



BUG BIZ

Pest Management and Insect Identification Series



Pecan Phylloxera

Distribution

Pecan phylloxera is found throughout the native pecan-producing regions of the United States.

Damage

Beginning in mid-April, galls or knots appear on the leaf veins, leaf rachises, catkins; current season's shoot growth and nuts of affected pecan trees, *Carya illinoensis* (Figure 1). These galls are caused by the feeding of small aphidlike insects known as the pecan phylloxera, *Phylloxera devastatrix*. During some years, the galls may be extremely numerous, covering the entire tree and giving the twigs a knotty appearance.

Galls can remain on the twigs for several years. Because of this, some growers refer to pecan phylloxera as stem phylloxera. High infestation levels of this insect cause the current season's shoots or twigs to become deformed, reducing their rate of growth. In some cases, severe infestations can lead to dieback of the current season's shoots. Galls also can form on the nuts, causing nut deformity and premature nut loss. Galls formed by pecan phylloxera are an alternate host for larvae of the hickory shuckworm, *Cydia caryana* Fitch.



Figure 1. Phylloxera gall mass.

Description and Life Cycle

Pecan phylloxera overwinters as a single egg within the body of a dead female insect (Figure 2). Prior to dying, the female seeks shelter on the tree under dead bark, within old galls or even under the carapaces (shells) of dead scale insects.

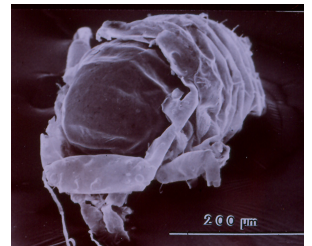


Figure 2. A phylloxera egg within the body of a female insect.

The overwintering eggs begin hatching in early spring at about the time the pecan buds are beginning to open. In northwestern Louisiana, this begins about mid-March. Upon hatching, the nymphs (stem mothers) move from the overwintering sites to the opening buds (Figure 3). The emergence period is approximately 50-60 days in length.



Figure 3. Stem mothers feeding on opening buds.

Once on the buds, the insects begin feeding. As they feed, a gall begins to form around the insect, eventually enclosing it within the gall (Figure 4). It is only this generation that forms a gall. Once the stem mother reaches maturity, she begins to lay eggs within the gall. The number of eggs laid ranges from 300 to 1,300 per gall.

The young that hatch from these eggs feed and develop within the gall. As they mature, they develop into wingless and winged females. The winged variants often are referred to as winged migrants.



The winged migrants emerge as the galls begin to split open in

Figure 4. Stem mothers feeding on pecan tissue. Note the beginning of the gall.

May (Figure 5). They disperse within the tree or, with the aid of the wind, are carried to other trees within the orchard. Soon after emergence, egg laying takes place. The small, light-yellow eggs are deposited on the upper and lower leaf surfaces (Figure 6). When infestation levels are high, the leaves often take on a yellowish tint because of the high numbers of eggs deposited on the leaves. The eggs deposited by the winged migrants hatch into sexual males and females.



Figure 5. Galls splitting open releasing the winged migrants.

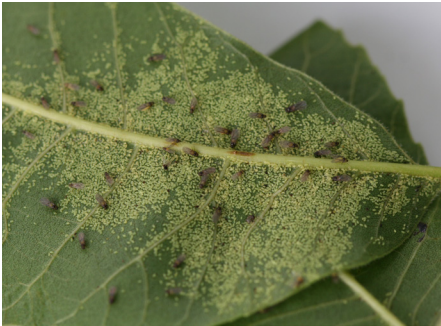


Figure 6. Winged migrants along with eggs deposited on leaf surface.

Almost immediately after hatching, the male and female phylloxera mate, and a single egg forms within the body of the female. Prior to dying, the female seeks shelter in a protected area on the tree, usually under the bark, in old galls or under dead scale insects. The egg will remain dormant within the body of the dead female until the egg hatches the following spring and begins another cycle.

Control

Infestations of pecan phylloxera do not occur on a regular basis, nor are all pecan cultivars susceptible to attack. Before an insecticide application is made, it is important to determine if phylloxera are present and on what cultivars.

One method of making that determination is to inspect the buds as they begin to open during the spring for the presence of the emerging nymphs. Another method is to attach white cloth adhesive tape coated with a bead of Tangle-Trap® to smooth-barked branches of the tree to capture the nymphs as they move from the overwintering sites onto the opening buds.

If phylloxera are present, insecticide applications should be made between the stages of bud development, where the leaves have begun to unfurl, and early leaf expansion (Figure 7). It is suggested that one insecticide application be made per year. If galls are found, another insecticide application can be made the next year. Insecticide applications need to be made prior to gall formation, because once the insects are enclosed in the galls, control is no longer possible.



Figure 7. Suggested stages of bud development when insecticide applications should be made for phylloxera control.

For a listing of insecticides that can be used to control pecan phylloxera, refer to the Louisiana Recommendations for Control of Pecan Insects. This can be found at www.lsuagcenter.com. When using insecticides, be sure to check the pH of the water used for spraying. The pH needs to be between 5.5 and 6.5 for optimum insecticide efficacy. Use of a buffering agent will help maintain the desired pH once pesticides have been added to a solution. Aerial application of insecticides for phylloxera control is not recommended because coverage usually is not adequate with that method.

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Fig. 2, Dr. Robert Clawson

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