RESEARCH LABORATORY TECHNICAL REPORT

BARTLETT TREE EXPERTS
SCIENTIFIC TREE CARE SINCE 1907

Periodical Cicadas

By The Bartlett Lab Staff
Directed by Kelby Fite, PhD

The periodical cicadas are known for their 17- or 13-year synchronized life cycles and loud, droning noise. Males and females join dense aggregations, or leks, where the males search for the stationary females using short flights and calls. Some of the louder choruses reach 90+ decibels as measured under trees. In certain years, cicadas emerge from the soil in tremendous numbers, and extensive damage to trees is common. Seven species are described from the group known as periodical cicadas. Annual cicadas ("dog-day cicadas") are similar, but are larger and adults emerge in mid-summer. Although mistakenly called "locusts," cicadas are not related to these grasshoppers.

Damage

In habitats such as suburban yards, parks, cemeteries, and orchards, periodical cicadas often reach higher population densities than they do in natural forests. Cicada populations may exceed 1.5 million per acre. Feeding by large numbers of nymphs over several years can reduce the vigor of small trees. Research in forests determined that feeding by cicada nymphs can reduce tree growth by as much as 30%. The twigs of trees and shrubs can be severely damaged through the egg-laying of the female cicadas (Figure 1). More than eighty species of trees and shrubs are used by cicadas for egg laying. Oak, apple, hickory, dogwood and members of the rose family are among the preferred species. Females insert a saw-like ovipositor into the bark and wood of twigs and cut a pocket into which eggs are deposited (Figure 2). One female may produce as many as thirty-five bark punctures. Repeated attacks can girdle twigs and may kill small trees and shrubs. The wounds also provide an entrance for disease causing organisms.

Figure 1: Cicada damage to oak trees caused by egg insertion into twigs

Life Cycle

Periodical cicadas have one of the longest life cycles of any insect. Adult cicadas begin to appear in late spring or early summer, once the soil temperature is consistently 64 to 65 degrees for several days. Adults live for only a few weeks, during which time they mate

Figure 2: Cicada oviposition (egg insertion) damage on Norway maple

and lay eggs in twigs of trees and shrubs. Eggs hatch into nymphs (Figure 3), drop to the soil, and burrow down in search of roots. Periodical cicadas spend their larval lives 6–24 inches underground, feeding on xylem fluid from rootlets and roots. The nymphs continue to develop within the soil for the next thirteen to seventeen years, although broods of cicadas exist nearly every year. At the end of the period, the nearly mature nymphs emerge from the soil and immediately

Figure 3: Newly emerged nymph

Figure 4: Newly emerged adult cicada (top right) with recently shed skin just below (bottom left)

Management

Spraying trees to prevent adult cicada damage has rarely been successful. There is no known method of controlling the nymphs in the soil. In areas where peak adult emergence is expected, the branches of small trees and high value shrubs can be protected with netting (Figure 5). Drape the netting over the entire tree canopy, and secure it to the trunk so no cicadas can crawl under the opening. Disposable mesh bags and plastic 1/4" netting is now readily available for this purpose. Female cicadas will not begin laying eggs until at least one week after they first emerge, so protection needs to be in place by that time. Fertilization will increase plant vigor and help offset the debilitating effects from the twig and branch dieback. Damaged plants should be inspected by an arborist to determine if borers or fungal diseases need to be treated. Please contact your Bartlett Arborist Representative for more information regarding this pest.

Figure 5: Cicada control tree netting bag

Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services.