Periodical Cicadas

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After a hiatus of 17 years, periodical cicadas will emerge this year. These large insects will emerge suddenly and unexpectedly by the thousands within a time span of several days.

Known for their deafening song, periodical cicadas will overwhelm parts of southern Wisconsin this spring. Brook XIII — as the group in this area is called — is one of two types of cicada expected to appear this season. The Dog Day cicada, the more common species, appears annually in mid to late summer.

There are two distinct races of the periodical cicada; one requires 17 years to complete its life cycle and is located primarily in the northeastern United States and the 13-year cicada which is more abundant in the southeast. There is a rather distinct line of demarcation between the two races; however, areas of overlap do occur. The 13-year and 17-year races are identical in appearance but apparently do not cross-breed.

Each race is further divided into broods. Broods are populations of cicadas which are separated both geographically and temporally. Scientists believe that originally there was a single brood. Unusual environmental conditions may have hastened or retarded nymph development by one or two years in some areas, thereby producing a local brood. Such conditions, if they continue, may further subdivide the brood in time. The fact that successive broods do not strongly overlap geographically suggests that competition reduces the successful establishment of straggling broods.

Brood XIII is composed of the species *Magicicada septendecim* and a smaller, almost identical variety, *Magicicada cassini.* This is the predominant brood in the southern Wisconsin counties of Crawford, Dane, Grant, Green, Iowa, Jefferson, La Fayette, Milwaukee, Richland, Rock, Sauk, Walworth, and Waukesha. Brood VI, a smaller brood predicted to emerge in the year 2000, is more centrally located in Wisconsin than Brood XIII. Historically, Brood VI has been sighted in Burnett, Columbia, Crawford, Dane, Fond du Lac, Green Lake, Marquette, Sauk, Sawyer, Washburn, and Waushara counties.

Damage

Periodical cicadas do relatively little harm to established plantings. However, en masse, they can do considerable damage to young orchards, nursery stock and new landscape plantings.

Damage is the result of egg-laying by the females. Egg-laying scars appear as roughened punctures on twigs of many woody plant species. The wounds are one to four inches long; the bark is cut and sapwood splintered and raised to produce a small egg nest. Damage to plants tends to be less severe in mature trees and shrubs due to their larger size. By contrast, injury to nursery stock and new landscape plantings may kill the tree or shrub, or more often, destroy a plant's form when the tender leader shoots are attacked.

Many newly planted landscape trees may escape cicada injury simply because of the history of the area. Most new subdivisions have replaced agricultural land which has been cleared of trees for many decades. Because adult cicadas typically do not travel far, damage to plantings in new developments is unlikely. However, plantings close to woodlots may be at a higher risk of attack.

Cicadas attack over 80 plant species, including oak, hickory, ash, maple, hawthorn, apple, black locust, birch, dogwood, and evergreens. If other hosts are unavailable, cicadas will also attack vines and herbaceous plants. Epinasty, the curvature resulting from more rapid growth on the uninjured side of the branch, and the breakage of the current season's growth are the most common symptoms. Plant varieties vary in their ability to recover.

Description and Life Cycle

The adult periodical cicada has a wedge-shaped body approximately 1 to 1½ inches long, including the wings. Their body is nearly black while the wings have a distinct reddish tinge with a black 'W' near the lower margin of the front wing. They are abundant in late May, June, and very early July. Dog Day cicadas, which appear yearly in late July and August, have a greenish margin to their wings and light markings on their thorax and abdomen.

The male cicada has musical organs located on the sides of the first abdominal segment. Strong muscles rapidly vibrate membranes, producing the cicada's trademark song.

The song of the cicada is actually made up of three separate sounds. The first sound, which occurs early in the season, just after the males have emerged is Pha-r-r-r-a-oh. As the season progresses, the song changes to the loud, shrill, and characteristic tsh-e-e-E-E-E-Ee-oh made by many males singing in concert. The song may last as long as 15 to 30 seconds but is usually five seconds or less in length. Finally, the male cicadas also produce an intermittent clicking or chirping not unlike that of a cricket.

All songs are loudest in hot, dry weather. As the humidity increases, the intensity of the song decreases. During a rainstorm, the song will actually stop until the weather dries. In fact, spraying water at the insects provides temporary relief from the deafening sound produced by the male cicadas.

The emergence of the last nymphal stage during the last week in May marks the beginning of the aboveground portion of the cicada's life cycle. The nymphs burrow directly upward and emerge from the ground, leaving behind a small, round hole one-half inch in diameter. In certain situations, such as shallow soil or saturated ground, immature cicadas may construct clay cones raised two inches above the ground surface where they complete their development.

Once emerged from the soil, cicadas climb the nearest tree, shrub, or post, split the nymphal skin down the back, and emerge as adults. The cicadas remain attached to their supports until their bodies dry and wings harden. The following day the adults take flight, feed, and begin to mate. Although

winged, the insects are relatively stationary and the short flights taken tend to concentrate, rather than scatter, the brood. Feeding injury to trees and shrubs is very slight as only a small amount of sap is removed. By contrast, the female's egg-laying permanently damages woody plants.

Within two weeks of emergence the females begin laying eggs. Each female cicada deposits from 400 to 600 eggs, in groups of 12 to 20, into slits made in the bark. The female cicada favors the tender twigs of one-year-old growth.

In six to seven weeks the eggs hatch, the young fall to the ground and enter the soil for their long subterranean existence. After forming a chamber adjacent to the rootlet, the nymphs penetrate the xylem vessels with their piercing-sucking mouth parts and begin to feed. No apparent damage results from the nymphal feeding. The nymphs remain in the soil for 17 years and only move from their original feeding site under duress. Even then, migration is minimal.

Control

Many reptiles, mammals, and birds, including the English sparrow and robin, as well as predatory insects such as ground beetles and dragonflies attack cicadas. Several parasitic flies and wasps also provide natural control. However, sheer numbers overwhelm these predators so you'll need to protect young plants.

Because of the large number and synchroneous emergence of the cicadas, as well as their meager feeding habits, chemical control provides only minimal success. Prevention, rather than treatment, is a better option.

Prevention

Prevention of cicada injury is aimed at destroying emerged adults. Hand collection to remove and mechanically crush the adults provides adequate protection if there are few plants to protect, such as in most home landscapes.

Covering shrubs with mosquito netting to provide a barrier against the emerging adults may also provide adequate protection on a small scale.

An alternative barrier system is tanglefoot. Place 2- to 3-inch bands of the sticky tape around the trunks of trees to prevent cicadas from reaching the tree canopy and causing damage. By hindering their ability to climb, tanglefoot allows more time for hand removal of the pests before damage is done. Apply tanglefoot carefully, particularly to thin-barked trees such as birch, so as not to damage the bark.

Barriers must be in place when cicadas first emerge and should be left on for at least five weeks, or until all cicada adults have died.

Remove and destroy severely damaged twigs to prevent the eggs from hatching. To minimize overpruning, you may want to forego pruning ornamentals the fall before an emergence.

Chemical Control

In nurseries or orchards with many young trees, chemical control may be of benefit.

Insecticides should only be applied after cicadas have emerged since they must come in direct contact with the chemical. Before using any insecticide, carefully read the label and follow all instructions. Synthetic pyrethroids such as lempo, Yardex, and Pounce are available to professional applicators for control of cicadas. For homeowners, Dursban and Sevin are available. You may need to repeat applications for adequate control. Be sure to follow label directions concerning application frequency. Keep in mind, however, that under severe conditions of heavy migration from wooded areas, even the most effective insecticide may provide little control.