium	Translaminar & Acropetal	Moderate
Oxadiazines	Medium	Cuticle Penetration	Moderate
Avermectins	Medium	Translaminar	Moderate
IGRs	Medium - Long	Translaminar	Moderate
Spinosyns	Short - Medium	Translaminar	Moderate - High
Diamides	Medium - Long	Translaminar	Moderate - High

We have also added a summary of insecticides and SWD activity by chemical class below:

Examples of Insecticides by Chemical Class and SWD Rating			
Chemical Class	Trade Name	SWD Rating	Blueberry Use
Organophosphates	Imidan	++++	Yes
	Malathion	+++	Yes
Carbamates	Lannate	++++	Yes
	Carbaryl	++	Yes
Pyrethroids	Asana	+++	Yes
	Brigade/Bifenture	+++	Yes
	Danitol	++++	Yes
	Hero	++++	Yes
	Mustang	++++	Yes
Neonicotinoids	Actara	-	Yes
	Admire	-	Yes
	Assail	++	Yes
Oxadiazines	Avaunt	-	Yes
Avermectins	Gladiator	+++	**Not Labeled**
IGRs	Confirm	-	Yes
	Esteem	-	Yes
	Intrepid	-	Yes
	Rimon	-	Yes
Spinosyns	Delegate	+++	Yes
	Entrust	++	Yes
Diamides	Altacor	-	Yes
	Exirel	++++	Yes
	Verdepryn	++++	Yes
METI	Apta	++	Yes
Lipid biosyn. Inhibitor	Movento	++	Yes

Aphids: Aphid infestation levels stabilized over the past week, with some decreases where populations were treated. Our averages were just over 4% of terminals (mostly new canes) infested, with a high of 76% on the lower shoots. Some aphid materials such as Actara and Movento can be effective for scale (see below), but these are not effective for SWD.

Putnam Scale: Scale crawlers have been active over the last couple of weeks. Growers should take note if any berries have scale on them (see Figure 1), and which fields they come from. There are practically no scale insecticides that also control SWD. The one exception is Diazinon, but that can be only used once per season and has a 7 day PHI. Coverage is also key, so ground applications are required for adequate scale crawler control. Since this insect has 2 generations per year, it is wiser to note the fields that will need treatments and plan on treating

Figure 1. Putnam scale recently settled on ripening fruit. Photo - Carrie Denson.

those fields in early August when the second generation crawlers are active.

Oriental Beetle (OB): Oriental Beetle adults started to emerge last week. Most trap captures as of this writing are now over 100 adults per trap. These insects are now mating and laying eggs. Any grower who has fields with significant populations should be treating for this insect with either Admire or mating disruption (which should already be placed on the bushes). There is a 7 day PHI for Admire use, and treatments must be applied prior to mid-July.

Oriental Beetle Mating Disruption

As an alternative to insecticides, we recommend the use of mating disruption for oriental beetle control. Dispensers (see Figure 2), containing the oriental beetle sex pheromone, are now available to growers. These dispensers are being sold by AgBio:

Mr. Jan Meneley, Ph.D.
AgBio Inc.
9915 Raleigh St.
Westminster, CO 80031
www.agbio-inc.com
ph 303-469-9221
fx 303-469-9598

Figure 2. Retrievable AgBio dispensers

To use, simply attach the dispensers to a lower blueberry branch at a density of 20-40 dispensers per acre in a grid pattern, depending on the size of the area to be treated. Please see label for information on restrictions, spacing, timing, etc.

By the Numbers:

% Injury Fruit						
Week Ending	% LEPS Injured Fruit		% PC Injury Fruit		% Scale	
	Avg	Max	Avg	Max	Avg	Max
5/11	0.05	0.1	0.2	0.3		
5/18	0.06	0.8	0.13	1.4		
5/25	0.122	1.1	0.43	3.8		
5/30	0.17	1.4	0.70	5.6		
6/6	0.122	1.1	0.43	3.8		
6/13	0.01	0.4	0.001	0.4	0.005	0.1

Traps												
Week Ending	CBFW-AC		CBFW-BC		SWD-AC		SWD-BC		OB-BC		OB-AC	
	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
5/11	0.1	1	0	0								
5/18	0	0	0	0								
5/25	0.1	1	0.25	1	0.8	7	0	0				
5/30	0	0	0.25	1	.75	5	.55	1				
6/6	5.5	34	0.75	3	2	8	2.1	5				
6/13	5.6	22	3.5	8	4	14	7.7	20	3.2	11	18	340
PC = plum curculio; CBFW = cranberry fruitworm; SWD = spotted wing drosophila; OB = oriental beetle												