

LEAFHOPPERS

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Leafhoppers, often called sharpshooters, vector numerous plant diseases, including phony peach disease and plum leaf scald. Leafhoppers are abundant insects and they are very strong fliers. Key species in southeastern peaches readily move in and out of orchards. Phony peach and plum leaf scald, caused by the bacterium *Xylella fastidiosa*, are important diseases, especially in the Southeast's warmer production areas. Phony peach and plum leaf scale can be key factors in premature orchard decline. These leafhopper-vectored diseases limit stone fruit production in the Southeast's lower coastal plain. The leafhopper *Homalodisca coagulata* (Say), often called the glassy-winged sharpshooter, is a key vector of phony peach disease. *Oncometopia orbona* (Fabr.) and *Graphocephala versuta* (Say) are probably next in importance. *Cuernia costalis* (Fabr.) and *Homalodisca insolita* (Walker) are principally grass feeders and are considered to be less important in the transmission of phony peach.

DESCRIPTIONS



Figure 1. Glassy-winged sharpshooter, *Homalodisca coagulata*. Image by Jeff Brushwein.

Leafhoppers are slender, elongate insects with round or pointed heads. The forewings are slightly thickened and frequently are held roof-like over the abdomen. Adults of the two most important species on peach, glassy-winged sharpshooter and *O. orbona*, are rather large, being about 1/2 inch (11-13 mm) in length. The glassy-winged sharpshooter (Figure 1) is generally gray-brown in color with a reddish tint when newly emerged and with an orange underside marked with black. An ivory-colored blotch is usually visible at the base of the abdomen when the insect is viewed from the side. *O. orbona* is greenish-blue with irregular dark spots; it is orange and black underneath. The legs are orange with sparse black markings. *G. versuta* is a smaller leafhopper, about 1/5 inch (5 mm) long. Adults are generally green with reddish-orange stripes. *H.*

insolita is brown to black, slightly less than 1/2 inch (10-11 mm) long, with a longitudinal ivory stripe on each side of the body.

PLANT INJURY

On peaches and plums, leafhoppers are important only as vectors of *X. fastidiosa*, which causes phony peach disease or plum leaf scald. Direct leafhopper injury to peaches and other stone fruit is insignificant. Leafhoppers inject saliva and suck plant juices while feeding. All important leafhopper species on peach are stem feeders that have specialized to feed on the nutrient-poor xylem fluid, likely because of the near absence of plant defensive components in xylem fluid. *X. fastidiosa* is a xylem-limited pathogen. The glassy-winged sharpshooter is a key vector of phony peach disease and plum leaf scald. It feeds on a variety of woody and herbaceous host plants. Plums and crapemyrtle, *Lagerstroemia indica* L., are favorite summer hosts. Glassy-winged sharpshooters are sensitive to minor changes in the amino acid concentrations of nutrient-poor xylem fluid. They feed very selectively, moving from tree-to-tree or to-and-from orchards in response to xylem nutrients. On peach, leafhoppers feed selectively and aggressively during May and June when concentrations of key amino acids are highest. Leafhoppers aggregate on healthy, uninfected trees that have high levels of glutamine and asparagine in their xylem fluid. Levels of these amino acids are suppressed in phony trees. *X. fastidiosa* infections advanced enough to produce the diagnostic visual symptoms of dark foliage and shortened internodes have already begun to render these trees unattractive to leafhoppers. Removal of phony trees is recommended primarily to remove

unproductive, weed trees. Root suckers from infected trees that have been cut are very attractive to leafhoppers.

SEASONAL HISTORY AND HABITS

Leafhoppers of peach generally overwinter as adults in wooded areas. They become active and feed extensively during warm winter periods. Some feeding, and possibly even reproduction, may continue throughout warm winters in the Southeast's lower coastal plain. Activity increases in early spring; considerable numbers of leafhoppers may be seen by March and April. They feed on peach twigs and on stems of other trees (hollies, *Ilex* spp., appear to be especially important), shrubs, and grasses. Leafhoppers normally feed head-down, moving rapidly to the opposite side of the stem when disturbed. Adults mate and females lay masses of eggs in plant stems or leaves. Herbaceous plants are generally favored for egg laying, although leafhoppers will oviposit in peach. Eggs normally hatch in one to two weeks. Emerging young (nymphs) pass through five growth stages (instars) before becoming adults.

The primary vectors of phony peach, the glassy-winged sharpshooter and *O. orbona*, are particularly active as vectors in May to June. Crape myrtle and hollies are two of their favorite summer hosts. Glassy-winged sharpshooter is known to feed on over 100 plant species. Later in the summer, they feed primarily on herbaceous, broadleaf weeds. In the fall, when herbaceous weeds and field crops begin to dry up, these leafhoppers move back to woody plants, including peaches. *G. versuta*, *H. insolita*, and *C. costalis* feed primarily on broadleaf weeds and grasses, although they may be found in association with peach trees and other woody perennials throughout the year.

Leafhopper vectors of phony peach are quite abundant in the Southeast's coastal plain. The lower abundance of glassy-winged sharpshooter in cooler regions, particularly upper piedmont and mountain sites, is felt to be a key factor in the low incidence of phony peach disease in the Southeast's cooler production areas. Leafhopper abundance fluctuates with climate. High populations are common in summers following warm winters. High winds associated with summer thunderstorms are thought to be important in spreading leafhoppers and *X. fastidiosa*. Cold winters, especially those with warm periods followed by sudden, severe cold, can significantly reduce overwintering leafhopper populations. The abundance and species of leafhoppers in orchards during the summer appear to be influenced by the vegetation in and around the orchards. Well-maintained, closely mowed orchards with low broadleaf weed levels generally harbor fewer leafhoppers. Clean orchard culture may discourage vector movement into orchards. Diminishing the attractiveness of orchards to leafhoppers by cultural practice is important because the incidence of phony peach disease is usually directly related to the abundance of leafhopper vectors in orchards.

CONTROL

Insecticides applied to peaches and other crops through the season probably reduce leafhopper populations. However, because of the leafhoppers' mobility, broad host ranges, and abundance on a variety of host plants, insecticidal control is impractical as a means of suppressing spread of phony peach disease.

Good cultural practices are the best means of reducing leafhopper populations in peach orchards. Orchard floor management practices that suppress broadleaf weeds and strong-stemmed, upright grasses such as johnsongrass and Texas panicum are recommended. Keep other grasses and vegetation on the orchard floor short. Remove succulent green peach suckers, as they frequently attract large numbers of leafhoppers.

Remove phony infected trees each year. Although phony trees are themselves less attractive to leafhoppers, vigorous regrowth from phony stumps is quite attractive to leafhoppers and may create an important source of infection. If phony trees are chain sawed, leaving stumps, it is important to either treat stump suckers with an herbicide or push out the stumps before they sucker. It is also helpful to remove or kill all wild plums within 300 yards of orchards; within one-half mile if possible. Plums are a favored host for both the phony peach organism and its leafhopper vectors. Plums serve as a constant reservoir of infection for

nearby peaches. Cultivated plums are also excellent disease and vector reservoirs, so do not grow domestic plums near peaches in phony areas.