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UC IPM

Integrated Pest Management for Home Gardeners and Landscape Professionals

UC PEER REVIEWED

Glassy-winged Sharpshooter

The glassy-winged sharpshooter, *Homalodisca vitripennis* (formerly *H. coagulata*) (Figure 1), is an insect that was introduced into California in the late 1980s. This insect is native to the southeastern United States and was most likely brought into southern California accidentally as egg masses in ornamental or agricultural plant foliage.

Figure 1. Female glassy-winged sharpshooter, *Homalodisca vitripennis*.

BACKGROUND

The glassy-winged sharpshooter is a large leafhopper that obtains its nutrients by feeding on plant fluids in the xylem, the water-conducting tissues of a plant. Feeding on plants rarely causes significant plant damage, although the insects do excrete copious amounts of liquid that can make leaves and fruit appear whitewashed when dry. The excrement, which is not necessarily damaging, can be a cosmetic nuisance when shade trees are heavily infested, because cars parked under the trees tend to become spotted. Additionally, during hot weather, large populations of glassy-winged sharpshooters feeding on small plants may cause them to wilt.

Authors:

Lucia G. Varela, UC Statewide IPM Program/UC Cooperative Extension, Sonoma County.

Cheryl A. Wilen, UC Statewide IPM Program/UC Cooperative Extension, San Diego County.

Matthew P. Daugherty, Entomology, UC Riverside.

David E. Haviland, UC Cooperative Extension, Kern County.

The main problem associated with the glassy-winged sharpshooter is that it can transmit the plant-pathogenic bacterium *Xylella fastidiosa* from one plant to another. This bacterium has a broad host range, able to infect hundreds of plant species in dozens of plant families. Although infection by *X. fastidiosa* does not lead to disease in many of these host plants, it does cause several important, often fatal, plant diseases in California. This includes Pierce's disease of grape, alfalfa dwarf, almond leaf scorch, and mulberry leaf scorch. Other diseases caused by this bacterium in landscape plants include oleander leaf scorch, sweet gum dieback, and cherry plum leaf scorch. Other strains of *X. fastidiosa* cause phony peach disease, plum leaf scald, bacterial leaf scorch in a wide range of shade trees (sycamore, elm, maple, oak), citrus variegated chlorosis, coffee leaf scorch, and olive quick decline disease, but these diseases have not been confirmed in California. It should be noted that the strain of *X. fastidiosa* that causes oleander leaf scorch will not cause Pierce's disease in grapes and the strain of *X. fastidiosa* that causes mulberry leaf scorch does not cause disease in oleanders or grapes. At this time there is no cure for any of these diseases. For more information on oleander leaf scorch, see the *Pest Notes: Oleander Leaf Scorch*.

When a glassy-winged sharpshooter feeds on a plant that is infected with *X. fastidiosa*, it may acquire the bacteria, which attaches to and multiplies within specific portions of the insect's mouthparts. The sharpshooter then

Figure 2. Detail of head of glassy-winged sharpshooter (left) and smoke-tree sharpshooter (right).

may inoculate the bacteria to another plant when it feeds. Once acquired, sharpshooter adults are infective immediately, and they remain so for the remainder of their life. Immature sharpshooters are only infective until they molt, at which time they shed the bacteria as they pass to the next stage of development. For more information about *X. fastidiosa* and its transmission by sharpshooters and other vectors see the websites listed in the Suggested Reading section below.

IDENTIFICATION AND BIOLOGY

The glassy-winged sharpshooter is a large insect compared to other leafhoppers. Adults are approximately ½ inch long and are generally dark brown to black when viewed from the top or side. Wings are clear with red venation that fades as they age, but they appear dark brown due to the body coloration beneath them. The abdomen is whitish or yellow. The head is brown to black and covered with numerous ivory to yellowish spots. These spots help distinguish glassy-winged sharpshooter from a close relative, smoke-tree sharpshooter (*Homalodisca liturata*), which is native to the desert region of Southern California (Figure 2). The head of the smoke-tree sharpshooter is covered with wavy, light-colored lines, while the glassy-winged sharpshooter head is covered with spots. In profile, the immature stages (nymphs) of the glassy-winged sharpshooter look similar to that of the adult, except they are smaller, wingless, uniform olive-gray in color, and have prominent bulging eyes.

Before laying eggs, the female secretes a chalky white substance that she transfers to the upper wings forming white spots. After laying the eggs, she covers them with this chalky material by transferring it from the wings. Thus, the white spots on the wings are only visible on females shortly before laying a batch of eggs and are not present on males. Females lay egg masses, in groups of 8 to 12 eggs arranged side-by-side, under the epidermis of the lower leaf surface of young, fully developed leaves (Figure 3). When it is first laid, each individual egg appears as a greenish blister beneath the epidermis of the leaf. Shortly after the eggs hatch, the leaf tissue surrounding the egg mass begins to turn brown and remains as a permanent brown scar.

In Southern California and in the San Joaquin Valley, the glassy-winged sharpshooter typically has two generations per year. It overwinters as an adult feeding on citrus and other non-deciduous plants, moving to deciduous plants in January and February where adults feed on the sap from the leafless twigs before returning to the non-deciduous plants during cooler evening hours. These overwintering adults begin laying eggs in February but lay most of their eggs in late March and April. At this time, first generation eggs are easily found on the non-deciduous hosts. Eggs hatch in 10 to 14 days and the nymphs feed on the leaf petioles or young succulent stems while they progress through five immature stages. In the summer, first generation adults begin to appear in May through July. Egg laying for the second generation occurs between mid-June and October. The nymphs emerging from these egg masses typically develop into overwintering adults.

The glassy-winged sharpshooter is found in many habitats, including agricultural crops, urban landscapes, native woodlands, and riparian vegetation. It feeds on hundreds of plant species across dozens of plant families. Hosts include numerous common woody plants as well as annual and perennial herbaceous plants. It is common to find this insect on acacia, avocado, eucalyptus, citrus, crepe myrtle, heavenly bamboo, grape, photinia, pittosporum, hibiscus, periwinkle, xylosma, some roses, and many others.

Figure 3. Glassy-winged sharpshooter female next to an egg mass laid under the epidermis of the lower leaf surface (on left).

Host preference changes throughout the year, depending on the availability and nutritional value of host plants. Some hosts are preferred for feeding while others are preferred for reproduction. Irrigation level and fertilizer additions can also impact the attractiveness of hosts for sharpshooters.

Glassy-winged sharpshooter is established in residential and agricultural settings throughout most of southern California. In the San Joaquin Valley, it is abundant in much of Kern County and is locally abundant in certain parts of Tulare and Fresno Counties. Other localized infestations have occurred in parts of San Luis Obispo, Santa Clara, Contra Costa, Solano, Sacramento and Butte Counties, but were successfully eradicated. Nonetheless, there continues to be great concern that this insect may eventually invade most California counties, leading to certain restrictions on the shipment of host plants from areas where the glassy-winged sharpshooter is established. The map (Figure 4) shows the areas in California where this sharpshooter has been found and counties where it is feared that the pest may establish if introduced. For the most recent information, see the California Department of Food and Agriculture website listed in Suggested Reading.

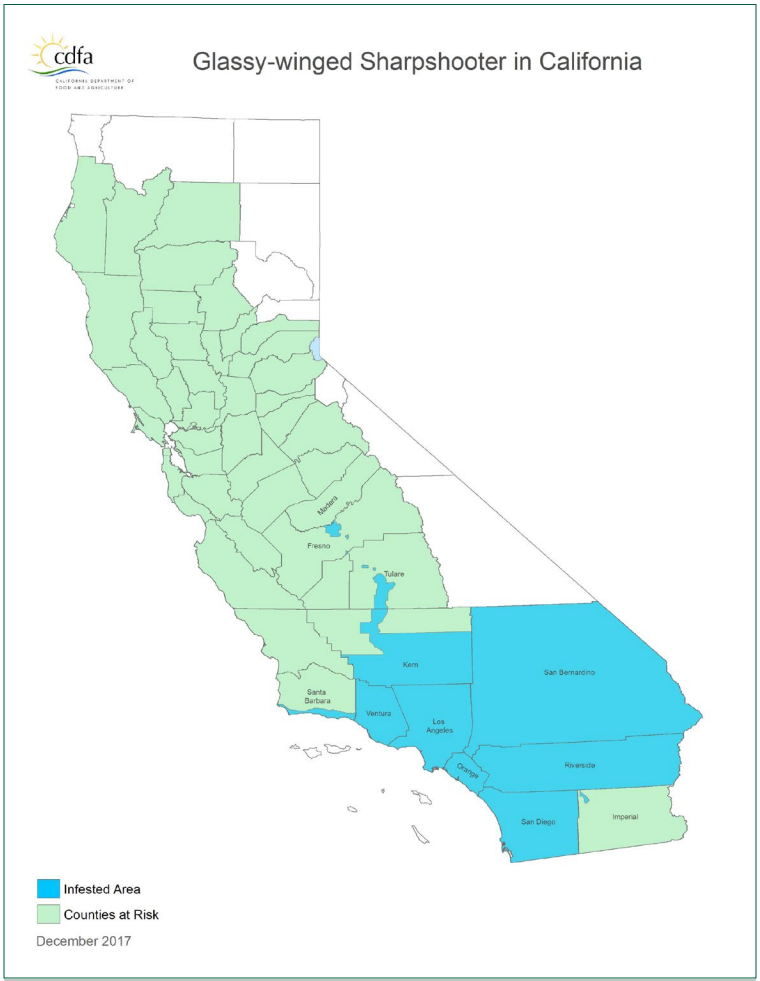

Figure 4. Distribution of glassy-winged sharpshooter in California as of December 2017. Infested areas are blue and at risk areas are green.

MANAGEMENT

For areas where the glassy-winged sharpshooter is not established, it continues to be important to identify new infestations as soon as possible. This requires careful monitoring and detection. If you find glassy-winged sharpshooter in an area not currently known to have this pest, immediately call the California Department of Food & Agriculture pest hotline at 1-800-491-1899, or contact your local agricultural commissioner's office.

In areas where the glassy-winged sharpshooter is established, the principal reason for controlling the glassy-winged sharpshooter is to prevent the spread of *X. fastidiosa* to susceptible plants. Plants cannot be cured of the disease. Management of glassy-winged sharpshooters in a residential setting relies on biological control in the surrounding environment and, in some cases, chemical control.

Detection and Monitoring

Even though this insect is large enough to be seen with the naked eye, it is inconspicuous in nature. The brown coloration of the insect blends in with the color of the twigs where it is usually found, and it hides by moving to the other side of the twig or branch when it detects movement or is otherwise disturbed. When inspecting host plants for glassy-winged sharpshooters, focus your attention about 6 inches to 1 foot from the tips of new shoots. This is where they prefer to feed. For taller hosts such as trees and grape arbors, the presence of small droplets of liquid falling as a mist from the canopy or whitish, powdery coating on leaves or fruit indicated that sharpshooters are present overhead. Yellow sticky cards are the preferred monitoring method for government agencies that track glassy-winged sharpshooter populations. If you find one of these cards on your property, direct any questions or inquiries to the phone number indicated on the trap.

Cultural Control

Once glassy-winged sharpshooter is established in an area, there are no cultural controls available to manage them. However, preventing transport of infested plant material to areas where

Figure 5. Glassy-winged sharpshooter egg mass with parasitoid emergence holes.

glassy-winged sharpshooter is not established is an essential step in slowing further spread in California. Nurseries shipping plants out of an infested area must follow rigorous treatment programs and have the plants inspected before they are shipped and again after they arrive at their destination.

Biological Control

Following the invasion of glassy-winged sharpshooters in California, multiple species of small wasps in the genus *Cosmocomoidea* (formerly *Gonatocerus*) were introduced for its control. These parasitoids, which attack and complete their entire life cycle within a glassy-winged sharpshooter egg, are now established in all regions of California where glassy-winged sharpshooters exist. Eggs parasitized by these tiny wasps are easily identified by pinpoint holes found at one end of the egg (Figure 5). Parasitoid populations are typically low early in the year, providing modest parasitism (10 to 50%). However, by the late summer or early fall these wasps can cause upwards of 90% mortality of glassy-winged sharpshooter eggs. It is important to support biological control by avoiding the use of broad-spectrum insecticides that may kill parasitoids and beneficial arthropods that eat sharpshooters (such as spiders, assassin bugs, praying mantids, and lacewings).

Chemical Control

In the event of glassy-winged sharpshooter spread to new areas, residential insecticide treatments may be necessary as part of localized eradication efforts by state and federal regulatory agencies. Otherwise, in most parts of California, insecticide applications for the control of glassy-winged sharpshooter are typically not recommended around homes and urban landscapes. This is because populations are generally low and under good biological control, and there is a relatively low prevalence of *Xylella* diseases in urban settings. The exceptions are cases where residents notice large sharpshooter populations on particularly favored hosts, such as some varieties of citrus, or rare instances where populations in ornamental plantings are high enough that white residues from excrement production become a significant nuisance.

The most common insecticides used for glassy-winged sharpshooter contain the active ingredient imidacloprid. Some retail imidacloprid products available to residents include Bayer BioAdvanced 12 Month Tree and Shrub and Bayer Advanced Fruit, Citrus and Vegetable Insect Control. Applications are made by calculating the amount of product needed (depending on the size of the tree or shrub), diluting the product with water, and pouring the mixture around the base of the plant where it soaks into the soil. With appropriate watering, the active ingredient is absorbed by the roots and moved throughout the plant in sufficient quantities to protect against sharpshooters. Typically, the plant becomes protected within a few weeks. Imidacloprid treatments may have a secondary benefit by helping to control other common sucking insect pests, such as some scales, aphids, or whiteflies. Recent research has suggested that imidacloprid may be less effective than in the past when used against glassy-winged sharpshooters in agricultural fields in Kern and Tulare Counties. Therefore, urban landscapes close to these agricultural areas may experience less effective control with imidacloprid products.

In instances where the white excrement produced by this pest causes residues on cars or other surfaces, other insecticides can be applied to infested foliage to provide immediate relief. The least toxic and least disruptive to biological control are insecticidal soaps and oils. Insecticidal soaps and oils are only effective in killing the soft-bodied nymphs of the glassy-winged sharpshooter and must directly contact the insect to kill it, so thorough coverage of the plant or tree foliage is essential. Applications of these materials need to be repeated at 7- to 10-day intervals. Other insecticides (including Bioadvanced Insect, Disease and Mite Control, Ortho Insect, Mite and Disease 3-in-1, or Sevin Insect Killer) are available for foliar applications that are more effective for longer periods of time. However, these materials may be more harmful to the parasitic wasps and predatory insects that provide biological control, and they can be toxic to pollinators. For all insecticide applications, it is important to follow application instructions on the label to minimize harm to pollinators and other beneficial insects.

REFERENCES

Varela LG, Smith RJ, Phillips PA. 2001. *Pierce's Disease*. UC ANR Publ. 21600. Oakland, CA.

Wilen CA, Hartin JS, Henry JM, Costa HS, Blua M, Purcell AH. April 2008. *Pest Notes: Oleander Leaf Scorch*. UC ANR Publ. 7480. Oakland, CA.

SUGGESTED READING

For current information regarding glassy-winged sharpshooter see the California Department of Food and Agriculture (CDFA) website, cdfa.ca.gov/pdcp/Glassy-winged_Sharpshooter.html.

For a map of infested sites in California see the CDFA website, cdfa.ca.gov/pdcp/map_index.html.

For more information on plant diseases caused by *Xylella fastidiosa,* see the University of California, Berkeley website, nature.berkeley.edu/xylella.

WARNING ON THE USE OF PESTICIDES

Pesticides are poisonous. Some pesticides are more toxic than others and present higher risks to people, nontarget organisms, and the environment. A pesticide is any material (natural, organic, or synthetic) used to control, prevent, kill, suppress, or repel pests. "Pesticide" is a broad term that includes insecticides, herbicides (weed or plant killers), fungicides, rodenticides, miticides (mite control), molluscicides (for snails and slugs), and other materials like growth regulators or antimicrobial products such as bleach and sanitary wipes that kill bacteria.

Always read and carefully follow all precautions and directions provided on the container label. The label is the law and failure to follow label instructions is an illegal use of the pesticide. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, and animals. Never place pesticides in food or drink containers. Consult the pesticide label to determine active ingredients, correct locations for use, signal words, and personal protective equipment you should wear to protect yourself from exposure when applying the material.

Pesticides applied in your garden and landscape can move through water or with soil away from where they were applied, resulting in contamination of creeks, lakes, rivers, and the ocean. Confine pesticides to the property being treated and never allow them to get into drains or creeks. Avoid getting pesticide onto neighboring properties (called drift), especially onto gardens containing fruits or vegetables ready to be picked.

Do not place containers with pesticide in the trash or pour pesticides down the sink, toilet, or outside drains. Either use all the pesticide according to the label until the container is empty or take unwanted pesticides to your local Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Hazardous Waste Collection site nearest you. Follow label directions for disposal of empty containers. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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Technical Editor: K Windbiel-Rojas

ANR Associate Editor: AM Sutherland

Editor and Designer: B Messenger-Sikes

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This and other Pest Notes are available at ipm.ucanr.edu.

For more information, contact the University of California Cooperative Extension office in your county. See your telephone directory for addresses and phone numbers, or visit: ucanr.edu/County_Offices.

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