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## Periodical Cicada Management on Blueberries

As we await the emergence of Brood X of the periodical cicada this year, it's time to think about what steps you might take to protect your small fruit plantings.

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**Figure 1. Oviposition wounds on a blueberry stem, July 14, 2004.**

**Photo: Kathy Demchak, Penn State**

Blueberries, like other woody species, can suffer significant damage, while raspberries and blackberries are less affected mainly because canes are short-lived. Ribes (gooseberries and currants) seem to be less preferred by cicadas than other small fruit crops, though data on these crops are limited. Although adult cicadas (*Magicicada septendecim*) can fly long distances, damage from Periodical Cicada tends to be concentrated around woods,

fencerows, and shade trees that were present 17 years ago. Newer plantings far (1/2 mile) from these areas should, at least early in the emergence period, be relatively free of adults. Later in the 6-week emergence, as populations peak and oviposition sites are saturated, the females will fly longer distances, so continual monitoring on a daily basis is necessary to determine whether insect pressures warrant chemical control to prevent injury.

Cicadas damage plants in two main ways. First, the nymphs feed on the sap they suck from the roots of woody plants, and this feeding can potentially weaken and stress plants. This year's cicadas have been doing that since they burrowed into the ground in 2004 because plant sap is such a poor food for development. However, the major and most noticeable damage occurs from oviposition wounds made

in the stems (Figure 1). These wounds can result in the terminal portion of each stem dying and for some crops like apple, these wounds serve as entry points for diseases like fireblight. In an established planting, this is problematic, but in a young planting, it can be devastating.

In a study in Maryland on preferred species (oak and hickory), each puncture in a series of wounds contained an average of 25 eggs. From these wounds, nymphs will hatch which then drop to the ground. How far the nymphs disperse from that point is unknown, but they are tiny and unlikely to travel far before burrowing into the soil. The adults do little damage from direct feeding in the few weeks that each adult lives. In forests and on large ornamental trees this insect is sometimes referred to as “nature’s pruners” as they cause few lasting effects and open up the tree canopy for better sunlight penetration.

On a smaller scale, plants may be netted to exclude the adults, but the netting holes must be only ¼” in width or smaller. For larger plantings, insecticides may be needed, and should be targeted to control adults before they have a chance to lay eggs; mating will begin about a week after the cicadas first emerge. Mating will occur soon after you hear the males “singing” to attract a mate, and egg-laying takes place soon afterward. In large numbers, the “singing” males may be so loud that it is difficult to carry on a conversation even when shouting in close proximity.

New adult cicadas will emerge from the soil at about the same time when the ground is soft from rain, but when the ground is dry, emergence can be protracted over a 4-week period, so that protection of plants may be needed for up to 6 weeks. Multiple applications on a weekly basis or less are often needed to prevent significant damage under high adult pressure. Some oviposition will likely take place before the contact activity of any insecticide knocks the adults down, so multiple insecticide applications may be needed. The frequency of application will depend not only on adult presence but also on the length of residual activity of the material used.

Pyrethroids are the most effective group of contact insecticides. For blueberries, this includes products with the active ingredients bifenthrin (Brigade and Bifenture, each with a 1-day PHI), fenpropathrin (Danitol, 3-day PHI), zeta-cypermethrin (Mustang Maxx, 1-day PHI and one of the active ingredients in Hero, 1-day PHI), and esfenvalerate (Asana, 14-day PHI - a serious constraint for use when fruit is nearing harvest). Contact insecticides in other classes that work well include Assail (1-day PHI), Carbaryl XLR, and malathion (1-day PHI). Among the above, only Brigade/Bifenture and Danitol had a significant length of residual activity (1 week or longer) on Periodical Cicada from the data that is available. Note that you will not see Periodical Cicada listed as a pest on most labels – but in PA the products can be used as long as the use pattern for other labeled pests is followed. If outside of PA, check to make sure you are abiding by your state’s regulations. For much more info on the use of insecticides for Periodical Cicada, see this recent

article regarding Periodical Cicada control in tree fruit crops: [A Blast from the Past: 17-Year Cicada Control in Pennsylvania Apple Orchards 2021](#) .

Keep in mind that the adults are skittish and tend to fly away from the sprayer, so not all will be directly contacted by the spray material – which affects effectiveness. In an early study in Maryland (back in 1936—but only 4 cicada generations before this one), spraying at nighttime tended to have a greater effect, as adults were less able to fly away quickly.

Pesticide exposure and resistance development are on growers' minds especially as related to spotted wing drosophila; SWD resistance to certain pyrethroid materials has been reported in California. In addition, pyrethroids are tough on beneficial populations, so flare-ups of other pests can occur. For blueberries, scale insects are the main pests likely to experience a flare-up as a result of periodical cicada sprays, though these flare-ups are already occurring thanks to the sprays needed to control spotted wing drosophila. For that reason, insecticides other than pyrethroids should be included in rotations. Also, note that all of the sprays listed above for Periodical Cicada should also be effective on spotted-wing drosophila and spotted lanternfly.

Finally, you will also want to prune as many of the damaged branches and their eggs out of your planting as soon as you can. Be sure to destroy the prunings or at least move them out of the plantings so that the eggs will not hatch and nymphs will not enter the soil. The emergence of nymphs occurs as soon as 6 weeks from the time that the oviposition wounds were made, so you will need to be ready with your pruners and available labor shortly.

If there is one bright spot in all of this, it is that you will have a 17-year break before you need to repeat this exercise for this particular pest!