

THE CICADAS

By Douglas C. Allen

Few events in the insect world are more spectacular or more disconcerting to land-owners than the emergence of a periodical cicada (ci-cay-dah) brood. Early this summer residents in southeastern NY and parts of NJ experienced an "invasion" of periodical cicadas - one homeowner collected six buckets of emerging nymphs from his backyard and off the sides of his house in one day!

Description

Cicadas have sucking mouthparts and are the largest members of the Order Homoptera (ho-mop-tera); which also includes the more familiar aphids, scales, planthoppers, and spittlebugs. Though many people never see a cicada, the loud, piercing, high-pitched mating call of the male is a common sound during summer. The large bodied adults of some species are 2" long. Adults are strong fliers with well developed, membranous wings and very conspicuous eyes (*Fig. 1*). Nymphs, the immature stages that spend most of their lives in the soil, are 1" to 2" long when full grown and almost crayfish-like in appearance with oddly shaped front legs that are fitted for digging (*Fig. 2*).

Life History

The two principle groups in this family are dog-day cicadas and periodical cicadas. Adults of the former appear in late summer (during the "dog days" of July and August, hence the common name), the latter appear during early summer. Dog-day cicadas require 2-5 years to complete a life cycle and rarely are abundant enough to attract attention, but because many broods overlap, adults can be heard every year. Periodical cicadas, on the other hand, have 17- (northern U.S.) or 13- (southern U.S.) year life cycles, the longest known among insects. Approximately 13 distinct populations (called broods) of the 17-year cicada have been identified. Both the 17-year and 13-year broods often consist of three distinct species.

The 17-year species (sometimes referred to as harvest flies or 17-year locusts) spend all but a few weeks of this period in the ground where the nymphs feed by sucking sap from plant roots, causing little apparent damage. Upon completing development in the 17th spring of the life cycle, nymphs emerge from the soil in prodigious numbers and leave behind innumerable



Fig. 1. Cicada adult.

conspicuous emergence holes. They quickly ascend plants, buildings or other available perches where they attach themselves and transform into adults. Shortly thereafter, the very loud noise made by large numbers of males calling for a mate fills the air with an unbelievable din. Some entomologists believe that in addition to fulfilling a mating function, this sound also may repel predators. Other scientists have demonstrated that certain natural enemies use this sound to locate cicadas.

The female uses her sawlike ovipositor (an egg-laying device at the posterior end of the body) to cut through twig bark and splinter the sapwood (*Fig. 3*). Eggs are deposited in the splintered wood. Following egg hatch, nymphs fall to the ground, burrow into the soil and disappear for another 17 years.

Damage

Though it is fascinating to behold an emergence of 17-year cicadas, their unexpected, overwhelming abundance and noise are a nuisance. The principle damage associated with these outbreaks occurs when females kill twigs in the act of egg-laying, which results in conspicuous flagging of branch tips.

Egg laying has been observed on more than 70 species of trees and shrubs, but oak, hickory and apple appear to be most susceptible. This damage does not kill the tree but can detract from its appearance.

Ecological Significance

It is important to remember that insects are "pests" only because in some fashion they interfere with human values or interests. To one degree or another, all species

that occur in forest systems play important ecological roles. The cicada is no exception.

For example, recent studies of the Apache cicada in Colorado River riparian communities revealed the ecological importance of this species. Feeding by the nymphs influences the vegetative structure of mixed stands of cottonwood and willow that occur in certain habitats. Excess water removed from the host's water conducting tissues (the xylem) during feeding is eliminated as waste and improves moisture conditions in the upper layers of the soil. Xylem fluids are low in nutrients and the nymphs must consume large amounts



Fig. 2. Cast skin of a cicada nymph attached to tree bark.



Fig. 3. Oviposition damage. Note broken tip of branch (black arrow) that results in "flagging".

of it to accommodate their energy needs. Most of the water is quickly excreted and becomes available to shallow rooted plants. The upper layers of the soil are relatively dry, but willow and cottonwood roots are

able to obtain moisture from deep in the soil profile. Additionally, cicadas comprise an important prey species for birds and mammals, and the burrowing activity of nymphs facilitates water movement within

the soil.

The Legendary Cicada

Much folklore and several interesting customs are associated with cicadas. For example, many native American tribes utilize them for food; the nymphs are fried in butter and eaten like popcorn! Other tribes believe the periodic appearance of this insect portends something evil. The Chinese often prescribe cast cicada skins for ringing in the ears or ear infections (periodically each nymph stops feeding for a short time and sheds its skin prior to forming the next, larger, nymphal stage). Also, extract brewed from cast skins is thought to quiet babies. So, don't be surprised someday if your physician says "take two cicada skins and call me in the morning!"

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