

## **Insects of Foliage and Houseplants**

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Relatively few kinds of insects, mites, and related pests occur on foliage and houseplants. However, those few have an extensive host range and can be highly destructive to the wide variety of valuable plants grown in the home.

Cultural and mechanical control measures are very important. They are often more practical than insecticides. Relatively few individual plants are grown in the home, but may represent a variety of kinds that seldom are all infested with pests at any one time. The use of pesticides in the home is generally undesirable and messy. Also, the preparation of small quantities is employed. Chemical injury to plants (phytotoxicity) may be a potential problem since foliage plants and other houseplants vary widely in their susceptibility to sprays and pesticides.

Insecticides should be used primarily as corrective control treatments when pests are known to have become established, not as a regular preventive measure. However, treatments should be applied before infestations become severe. Before applying any pesticide, **be sure** to read **all** of the directions on the label as well as directions and precautions for each pest and plant in the control recommendations.

The major pests include: aphids, whiteflies, mealybugs, scale insects, and mites (spider mites, cyclamen mite, bulb mite). Less common are thrips, cutworms and other caterpillars, millipedes, and sowbugs. Fungus gnats and springtails are primarily nuisance pests, seldom causing serious damage.

### **Cultural Control**

Prevention is the best way to protect house plants from insects. Once established, the more common pests are most difficult to eliminate, even with pesticides, and easily spread to nearby healthy plants. Cultural control includes the following important aspects of proper plant care.

#### **A. Exclusion**

Carefully inspect any plant to be purchased or propagated for evidence of pests.

Buy or propagate **only** pest-free plants.

Isolate new plants from the vicinity of existing plants for at least a month and look for evidence of pests before placing them among clean, healthy plants.

Remove and isolate any existing plant at the first suspicion of pest infestation.

Avoid placing plants close together to discourage pests from crawling from plant to plant.

Never permit compassion for a sick plant to justify bringing home diseased, pest-ridden plants to recover and hopefully become beautiful again. Discard infested, damaged plants.

#### **B. Sanitation**

Use clean pots, potting materials, soil mix components.

Use only sterilized soil or soil mixes.

Do not contaminate potting soil or pots with garden soil, compost, old soil from used pots, or cuttings from infested plants.

Eliminate weeds; they support pest populations.

#### **C. Resistance (Plants not attacked by or that are less susceptible to pests)**

Select plant types and varieties known to be relatively free from attack by insect and mite pests.

Avoid growing cultivars that are more prone to attack by pests.

### **Mechanical Control**

When relatively few plants are lightly infested with insects or mites, several mechanical control methods may be used effectively. Usually a continued effort is necessary over a period of time and the job itself is time consuming. First isolate the plant from the non-infested area. (If plants are severely infested, see item 4).

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1. **Washing** the plant with warm or tepid water, or water with a small amount of insecticidal soap, is effective in removing aphids, mealybugs, mites, thrips, and to some extent scale insects and whiteflies. Lightly spray the leaves and stems, particularly where leaves and branches join the stems, with a gentle spray from a faucet or sink hose. The bases of the stems and the crowns of plants are difficult to wash, but often harbor the pests. Washing with a light spray of water alone is not as effective as a soap mixture, especially for mites, scale insects, and whiteflies.
2. **Wiping** or cleaning foliage and stems (both upper and lower leaf surfaces) with a very soft brush or cloth **dampened** with detergent washing solution or rubbing alcohol will remove most of the pests. This method is better for scale insects and mites. Those individuals along leaf veins are especially difficult to wipe away. Excessive alcohol may be injurious to the plant.
3. **Hand-removal** with a cotton swab or a cotton-tipped toothpick dipped in rubbing alcohol, or fine tweezers is a convenient way to remove mealybugs, some scale insects, and aphids when only a few individuals are present. Be sure to check cracks and crevices where petioles and branches join the stems. Slugs and caterpillars can be picked off individually or brushed into a container of alcohol for disposal. Slugs and cutworms feed at night and are most easily found after the plant has been in the dark for an extended period of time.
4. **Plant trimming.** If plants become severely infested and have extensive damage, wash the plants to dislodge excess insects or mites, then prune away the most severely injured foliage and stems to permit regrowth and recovery. Repeat the washing process. This is a good time to repot the plant and renew the soil medium. Follow up with regular washing or insecticidal treatments. If entire plants are damaged, it is best to destroy them without contaminating other plants or planting areas. Remember that handling and moving severely infested plants often results in dislodging some of the pests or permitting them to drop, be brushed, or blown off the plants.

## Chemical Control

Plants can be treated with insecticides or miticides by any method that conveniently but thoroughly covers **ALL** of the plant surfaces. Generally, the use of a pesticide is quicker and more convenient than mechanical control measures. However, dense plants with multiple stems and bushy foliage to the soil level almost defy good coverage. Applying materials can be messy and involves

considerable handling. Certain plants are more difficult to wet with sprays than others. House plants may be variously susceptible to injury by pesticides. In treating relatively few plants, only small amounts of pesticides are needed, making measuring and mixing difficult. Despite these problems, plants must be treated with insecticides when it is necessary. It is best to apply treatments out-of-doors away from other plants when feasible or in a well-ventilated garage or basement.

## Spraying

Spraying is usually the most effective and most convenient way to apply insecticides and miticides to plants, soil, pots, saucers, etc. Plants should be sprayed until thoroughly wet, but without excessive drip. Spray deposit decreases with runoff. Sprayers must be cleaned thoroughly and allowed to dry after each use. Most pesticide sprays are highly corrosive to metal. Some liquid formulations will dissolve certain types of plastic. Sprays may be applied in several ways:

### Aerosols

Aerosols are available in small pressurized cans ready-to-use and pump spray bottles. These are most convenient, but more expensive than mixing dilute sprays from concentrates. Never hold the container close to the plants treated. Injury is likely to result from the propellant, solvent, or excess spray deposit nearest the can. Plants should **NOT** be thoroughly wetted with aerosols, unless so directed on the label.

### Hand Atomizers

Hand atomizers are hand-pumped sprayers that have a 0.5 pint to 1.0 quart metal “tank” or are fitted to accommodate a standard screw-top jar. The most effective is a sprayer that delivers a continuous spray and that has an adjustable nozzle governing the direction of the spray upward or downward.

### Hand Misters

Hand misters are available for “watering” plants by misting, or used containers from window or household cleaning products may be used as inexpensive, replaceable sprayers. A thumb-depressor pump atomizes the spray adequately enough for treating small numbers of plants.

## Compressed Air Sprayers

Compressed air sprayers are the most effective, serviceable, and versatile. However, they are more expensive and generally larger than is necessary for a few small houseplants. If a compressed air sprayer is available, it still may be the most convenient way to treat even small numbers of plants if they are moved outside or to a garage or basement.

## Tips and Precautions for Spraying

1. For hard to wet foliage, add a spreader-sticker to the spray according to the label directions; or, add 0.25 to 0.33 teaspoon of low-sudsing detergent (NOT SOAP) to a gallon of spray mix, or its equivalent in lesser quantities.
2. Do **not** dispose of excess spray material in household drains, outdoor catchbasins, near any water supplies or let runoff into streams. Spread or spray it out as much as possible away from gardens, children, and pet areas where it will not pose a hazard.
3. **Never** put or store insecticides in other than their original container, and **never** leave containers with or without contents outside of proper storage areas. Keep pesticide supplies in a separate storage area that is locked and labeled "Pesticides." Carefully dispose of empty containers in normal trash disposal.
4. Thoroughly wash yourself after spraying, and clean all equipment and sprayed areas.

## Dipping

Dipping plants into a large container of an insecticide-water mixture is effective and avoids any atomized spray in the air. However, this technique requires a larger amount of pesticide mix and creates the problem of disposing of the excess. The mixture must be ample in a large enough container to accommodate the top of the largest plant to be inverted and dipped. Do **not** dispose of excess mixture into the sink or other drains that empty into sewage systems. Dispose of excess on or in the ground where runoff or other contamination is not likely. Do **not** use any container that is involved with food or personal use.

## Dusting

Dusts are not as commonly available for use on house plants, but are effective. They tend to leave excessively evident residues, to be messy if used indoors, and to be easily washed off if plants are misted or watered from above. Dusts are available in small "squeeze" bottles or plastic containers, or can be put into used plastic bottles that have removable caps with small dispenser openings such as those holding lotions or shampoo. The most efficient is a commercial hand duster. Only a barely visible coating of dust is necessary to be effective. Do not coat the foliage.

## General Information

### *Insecticides and Miticides*

The basic insecticides and miticides used are available under a great many brand or trade names. Even with considerable knowledge about pesticides, the many product names, formulations, and ingredient statements are formidable and confusing. Individual

pesticides are identified by their common names (such as malathion, diazinon, or resmethrin, for example) or trade name (such as Orthene, or Sevin, for example). Brand names (such as Isotox or Blue Dragon, for example) do not identify the pesticide in the container; the ingredient statement on the label should be consulted to determine the contents. In some cases, the contents are specified, unfortunately, only with the long chemical name.

### *Formulations*

Pesticides are available in ready-to-use mixtures (push-button aerosols, pre-diluted sprays, and dusts) and as spray concentrates to be mixed with water. The latter include emulsifiable or sprayable concentrates, sometimes indicated as EC-emulsifiable concentrate, EL-emulsifiable liquid, E-emulsifiable, S-sprayable, F-flowable, and WP or W-wettable powder. The number preceding the letter indicates the percentage concentrate (2E, 4EC, etc.). In general, emulsion type sprays provide the most resistance to washing off, but the greatest hazard of plant injury. Wettable powders or flowable formulations are somewhat more readily washed off but are safer to apply on plants. They form suspensions in the spray "tank," however, and must be continually agitated to achieve uniform deposit of spray material. Dusts are readily washed off plants.

It is extremely important to follow label directions for mixing for each formulation used. **Use only the recommended amount.** Increasing the amount of concentrate in the spray mix will **not** make the spray more effective. It will increase the hazard to the person spraying and the likelihood of plant injury.

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### Active Ingredients

It is most economical and logical to apply only the insecticide and/or miticide that is needed and effective. The best indication of which material is effective against which pests is given in these recommendations and on the labels of the products. Certain insecticides work more effectively against some insects than others. Using the wrong chemical is ineffective and a waste of time and money. Always follow all of the directions on the label. Apply treatments only for the pests and plants listed on the label.

Although there are many different products in many combinations, and frustratingly few with houseplants specified by the name on the label, the insecticides and miticides listed in this publication are effective for the pests indicated. Be sure to note the potential plant injury reference. If pests infest plants that are not listed on the label, spray the recommended insecticide on a few leaves and observe if any injury results after a 3- or 4-day period.

**Table 4.8 - Chemical Names and Potential Plant Injury**

Familiar, Common, and Chemical Names	Formulation	Amount Per Gallon	Potential Plant Injury
<b>insecticidal soap</b>	Various	See label	See label
<b>malathion</b> (Cynthion) O,O-Dimethyl S-(1,2-diarbethoxyethyl) phosphorodithioate OR O, O-dimethyl phosphorodithioate of diethylmercaptosuccinate ferns	50% EC	1.5 tsp	anthurium, aralia, <i>Asparagus plumosa spengeri</i> , begonia, <i>Cissus antarctica</i> , crassuala, dieffenbachia (dumb cane), <i>Fiscus</i> sp., <i>Peperomia</i> sp., <i>Pilea</i> sp., schefflera, syndapsis (pathos) syngonium.
<b>Mesuroi</b> (methiocard) (Slug-Geta) 3,5-Dimethyl-4 (methylthio) phenol methylcarbamate	2% Bait	—	None listed.
<b>metalddehyde</b> (Bug-Geta) polymer of acetaldehyde OR metacetaldehyde	3.25% Bait	—	None listed.
<b>Orthene</b> (acephate) O, S-Dimethyl acetylphosphoramidothioate	9.4% EC	3.0 tbsp	gloxinia, philodendron, sabria (repeat application), aphelandra, schefflera, Neanthe belle palm, Nephrolepis fern.
<b>pyrethrins</b>	0.3 A	—	See Label
<b>resmethrin</b> (SBP 1382) 5-Benzyl-3-furyl methyl-2, 2-dimethyl-3-(2-methylpropenyl) cyclopropanecarboxylate (70% trans and CIS ISOMERS) (often with tetramethrin)	24.3% EC	1.0 tsp	General injury may occur if plants are confined in small closed space at high temperature and humidity for longer than prescribed exposure periods.
<b>Sevin</b> (carbaryl) 1-Naphthyl N-methylcarbamate	50% WP	2.0 tbsp	Boston ivy, English ivy, Boston fern, schefflera, <i>Peperomia</i> sp., <i>Pilea cadierri</i> (aluminum plant), syngonium.

**Table 4.9 - Recommended Use**

<b>Pest</b>	<b>Pesticide</b>	<b>Remarks</b>
Aphids	resmethrin, Orthene, malathion, insecticidal soap, imidacloprid	Spray when aphids are first seen. Repeat when necessary.
Armyworms	malathion, Orthene	Hand-picking may be adequate for just a few caterpillars. Wet the soil well while treating the foliage.
Cutworms	malathion, Sevin	Hand-picking may be adequate for just a few caterpillars. Look for them after rooms have been darkened for a few hours; they feed at night. Wet the soil well while treating the plants.
Cyclamen mite	insecticidal soap	Make 2-3 applications at 10-day intervals. For non-chemical control, plants may be immersed with their pots in water carefully maintained at 115° for 15 minutes.
Fungus gnats	Gnatrol	Treat the soil with a light watering.
Mealybugs	pyrethrins, Orthene, malathion, insecticidal soap	Treat 2-4 times at 7- to 10-day intervals.
Millipedes	malathion	Wet the soil and treat the bottom of pots. Millipedes stay in soil.
Scale insects	Orthene, malathion, pyrethrins, insecticidal soap	Treat 2-4 times at 7- to 10-day intervals. Severely infested plants are best discarded.
Slugs, snails	Mesurol, metaldehyde	Do not use mesurol around food plants. Evenly, but lightly, scatter bait on the soil surface; do not put the bait on the foliage. Apply only to established plants. Do not water for 24-48 hours.
Spider mites	insecticidal soap	Treat 2-3 times at 10-day intervals. Insecticidal soap and spider mite aerosols or atomizers are effective if Kelthane is not available.
Springtails	malathion	Treat the soil with a light watering.
Whiteflies	Orthene, resmethrin, tetramethrin, imidacloprid	Treat 2-3 times at 7- to 10-day intervals.

