

The Blueberry Bulletin

A Weekly Update to Growers

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- ❖ Visit the Blueberry Bulletin webpage at njaes.rutgers.edu/blueberry-bulletin
- ❖ The 2024 Commercial Blueberry Pest Control Recommendations for New Jersey is available on <https://njaes.rutgers.edu/pubs/>

BLUEBERRY CULTURE

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

Tips on Protecting Blueberries from Freezes:

- Dew point is important because water vapor slows the rate of temperature drop during a freeze.
- A low dew point is always worse than a high dew point. Dry air loses heat faster.
- Wind can be bad or good during a freeze.
- Bad - If overhead irrigation is being used, wind is a serious problem.
- Good – If water is not being applied, the wind prevents a cold pool of air.
- Pine mulch results in lower air temperatures at the flower level by as much as 3 degrees.
- Dry soil and any weeds, alive or dead, lower the temperature in the field.
- Wet soil has been reported to conduct heat from the warm depths of the soil to the cold surface eight times greater than dry soils.
- Applying irrigation either from overhead or trickle before the freeze event has been found to be beneficial.
- **Table 1.**
- **Suggested overhead irrigation application rates for cold protection of blueberries under different wind and temperature conditions**

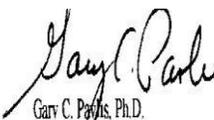
Minimum temperature expected

Wind speed (miles per hour)

0-1 2-4 5-8 10-12

Application rate (inches per hour)

27°F	0.10	0.10	0.2	0.2
26°F	0.10	0.10	0.2	0.2
24°F	0.10	0.16	0.3	0.4
22°F	0.12	0.24	0.5	0.6
20°F	0.16	0.3	0.6	0.8
18°F	0.20	0.4	0.7	1.0
15°F	0.26	0.5	0.9	---


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PEST MANAGEMENT

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

Dr. Janine Spies, IPM Agent – Fruit

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During the week of April 15th–19th, 61 fields were scouted throughout Burlington and Atlantic Counties. **Cranberry Weevil (CBW)** was reported to have a maximum of 12.5 and an average of 1.4 adults per 15 bushes per field site. Among the 61 fields surveyed, 4 fields reached the treatment threshold; however, given the presence of pollinators in the field, insecticide applications are NOT recommended at this time. Furthermore, CBW is expected to no longer pose a concern, so any treatments should be postponed until next year.

Leafrollers (LR), Spongy Moth (SM) and Plum Curculio (PC) were scouted as well in the 61 fields. We have observed some PC activity (see Figure 1), with a maximum of 1.5 and an average of 0.16 adults per 10 bushes per field site. At this point, we do NOT recommend insecticide applications until pollinators have removed from fields.

Plum curculio (PC). PC is a native pest of blueberries in North America. In New Jersey, adults overwinter in leaf litter and become active in late April to early May (this time of year), when they move to blueberry fields to mate. Peak activity is typically observed at the end of flowering and the beginning of fruit set. Females lay eggs on the fruit, creating a crescent-shaped scar at the oviposition site. Inside the fruit, one larva develops until it is ready to pupate, at which point it drops to the soil and emerges as an adult in July and August. Newly emerged adults may feed on mature fruit before moving to overwintering sites.



Figure 1. Plum curculio adult. Photo by: Karlton Neidigh

Damage. PC adults feed on both the flowers and developing fruits, particularly immediately following petal fall. Fruit damage occurs in two forms: cosmetic damage when the adult female oviposits and leaves a scar, and internal damage as the larvae feed inside the fruit. Larval feeding can also lead to premature fruit development and subsequent dropping to the ground. In early-maturing varieties, fruit may be harvested before dropping, leading to rejections due to zero tolerance for PC in blueberries.

Management. Insecticides targeting adult PC can be applied once commercial honeybees have been removed from blueberry fields. The primary insecticides recommended for PC control in blueberries are Avaunt and Imidan. Entomopathogenic nematodes (EPNs) can also be used for control of PC larvae in the soil. Recently, we tested four commercially available EPNs—*Steinernema feltiae*, *S. carpocapsae*, *S. riobrave*, and *S. scarabaei*—against PC larvae. Emergence traps, baited with PC-infested berries, indicated that *S. riobrave* was the most effective at reducing adult emergence and could persist in the soil for up to 21 days in the field.

A commercially available product containing *S. riobrave*, named NemAttack (ARBICO Organics), is now available (note that other EPNs are sold under the same name, so it's important to check the product information to ensure you're purchasing the correct EPN).

Future research is needed to determine optimal method and timing of EPN application. Please consult with us if you are interested in tested EPNs for PC control.

Week Ending	CBW Adults/Site		LR/Tray		SM/Tray		PC/Tray	
	Average	Maximum	Average	Maximum	Average	Maximum	Average	Maximum
4/6	0.42	8.8	.	.	.	.	.	.
4/13	0.59	10.6	.	.	.	.	.	.
4/19	1.4	12.5	0.01	0.2	0.006	0.2	0.03	0.3

CBW = Cranberry Weevil, LR = Leafrollers, SM = Spongy Moth, PC = Plum Curculio

Cranberry Fruitworm (CBFW) and **Cherry Fruitworm (CFW)** traps were checked this past week as well. Some minimal activity for CFW males in Atlantic County traps was reported.

Week Ending	CBFW Traps				CFW Traps			
	AC AVG	AC Max	BC AVG	BC Max	AC AVG	AC Max	BC AVG	BC MAX
4/19	0	0	0	0	0.44	2	0	0

AC = Atlantic County, BC = Burlington County, CBFW = Cranberry Fruitworm, CFW = Cherry Fruitworm

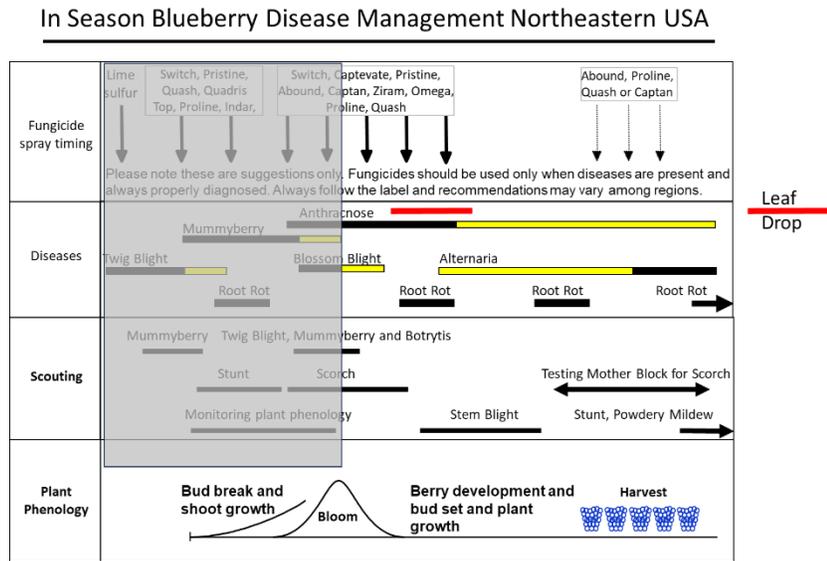
DISEASES

Dr. Peter Oudemans, Professor and Extension Specialist, Plant Pathology

At A Glance

Timing	Leaf Drop	Mummy berry	Anthracnose
Week of April 24	N/A	declining	Continue (7-10 day interval)
Material	N/A	Quash or Switch	Ziram/Abound
Week of May 1	N/A	N/A	Continue (10-14 day interval)
Material	N/A	N/A	Ziram/Abound
Week of May 8	Spray preventative	N/A	Continue (7-10 day interval)
Material	Quadris Top, Quash, Proline, Cevya	N/A	

Where we are in the season. Blueberry bloom is progressing and hopefully the bees continue to do their work. Weather forecasts predict at least one more good frost and see Garys article for frost control methods. The figure above is a reminder of where we are in the season and what you should be looking forward to. For the next few weeks the focus will be on **Anthraco**se. If pollination slows down due to wet weather, frosts, or cool temperatures **Botrytis** will likely arise. I expect mummy strikes should also begin this week and if they occur on your farm you should spray for the secondary phase of **Mummyberry**. Also **Phomopsis** symptoms will begin in the next couple of weeks.



Disease management choices: A few notes on abound (and the generic materials). Always read the label. For Abound use we are limited to 4fl.oz./acre/year. Therefore reducing to 14 fl.oz. per application will give you a third possible spray. Remember the Ziram preharvest interval is 30 days and it is looking like a June 10 (on average) picking date.

Understanding the target: The fungus causing anthracnose overwinters to a large extent in the scales surrounding the flower clusters. As the clusters open the fungus grows out of the scales, down the pedicel and penetrates the ovary of the developing flower. In the photos on the right you can see the position of the bud scales and ovaries from earlier this week. Bud scales on Duke are beginning to drop and disease pressure is declining. Bluecrop are still hanging on.



To “Gib” or not to “Gib”?

With the series of frosts over the past two weeks the question that has come up repeatedly concerns the use of gibberellin to promote fruit set. The basis for this question lies in the knowledge that soon after pollination has occurred the flower transforms from a non-growing state to rapidly developing fruit. Production of gibberellin is triggered by pollination and it, in part, is responsible for this transformation. Applications of gibberellin can also trigger this change from non-growing or static state to fruit development in the absence of pollination.

Research has demonstrated that gibberellin application can significantly increase fruit set under a variety of conditions. This increase in fruit set often comes with a reduction in fruit size, seed number and stemmy fruit as well as a delay in ripening. As a result, the cost of the application may not always justify the benefit. However, there are several known factors that play into the successful use of gibberellins. These factors include timing, rate, number of applications and conditions during and after application. There is also considerable variation in the level of success with these materials. Researchers in Georgia (NeSmith and Krewer) and Michigan (Hansen) have lead investigations on the use of gibberellin and recommendations have been developed from that work.

The benefit, especially with frost affected flowers, is that gibberellin application can help set flowers that would otherwise be incapable of being pollinated. Although, even flowers with damaged ovaries have been shown to make fruit, as the severity of the damage increases the likelihood for marketable fruit declines.

For a gibberellin application to be effective applications should be made during peak bloom and shortly following a frost event. If you use Gib regardless then it should be timed to full bloom. A second application can be made again 10-14 days later but read the label for rates. Since this application can inhibit natural pollination an assessment should be made on the level of damage and if the application should be delayed until bee pollination has reached a desired level. The first application should be made in-bloom since post bloom applications are much less effective and could have undesirable side effects. Rates are provided on the label and should not exceed 80 g ai/acre total (ie. 2 applications of 40g or one of 80g). For the material to be active there must be sufficient contact time with the plant to be taken up. Up to 50% activity is achieved within the first 4 hours of contact and the remaining activity is taken up over the next 72hrs. Any wash-off prior to this time may require re-application. Applications should be made in sufficient water to fully wet the plant and the water diluent should be between pH 4-8.5.

Keep in mind that gibberellin is a very potent growth regulator that is involved in a diversity of functions in the plant. This ranges from fruit thinning, flower bud suppression, shoot elongation, as well fruit sizing. These different effects are achieved with different rates and timing of application. It is therefore critical to use optimal timing.