

# Return of the Periodical Cicadas

—By Chris T. Maier, Department of Entomology, Connecticut Agricultural Experiment Station

This spring, one of the most spectacular events in all of nature will unfold before our eyes on the forested slopes of Sleeping Giant and elsewhere in Connecticut—the mass emergence of periodical cicadas. These unique insects live underground for most of their life cycle, but every seventeen years their nymphs emerge from the ground and transform into short-lived adults. The synchronous mass emergence and the lengthy life cycle of periodical cicadas have amazed scientists and laypeople for centuries.

Periodical cicadas have one of the longest developmental cycles among insects. Their nymphs (Figure 1) develop underground by feeding upon the xylem



Figure 1. Full-grown nymph of the seventeen-year periodical cicada. The eye color changes from white to red a few days before the nymphs emerge from the ground. The mature nymph is about one inch (2.5cm) long.  
—Photo by Chris T. Maier

fluid in tree roots with their piercing-sucking mouthparts. The xylem fluid is so nutritionally poor that some scientists have suggested that this diet may be responsible for their lengthy developmental period of almost seventeen years. The nymphs shed their exoskeleton, or molt, five times before they become adults. On warm evenings between late May and mid-June of their seventeenth year, the nymphs leave their underground tunnels and ascend nearby trees, where they soon molt to the adult stage. The adults

are white at first, but soon they darken. Typically, the adults have red eyes, wings with orange veins at the leading margin, and a black body trimmed with reddish orange (Figure 2).



Figure 2. Adult female seventeen-year periodical cicada. The body length from the front of the head to the tip of the wings is about 1-1/2 inches. Note that the female has her black ovipositor (on the underside of the abdomen) inserted into the twig.  
—Photo by Chris T. Maier

Adults must reproduce during their short life of two to three weeks, thus beginning the next generation. Based upon my studies in Connecticut during 1979 and 1996, the reproductive activity of adults begins when they reach an age of about one week. Adult males attract mates by singing, with the characteristic song produced by rapidly vibrating a pair of ribbed membranes, known as "tymbals," located at the base of the abdomen. Their calling is hard to ignore because males usually chorus in groups of thousands, or even millions, in a forest. Just imagine the sound produced by one dog-day cicada in summer, and then multiply that sound by a thousand or a million! The clamor is not soon to be forgotten. After mating, the females use their saw-like ovipositor to carve cavities in pencil-sized branches and then to deposit thirty to forty eggs into each egg "nest." During their life, they apparently can lay 400 to 600 eggs.

Periodical cicadas that emerge in the same year and have the same developmental time are assigned to a numbered brood. Northern broods with a seventeen-year life cycle are numbered I to XVII. Cicadas that will emerge in the spring of 2013 belong to brood II, our lone extant brood. Those that emerge

wound often dries out and dies, which can lead to twig death and breakage. If the damage to branches is

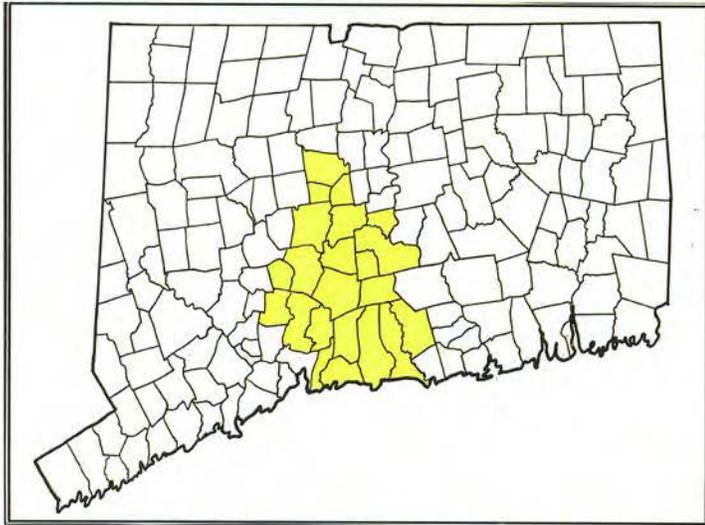


Figure 3. Distribution of periodical cicadas in Connecticut. The towns that are shown in yellow had periodical cicadas in 1996  
—Photo by Chris T. Maier

in 2014 will be brood III, and so on. In Connecticut, brood II is restricted to the central portion of the state (Figure 3), especially on or near traprock or basalt ridges. The first Connecticut specimens of brood II were collected near West Rock in 1843 by C.L. Hillhouse. At one time, the very small brood XI also existed in Connecticut, but now it is extinct, last being seen in Willington in 1954.

Three species of seventeen-year cicadas inhabit the Northeast, but only the most common species, *Magicicada septendecim*, occurs in Connecticut. Based upon counts of nymphal emergence holes in seven deciduous in Connecticut forests in 1996, the density of this species can range from 10,700 to 171,900 per acre at favorable developmental sites. Fortunately for us, the highest density was recorded in Hamden at the *Magicicada* Preserve (owned by the South Central Connecticut Regional Water Authority), which has an entrance on River Road to the east of the Mill River.

Although most people consider the mass emergence of periodical cicadas to be a wonderful natural phenomenon, fruit growers and nurserymen often have a different perspective. Some adult females cause noticeable injury to trees when they lay eggs (See Figure 4). The area around the egg-laying



Figure 4. Damage caused by female periodical cicadas when laying eggs  
—Photo by Chris T. Maier

extensive, young trees can be disfigured. Sometimes orchardists and others must apply insecticides to protect valuable trees.

By early July of 2013, the clamor will be over. The only evidence of the large emergence will be the cast exoskeletons of nymphs, dead bodies of adults



Figure 5. Cast exoskeletons and dead adults scattered on the ground under trees in July of 1996.  
—Photo by Chris T. Maier

(Figure 5), and dead leaves and twigs on trees—and these, too, will soon disappear. In late summer, the nymphs of the new generation will hatch from eggs and burrow into the ground to begin another seventeen-year cycle. Periodical cicadas will then be out-of-sight and out-of-mind until 2030 when, again, the forests will reverberate with their sound. ♪