2021 Periodical Cicada in New Jersey and Pennsylvania

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Growers across NJ and eastern PA have been inundated with this brood of insects, see the Brood X map for areas affected (Figure 1). Figure 2 shows that eastern US, NY, and western MA are impacted by Brood 11, but not this season (2021).

Danger to Leaders on Newly Planted and Young Trees

The adults cause injury with their thick needle-like ovipositor while laying eggs, not through feeding injury (Photos). The adults oviposit in the leaders and branches causing breakage of one-year-old wood. The most effective insecticidal control is through direct contact of the adults while spraying.

My observations this season are that you need to apply every 2-3 days max. With no residual impact, it is essential to hit the adult females when they are in your trees or on the fly. The best time is when they are active in the daytime, usually morning. As evening approaches, they are less active, especially with cooler temperatures. We want to kill as many as possible at each application.

The adults are large hard-shelled insects and are difficult to kill. Some insecticides knock them down, but they are back up in several hours.

If there is a large population in adjacent woods or trees (hedgerows), the females will repopulate theapple orchard the next day after application and begin laying eggs again. With some materials, like Cavalary (Lambda-cyhalothrin), they seemed to land and shy away for a day, but then are back in full force a day later.

Photo 1. Cicada Damage to apple shoot- Photo credit: G. Krawczyk, Penn State University.

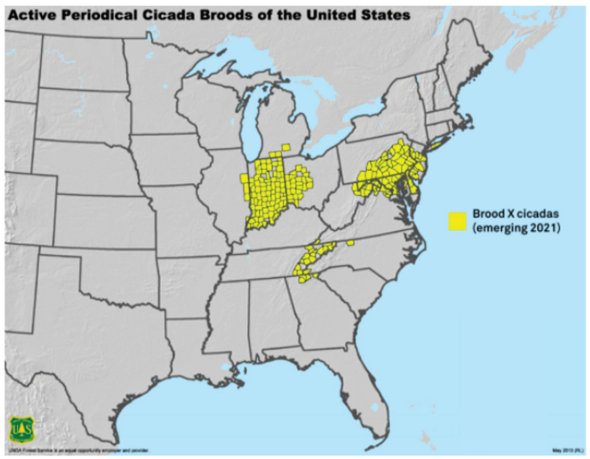

Figure 1. NJ-PA-brood X map. US Forest Service.

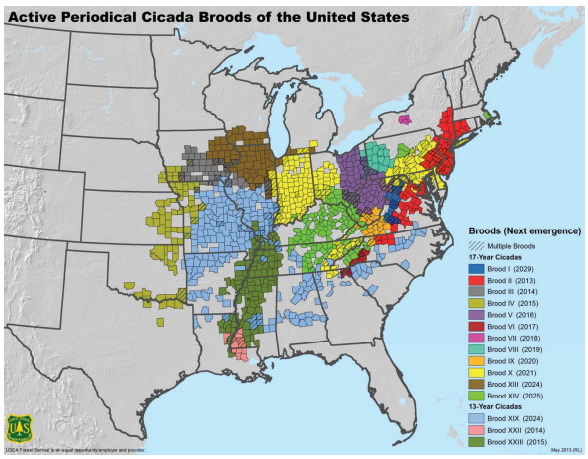

Figure 2. MA and NY have overlapping Broods (Brood 11). US Forest Service.

Photo 2. Cicada on apple shoots. Photo credit Win Cowgill.

Table 1. Pesticide impacts on cicada oviposition, from Chis Bergh, Virginia Tech, 2004.

Treatment	Rate amt form/acre	Mean number of cicada oviposition slits/branch May 27	June 3	June 10	June 17
Actara 25WG	5.5 oz	9.9 a	21.1 a	26.7 a	30.2 abc
Asana XL	14.5 fl oz	1.3 b	2.6 b	3.4 c	3.5 e
Assail 70WP	3.4 oz	2.1 b	15.6 ab	21.9 ab	19.3 bcde
Avaunt 30WG	6.0 oz	9.7 a	21.1 a	31.1 a	38.4 a
AzaDirect 1.20%	1.0 qt	4.6 ab	16.4 ab	27.4 a	34.3 ab
Calypso 480SC	8.0 fl oz	5.1 ab	15.1 ab	21.1 ab	27.1 abcd
Danitol 2.4EC	21.0 fl oz	1.2 b	1.8 b	2.1 c	2.1 e
Lannate LV	3.0 pt	1.4 b	4.9 b	9.3 bc	11.1 de
Warrior 1CS	5.1 fl oz	1.2 b	7.6 ab	11.1 bc	13.3 cde
Untreated check		7.9 ab	21.3 a	28.4 a	32.6 ab

Means within a column followed by the same letter(s) are not significantly different (Fisher's Protected LSD, P > 0.05).

Table 2. Pesticide impacts on cicada damage, from Chis Bergh, Virginia Tech, 2004.

Treatment	Rate amt form/acre	Mean no. flagged shoots/tree (June 24)	Mean no. fallen shoots/tree (June 24)
Actara 25WG	5.5 oz	8.3ab	1.75a
Asana XL	14.5 fl oz	0.3e	0.50ab
Assail 70WP	3.4 oz	3.0cde	0.25ab
Avaunt 30WG	6.0 oz	9.0a	1.75a
AzaDirect 1.20%	1.0 qt	4.8abcd	0.75ab
Calypso 480SC	8.0 fl oz	4.5bcde	0.75ab
Danitol 2.4EC	21.0 fl oz	1.0de	0.0b
Lannate LV	3.0 pt	5.0abcd	0.75ab
Warrior 1CS	5.1 fl oz	4.5bcde	0.50ab
Untreated check		7.3abc	1.25ab

Means within a column followed by the same letter(s) are not significantly different (Fisher's Protected LSD, P > 0.05).

Table 3. Pesticide effects on cicada mortality via bioassay (180 adult cicadas tested in 6 replicates of 30 individuals each, from Biddinger and Hull, 2004).

Treatment	Rate/A in 100 gal water/A	Concentration (ppm)	Av. % Mortality at 48 hours
Actara 25WDG	4 oz	75	58.3 b*
Assail 70WG**	2.5 oz	141	97.8 c
Calypso 4SC	4 fl oz	150	87.8 c
Warrior 1CS**	3 fl oz	28	72.8 b
Water			13.9 a

Pesticides for Cicada Control (sources Cornell, Penn State, Virginia Tech)

Most past work on cicada was done in 2004 by Penn State, Cornell, and Virginia Tech. Thanks to Peter Jenstch for all the telephone guidance on controlling this pest this season.

Lanate (methomyl) and the pyrethroid-class insecticides, including Asana (esfenvalarate), Danitol (fenpropathrin) or Warrior (lambda-cyhalothrin), have proven to be quite effective against the cicada, often providing high mortality on contact.

Of these insecticides, it appears that two of the pyrethroids are capable of maintaining low oviposition damage to trees to reduce limb breakage and fruit loss. In studies conducted by Chris Bergh at Virginia Tech in Winchester, VA, three dilute applications were made at 6–8-day intervals to young trees beginning on May 28. Near the end of the egg-laying season, Asana applied at the high labeled rate of 14.5 oz/A and Danitol applied at 21.0 oz/A provided significantly better ovipositional deterrence to the 17-year cicada. These same two materials, Asana and Danitol, were the best in 2004 in work conducted by Peter Jenstch at Cornell. All materials tested had very little residual control, and so we must depend on knock down of the adults with our strongest hottest materials, it may require a scheduled application every 3-5-7 days, depending on the numbers of insects in your area/orchard (according to Peter Jentsch, Hudson Valley, NY).

If you see cicada, spray with a knock-down pesticide as soon as weather allows. Depending on cicada population and their movement into your orchard blocks, you may have to spray on a 2-3-day schedule. If you have young trees, be more vigilant and spray more

often to prevent damage to leaders and new scaffolds. Note each material's label restrictions for frequency of application. Likely, we will have a mite problem with multiple applications of these materials, as we are killing mite predators, Plan on applying an ovacide mite material like Apollo or Savey 50 DF at end of your cicada applications and then keep a close eye on mite eggs and adult populations.

The best information comes from Cornell and Penn State newsletters, both based on data from the last brood and insecticide trials in 2004.

For More Information

Full reports, maps, and research results are provided at the links listed below.

Resnick, B. 2021. Where billions of cicadas will emerge this spring (and over the next decade), in one map. https://www.vox.com/science-and-health/22362042/cicada-brood-x-map-2021

Jentsch, P. 2013. He's only mostly dead – Managing Brood II of the 17-year cicada in the Hudson Valley, 2013. http://www.scaffolds.entomology.cornell.edu/2013/SCAFFOLDS%206-10-13.pdf

Krawczyk, G. and D Biddinger. 2021. A Blast from the Past: 17-Year Cicada Control in Pennsylvania Apple Orchards, 2021. https://extension.psu.edu/a-blast-from-the-past-17-year-cicada-control-in-pennsylvania-apple-orchards-2021


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