# High Priority Organism: Glassy Winged Sharpshooter (*Homalodisca vitripennis*)

This highly polyphagous sucking pest, originating from the western USA, is spreading through the Pacific. It can transmit a very serious disease of the vascular bundle (Pierce's disease) in grapes and other species (incl. citrus) and it can cause production losses by staining fruit. Its arrival in NZ could pose a substantial threat to the kiwifruit industry.

## Assessment of risk

| Establishment in NZ | | Economic impact | | Market Access | |
|---|---|---|---|---|---|
| Entry pathway | | Host range (incl. kiwifruit) | ? | Treatment required | ? |
| Ease of establishment | | Plant health | | Area freedom required | ? |
| Ease of detection | | Crop productivity | | Movement control | |
| Ease of eradication | | Crop protection | | Quarantine requirements | |

**Key:** High risk | Moderate/unknown risk (?) | Low risk

## Description & Life cycle

Glassy-winged sharp shooter (*Homalodisca vitripennis*) adults are about 13-14mm long. They have dark brown bodies with small yellow dots on the head and thorax. The face and legs are yellow-orange in colour, and the eyes are yellow with dark speckles.

There are two generations in California per year. Females overwinter as adults and lay eggs in late-winter or early spring.
They lay their eggs inconspicuously below the epidermis of plant leaves which has allowed them to spread to new locations through the nursery trade at an alarming rate.

When populations are more abundant, egg masses can be laid into the rind of immature fruits of crops such as citrus and melon.

The young wingless nymphs emerge from eggs after about two weeks.

Nymphs undergo five molting stages before reaching maturity, during which time they feed on the stems of the host plants. They mature in late spring through summer and lay more eggs.

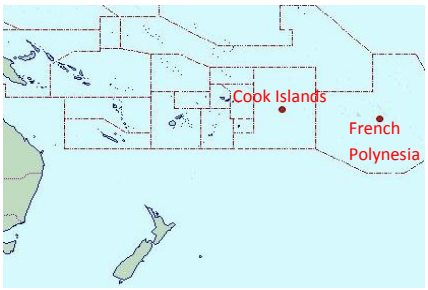
**Nymph**

This second generation begins to mature in summer and provides the overwintering adults for the following year.

## Distribution

GWSS is native to the south-eastern United States and regions of northern Mexico. GWSS is abundant from eastern Texas to northern Florida, including the states of Louisiana, Alabama, Mississippi, Georgia, South Carolina and the southern parts of North Carolina and Arkansas. It appears to be rare in north-eastern Mexico.

It spread to California in the late 1980s and from there to French Polynesia (where it was first seen in Tahiti in 1999), Hawaii in 2004 and the Cook Islands (Rarotonga) in March 2007. This gradual spread across the Pacific was almost certainly facilitated by air transport, which shows that both the GWSS insect and egg masses can survive after travelling for long distances.




Chile also reported the presence of GWSS (on Easter Island) and classified it as subject to official control in 2010. Tahiti poses a major infestation epicentre for the South Pacific. Dead sharpshooters have been found in cargo bins. Large numbers are attracted to hangar lights at night and yellow on the sides of planes may attract flying sharpshooters, which will enter open plane doors.

## Host & Climatic Range

The glassy-winged sharpshooter is highly polyphagous, feeding on the xylem fluid of over 100 known species of plant, in at least 37 different families. The experience out of the USA is that the greatest threats are for regions with mild winters where one or more of the following crops are grown: grapes, citrus, almond, stone fruits (*Prunus* spp.), coffee, oleander, or where tree species potentially affected by leaf scorch diseases occur.

Since its accidental introduction to California (circa 1989), both the ovipositional and feeding host lists continue to expand, primarily within ornamental plant species grown in nurseries or landscape gardens.

As a xylem feeder, it circumvents secondary plant defence chemistry found in phloem sap and, as a result, it appears to be able to feed on most plant species during the vegetative growth stages. The high volume of xylem fluid intake required limits its survival to situations in which continued contact with a living host is possible.

There have been no reports of GWSS feeding on kiwifruit nor reports on the impacts *Xylella fastidiosa* causes on kiwifruit and is an area of research that would be highly advantageous for the New Zealand kiwifruit industry.

Despite originating in a humid, subtropical region GWSS can become abundant in Mediterranean climates if plants receive adequate irrigation and winter temperatures are not too severe. There is no indication that GWSS would struggle to establish in New Zealand.

## Impacts

The actual feeding on plants causes little damage; it is the ability of the GWSS to vector the bacterium *Xylella fastidiosa* that causes devastating diseases of many plants which is a major problem.

The insect consumes hundreds of times its body weight per day in xylem fluid. The excrement of GWSS is watery, high in ammonia and dries to a fine, whitish powder which that can make leaves and fruit appear whitewashed when dry. High densities of feeding sharpshooters excrete enough waste product to cause a 'rain', which falls from the trees. This phenomenon is particularly acute in Tahiti where puddles form on roads and footpaths as result of sharpshooter rain.

There are almost 150 known strains of *X. fastidiosa*, which may be benign or cause mild to severe disease symptoms. In grapes one of these strains causes a lethal disease known as Pierce's disease. Pierce's disease has been particularly damaging to wine grapes in the Temecula Valley viticulture area (California), where losses have been as high as 20-30% for some vineyards. Although the disease has been present for many years prior to GWSS, it was easily managed because native sharpshooters were poor vectors. The arrival of GWSS, which are far more efficient vectors, has allowed the bacterium to spread much further causing damage to hundreds of hectares of vines.

In California, *X. fastidiosa* also causes oleander leaf scorch, almond leaf scorch, mulberry leaf scorch, cherry plum leaf scorch and sweet gum dieback. Outside of California other strains of the bacterium cause phony peach disease, plum leaf scald, leaf scorches in sycamore, elm, maple, and oak, and variegated citrus chlorosis.

Again the full impacts on kiwifruit both from GWSS and *X. fastidiosa* are not fully understood as the current distribution range of GWSS has only limited commercial plantings of kiwifruit.

An incursion of GWSS however would regardless of the direct impact on kiwifruit have major implications for the kiwifruit industry both from a direct pest and disease management as well as restrictions to plant material movements.

It is also anticipated significant quarantine restrictions would be required by importing countries due to the possible risk of egg laying in immature fruit, plus the potential for the adult to be a passenger in export consignments.

## GWSS establishment information

**Dispersal ability**

Adult glassy-winged sharpshooters are strong fliers and can disperse great distances to search for optimal host plants. This has led to their successful spread within the islands of French Polynesia in a short space of time.

**Ease of detection**

Current trapping relies on use of the yellow Seabright trap which is flat with two sides covered with stickem to capture the insects. Attempts have been made to improve the efficiency of monitoring and improve the correlation to the population present.

This method of detection is suitable to monitor populations where GWSS has established but has limited application if the country is free of the pest.

**Ease of Eradication**

In areas where glassy-winged sharpshooter is not well established, authorities will treat infestations with various insecticides to eradicate this pest when it is discovered. However once established the approach appears to be damage limitations and options to reduce the spread of X. fastidiosa.

The main material used to protect Xylella-susceptible plants in both commercial agriculture and urban landscapes is imidacloprid. The soil-application formulation provides the most effective, long-lasting control and is less disruptive to the biological control provided by the parasitic wasps.