



PERIODICAL CICADA

Magicicada septendecim (Linnaeus)

Periodical cicadas are spectacular insects, often making sudden and dramatic appearances. Alexander and Moore wrote in 1962, "The periodical cicadas make up a truly amazing group of animals; since their discovery 300 years ago, the origin and significance of their extended life cycles have been a continual source of puzzlement to biologists. Their incredible ability to merge by the millions as noisy, flying, gregarious, photopositive adults within a matter of hours after having spent 13 or 17 years underground as silent, burrowing, solitary, sedentary juveniles is without parallel in the animal kingdom."

The periodical cicada is a native North American species. It is the longest-lived insect in North America. No other insect in North America generates as much interest and curiosity as do periodical cicadas when they make their sudden, springtime emergence. They are widely distributed over the eastern half of the United States and occur nowhere else in the world.

Periodical cicadas are commonly called or referred to as "17-year locusts." Early American colonists had never seen periodical cicadas. They were familiar with the biblical story of locust plagues in Egypt and Palestine, but were not sure what kind of insect was being described. When the cicadas appeared by the millions, some of these early colonists thought a "locust plague" had come upon them. Some American Indians thought their periodic appearance had an evil significance. The confusion between cicadas and locusts exists today in that cicadas are commonly called locusts. The term "locust" is correctly applied only to certain species of grasshoppers.

There are six species of periodical cicadas, three with a 17-year cycle and three with a 13-year cycle. The three species in each life-cycle group are distinctive in size, color, and song. The 17-year cicadas are generally northern, and the 13-year cicadas southern with considerable overlap in their distribution. In fact, both life-cycle types may occur in the same forest.

For convenience of reference, each "brood" has been designated by a Roman numeral. The numerals I through XVII are assigned to the 17-year broods, and XVIII through XXX to the 13-year broods. The numbering of the 17-year broods began with the 1893 brood which was designated as Brood I. In 1909, Brood XVII appeared, and in 1910, Brood I appeared again. There are at least 13 broods of 17-year cicadas and five broods of 13-year cicadas.

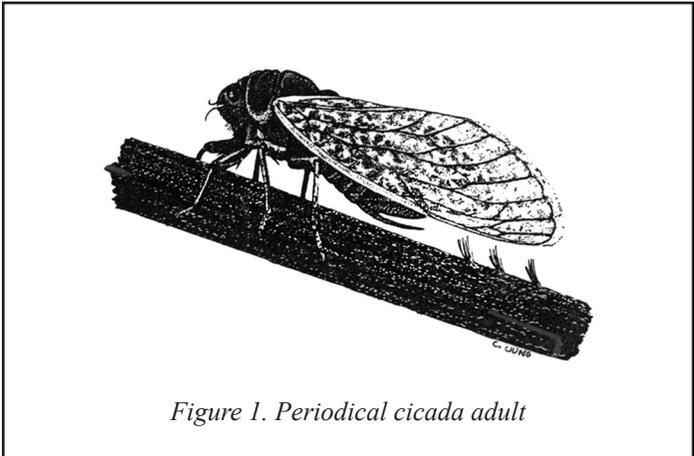


Figure 1. Periodical cicada adult

In Pennsylvania separate populations referred to as broods are present during eight different years in different geographic ranges in the state (Table 1). All of the broods in Pennsylvania require 17 years to reach maturity. Several of these broods are very small. Brood X, known as the "great eastern brood," is a large brood with heavy concentrations found in the eastern half of the state from late May through June during the years they emerge.

DESCRIPTION

Periodical cicada adults are about one and one-half inches long and have eyes and wing veins that are reddish (Fig. 1). They are smaller than their cousins, the dog-day cicadas. Dog-day cicadas, *Tibicen* spp., are mostly large, blackish insects usually with greenish wing veins and appear every year from mid-July through mid-September.

LIFE HISTORY

After 17 years of living in the soil from depths of two to twenty-four inches, mature nymphs of the periodical cicada start burrowing upward. In April they burrow to about an inch beneath the soil surface where they stop and await the proper time to emerge. If the ground is too damp, mature nymphs build a protective earthen turret. Their bodies undergo major changes in muscle structure at this time. When the undetermined signal for emergence occurs, nymphs exit from about a one-half inch diameter hole in the ground. Nymphs crawl a foot or more up tree trunks, weeds, or other upright objects where adults emerge leaving their nymphal skins behind. The process of shedding a nymphal skin is completed

in an hour or less. The periodical cicada is now an adult, but it is soft and white. In time its exoskeleton hardens and becomes darker. During some years, practically all of the population in a brood from a forest may emerge on the same night, or on two or three different nights.

Adults are rather clumsy fliers and often collide into objects during flight. Soon after emerging, males begin their constant "singing" while females remain silent. The sound made by adult males is sometimes haunting and eerie. About 10 days after emergence, females will mate and begin depositing eggs in twigs and branches of nearly 80 different preferred species of trees and woody shrubs. They usually do not deposit eggs in coniferous trees. Generally, the female will deposit 400-600 eggs in the twigs of their preferred species. Using the blades of a sawlike, egg-laying device at the end of the abdomen, females puncture the bark of a twig and make a pocket in the wood. Females may deposit from 24-28 eggs in two rows in one of these pockets. They then move forward, cut another pocket, and lay more eggs. The pockets are placed close together in a straight row sometimes forming a continuous slit for two to three inches. Adults live for approximately three to four weeks above ground. Most are usually gone by the beginning of July.

Hatching occurs six to seven weeks after egg laying, and the white, antlike nymphs work their way out of the slits and drop to the ground where they enter the soil. Here they insert their piercing-sucking mouthparts and draw plant fluid from roots of plants for the next 17 years. The number of nymphal instars (growth phases) is still uncertain, although some studies indicate that there are five instars. According to one researcher, the first instar lasts about one year, the second and third about two years each, the fourth three years, and the fifth nine years.

DAMAGE

Adults do not feed on leaves. If they feed at all, it is by sucking plant fluid from tender young twigs. The most noticeable damage done by periodical cicadas is from egg-laying. Twigs slit by the female's ovipositor will frequently have leaves that wilt and die. Many of the damaged twigs will break off and drop to the ground. Fruit and nut orchards can suffer heavy pruning losses from high populations of these insects. The effect of root feeding by the nymph is considered inconsequential to most trees.

MANAGEMENT

Non-chemical

A periodical cicada year is a time of feasting for a surprising array of creatures. Birds and fish feed ravenously on the adult stage of

these insects. Grackles and crows voraciously dine on periodical cicadas. Fish will literally gorge themselves on adult cicadas when they are abundant in trees and shrubs along a stream.

Small trees can be covered with a mesh cloth to prevent the females from laying eggs in the twigs. Delaying the planting of trees during a cicada year may also be considered.

Chemical

Deciduous shrubs, fruit, nut, and shade trees may be protected with registered formulations of insecticides. The first application should be made prior to egg laying; this is approximately 7-10 days after the male periodical cicadas start their singing. Additional applications may be necessary. Apply all control materials according to label directions. Always refer to individual insecticide labels for host plant clearance information.

WARNING

Pesticides are poisonous. Read and follow directions and safety precautions on labels. Handle carefully and store in original labeled containers out of the reach of children, pets, and livestock. Dispose of empty containers right away, in a safe manner and place. Do not contaminate forage, streams, or ponds.

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Table 1. Timetable of expected appearances of the periodical cicada in Pennsylvania.

<u>Year(s)</u>	<u>Brood No.</u>	<u>Counties in Which They May Emerge</u>
2004 (2021)	X	Adams, Bedford, Berks, Blair, Bucks, Cambria, Carbon, Centre, Chester, Clinton, Columbia, Cumberland, Dauphin, Delaware, Elk, Franklin, Fulton, Huntingdon, Juniata, Lackawanna, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, McKean, Mercer, Mifflin, Monroe, Montgomery, Montour, Northampton, Northumberland, Perry, Philadelphia, Schuylkill, Snyder, Somerset, Union, and York Counties; last emerged in 1987
2008 (2025)	XIV	Adams, Bedford, Berks, Blair, Centre, Clearfield, Clinton, Cumberland, Franklin, Huntingdon, Lackawanna, Lehigh, Luzerne, Lycoming, Mifflin, Montour, Northumberland, Perry, Potter, Schuylkill, Snyder, Tioga, Union, and York Counties; last emerged in 1991
2012 (2029)	I	Adams, Cumberland, and Franklin Counties; last emerged in 1995
2013 (2030)	II	Berks, Bucks, Carbon, Chester, Dauphin, Delaware, Lancaster, Lebanon, Lehigh, Luzerne, Monroe, Montgomery, Northampton, Philadelphia, Pike, Potter, Schuylkill, and Wyoming Counties; last emerged in 1996
2016 (2033)	V	Fayette, Greene, Somerset, Washington, and Westmoreland Counties; last emerged in 1999
2017 (2034)	VI	Bucks, Dauphin, Lancaster, Lehigh, Montgomery, Northampton, Philadelphia, and Westmoreland Counties; last emerged in 2000
2018 (2035)	VII	Allegheny, Butler, Washington, and Westmoreland Counties; last emerged in 2001
2019 (2036)	VIII	Allegheny, Armstrong, Beaver, Butler, Cambria, Clarion, Crawford, Fayette, Forest, Huntingdon, Indiana, Lawrence, Mercer, Venango, Washington, and Westmoreland Counties; last emerged in 2002