BUG BIZ
Pest Management and Insect Identification Series
LSU AgCenter Research & Extension

Pecan Phylloxera

Distribution

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

Damage

Beginning in mid-April, galls (knots) begin to appear on the leaf veins, leaf rachises, catkins, current seasons shoot growth and nuts of the pecan, *Carya illinoiensis* (Fig. 1). These galls are caused by the feeding of a small, aphid-like insect 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 shoots or twigs to become deformed, reducing their rate of growth. In some cases, severe infestations can lead to dieback of the current seasons 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).

Description and Life Cycle

Pecan phylloxera overwinter as a single egg within the body of a dead sexual female (Fig. 2). Prior to dying, the female seeks shelter on the tree under dead bark (Fig. 3), within old galls and even under the carapaces (shells) of dead scale insects.

The overwintering eggs begin hatching in early spring about the time the buds are beginning to open. In northwest Louisiana, hatching begins in early March. Upon hatching, the nymphs (stem mothers) move from the overwintering sites to the opening buds (Fig. 4).

Once on the buds, the nymphs begin feeding. As they feed, a gall begins to form around the insect, eventually enclosing it within (Fig. 5). 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 (Fig. 6).

The young that hatch from these eggs feed and develop within the gall. As they mature they develop into wingless and winged females (Fig. 7). The winged forms are often referred to as winged migrants (Fig. 8).

The winged migrants emerge as the galls begin to split open in late April and May. They disperse within the tree and 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 (Fig. 9). When infestation levels are high, the leaves often take on a yellowish tint because of the high numbers of eggs deposited on

Fig. 1. Phylloxera gall mass.

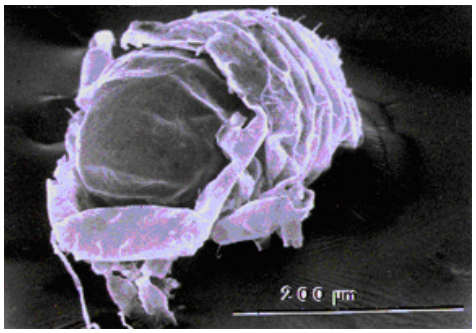

Fig. 2. A phylloxera egg within the body of a female.

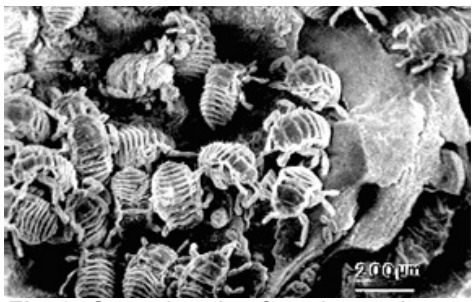

Fig. 3. Overwintering females under the bark of a pecan tree.

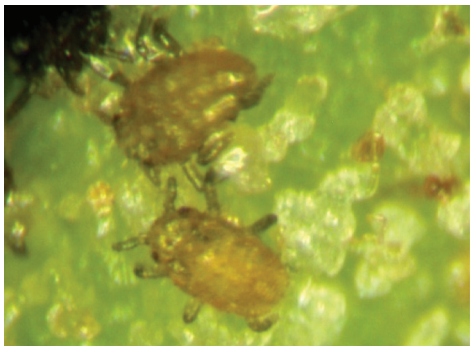

Fig. 4. Stem mothers feeding on opening buds.

the leaves. The eggs deposited by the winged migrants hatch into sexual males and females. Fig. 10 shows a closeup of one of the eggs deposited by the winged migrant.

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 it hatches the following spring to repeat the 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 is to inspect the buds as they begin to open in 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 (a brand of insect-trapping glue) 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 are usually made at the time of bud break when there is approximately one-half to three-fourths inch of new growth appearing. If large numbers of phylloxera are present, a second application, seven to 10 days later might be needed. Insecticide applications need to be made prior to gall formation, because once the phylloxera are enclosed within the gall, control is no longer possible.

For a listing of insecticides that can be used to control pecan phylloxera, refer to the "Louisiana Recommendations for Control of Pecan Insects," found at www.lsuagcenter.com.

When using insecticides, be sure to check the pH of the water being used for spraying. The pH needs to be between 5.5 and 6.5 for optimal insecticide efficacy. Use of a buffering agent will help maintain the desired pH once pesticides have been added to a solution.

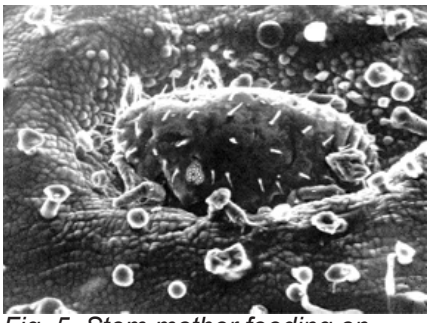

Fig. 5. Stem mother feeding on tissue. Note the beginning of the gall.

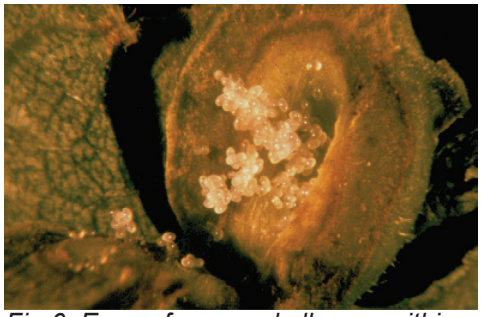

Fig 6. Eggs of pecan phylloxera within a gall.

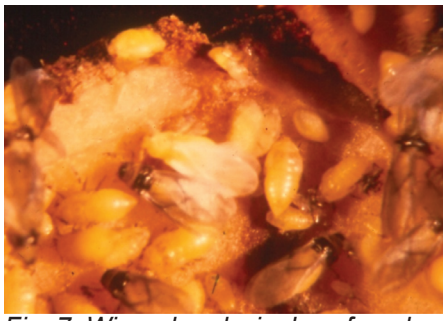

Fig. 7. Winged and wingless females within the gall.

Fig. 8. Winged female (migrant).

Fig. 9. Eggs deposited on the leaf surface by the winged migrants.

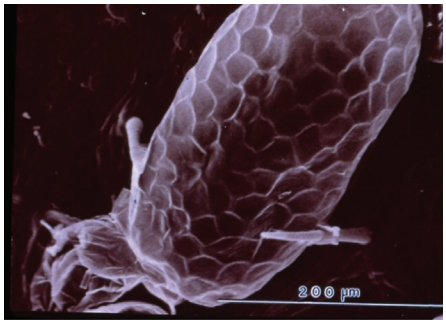

Fig. 10. A scanning electron microscope photograph of an egg.

Author: Michael J. Hall, Pecan Research/Extension Station
Photo Credits: David Boethel, Robert Clawson, Rebecca Melanson and Michael Hall

Louisiana State University Agricultural Center, William B. Richardson, Chancellor
Louisiana Agricultural Experiment Station, David J. Boethel, Vice Chancellor and Director
Louisiana Cooperative Extension Service, Paul D. Coreil, Vice Chancellor and Director
Pub. 2547 (online only) 9/09 Rev.