

Silverleaf Whitefly, *Bemisia argentifolii* (Homoptera: Aleyrodidae)

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The silverleaf whitefly *Bemisia argentifolii* (Homoptera: Aleyrodidae) causes many plants to change color, turning yellow, white, or silver, depending on the specific host plant. Because various squash species turn silver when infested the species was given the common name 'silverleaf whitefly'. In north Florida, high populations of this serious pest are often seen in the fall whereas in south Florida populations tend to exist throughout the year with the peak in the summer. Monitoring is an essential part of a whitefly management program. The pest is difficult to control with insecticides because adults and immature stages infest the lower surfaces of leaves which are hard to reach with insecticide sprays. Also, the pest has developed resistance to many insecticide chemistries. Therefore, this pest should be managed using preventive and curative pest management tactics.



Whitefly Adult and Immatures



Whitefly Infestation

Photos by Muhammad Haseeb © FAMU

Identification

- Adult flies are moth-like and covered with white, waxy powder. Adult female whiteflies are about 2 mm in length.
- Eggs are whitish to light beige but change to a dark blue or purple before hatching.
- The immature stages resemble miniature scale insects. They are flat and oval, glassy to opaque, light yellowish or greenish, and often provided with a fringe of wax filaments. Older immatures tend to be darker and either cream or yellow in color.
- Newly hatched immature crawlers move around on the leaf for only a few hours, then insert their mouthparts and begin to feed. The remainder of immature development is sessile.

Host Plants

- Hosts include vegetable, field, and ornamental crops.
- This whitefly is a major pest of tomato, pepper, squash, cucumber, bean, eggplant, watermelon, and cabbage in Florida.

Distribution

The pest is found throughout the southern United States and can overwinter outdoors in some states.

- It is widely distributed throughout the Caribbean basin, Central and South America, and Mexico.
- The species is present throughout most of the southern Europe, Africa, India, and Pakistan and has recently moved into Australia.

Damage

- Heavy infestations of adults and their immature states can cause reduction in vigor and yield of older plants.
- When adult whiteflies feed, they excrete honeydew, a sticky excretory waste that is composed largely of plant sugars.
- Sooty mold grows on honeydew-covered substrates, reducing photosynthesis, and reducing fruit quality grade.

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Monitoring and Pest Density

- Pest levels can be monitored by trapping winged adults on sticky cards and inspecting leaves for the presence of feeding and immature stages:
- Place yellow sticky cards throughout the field or raised beds.
- To detect whiteflies on plants, randomly select ten plants per thousand square feet of greenhouse space using a 10X hand lens.
- Examine the undersides of these plants' leaves for the presence of whitefly adults, nymphs and eggs.

Biology and Ecology

- Eggs are laid singly on the underside of the leaves and are white in color. Each female can produce up to 300 eggs.
- The first instar, called the crawler, has legs and is the only mobile instar that moves to look for feeding sites. The life cycle is dependent on the temperature and plant species. It can take 14-60 days, but typically *Bemisia* spp. takes 20 days at 80°F.
- Whiteflies feed exclusively on leaves, nearly always occurring on the undersurface. They suck juices from the plants and also excrete large quantities of honeydew in which sooty mold grows.

Pest Management Strategies

- Do not use infested plants for transplanting.
- Several cultural controls can reduce pest populations and lessen their impact on crops.
- Sanitation. During the growing season, geminivirus-infected plants can be rogued out and destroyed.
- After harvest, crop residue should be removed.
- Plastic mulches may be effective in reducing whitefly populations and geminivirus incidence.
- Use and conservation of biological control agents (parasitoids and predators) is highly recommended.
- Several biological agents are available. These include predators (e.g., *Orius*, *Delphastus*, *Chrysoperla*), parasitoids (e.g., *Eretmocerus*, *Encarsia*), or pathogens (e.g., *Beauveria bassiana*).
- The pest is hard to control with insecticides because adults and immature stages infest the lower surfaces of leaves which are difficult to reach with insecticide sprays. Also, the pest has developed resistance to many insecticide chemistries.
- Homeowners are advised to treat populations before they reach outbreak levels and to spray immature whiteflies with a mixture of insecticidal soap or insecticidal oil in water.

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