To “Gib” or not to “Gib”?

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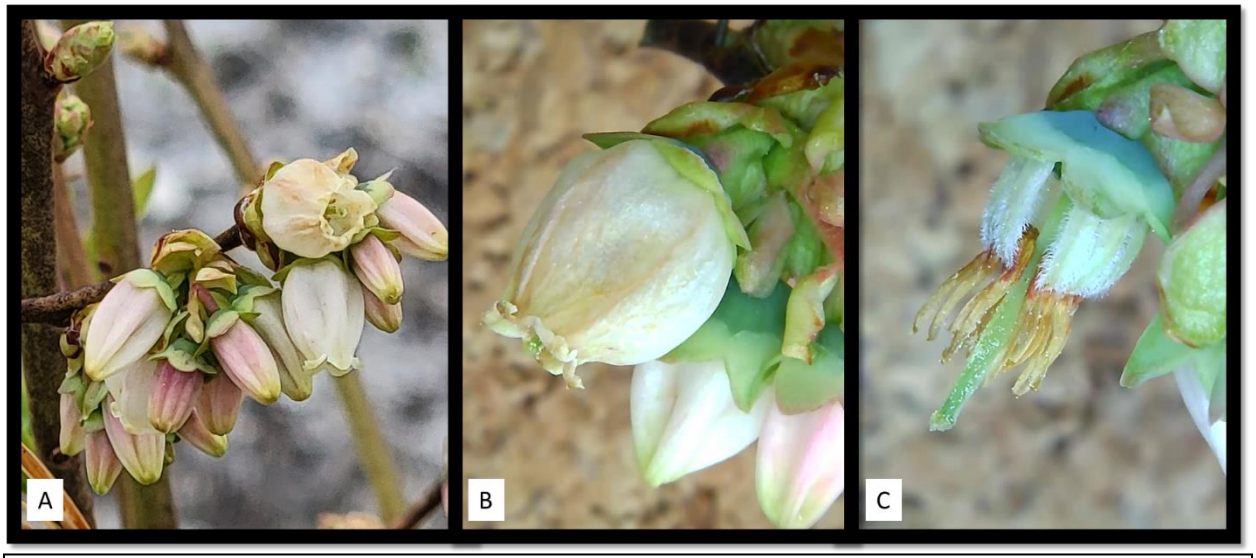


Frost damage in blueberries (April 18, 2022). Temperatures as low as 24F were experienced in our Duke field here in Chatsworth. Others experienced even lower temperatures. The temperature tolerance chart (at the end of this article) suggests that open bloom will see damage whereas closed flowers are more tolerant. The photos suggest this is true. Open bloom was damaged although stigmas seem intact at this location and will probably make fruit. Closed flowers basically in good shape.

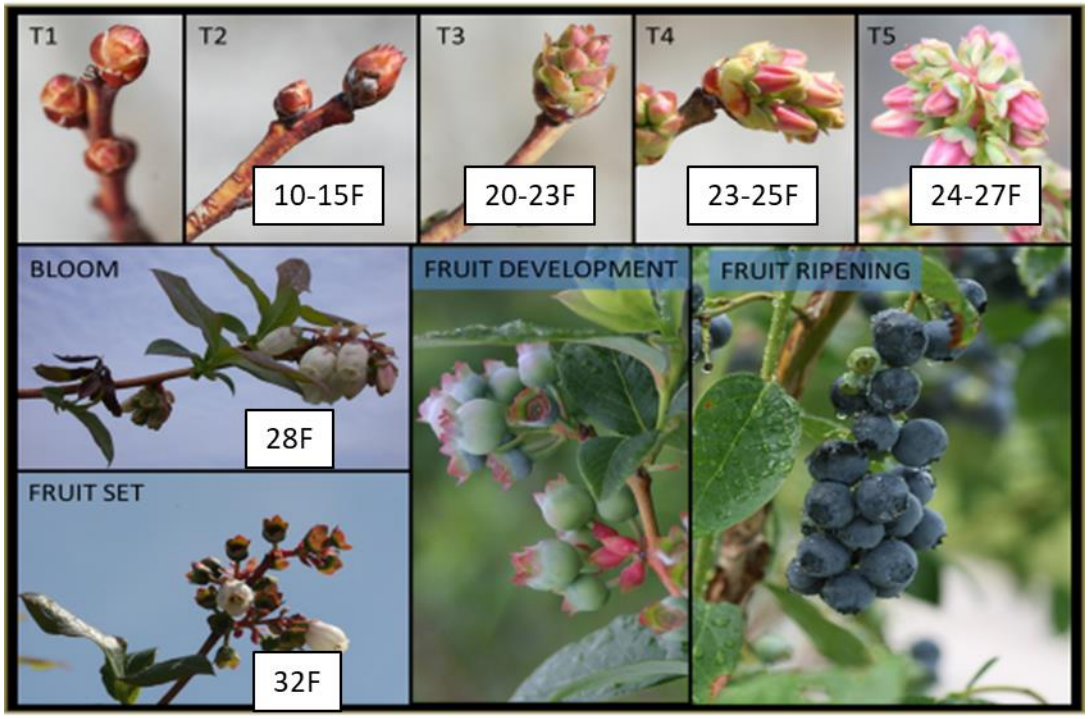
With the frost over the past week the question concerning the use of gibberellin to promote fruit set. The basis for this question lies in the knowledge that soon after pollination has occurred the flower transforms from a non-growing state to rapidly developing fruit. Production of gibberellin is triggered by pollination and it, is in part, 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. So given the amount of open bloom vs closed bloom what should you base your decision on?

(From my newsletter article 2020) 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 shortly following a frost event and again 10-18 days later. 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.



Development chart for blueberries showing the critical temperatures for bud damage. Critical temperature data is from Michigan State University (https://www.canr.msu.edu/blueberries/weather/critical-spring-temperatures

PEST MANAGEMENT

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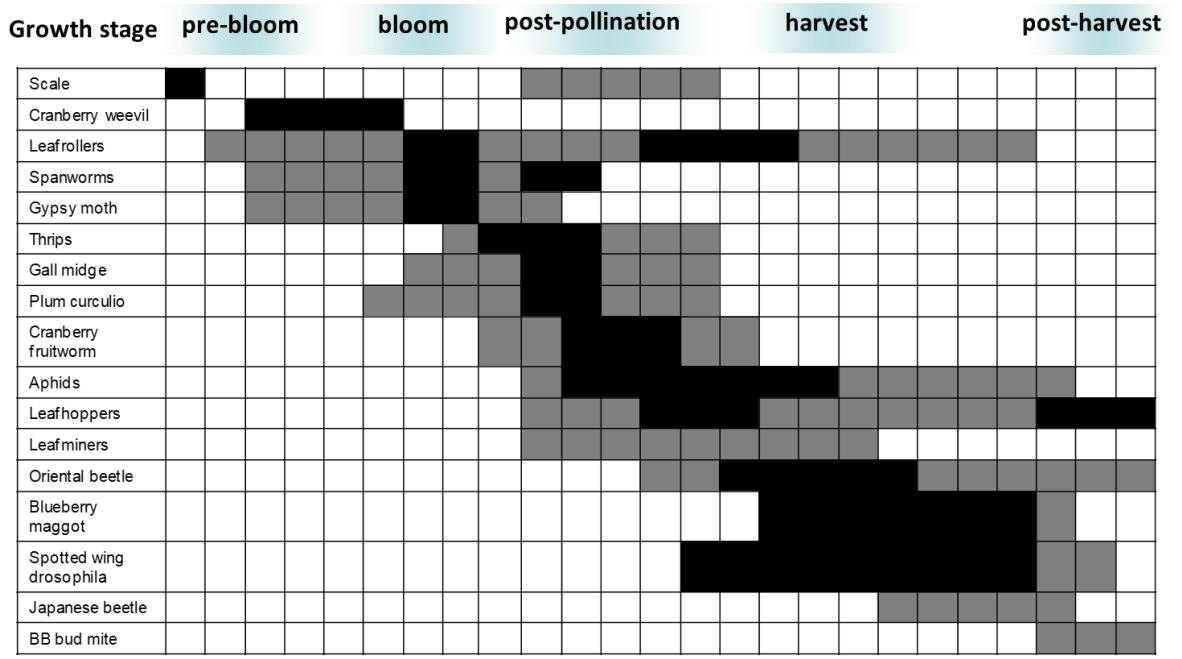
The Table below shows the activity periods of insect pests of blueberries in New Jersey. Bars show the period when scouting (in grey) and management (in black) of the pest is most important.



Cranberry Weevil

During the week of 4/10-16 there a few sites where treatment of cranberry weevil was needed. All activity was recorded in Atlantic County. However, one plum curculio and a few spanworms were also seen. A summary of survey results is below. During this past week of scouting, weevil adults averaged 2.07 per bush with a high of 13.3. About 40% of our samplers near wooded areas have been above treatment levels.

Cranberry Weevil on a Blueberry Flower Bud (Photo by D. Polk)

Week Ending	Adults/Bush (Beating Tray)	
	Avg	Max
4/15	2.07	13.3

Life cycle: Adults move from wooded areas, where they overwinter, into the fields; however, adults occasionally overwinter inside blueberry fields if left unmanaged. The adults are small (1/16 inch long), dark reddish brown beetles, with few whitish bands on the wings, and a long snout. Eggs are laid singly through the feeding holes into the flower. Larvae feed from egg hatch to pupation within the flower buds in which they were deposited as eggs. Pupation occurs within the infested flowers and adults emerge in late May. Infested flowers turn purplish, fail to open, and eventually fall to the ground.

Cranberry Weevil feeding injury to buds
Photo by D. Polk

Scouting and Control: To monitor adults, use a beating tray under each bush and hit the bush to dislodge weevils; repeat on both sides of the bush to obtain number of weevils per bush. Because weevils are abundant near the woods where they overwinter, sampling for weevils should be intensified along the edge rows near the woods. Adults are found on sunny days. Monitor at least 10 bushes per sample site. Spraying should be confined to these "hot" spots on edge rows. Treatment thresholds are 5 weevils per bush or 20% of blossom clusters with feeding injury (i.e., at least 1 injury/puncture per 5 clusters). Asana, Avaunt, Imidan, or Mustang Max are recommended for cranberry weevil control.