

Insects

Whiteflies on Ornamentals

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Whiteflies are economically important insects on ornamentals grown in the greenhouse. Although these pests are most serious in the greenhouse, whiteflies may also attack ornamental plants grown outdoors. Some of the preferred woody ornamental hosts include barberry, redbud, *Fuchsia*, honeylocust, black locust, *Hibiscus*, *Lantana*, coffeeberry, rose and Jerusalem cherry.

Description and Life Cycle

Adult whiteflies vary in size from 1 to 3mm. Their wings are generally covered with a powdery substance, giving them the appearance of tiny white moths. Adult females lay eggs on the lower leaf surface of plants. Their oblong eggs vary from yellow to pale green to purple. Some species (the greenhouse whitefly in particular) lay their eggs in a characteristic circle or semi-circle. Each female may lay up to 400 eggs and live as long as two months. Eggs require one to three weeks to hatch.

After hatching, young nymphs (immatures) crawl about the plant for a few days, then settle down to feed. At this point, they insert their mouthparts into the plant tissue to feed. They then remain motionless until maturity. Nymphs are flattened and scale-like in appearance. A fringe of waxy material radiates outward from their bodies. This fringe is made of thick waxy plates or fine strands, depending on the species. The nymphal stage requires three to four weeks before pupation.



Life cycle of the greenhouse white fly. A, Adult. B, Eggs. C-E, Nymphs. F, Pupa.

The pupa may be darkened (parasitized) or white, often with a fringe of long hairs on its back. The newly emerged adult whitefly is whitish yellow. It shortly becomes covered with a white, powdery material.

Whiteflies reproduce very slowly (about one generation per month). Whiteflies in all stages of development may be seen in infested plants. Several generations may occur each year.

The removal of sap by this pest results in yellowing and drying of the foliage. While feeding, whiteflies excrete honeydew (a sweet sticky substance). Sooty mold fungi growing on the honeydew detracts from the appearance of the plant.



Control

Eggs and immature stages are resistant to many insecticides. Thus, whitefly control is difficult. Insect growth regulators such as kinoprene, azadirachtin, diflubenzuron, pyriproxyfen and fenoxycarb should be used to aid in control of the immature stages. The other listed insecticides should be used to target both immatures and adults. Use both insect growth regulators and conventional insecticides for best control. Start chemical control early before populations build, using alternate sprays of insect growth regulators, insecticidal soap and horticultural oil. If adult populations are increasing, use one of the other insecticides to reduce the adult whitefly population.

Chemical Controls

Greenhouse use: bifenthrin (Talstar GH 7.9 F, PT Attain TR 0.5A), fluralinate (Mavrik Aquaflow 22.3 F), permethrin (Astro 36.8 EC), endosulfan (Thiodan 50 WP, Thiodan 3 EC), naled (Dibrom 8E), acephate (Orthene Turf, Tree and Ornamental Spray 75 SP, Address T/O 75 SP, PT 1300 Orthene TR 12 A), cyfluthrin (Decathlon 20 WP), chlorpyrifos plus cyfluthrin (PT Duraplex TR 8 A), pyrethrins plus piperonyl butoxide (Pyrenone, PT 1100 Pyrethrum TR, Natural Pyrethrin Concentrate), imidacloprid (Marathon 1% Granular, Marathon 60 WP, Marathon II 2F), horticultural oil (SunSpray Ultra-Fine Oil 98.8 EC [Use a 0.5-1% spray solution]), insecticidal soap (M-Pede), abamectin (Avid 0.15 EC), kinoprene (Enstar II), fenoxycarb (PT Preclude TR 4.8 A, Precision 25 WP), azadirachtin (Ornazin 3% EC, Azatin XL), pyridaben (Sanmite 75 WSB), diflubenzuron (Adept 25 WSP), pymetrozine (Endeavor 50 WDG), pyriproxyfen (DISTANCE 0.86 EC) or lambda-cyhalothrin (Scimitar GC 9.7 ME).

Interior plantscapes such as in hotels, shopping malls, office buildings, etc: horticultural oil (SunSpray Ultra-Fine Oil), insecticidal soap (Safer Insecticidal Soap, M-Pede), fluralinate (Mavrik Aquaflow 22.3F), cyfluthrin (Tempo 20 WP, Decathlon 20 WP), beta-cyfluthrin (Tempo SC Ultra 1 SC), pyrethrins plus piperonyl butoxide (Pyrenone, Natural Pyrethrin Concentrate, PT 1600 X-clude A), permethrin (Astro 36.8 EC), imidacloprid (Merit 75 WP, Merit 2F, Marathon II 2F), kinoprene (Enstar II), or azadirachtin (Safer Bioneem, Azatin XL, Ornazin 3% EC).

Home use indoors: azadirachtin (Safer Bioneem), insecticidal soap (Safer Insecticidal Soap), horticultural oil (SunSpray Ultra-Fine Oil), or pyrethrins plus piperonyl butoxide (Pyrenone, PT 1600 X-clude A).

Outdoors use: bifenthrin (Talstar Lawn and Tree 7.9 F), fluralinate (Mavrik Aquaflow 22.3 F), endosulfan (Thiodan 50 WP, Thiodan 3 EC), acephate (Orthene Turf, Tree and Ornamental Spray 75 SP, Address T/O 75 SP), cyfluthrin (Advanced Garden Lawn and Garden Multi-Insect Killer, Tempo 20 WP, outdoor use of Decathlon 20 WP designated for nurseries), beta-cyfluthrin (Tempo SC Ultra 1 SC), permethrin (Astro 36.8 EC), insecticidal soap (Safer Insecticidal Soap, M-Pede), horticultural oil (SunSpray Ultra-Fine Oil), pyrethrins plus piperonyl butoxide (Pyrenone), imidacloprid (Merit 75 WP, Merit 2 F, Marathon 60 WP, Advanced Garden Tree and Shrub Insect Control, Marathon II 2F), imidacloprid plus cyfluthrin (Advanced Garden Rose and Flower Insect Killer), disulfoton plus 12-18-6 fertilizer (Advanced Garden 2-in-1 systemic Rose and Flower Care), abamectin (Avid 0.15 EC), or azadirachtin (Azatin XL, Safer Bioneem, Ornazin 3% EC).

Follow label directions carefully. Repeat sprays every four to five days until whiteflies are under control. Do not use horticultural oil more than once per week.

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label. Persons who do not obey the law will be subject to penalties.

Disclaimer Statement

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide registrations are continuously reviewed. Should registration of a recommended pesticide be canceled, it would no longer be recommended by The University of Tennessee.

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