

# Bug-Wise



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**Insect Pests of Houseplants:** Houseplants have fewer insect pests than outdoor ornamentals, but they are not pest-free. Most of the pests that occur on houseplants are small insects or mites that spend most of their time on the undersides of the leaves. This includes pests such as aphids, whiteflies, mealybugs, scales, thrips, spider mites and broad mites. Heavy infestations of any of these pests can cause houseplants to be unsightly and undesirable and indoor gardeners need to know how to recognize and control these pests.

The insects and mites that occur on houseplants also occur in commercial greenhouses and interiorscapes. Commercial producers have access to a much wider array of effective insecticides and biological control agents than do homeowners. Control options for commercial greenhouses and interiorscapes are not discussed here. This newsletter focuses on insect pests of houseplants grown in home settings and discusses control options available for use by homeowners.

**Aphids:** Several species of aphids occur on houseplants. These small, soft-bodied insects concentrate on new growth and on the undersides of leaves where they use their piercing-sucking mouthparts to feed on plant sap. They excrete undigested sugars as honeydew, which accumulates on leaves and table tops and makes them sticky. Honeydew can support the growth of sooty mold fungi, resulting in an unsightly black coating on the leaves that is difficult to remove. Aphids usually reproduce without mating, giving birth to live nymphs that look like smaller versions of the adults. Immature aphids must shed their skins in order to grow and these old, shed skins accumulate on the plant where they are often mistaken for live insects. In addition to honeydew and sooty mold, heavy aphid infestations cause distorted leaves and poor growth.

Aphids are a bit easier to control than most other houseplant pests because all stages, nymphs and adults, are exposed to control at any given time. Foliar sprays with a ready-to-use product containing imidacloprid + cyfluthrin will usually give fast effective control. The recommended insecticide table list several other effective foliar sprays, but spray coverage is more critical. Imidacloprid will also control aphids when applied as media treatment. Washing the aphids from the plant with a forceful spray of water (not so strong as to damage the plant, just strong enough to wash the aphids off the leaves) is a non-insecticidal method of controlling aphids that can work in some situations.

**Whiteflies:** Greenhouse whitefly and silverleaf whitefly are the two most common species found on houseplants. Adults of both species look much alike, having white powdery wings that they hold tent-like over their body when at rest and flying around the plant when the leaves are disturbed. Although adult whiteflies are relatively easy to detect, many gardeners have difficulty finding and recognizing the immatures. Whitefly nymphs have oval-shaped, flattened bodies and are immobile, feeding on the undersides of leaves with their sucking mouthparts embedded in the leaf tissue. The last nymphal instar is a non-feeding, transformation stage that is sometimes referred to as a "pupa." Adults emerge through a T-shaped slit in the back of the pupal case. After mating, female whiteflies attach their tiny white eggs to the undersides of leaves. Newly hatched crawlers do not move very far before beginning to feed and molting to the immobile stage. Whiteflies damage plants by causing honeydew and sooty mold and by reducing plant growth. They also spread several important plant virus diseases.

Whiteflies are difficult to control and you will not succeed by only treating the adults. You have to control the immatures on the undersides of the leaves to eliminate a whitefly infestation! Media

treatments with the systemic insecticide imidacloprid and/or foliar sprays with horticultural oil are two of the most effective treatments for whiteflies. Azadirachtin is an effective organic treatment that works by disrupting the growth of the immatures, but it takes several successive treatments to obtain control, and you will not be successful unless you get excellent coverage of the undersides of the leaves.

**Mealybugs:** This is one of the more difficult houseplant pests to control. Mealybugs get their name from the white powdery material that covers their bodies. There are several species that attack houseplants, but all are similar in appearance and habits. Mature females are wingless and oval-shaped, with short projections along the margins of the body, and are covered with a white, powdery material. Nymphs look similar, but are smaller, and may be pale yellow to white. Females lay their eggs in "egg sacs" that are covered in a cottony material. Newly hatched nymphs do not crawl far before inserting their sucking mouthparts into the plant, but older nymphs do move about on the plants. Infestations are usually concentrated on the undersides of leaves and on new growth in the terminal of the plant. Heavily-infested plants will be covered with honeydew and sooty mold and leaves and terminals may be crinkled and distorted.

If you are thorough and persistent, you can eliminate mealybugs from a small plant by using a cotton swab dipped in alcohol to remove or kill individual insects and egg masses, but you will have to resort to insecticides to control larger infestations. Foliar sprays of horticultural oil will control mealybugs provided you do a good job with spray coverage, but you may need to spray several times, being sure to follow label directions. Media treatments with imidacloprid are slow-acting, but usually provide good long-term control. Use a dual approach against heavy infestations, an oil spray and an imidacloprid media treatment. Be sure to isolate infested plants until you get the problem solved.

**Scale:** When dealing with scale insects it is important to distinguish between soft scales and armored scales. These are major groups of scales and there are many species within each group. One of the main differences is that soft scales produce honeydew, while armored scales do not. Brown soft scale is the most common scale of houseplants, occurring on ferns, schefflera, orchids and many other indoor ornamentals. Sticky leaves, a result of the honeydew, are usually the first sign of a soft scale infestation. Carefully examine the undersides of leaves to check for the flattened, oval-shaped scale. Mature females are about 3/16 inches long and brown, and reproduce without mating. They look like brown bumps on the undersides of the leaves. Both immatures and adults are usually concentrated along leaf veins or stems. Females give birth to live crawlers that usually do not move far before beginning to feed. Once crawlers molt, they remain immobile for the remainder of their life, using their long, thread-like mouthparts to probe the plant and suck sap. Although scale insects do not fly, crawlers can be carried to uninfested plants by hitching a ride on people, birds, or flying insects. In indoor settings uninfested plants become infested when their leaves touch those of an infested plant or when someone handles an infested plant, gets some crawlers on their shirt sleeve, and then handles an uninfested plant.

Scale infestations are notoriously difficult to eliminate, so avoid buying, or acquiring, infested plants if possible. The first step in dealing with infested plants is to decide whether you are willing to aggressively treat the plant or whether to discard it instead. Systemic media treatments containing imidacloprid will usually do a good job controlling brown soft scale and other soft scales, but imidacloprid is less effective on armored scale. Foliar sprays with horticultural oil usually work better against armored scale, but are also useful against soft scale. Be sure to follow label directions when using oil sprays, and plan to make several treatments.

**Thrips:** Several species of thrips occur on houseplants. All are tiny insects (1/8 inch long or less) with elongate, spindle-shaped bodies. Adults and larvae feed by rupturing plant tissue with their single, ice pick-like mandible and sucking up the sap. Most of the species that occur on houseplants feed on the undersides of leaves and on tender new growth, resulting in distorted growth and curled or cupped leaves. One species causes unsightly leaf galls on weeping fig, *Ficus benjamina*. Fortunately, this thrips does not

infest many other plants. Some species feed on flower blooms, especially as adults, but the immatures of flower-feeding thrips usually feed on the bottoms of leaves.

A foliar spray with a ready-to-use product containing imidacloprid + cyfluthrin is one of the more effective treatments for thrips. Apply a second treatment in seven to ten days, even if you think you have gotten good control. Products like insecticidal soap and horticultural oil will also work if you get good spray coverage, and media treatments with imidacloprid granules or stakes will provide long-term suppression of many species. The species that causes galls on weeping fig is especially difficult to control. Inspect weeping figs carefully before purchase and don't buy plants that have any leaf galls.

*Spider Mites:* There are several species, but twospotted spider mite is the most common. Spider mites feed on the undersides of leaves, using their tiny sucking mouthparts to probe individual leaf cells. This results in tiny spots of dead tissue that often appears as a stippling effect on the upper side of the leaf. More severely damaged leaves may be yellowed, reddened, bronzed, or brown and crinkled, and heavy infestations of spider mites can cause leaf drop and even kill plants. Heavy infestations produce fine webbing over the leaves and terminals that looks much like spider webbing. Plants growing in especially warm, dry locations, such as under the heating vent, and/or plants that are not being adequately watered are especially susceptible to spider mites.

Foliar sprays of horticultural oil or insecticidal soap are some of the most effective treatments for spider mites on houseplants. It is important to get thorough coverage of the undersides of leaves and to treat two to three times at five day intervals (be sure to check the label of horticultural oils before applying at close intervals). Washing the mites from the leaves with a forceful spray of water is sometimes practical and effective on small plants, especially if you repeat this washing several times at three to five day intervals. Misting leaves of infested plants daily with water can also help discourage spider mites, but this treatment can also encourage foliage diseases. Systemic imidacloprid treatments do not control spider mites.

*Broad mites and Cyclamen Mites:* These mites are considerably smaller than spider mites and are usually identified by their damage and by what species of plants they are infesting, rather than by seeing the mites themselves. Damage is often mistaken for some other malady, such as herbicide injury, virus infection, or a nutritional problem. Cyclamen mite is the most damaging pest of African violets, causing leaves to be puckered and distorted. Broad mites are most often seen on begonias, gerberas, impatiens and a few other plants. Infested leaves may be bronzed or distorted, crinkled, or thickened and may be "brittle" or easily broken when handled. Despite their small size, these mites can quickly spread to uninfested plants by hitching rides on shirt sleeves or on flying insect pests, even pests as small as whiteflies.

Discarding infested plants is probably the best way for most homeowners to deal with broad mite and cyclamen mite infestations. Totally immersing infested plants, pot and all, in hot water (110-120° F), for 15 minutes is a method that some gardeners use to try to salvage infested plants, the goal being to cook the mites without killing the plant. Sometimes you have to "kill it or cure it." You can try to control these mites with repeated applications of insecticidal soap. The spray will kill all the mites it contacts, but if you miss even a few mites, the infestation will return.

*Fungus Gnats:* Most homeowners usually notice the tiny gnat-like adult flies first. Although the tiny gnat-like flies do not bite, they can be a minor nuisance, especially when numerous, but it is the larvae that actually damage the plants. The slender white larvae live in the pot media, where they feed on decaying organic matter and developing root hairs. This root pruning can adversely affect plant growth. Fungus gnat larvae thrive in growing media that is kept excessively moist. Mature larvae are only about  $\frac{1}{2}$  inch long.

The key to controlling fungus gnats is to control the larvae developing in the pot media. Proper watering is an important cultural control practice for this pest. Allow pots to dry properly between watering and

you will have a lot fewer problems with fungus gnats! Pot drenches containing the active ingredient *Bacillus thuringiensis israelensis* are the most effective treatments for fungus gnats (Gnatrol and Knock-Out Gnats are two of the more readily available brand names). Do not try to use Bts that are labeled for caterpillar control for this purpose, they will not work on fly larvae, nor will *B.t. israelensis* control caterpillar pests.

## Insecticides for Use on Houseplants

Active Ingredient(s)	Brand Name (example) *	% AI & Formulation *	Pests Controlled **
potassium salts of fatty acids ***	Safer Houseplant Insect Killing Soap	2%, ready-to-use	<b>Aphids, thrips, whiteflies, mealybugs, mites, scale crawlers</b>
paraffinic oil ***	Bonide All Seasons Horticultural Spray Oil RTU	2%, ready-to-use	<b>Aphids, thrips, whiteflies, mealybugs, mites, scale</b>
Neem oil ***	Monterey 70% Neem Oil	70%, liquid conc.	Aphids, thrips, whiteflies, mealybugs, mites, scale crawlers
Azadirachtin ***	Azatrol, PBI Gordon	1.2%, liquid conc.	<b>whiteflies, mealybugs, scale crawlers</b>
Pyrethrins + PBO	Garden Safe Houseplant and Garden Insect Killer	0.02% + 0.2%, ready-to-use	Aphids, thrips, whiteflies, mites (short residual & limited efficacy)
Resmethrin	Bonide Houseplant Helper	0.02%, ready-to-use	Aphids, thrips, whiteflies, mites (short residual & limited efficacy)
cyfluthrin + imidacloprid	Bayer Rose & Flower Insect Killer	0.0015% + 0.012%, ready-to-use spray	<b>Aphids, thrips, whiteflies, mealybugs, mites, scale crawlers</b>
imidacloprid	Bonide Systemic Insect Control Granules	0.22% granule (applied to pot media)	Aphids, <b>whiteflies, mealybugs, soft scale,</b>
imidacloprid	Bayer 2-in-1 Plant Spikes	2.5%, "spike" (applied to pot media)	Aphids, <b>whiteflies, mealybugs, soft scale,</b> (may suppress armored scale)
<i>B.t. israelensis</i> ***	Knock-Out Gnats by Gardens Alive	0.6%, Water dispersable granules	<b>Fungus gnats</b> (applied as a growing media drench)

\* In most cases where the listed formulation is a ready-to-use spray there are also products that are liquid concentrates.

\*\* When the name of the pest is listed in bold the indicated active ingredient is one of the more effective products for control of that pest.

\*\*\* These active ingredients are “organic insecticides”. Products containing only pyrethrins are also organic.

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This information is for educational and preliminary planning purposes only. Brand names mentioned in this publication are used as examples only. No endorsement of these products is intended. Other appropriately labeled products containing similar active ingredients should provide similar levels of control. Always read and follow the insecticide label.

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