Technical Bulletin

Forest Health Notes #72

Another Brood of Periodical Cicadas Creating A Buzz In Mississippi Forests

By Dr. John J. Riggins, Forest Entomologist.

Periodical cicadas, sometimes mistakenly called locusts, will be making another long awaited emergence very soon in a localized area of the Magnolia State and neighboring portions of Louisiana. Cicadas are members of the insect Order Hemiptera. They have piercing-sucking mouthparts that they use to feed on tree roots. They have relatively robust black and orange bodies, with 4 large clear wings and bright red eyes (Fig. 1). They also differ from annual cicadas (also called the dog-day cicada, Fig. 2), which emerge as adults every year. Annual cicadas in our area are usually much more greenish in color and have black eyes instead of red.

Periodical cicadas are a wonderfully unique occurrence in nature, mostly because of their extended immature stage (nymphs) and synchronous emergence. The vast majority of their long lives is spent as nearly immobile nymphs living in solitude underground, attached to the hardwood roots on which they feed. In the South, they emerge 13 years later, crawl up the sides of trees and structures and shed their skins before flying off to mate. Further north in the midwest States, emergences are usually on 17-year cycles, likely because of lower temperatures and shorter growing seasons.

Although all 13- and 17-year periodical cicadas emerge on either 13- or 17- year cycles, not all local populations emerge during the same year. These localized populations are called broods, and are distinguished by roman numerals. Three broods of 13- year cicadas occur in Mississippi. The last brood to emerge in Mississippi was brood XIX in 2011. Brood XIX is arguably the largest brood emergence geographically, historically occurring in AL, AR, GA, IN, IL, KY, LA, MD, MO, MS, NC, OK, SC, TN, TX, VA. Two other broods have historically occurred in Mississippi. Brood XXII, a relatively localized brood occurring in extreme southwest MS (Vicksburg area, Fig. 3) and east central LA, is scheduled to emerge in Mississippi this year (2014). The third Mississippi brood, XXIII, has historically occurred over a large portion of the Mississippi River corridor (AR, IL, IN, KY, LA, MO, MS, TN) and is scheduled to emerge in 2015. After the 2015 emergence of brood XXIII, the Mississippi springtime woods will be relatively quiet for nearly the next decade, until the next emergence of brood XIX in the year 2024. See http://insects.ummz.lsa.umich.edu/fauna/michigan_cicadas/periodical/index.html or http://www.magicicada.org/magicicada_2014.php for more information and maps of all broods and their distributions. The actual current distribution of most broods is probably much smaller than historical reports and some broods are completely extinct, due to decline in hardwood acreage and other stressors like logging and pesticides.

The exact mechanisms that allows millions of periodical cicadas to emerge at the same time over large areas are still somewhat unknown, although soil temperature seems to be an important factor. When larvae emerge, they leave many small round exit holes in the soil underneath the hardwood trees on which they developed. Huge populations of over a million cicadas per acre are sometimes reached, although typically numbers are much lower than that. Their high population densities and synchronous emergence are believed to be a strategy to protect themselves from predation. They have few other defenses...they are not poisonous, do not bite or sting, and are less likely to fly to avoid predators than their non-

Figure 1: *(left)* An adult periodical cicada emerging from Brood XXII. Photo taken by Chris Simon near Vicksburg, MS during the 1975 periodical cicada emergence. (Photo Courtesy Chris Simon)

Figure 2: *(Bottom)* Annual cicadas emerge every year, usually in summer months, and differ greatly in appearance from periodical cicadas.

For additional information, contact your local office of the Mississippi Forestry Commission. For more information on the Mississippi Forestry Commission's Forest Health Program, contact Randy Chapin at rchapin@mfc.state.ms.us.

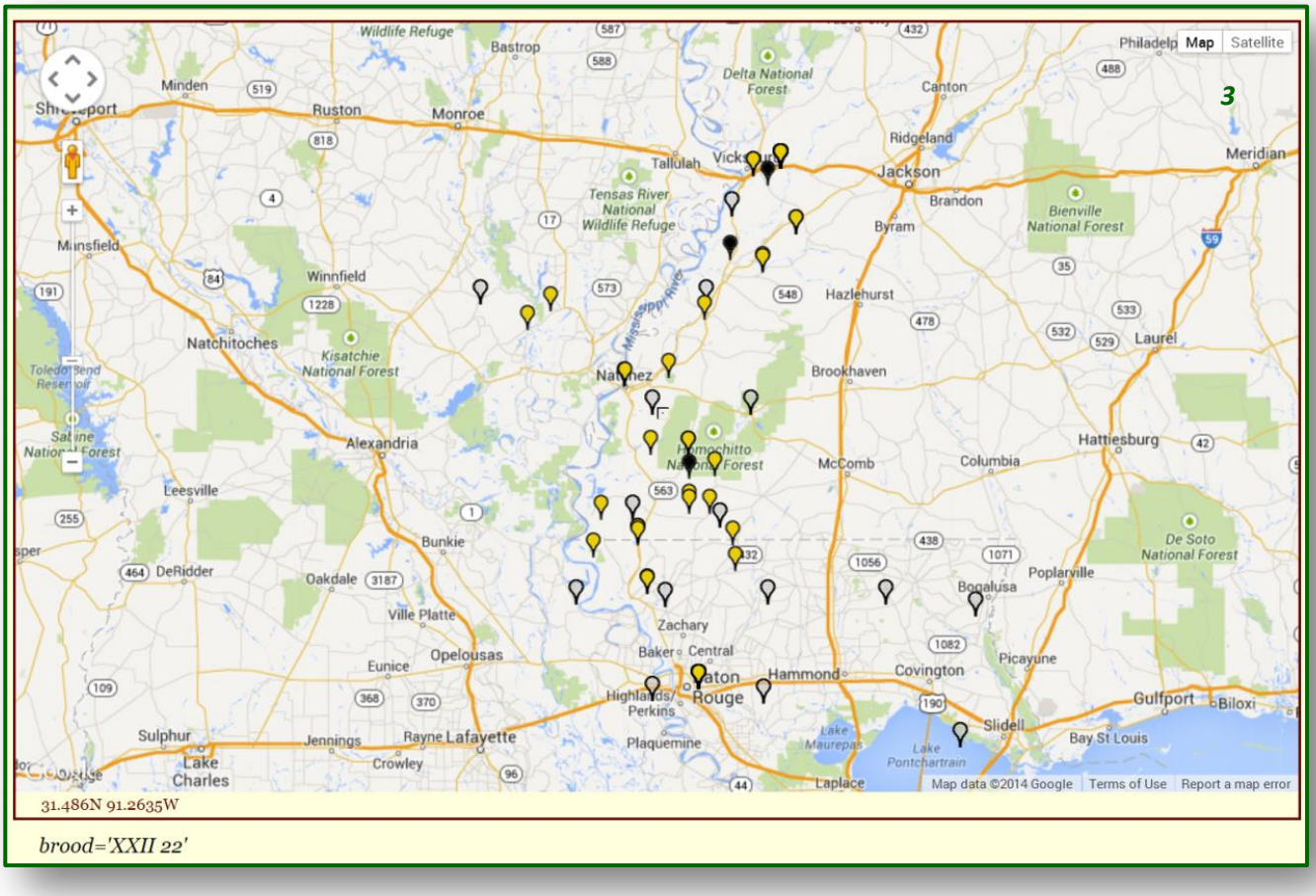

Figure 3. Magicicada.org distribution records of previous periodical cicada brood XXII emergences in Mississippi and Alabama. (Photo Courtesy Chris Simon)

periodical cousins. Many animals, both vertebrates and invertebrates, feed on the cicadas after they emerge, but the sheer numbers of cicadas satiate predators before they can make any real impact on cicada populations.

The adults spend about 4 weeks enjoying their brief stint in the sunshine. Males make loud buzzing noises to attract mates. After mating, females use their ovipositors to make egg-laying slits in hardwood twigs where they lay up to 600 eggs each. After the eggs hatch, larvae drop to the ground where they burrow into the soil to find a root and begin their long wait to develop.

Periodical cicadas can sometimes cause physical damage to young trees or shrubs if too many lay eggs in their twigs (Fig. 4). The most common type of damage is called "flagging", which is the browning and death of individual twigs and small branches. This is caused by the egg-laying galleries created by the female cicadas. Usually, this damage is only unsightly and does not kill the trees, however it can sometimes cause growth deformities or reduce growth. Some people recommend that orchard and nursery operations should avoid planting in the years preceding an emergence of periodical cicadas. Mature trees and shrubs usually survive dense emergences of cicadas without long-term detriment. The damage can appear significant immediately after it occurs, but will usually be short-term on mature, healthy trees. Periodical cicadas are often too numerous to make application of pesticides practical. Except for damage to nursery and orchard seedlings which is usually minor (and perhaps occasional annoyance for some people due to their loud

courtship songs), periodical cicadas are generally not considered to be pests.
A citizen-science opportunity exists for anyone interested in helping scientists to understand this phenomenon. Scientists at the University of Connecticut have been studying periodical cicada emergence patterns since 1975. Interested citizens can report the location and timing of periodical cicada emergences at the following website: http://www.magicicada.org/report/report.php. The information collected will help scientists to understand how these amazing creatures are capable of emerging synchronously on such a long timescale, as well as to map their distributions for conservation.

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Figures 4: Twig damage caused by periodical cicada egg laying.

Figure 5: Periodical Cicada nymphs crawling up a tree trunk, just before shedding their skin and emerging as adults.