

NSW Cut Flower Industry

Managing Whiteflies in Cut Flowers

Description

The two major species of whiteflies that are pests of production nurseries in Australia- silverleaf whitefly (SLW - *Bemisia tabaci* biotype B) and greenhouse whitefly (GHW - *Trialeurodes vaporariorum*). Both species are small, winged insects related to aphids, leafhoppers and mealybugs, and have a wide host range. They measure about 1.5-2mm in length, with adults typically white with powdery wings, and nymphs translucent, scale-like, sedentary, and found on the undersides of leaves. They have a rapid lifecycle, with eggs hatching into nymphs/ larvae that feed before maturing into pupae and then adults within a few weeks under ideal conditions. Infestations can be identified by the cloud of white flying adult insects that emerge when leaves are disturbed.



Image: Thomasz

Figure 1. GHW (*Trialeurodes vaporariorum*) larvae



Image: Thomasz

Figure 2. GHW (*Trialeurodes vaporariorum*) adults

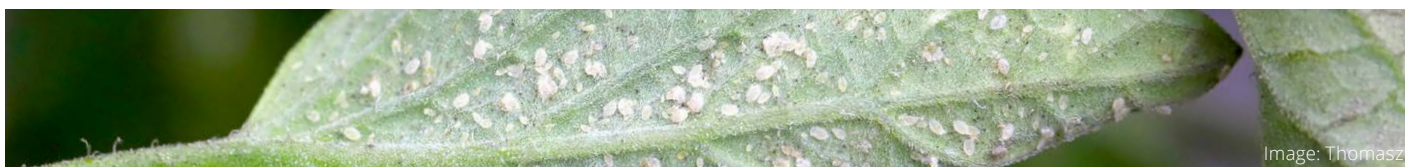


Image: Thomasz

Quick Facts

● HOST PLANTS:

Whiteflies commonly infest a range of cut flowers, including gerberas, lilies, and orchids. Whiteflies are particularly problematic on plants with dense foliage.

● WHERE TO CHECK:

Inspect the growing tips of plants for adults, underside of leaves for adults and nymphs, and foliage and stems for signs of sooty mould.

● HOW OFTEN TO MONITOR:

Weekly inspections during the growing season, with increased frequency during periods of high infestation. Also monitor using yellow sticky traps.

● ACTIONS:

Take action when whiteflies or damage is detected, especially if virus transmission is a concern.

Damage

Whiteflies suck sap, reducing plant growth rates and causing leaf chlorosis, senescence, or even plant death, depending on the whitefly species and their infestation levels. They also excrete honeydew, encouraging black sooty mould fungus, which reduces photosynthesis and may render plants unsightly and unmarketable. SLW can also produce toxic effects resulting in abnormal growth in some plants.

Additionally, SLW is a vector for several plant viruses such as Tomato Yellow Leaf Curl Virus (TYLCV). SLW acquires viruses through feeding, with a transmission period of 12-24 hours for TYLCV.

Prevention

- **Control Alternative Hosts:** Control weeds from families such as Euphorbiaceae, Asteraceae, and some Malvaceae around production areas as they can harbour whiteflies and serve as reservoirs of infestation.
- **Use Physical Barriers:** Install fine mesh screens with mesh sizes less than 0.19 mm (400 microns) on greenhouse vents and doors to prevent whitefly entry. However, be aware that screens can increase humidity, so consult with a protected cropping consultant before installation.
- **Inspect Incoming Stock:** Check all new plants and seedlings for whiteflies before introducing them to your production area.
- **Maintain Crop Hygiene:** Practice strict hygiene to avoid contamination between different areas. Do not move plants from infested areas to clean ones.
- **Use Resistant Varieties:** Choose virus-resistant plant varieties where possible to lower the risk of infestation.
- **Implement Preventive Cultural Practices:** Use weed mats, plastics, or gravel to minimise weed growth and improve airflow.

Monitoring

- **Yellow Sticky Traps:** Place traps above plant tops and near vulnerable areas (such as crop edges, greenhouse entrances or vents). Use one trap per 100m² in greenhouses; inspect weekly and replace every 2-4 weeks.
- **Frequency:** Inspect plants weekly; increase frequency during warmer weather and with susceptible plant species.
- **Visual Inspection and Plant Beating:** Check 1-10% of each plant type. Use a x10 or x15 hand lens to examine leaves, especially those that are stunted or chlorotic. Note any flying whiteflies when plant foliage is disturbed. Examine leaves (including older leaves) for nymphs and pupae. These are the stages targeted by natural enemies.

Cultural

- **Manage Infestations Promptly:** Remove and destroy heavily infested plants to prevent the spread of whiteflies. Bag infested material and either bury it or place it in a black bag under the sun for several hours to kill pests.
- **Minimise movement:** Limit staff movement between infested and clean areas to prevent the spread. Visit infested areas last during routine inspections.
- **Environmental Control:** Ensure adequate spacing between plants to improve airflow
- **Mass trapping:** Yellow sticky rolls can be installed, particularly in greenhouses, to attract and capture adult whiteflies and other harmful flying insects.

Biological

- **Predatory Beneficials** - release commercially available natural enemies as shown below.

TYPE OF PREDATORY BENEFICIAL	SPECIES	EFFECTIVE AGAINST
Parasitoid wasps	<i>Eretmocerus hayati</i>	SLW
	<i>Encarsia formosa</i>	GHW and SLW
Predatory mites	<i>Typhlodromips montdorensis</i>	SLW
	<i>Typhlodromus lailae</i>	GHW and SLW
Predatory bugs	<i>Nesidiocoris tenuis</i>	GHW and SLW
Lacewings	<i>Mallada signatus</i>	GHW and SLW

- **Habitat curation:** Augmentative releases and habitat manipulation, like providing flowering plants that attract beneficials, can enhance biological control effectiveness.



Figure 3. SLW on underside of leaf
(<https://www.horticulture.com.au/globalassets/hort-innovation/resource-assets/ny11001-managing-silverleaf-whitefly-in-production-nurseries.pdf>)

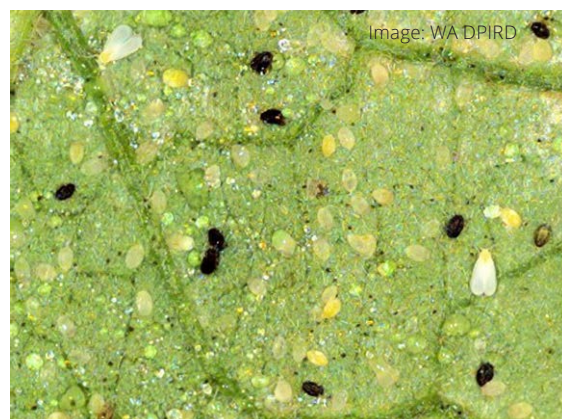


Figure 4. Symptoms of whitefly parasitism by the parasitoid *Encarsia formosa*

Chemical

- **Insecticide selection:** SLW biotype B can rapidly develop resistance to insecticides, so avoid use of residual chemicals and rotate insecticides from different modes of action.
- **Compatibility with Biological Control:** Select insecticides that are less harmful to beneficial natural enemies. Limiting broad-spectrum insecticides encourages natural parasitism and predation.

Insecticide Resistance

As whiteflies are found on the undersides of leaves, care must be taken to ensure thorough coverage. A systemic insecticide, applied as a soil drench, can provide effective longer-term control and is not as toxic to predators as a foliar application. However, highly residual products will increase the likelihood of the development of resistance, especially in SLW, particularly if they are applied regularly.



Image: Thomasz

Take Aways

- **Monitoring:** Regular monitoring is the cornerstone of Integrated Pest Management. Identify whitefly presence (and correct species) early and track population trends to determine the best time for intervention (biological control or insecticides).
- **Decision-Making:** Use a combination of monitoring data, pest thresholds, and environmental conditions to make informed decisions on when and how to apply cultural, biological, and chemical controls.

References / More Information

- <https://www.horticulture.com.au/globalassets/hort-innovation/resource-assets/ny11001-managing-silverleaf-whitefly-in-production-nurseries.pdf>
- <https://bugsforbugs.com.au/whats-your-pest/whiteflies/>
- <https://biologicalservices.com.au/pests/silverleaf-whitefly/>
- <https://biologicalservices.com.au/pests/greenhouse-whitefly/>

This fact sheet has been developed by RMCG and reviewed by Dr Robert Spooner-Hart as part of a Storm and Flood Industry Recovery project to reduce chemical use in the NSW cut flower industry.



Image: hedgehog94

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Australian Government

