GIANT WHITEFLY

Integrated Pest Management for Home Gardeners and Landscape Professionals

The giant whitefly, *Aleurodicus dugesii*, (Fig.1) is native to Mexico. It was first discovered in San Diego County in October 1992 and is now found in southern California and elsewhere, including Arizona, Florida, Hawaii, Louisiana, and Texas. Since its introduction into southern California, giant whitefly has spread rapidly northward along the coast.

Giant whitefly can severely infest many ornamental plant species found in nurseries, landscapes, and home gardens. The plant species most affected by the giant whitefly include begonia, hibiscus, giant bird of paradise, orchid tree, banana, mulberry, *Xylosma*, aralia, and various vegetables. Certain varieties of citrus and avocado are also affected. As the giant whitefly adapts to vegetation in new areas, the list of known host plants (Table 1) is likely to grow.

IDENTIFICATION AND LIFE CYCLE

Whiteflies go through three developmental stages: egg, a progression of immature stages called nymphs, and the adult stage (Fig. 2). Because immature whiteflies change greatly in appearance during their last nymphal stage, nymphs in this stage are sometimes called "pupae," even though whiteflies do not have a true pupal stage. Whitefly nymphs have small, oval bodies with no wings and no apparent legs or antennae. The adult emerges from the last nymphal stage as a winged insect that looks like a very tiny moth. All stages of development generally occur on the undersides of leaves.

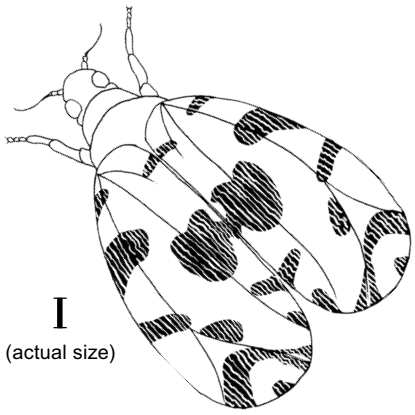

Figure 1. Giant whitefly adult.

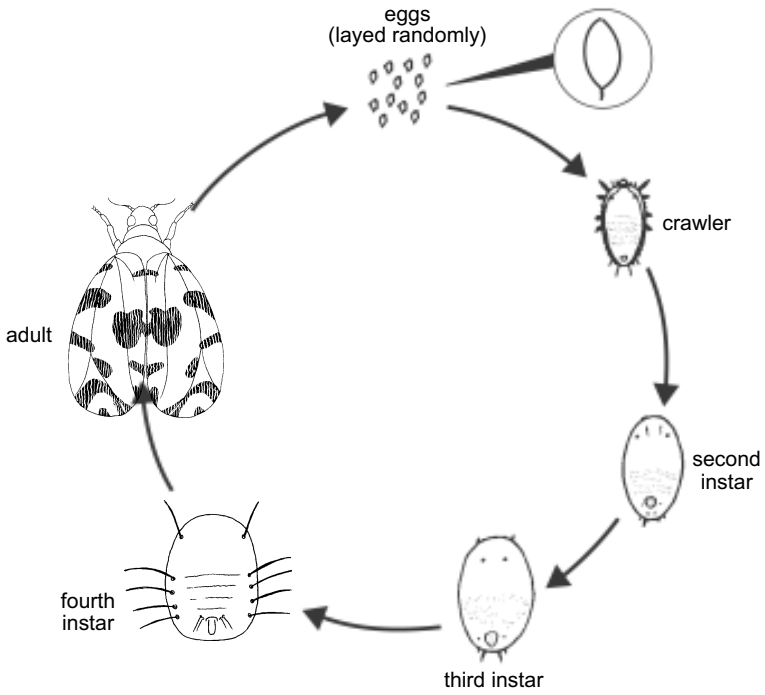

Figure 2. Giant whitefly life cycle.

Giant whitefly gets its name from its large size (adults can be up to 3/16 inch long) relative to many other whitefly species in North America. This species can also be identified by the spirals of wax that are deposited by adults as they walk on leaves. When populations of giant whitefly reach high levels, the whiteflies and their waxy deposits occur on both upper and lower leaf surfaces. Eggs are often laid among the wax deposits. After hatching, the

PEST NOTES Publication 7400

University of California
Agriculture and Natural Resources

January 2002

Table 1. Partial List of Giant Whitefly Host Plants.

Acacia longifolia
Acacia saligna
Aralia
avocado
bamboo
Bauhinia galpinni
Begonia
Bishofia javanica
Bombax sp.
Bougainvillea variegata
Brachychiton spp.
Buxus japonica (boxwood)
Calliandra sp.
Canna sp.
castor bean
citrus
Colacasia (Elephant ear, taro)
Cyperus papyrus (papyrus)
Erythrina sp.
Eucalyptus spp.
Ficus spp.
fuchsia
ginger
gladiolus
Hedera helix (ivy)
Heliconia sp.
Hibiscus spp.
Hoya sp.
Kentia palm
lantana
liquidambar (sweet gum)
mandevilla
Morus alba
Murraya paniculata
Musa spp. (banana)
Myoporum
Nandina domestica (heavenly bamboo)
nasturtium
orchids
Osteospermum sp.
Passiflora sp. (passion flower)
Pelargonium sp. (geranium)
Philodendron spp.
Pittosporum undulatum
Plectranthus sp.
Plumeria sp.
poinsettia
Salix spp. (willow)
Schefflera sp.
Schinus terebinthifolius
Solandra spp.
Solanum sp.
Strelitzia spp. (bird of paradise)
Syzygium sp. (Eugenia)
Tupidanthus sp.
Vitex lucens
water lily
Xylosma compacta

nymphs produce long hairlike filaments of wax up to 2 inches long that give a bearded appearance to affected leaves and is often mistaken for a leaf fungus.

Giant whiteflies exhibit a strong tendency to feed in groups. After adults emerge, the majority will remain on the same plant to feed and lay eggs.

PEST DAMAGE

Whiteflies can damage plants directly by their feeding. Both nymphal and adult whiteflies feed by inserting their needlelike mouthparts into the vascular tissue or phloem of the leaves and suck out the plant sap. If the numbers of whiteflies per leaf are great enough, the plant will suffer from lack of water and nutrients, resulting in a weakened plant and loss of leaves but rarely in plant death.

However, the most common and annoying problems associated with giant whiteflies are the waxy, hairlike filaments and growth of unsightly sooty mold. During feeding, whiteflies excrete a sticky, sugary solution called honeydew that accumulates on leaves and fosters the growth of the black sooty mold fungus. This sooty mold is not only unattractive, it also reduces the photosynthetic (food-producing) abilities of the leaves.

MANAGEMENT

Manage giant whiteflies in your landscape with an integrated program that includes removal of infested leaves and, if necessary, washing whiteflies off leaves with water. When choosing plants, consider species less susceptible to giant whitefly. Biological control agents are presently being introduced and have become established in parts of southern California. Check with your University of California Cooperative Extension farm advisor about the status of the biological control program in your area. Insecticides are not generally recommended because they destroy the biological control agents. A forceful stream of water (syringing) directed at colonies can be just as effective as insecticide sprays.

Leaf Removal

The tendency of giant whitefly adults to remain on the plant where they developed leads to a strongly clustered distribution. This clustering behavior means that removing relatively few leaves can destroy large numbers of whiteflies. Leaf removal is most effective when populations are restricted to a few plants or leaves. Thus, monitoring to detect early infestations is extremely important in control of giant whitefly. Place infested material in plastic bags, seal, and remove the bags from the property. If the infested leaves are left in the open after removal, a portion of the adult whitefly population may migrate to new plants.

Leaf removal will work better on some plants than others. Giant whitefly is currently found on many different plant species, and it reproduces more successfully on some than on others. On less preferred hosts, such as yellow hibiscus, removal of leaves should be sufficient to control populations. On more preferred host plants, such as red hibiscus, giant bird of paradise, and *Xylosma*, control will require early detection, rigorous leaf removal, and syringing with water.

Syringing

The use of a strong stream of water directed to the undersides of infested leaves (syringing) can be very effective in managing giant whitefly. Comparison studies with several pesticides indicate that syringing performed as well or better than chemical treatments. With high whitefly populations, syringing is recommended at least once a week. As populations decrease, intervals can be lengthened to once every 2 or 3 weeks. An additional advantage of syringing is improved plant appearance. Moreover, unlike insecticide sprays, water syringing will not have the negative impact on biological control programs.

Biological Control

Native insect predators such as green lacewings (*Chrysopa* and *Chrysoperla* spp.), larvae of syrphid flies (also called flower flies and hover flies), and lady beetle adults and larvae (*Cycloneda polita* and *Delphastus catalinae*) attack giant whitefly in California but do not provide adequate biological control. The introduced Asian lady beetle, *Harmonia axyridis*, also feeds on this pest.

Parasitic wasps often found parasitizing giant whitefly include *Entedononecremnus krauteri* and *Encarsia hispida*. *Entedononecremnus krauteri* is a dark parasitic wasp with red eyes and is often observed on the upper surface of leaves where it lays eggs through the leaf surface into whiteflies on the undersides of leaves. Two other parasites of giant whitefly, *Encarsiella noyesii* and *Idioporus affinis*, have more recently been introduced into California from Mexico to help control populations of the giant whitefly. These tiny, stingless, parasitic wasps lay their eggs inside the whitefly larvae. When the wasp eggs hatch, their larvae feed on the giant whitefly larvae. The wasp then pupates and emerges, leaving behind either a hollow, yellowish shell (*Idioporus affinis*) or a clear shell in which the black skin that the parasite shed is visible (*Encarsiella noyesii*). In both shells, with the aid of a magnifying glass, you can see the round exit holes through which the parasites emerged (Fig. 3). While these parasites don't completely eradicate all of the whiteflies, they can dramatically reduce their numbers to all but a small number at the base of plants. For most situations, this level of control is considered satisfactory.

Some natural enemies are commercially available for release against giant whitefly, but there is no evidence that purchasing and releasing natural enemies is effective. The whitefly parasites mentioned above are being released by University of California and California state scientists. It is hoped that these parasites will permanently establish and distribute themselves throughout infested areas; release by home gardeners should not be necessary.

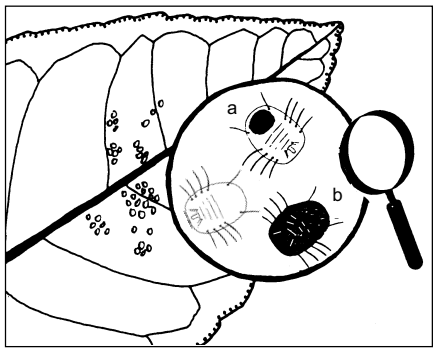

Figure 3. Examine whitefly colonies for grayish black or yellow nymphs with exit holes (a) or darkened nymphs (b), which indicate parasitization.

Chemical Control

Although some insecticides are registered to control giant whitefly either by foliar or soil application, their use is not recommended if parasites are present in the area. To determine if parasitic wasps are present, use a hand lens to examine several leaves containing whitefly nymphs. Look for a dark discoloration of the nymph or the tiny holes that parasites make when they emerge from the dead larva (Fig. 3). If there is evidence of parasites, insecticide treatments should not be necessary.

REFERENCES

Dreistadt, S. H., J. K. Clark, and M. L. Flint. 2001. *Integrated Pest Management for Floriculture and Nurseries*. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 3402.

For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone book for addresses and phone numbers.

AUTHORS: T. Bellows, J. Kabashima, and K. Robb
EDITOR: B. Ohlendorf
TECHNICAL EDITOR: M. L. Flint
DESIGN AND PRODUCTION: M. Brush
ILLUSTRATIONS: Fig. 1: David H. Headrick; Fig. 2: adapted from Flint, M. L. 1995. *Whiteflies in California: A Resource for Cooperative Extension.* IPM Publ. 19. Adult and fourth instar: David Headrick; Fig. 3: adapted from *IPM for Floriculture and Nurseries,* ANR Publ. 3402.

Produced by IPM Education and Publications, UC Statewide IPM Project, University of California, Davis, CA 95616-8620

This Pest Note is available on the World Wide Web (http://www.ipm.ucdavis.edu)

This publication has been anonymously peer reviewed for technical accuracy by University of California scientists and other qualified professionals. This review process was managed by the ANR Associate Editor for Pest Management.

To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

This material is partially based upon work supported by the Extension Service, U.S. Department of Agriculture, under special project Section 3(d), Integrated Pest Management.