Periodical Cicadas in the Nursery – 2024 Update

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Periodical Cicadas

Every year, several species of annual cicadas can be found in Tennessee. In addition to annual species, there are also three distinct species of 17-year cicadas (*Magicicada septendecim, M. cassini,* and *M. septendecula*) and four species of 13-year cicadas (*M. tredecim, M. neotredecim, M. tredecassini,* and *M. tredecula*). The populations of these cicadas emerge simultaneously in great numbers called broods. There are 15 recognized broods made up of combinations of different species of 13 or 17-year cicadas. Brood X, The Great Eastern Brood of the 17-year cicadas emerged primarily in East Tennessee in 2022. Brood XXIII, The Mississippi Valley Brood of the 13-year cicadas last emerged in West Tennessee in 2015 and is expected to return in 2028. Brood XIX, known as The Great Southern Brood of the 13-year cicadas last emerged in 2011 and will return in 2024 (see Map). This brood includes the species *Magicicada neotredecim*, *M. tredecim*, *M. tredecassini*, and *M. tredecula,* with the majority of Tennessee population is made up of the species *M. tredecim*.

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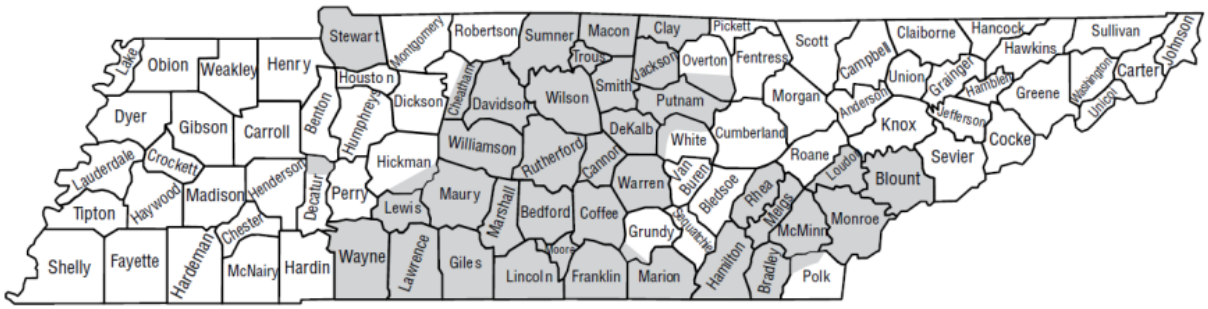
Brood XIX is set to emerge in late spring 2024. It has the widest geographical range of all documented broods with emergence occurring in Tennessee, Alabama, Arkansas, Georgia, Illinois, Indiana, Kentucky, Louisiana, Missouri, Mississippi, North Carolina, Oklahoma, South



Map of previously reported 2011 Brood XIX emergence (adapted from Hale 2012)

Carolina, and Virginia. Brood XIX adults are expected to be **present in Tennessee from mid-May through mid-June**. Counties with substantial emergence reported are shaded grey in the map below.

Description, Life Cycle and Damage

The adult periodical cicada is 1 to 1½ inches long. The body is black, while the legs, eyes and wing veins are reddish-orange. Adults usually emerge in early May when soil temperatures reach 67°F at 4-8 in deep. Four or five days after emergence, the males start "singing." This high-pitched, shrill call is produced by two drum-like membranes on the side of the abdomen. Females are attracted to singing males. Following mating, the female cicada uses her knife-like ovipositor to deposit eggs in slits she makes into twigs under ½ inch in diameter. Apple, pear, dogwood, oak, and hickory are favorite egg-laying sites; however, many other plants have been reported. In each slit, the female can lay 24 to 28 eggs. Females will repeat this procedure, cutting numerous slits along the same branch and depositing more eggs. Twigs or branches with a diameter the size of a pencil are preferred. Each female can lay a total of 400 to 600 eggs during her lifetime. Egg deposition is the major cause of cicada damage in nurseries and newly planted orchards. Egg laying punctures cause the twig tips to wilt and die, observed in the field as tip flagging. Additionally, egg-laying wounds can serve as a point of entry for other insects and disease.

Adult cicadas live for four to five weeks and eggs hatch in six to seven weeks. Newly hatched nymphs are white and ant-like in appearance. They drop to the ground and burrow into the soil until a suitable root is found. Cicadas have straw-like, piercing-sucking mouthparts. Nymphs feed by sucking the sap from roots. Their development is slow and nymph feeding has no noticeable effect on trees, even under heavy pressure. The nymphs continue to feed and develop for 13 or 17 years, depending on the species. In that final year, the nymphs emerge from the soil. This large emergence of nymphs occurs shortly after sunset. Nymphs climb up onto nearby structures where they can hang vertically to allow their wings to expand fully (see photo). Shortly after emerging from their larval skin, the adults are soft and white and are easily damaged. Over a few hours, they become harder and darker in color. Once the adult is fully hardened it will fly into a nearby tree canopy, and the life cycle repeats. The reason cicadas emerge simultaneously in such vast numbers is suspected to be as a defense against natural enemies. Cicadas have no natural defenses against birds and other predators. Their synchronous

emergence, however, causes predators to become full quickly since there are more cicadas than they can eat. By overwhelming predators with potential food, it gives the overall cicada population a high chance of survival.

Adult Cicada Damage and Control

Adult cicadas do not feed on foliage but may feed on twig sap to a limited degree. As previously described, the most immediate and noticeable damage from cicadas results when females make slits in twigs and limbs of trees as they deposit eggs. In areas with a previous history of high populations of periodical cicadas, certain preventative measures should be followed. Small individual trees or those in production rows can be protected mechanically by enclosing them in netting or some other kind of cloth for the duration of the egg-laying period. This cloth should have a mesh size no larger than ¼ inch. The netting should be placed on trees when the first male singing is heard and removed after adult activity has stopped. All branches less than ½ inch in diameter should be protected. In young tree plantings, delay pruning of trees until after cicada emergence so damaged branches can be removed and proper scaffolding of branches established. Pruned twigs can be collected and burned to reduce future populations in the area.

Kaolin clay applications (Surround WP) reduced damage by 50% in one study and worked better than weekly pyrethroid sprays alone at reducing damage. Pyrethroid insecticides such as bifenthrin and lambda-cyhalothrin can be applied weekly when adults are present. Be aware that frequent applications of broad-spectrum insecticides can result in secondary outbreaks of other pest insects and mites. Soil drench applications of imidacloprid also reportedly reduce female egg-laying by around 50%. Apply drench treatments before mid-April to ensure uptake into plants by the time cicadas emerge. Combination applications of kaolin + imidacloprid or kaolin + pyrethroid might work better than either product alone.

References

Ahern, Robert G., Steven D. Frank, And Michael J. Raupp Comparison of Exclusion and Imidacloprid for Reduction of Oviposition Damage to Young Trees by Periodical Cicadas (Hemiptera: Cicadidae). J. Econ. Entomol. 98(6): 2133Ð2136 (2005)

Hale, Frank. 2012. SP341-F Insects: Periodical Cicadas. UT Extension. https://trace.tennessee.edu/utk_agexdise/89/

Taylor, Amanda. 2020. Preventing Periodical Cicada Damage on Nursery Stock in the Foothills Area Specialized Agent. NC State University Extension. https://burke.ces.ncsu.edu/2020/05/kaolin-clay-reduces-periodical-cicada-damage-to-nursery-trees/