'In The Garden' with the Viettes

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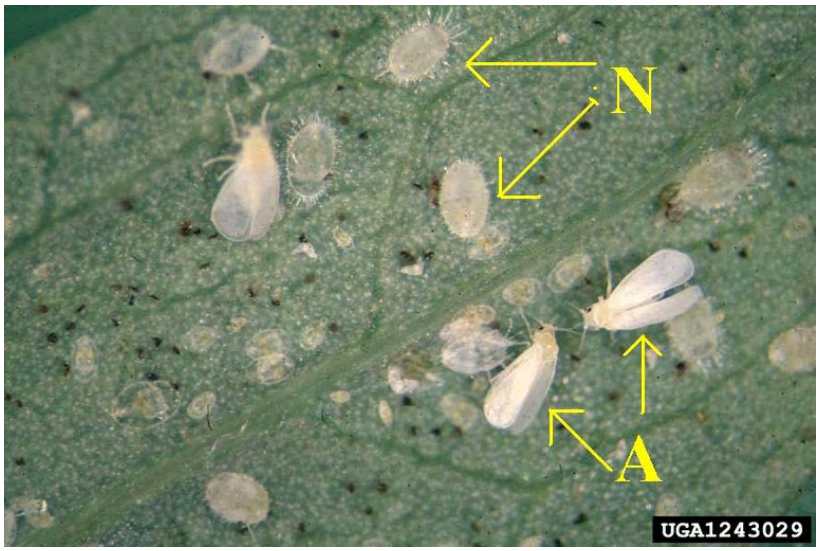
Whiteflies



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

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

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

Mechanical Methods: Yellow sticky boards (**Figure 1.**) 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.

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

Houseplants: Also see *Biological Control—Parasites and Predators.*

Begonia: Wash plants with **soapy water** and a soft brush or cloth to remove insects. Use 2 tsp. of mild dish detergent in 1 gallon of water. A jet of clean water can also be used to knock insects off. Thoroughly wash undersides of leaves where pests may also reside. Treat with **insecticidal soap**, **neem**, or **resmethrin**.

Citrus: Wash plant. Use **insecticidal soap, pyrethrins** plus **soap,** or **neem**.

Coleus: See *begonia* for information on washing. Spray with **insecticidal soap**, **pyrethrins** plus **soap, neem**, or **resmethrin**.

Fuchsia: Rogue plant: remove and destroy or discard entire infected plant and potting soil. Or see *begonia* for information on washing. Treat with **insecticidal soap**, **neem**, **resmethrin, tetramethrin.**

Gardenia: Wash plant. Use **insecticidal soap**[(1)], **horticultural oil, pyrethrins** plus **soap,** or **neem.** Or use **imidacloprid** plant spikes.

Geranium: See *begonia* for information on washing. Treat with **pyrethrins** plus **soap, neem,** or **resmethrin**. Or use **imidacloprid** plant spikes.

Poinsettia: Treat with **neem** or **acephate**.

(1) = Some varieties have shown sensitivity to insecticidal soap. Read label directions carefully before using. Some formulations should not be used on this plant.

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.

Ageratum: Rogue infested plants. **Insecticidal soap, cyfluthrin, permethrin**, **resmethrin**, or **malathion**: spray 2 or more times at 5-day intervals.

Lupine: Rogue heavily infested plants. **Insecticidal soap, cyfluthrin** or **malathion**: spray as needed.

Sweet alyssum: Rogue heavily infested plants. **Resmethrin**: spray as needed.

Woody Trees and Shrubs (in the outdoor landscape)

Azalea: Plant resistant azalea varieties. Large populations may require the use of insecticides. **Horticultural oil, insecticidal soap**, **malathion**, or **permethrin**: early June (448-700 GDD), mid-July, and mid-August (1250-1500 GDD). Or use **disulfoton** per label directions.

Honeysuckle and Laurel (Kalmia spp.*)*: See *azalea*.

Home Vegetable Garden Plants: Before using any pesticide, check the label. Both the crop you wish to treat and the pest you are treating for must be listed on the label. If not, do not use the pesticide. Also make sure to read the label to determine how long to wait before harvest. Harvesting treated vegetables too soon after a pesticide application may result in excessive residue being present when consumed.

Tomato: apply **pyrethrins**, **insecticidal soap**, or **oil (horticultural)**, as needed; wait one day before harvesting.

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Pesticide/management recommendations obtained from*: Part I Guide to Pest Management Around the Home, Cultural Methods* and *Part II -- Pest Management Around the Home,2005-2006 Pesticide Guidelines,* Miscellaneous Bulletins 139S74I and 139S74II, Cornell Cooperative Extension Publications available from our office.

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.

Read the label before applying any pesticide.

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