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Horticulture Diagnostic Laboratory
Extension Education Center
423 Griffing Ave, Ste 100
Riverhead, NY 11901-3071
631-727-4126
www.ccesuffolk.org
Bayard Cutting Arboretum
Montauk Hwy
Great River, NY 11739
631-727-4126
Cornell Cooperative Extension
Suffolk County

Whiteflies

Adults (A) and **nymphal** (N) stage greenhouse whiteflies on the undersurface of a leaf. (Whitney Cranshaw, Colorado State University, www.bugwood.org)

Description: Adult whiteflies are small insects, approximately 1/16th inch (1.5 mm) in length, with four powdery white wings. When heavily infested plants are disturbed, one may notice a "cloud" of tiny white insects rising above it. The immature stages (eggs, crawlers, scales and pupae) are all yellowish and found primarily on the undersides of leaves.

Injury: Whiteflies are sucking insects, feeding on plant sap. As a result plants are weakened, may exhibit symptoms of stunting or wilting, and may have large amounts of honeydew on them. In New York State, the greenhouse whitefly is the most common species. It feeds on over 60 host plants. It usually does not survive our winters out of doors to cause new infestations, but is brought in anew each year.

Life History: The whitefly has a complex life history. It undergoes five distinct stages of development. Eggs are laid on the undersides of the leaves, and are at first pale yellow, but turn gray before hatching in five to seven days. The crawler is a small, translucent, mobile stage that actively searches for a feeding site. Within a few days, crawlers settle down and begin feeding, soon transforming to the sedentary scale stage. The scale is a highly modified sucking insect, and its outer covering thickens after it feeds giving it added protection. Adult development (pupation) occurs within the scale cover. Four days later, adults emerge. The life cycle takes about 40 days, depending on temperature.

Management: This insect is difficult to manage. The five distinct stages of the life cycle all differ in their tolerances to insecticides. Eggs are resistant to most insecticides, as are the scale and pupal stages. The crawler and adult stages are susceptible to insecticides especially contact materials. All stages, however, can coexist. A single application of a particular insecticide only affects the susceptible stages present at the time of treatment or shortly thereafter. Other stages will survive and ultimately reproduce again continuing the cycle. Therefore, when sprays are recommended, they are usually applied covering the 40-day period that it takes for completion of the life cycle. Missing even one application would allow the pest to continue to develop and possibly reinfest the area. When using insecticides good coverage of leaf undersides is important for control. Repeat sprays may be needed.

There are some practices that one can employ to help prevent whiteflies on most all types of plants: 1) prevent whiteflies from entering the growing areas—when new plants are brought home, isolate them for about one month to allow you to monitor the newcomer(s) for development of pests; do not purchase infested transplants; 2) learn to recognize the various stages of the whitefly; 3) isolate and treat infestations (or discard plants) early before the insects have a chance to spread.

Biological Control—Parasites and Predators: A number of beneficial insects attack whiteflies, i.e., lady beetles, green lacewings and various predaceous bugs. The tiny parasitic wasp, *Encarsia formosa* can be effective against the greenhouse whitefly. These natural enemies do not remove the whiteflies but they can reduce their numbers so that little damage results. Further research is needed to make this method a practical alternative to chemical control methods, at least in commercial greenhouses.

Mechanical Methods: Yellow sticky boards (**Fig. 1,** next page) have been used with some success in the control of adult whiteflies. This method may be most useful in a home greenhouse. Whiteflies have a natural attraction to the color yellow, and if yellow boards are painted with a sticky material, whiteflies will fly to them and adhere. The yellow color

used in USDA experiments with success was RustOleum 659* yellow; however, other deep orange-yellow paints would also be effective. Of the sticky substances tried, Tack trap, a commercial insect trapping compound worked the best. The USDA research also used heavy motor oil (SAE 90) successfully on the boards to trap whiteflies and found the oil easier to wash off the boards than the sticky trapping materials. A combination of the use of sticky yellow boards and the parasite *E. formosa* in some cases provided almost complete control of the whitefly in commercial greenhouses. *The products mentioned above are only mentioned as part of the research and are not recommended by USDA or Cornell University over other products.

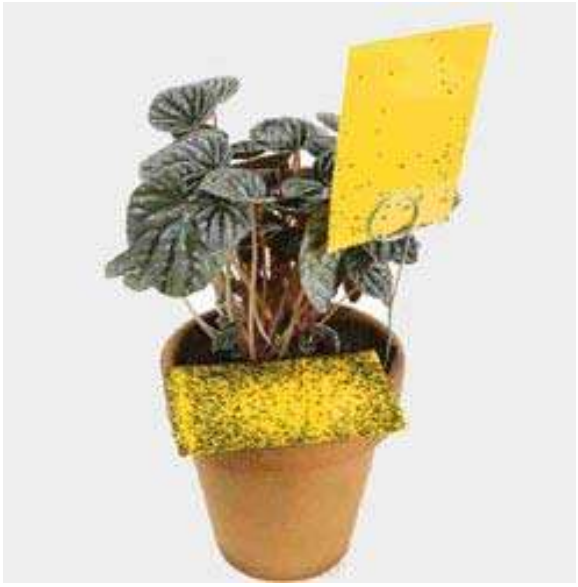

Fig. 1 - A yellow stick trap being used to catch insects in a potted houseplant.

Insecticide Control: When using insecticides (below) good coverage of leaf undersides is important for control. Repeat applications may be needed.

Houseplants

- Consider removing infested leaves or discarding infested plants rather than treating with a toxic substance.
- *Check all pesticide labels carefully.* Products may not be registered on all varieties or may not be tested on all rare or unusual varieties. If the host and pest are not listed on the label, do not use the pesticide.
- **If houseplants need to be sprayed, remove them from the living space for treatment.** If weather allows, take the plants out of doors or into a garage to make the application. Bring plants back indoors when dry. Contact your local Cooperative Extension for specific pesticide recommendations.

Begonia: Good coverage of leaf undersides is important for control. Repeat sprays may be needed.

Citrus: Wash plant. IRepeat applications may be needed.

Coleus: Good coverage of leaf undersides is important for control. Repeat sprays may be needed.

Fuchsia: Some product labels recommend testing on a small area first. Good coverage of leaf undersides is important for control. Repeat sprays may be needed.

Gardenia:. Good coverage of leaf undersides is important for control. Repeat applications may be needed. ***Note:** Some formulations containing insecticidal soap should not be used on gardenias. Some varieties have shown sensitivity to it. Read label directions carefully before using.

Geranium: Good coverage of leaf undersides is important for control. Repeat sprays may be needed.

Poinsettia: Discard infested plant to avoid spread of whiteflies to other plants, or isolate and treat with an appropriately labeled insectide.

Annual and Perennial Herbaceous Plants (in the outdoor landscape)

- Out of doors whitefly populations are usually not sufficiently damaging to make treatment necessary.
- Occasionally, however, populations build up to damaging numbers.
- Contact your local extension service for specific pesticide recommendations.

Ageratum: Spray two or more times at five-day intervals. Good coverage of leaf undersides is important for control. Repeat spraying only if necessary

Lupine: Apply as necessary. Good coverage of leaf undersides is important for control. Repeat spraying may be necessary.

Sweet alyssum: Apply as necessary. Good coverage of leaf undersides is important for control. Repeat spraying may be necessary.

Woody Trees and Shrubs (in the outdoor landscape)

Contact your local Cooperative Extension for specific pesticide recommendations.

Azalea: Large populations may require the use of insecticides. Treat in early June (448–700 GDD), mid-July, and mid-August (1250–1500 GDD). Apply to undersides of leaves.

Honeysuckle: Large populations may require the use of insecticides. Treat undersides of leaves in early June (448–700 GDD), mid-July, and mid-August (1250–1500 GDD).

Mountain laurel (Kalmia spp.*)*: Large populations may require the use of insecticides. In early June (448–700 GDD), mid-July, and mid-August (1250–1500 GDD), treat undersides of leaves.

GDD = growing degree days. For information on using GDD for insect pest management refer to the Cornell Cooperative Extension – Suffolk County leaflet titled *Using GDD for Insect Pest Management*.

Home Vegetable Garden Plants

Avoid purchasing infested plants as this can introduce whiteflies to your garden. Always check the pesticide label to make sure both the crop and the pest are listed, and to check for the minimum number of days to wait between application and picking the crop ("Days to Harvest"). Follow label directions carefully.

Reprinted from *Whiteflies* prepared by Carolyn Klass, Senior Extension Associate, Department of Entomology, Cornell University. 2/74. 9/96 revised.

Management recommendations obtained from*: Part I Guide to Pest Management Around the Home, Cultural Methods* and Cornell Pesticide Guidelines for Managing Pests Around the Home, Cornell University Cooperative Extension, 2014.

The New York State Department of Environmental Conservation (NYSDEC) Bureau of Pest Management maintains a web site with a searchable database for pesticide products currently registered in New York State. Individuals who have Internet access can locate currently registered products containing the active ingredients suggested in this diagnostic report at http://www.dec.ny.gov/nyspad/products?0.

This publication contains pesticide recommendations. Changes in pesticide regulations occur constantly and human errors are still possible. Some materials mentioned may no longer be available, and some uses may no longer be legal. All pesticides distributed, sold or applied in New York State must be registered with the New York State Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to the appropriate Cornell Cooperative Extension Specialist or your regional DEC office. Read the label before applying any pesticide.

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