House plants have become one of the country's most popular hobbies. They provide great pleasure to people who keep them, but when they harbor insects and other pests they no longer provide such pleasure.

MAJOR PESTS

Aphids. These are small insects about 1/16 to 1/8 inch long. They are six-legged, variously colored, and some look powdery or woolly. Both wingless and winged forms can be found on plants. Under the right conditions, aphids rapidly multiply and can spread quickly to other plants in the house. Heavy infestations may damage or actually kill plants. Aphids have sucking mouth parts that pierce the tissue and suck plant juices. Damaged leaves lose their green color and look stunted, distorted, or curled. The excreta or honeydew given off by aphids is another problem associated with this pest. This material is sticky, gives the leaf surface a shiny look, and provides food for the development of sooty mold.

Whiteflies. Whiteflies are tiny insects about 1/10 to 1/16 inch long that resemble tiny moths. The body and wings are covered with a white powdery substance. When at rest, the wings are held roof-like over the body. Both the immature stages and the adults have sucking mouth parts. There are five distinct stages in the whitefly's development: (1) the small egg which is laid on the underside of leaves and is often covered with a powdery material; (2) the newly hatched or “crawler” nymph which is flat, nearly transparent, and can move; (3) an intermediate nymph which has no antennae or legs and therefore cannot move; (4) a dark nymphal stage which is somewhat segmented;
and (5) the adult. Up to 400 eggs can be laid by a single female, and whiteflies continuously breed in homes and in greenhouses. Damage by whiteflies is very similar to that of aphids. In addition, the adults are active fliers and become a household nuisance.

Scales: Several different scales infest house plants. The adults are generally quite small, ranging from 1/16 to 1/8 inch in diameter, and may be colored white, black, brown, gray, or tan. Many are shaped somewhat like a ball and have no distinctive features other than that they are flattened or bulge slightly and are rigidly attached to plants. Others have distinctive shapes like oystershells (i.e., oystershell scale), while others may look like turtle shells. The scale is actually a hard or soft covering which protects the insects.

Chemical control in this stage is often impossible. The female often lays eggs under the scale. When the eggs hatch, tiny "crawlers" emerge and begin to move about in search of a place to feed. The crawler stage is the most easily killed with chemical sprays. The adult male is the only winged member of the scale group. Damage by scales is similar to that of aphids and whiteflies. Honeydew and sooty molds caused by mealybugs are frequently a problem.

Spider mites. Mites are frequently referred to as insects. They are not insects since they have eight legs, have only two body regions, and are always wingless. They are, in fact, closely related to spiders. Spider mites are extremely small and a hand lens of at least 10X magnification is often needed to see them. Usually mite damage is seen long before the mites themselves are noticed. Webbing is characteristic of spider mites. The web helps them spread to other plants, often on air currents. There are three stages in the mite's development: egg, a series of nymphal stages, and the adult. All stages except the egg damage plants. Mite damage is characterized by general lack of vigor, loss of color, and a speckled appearance on the leaves.

Cyclamen mite. Although named for cyclamen, these mites also damage many other plants. Adults are too small to be seen with the naked eye. Under a magnifying glass, they are seen as oval, amber, or tan colored, semi-transparent, and glistening. The young are even smaller and milky white. These mites are found mostly in protected places on young, tender leaves, young stem ends, buds, and flowers. They crawl from plant to plant where leaves
touch. They can also spread to other plants by transfer on hands or clothing. Damage consists of twisted, curled, and brittle leaves, deformed buds, and flowers that are often streaked with darker color. Blackening of leaves is also common.

MINOR OR LESS COMMON PESTS

Leafminers. A large number of different insects are commonly called leafminers. Members of the fly, sawfly, and moth-butterfly group are the most common. The larval stage is responsible for the leaf-mining damage which appears as a winding, discolored trail or an irregular blotch within the leaf tissue. Damage from these insects is rarely serious. It is usually a case of unsightliness. Simply remove and destroy the infested leaves to solve the problem.

Fungus gnats. These small black flies are first noticed around windows. The larvae feed on decaying matter, and therefore are most often found in highly organic soils. They rarely damage plant roots unless there are a great many of them. Generally, they only annoy people.

Caterpillars. The larvae of many moths and some butterflies sometimes feed on house plants. They range from very tiny, ½ inch or so, in length up to 1½ inches in length. Coloring of adults and caterpillars varies, although gray, whitish, or brownish is most common. Caterpillars may have stripes, spines, or bumps in any combination according to species. They have three pairs of true legs, and may also have a series of false legs along the tail end. Their presence is usually the result of an uninvited, fertile female moth who has slipped past the screen door and laid eggs on whatever was available. Caterpillars, as well as other pests, can also develop on plants that have been placed outdoors during the summer. Remove and destroy the eggs or caterpillars when they are noticed.

Beetles. Many beetles, including flea beetles and other leaf feeding beetles, are potential house plant pests. These beetles have chewing mouth parts, and often the adults and larvae feed on plant tissue. Beetles have four life stages: egg, larva, pupa, and adult. In most species the adults can fly, which in some cases may explain their presence in homes. Again, the likelihood of beetle infestation increases when plants are placed outdoors. Removal of the insects is probably the most convenient and effective control.

Thrips. Thrips are small, slender insects about 1/16 inch long. Many have two pairs of fringed wings which are folded flat over the back when at rest. Some are predators, some scavengers, but the majority are serious plant pests. Their mouth parts are used for rasping leaf surfaces. Damage appears as a whitening or speckling of the leaf. Little black droplets may also be noticeable on some plants. Some plants may have a silvery appearance. Flowers are also damaged.

Leafhoppers. Leafhoppers are small to moderate sized sucking pests 1/16 to 1/4 inch long. They are related to aphids. They are only occa-
Periodically pests of house plants. They vary in color and are wedge shaped. Leafhopper damage usually appears as mottling or speckling of the leaves and may be confused with mite injury.

**Springtails.** Springtails are very tiny, 1/5 inch or less, and vary in color. They are wingless and, as the name implies, many are capable of jumping. While they may chew on little seedlings or tender plant parts, they mostly prefer to feed on decaying matter. They can become a nuisance when numerous.

**Slugs and snails.** These are soft-bodied, fleshy, legless creatures related to clams. They can be very destructive to a wide variety of plants. They usually require a moist environment. Slugs and snails are voracious feeders and frequently devour whole plants or whole plant parts. Their presence can also be detected from the slime trails they leave behind. These animals lay small, round, milky white eggs in the soil. Some commercial slow release fertilizer pellets closely resemble slug eggs and are often identified as such even by professionals. Hand removal of slugs is usually all that is necessary. Look for them hiding under mulch, under pots, and under pot rims. Placing shallow dishes of beer near the plants is helpful as they are attracted to beer and will crawl in and drown. House plants may become infested when the plants are placed outdoors.

**Millipedes.** These can build up in potted plants. They feed on plant parts, but more frequently on decaying organic material. They become a nuisance when present in large numbers. Many species can occur on plants. They vary in color and can be tiny or up to 1 1/2 inches or more in length. They are easily identified by the presence of many legs, by the rounded shape, and by being slow moving.

**Centipedes.** These animals are not plant pests. They feed on many insects and insect relatives, and thus are beneficial. While they resemble millipedes by having many legs, they are very flat and very fast moving. They vary in size (¼ to 2 inches) as well as in color. Some of the larger ones often bite when disturbed. So, if their presence is annoying, remove them carefully and place them outdoors where they can continue to be useful in nature’s scheme of things.

**PREVENTION OF PESTS**

There are a number of things you should do, and do routinely, that will help you avoid unhappy encounters with house plant pests. When you buy plants, inspect the leaves and stems carefully. Even those that are seemingly clean can have pests that are easily overlooked. Put new plants in isolation for a week or two in a separate room or garage. Many pests can fly, so isolation is necessary. Keep close watch on the plants to see if a pest population is building up. Putting house plants outdoors on patios, etc., can invite a whole series of pest problems. If you wish to do this, treat the plants as newly purchased plants when you bring them back indoors.

Sometimes pests come indoors from outside. Good screens on windows will keep out most flying insects such as moths, beetles, etc.

Using soil from outdoors is another source of infestation. When you use it, you may also bring in uninvited members of the soil fauna such as mites, slug eggs, etc. Commercially prepared potting soil might be a better choice. If outside soil is used, sterilization is an option; however
this kills desirable organisms in the soil and may make the plants more susceptible to disease.

Pests are transferred from plant to plant in a variety of ways. Some have already been discussed. Some of the more subtle ways are through human activity. Consider the times you have handled garden store plants or admired a friend’s collection. In doing so, you could pick up scale crawlers, mites, etc., and bring them home to your own plants. It would be wise to be on the lookout for plant pest infestations before you handle strange plants. Such awareness will pay off.

Many pests maintain themselves because they have suitable hiding places or suitable protective sites. Avoid buildup of dead leaf material that might provide such sites.

**NON-CHEMICAL CONTROL**

Several techniques can be used as alternatives to chemical controls. Some require more work than using chemical sprays, but they often give equally good control.

**Removal of infested parts.** If only a few leaves are infested, as with leafminers, it is quite effective to simply remove and destroy that portion of the plant. If roots are being damaged by mealybugs or grubs of one kind or another, it is advisable to take a cutting and start over again. Discard infested soil and thoroughly clean the pot or container.

**Disposal.** Some plants may be so badly damaged that they are too far gone to save. Getting rid of them is the simplest answer.

**Hand removal.** This method is fairly effective for a number of pests and usually needs no supplemental chemical control. Slugs, caterpillars, many beetles, and larger insects in general can be eliminated in this manner. Where scales or mealybugs are few in number, a thumbnail or toothpick can be used in removal. Watch the plants closely for a few weeks afterwards in case some smaller individuals were overlooked.

**Swabs.** Cotton swabs dipped in rubbing alcohol are effective in controlling aphids or mealybugs. This is practical for light infestations but is extremely tedious for heavy infestations, particularly on large plants.

**Soapy water.** Using soapy water will give good control if done correctly. There is no complete list of plants which might be harmed by this technique. The decision is yours. The authors have used soapy water with good results on several different kinds of plants.

First, rinse the plant with a spray or cloth dipped in clear lukewarm water to reduce the number of insects or mites. Next, dissolve a teaspoon of mild or nondetergent soap in a gallon of lukewarm water. If the plant is small, turn it upside down (while holding the soil in place with your hands) and immerse all the leaves and stem in the soapy solution. If the plant is too large to immerse, wash the surfaces of the leaves and stems with a soft cloth and the soapy solution. Some plants may not be able to tolerate soap film residue, so rinse the plant a few minutes after treatment. For best results, use this treatment two to three times at five- to six-day intervals. Some individuals, such as eggs, may be missed the first or even the second time. Repeating the treatment will break most pests’ life cycles. Eggs missed during earlier treatments will hatch between washings but will fail to reach the reproductive stage to start the life cycle over again.

This treatment will not be totally effective against insects whose adults have wings (example: whiteflies), since they will leave the plant during treatment only to return after a while. Thus, it is necessary to spray the adults with a registered insecticide to get complete control of all stages of the pest.

**CHEMICAL CONTROL**

There are not many pesticides registered for indoor use on house plants. Read labels carefully for where and how to use a pesticide. If indoor use is not designated, take the plant to be treated outdoors away from normal child and pet traffic. Do not bring it back indoors until sprays have dried. It may be well to leave the plant in the garage for a day or two for a measure of extra safety. Spraying house plants indoors, even according to label directions, should probably be avoided as many sprays have objectionable odors, can cause allergic responses in some people, and should not be used where the spray could drift onto cooking utensils and food.
## CHEMICAL CONTROL OF HOUSE PLANT PESTS

<table>
<thead>
<tr>
<th>Chemical trade and generic name</th>
<th>Pests controlled</th>
<th>Remarks</th>
<th>May damage these plants</th>
<th>Scientific name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diazinon or Spectracide (diazinon)</td>
<td>Aphids, many scale crawlers, mealybugs, thrips, whiteflies, flea beetles</td>
<td>Do not use indoors unless label indicates such use</td>
<td>Adiantum cuneatum (Maidenhair fern), Anthurium spp., Asparagus spp., Asters, Begonia spp., Brunfelsia spp., Cacti, Cissus spp., Crepe Myrtle, Cyclamen spp., Cytisus spp., Dianthus spp., Dracaena sanderiana, Euphorbia spp., Ferns, Gardenia jasminoides, Gloxinia, Hedera spp., Hibiscus spp., Hoya spp., Lilium longiflorum, Papaya, Peperomia spp., Pigmy Date Palm, Pilea spp., Rose, Saintpaulia spp., Scindapsus spp., Stephanotis spp., Violet</td>
<td>0-0-Diethyl 0-(2-isopropyl-4-methyl-6-pyrimidinyl) phosphorothioate</td>
</tr>
<tr>
<td>Kethane (dicofol)</td>
<td>Mites</td>
<td>Available as an indoor house plant spray</td>
<td>Pyrene: Poinsettia; Resmethrin: Chrysanthemum, Poinsettia, Red Calceolaria</td>
<td>tubotoxine</td>
</tr>
<tr>
<td>Pyrethrins (and synthetic pyrethroid compounds such as tetramethrin or resmethrin)</td>
<td>Aphids, spider mites, whiteflies</td>
<td>Available as indoor house plant sprays alone or in combination with other materials</td>
<td>Sevin Aphids, flea beetles, leafhoppers, scale insects (crawlers), thrips, mealybugs, caterpillars</td>
<td>1-Naphthyl N-methyl carbamate</td>
</tr>
<tr>
<td>Cube or derris root (rotenone)</td>
<td>Aphids, spider mites, whiteflies</td>
<td>Available as an indoor house plant spray. May be available only in combination with pyrethrin</td>
<td>Adiantum sp. (Maidenhair fern), Parthenocissus sp. (Boston ivy), Brassaia actinophylla (Schefflera), Hedera helix (English ivy), Nephrolepis exaltata (Florida Ruffle fern), Peperomia spp., Pilea cadierei (Aluminum Plant), Syngonium sp. (Nephthytis), Virginia creeper</td>
<td></td>
</tr>
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<td>Chemical trade and generic name</td>
<td>Pests controlled</td>
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<tr>
<td>Orthene (acephate)³</td>
<td>Aphids, flower thrips, scale crawlers, spider mites, mealybugs, whiteflies⁴</td>
<td>Do not use as an indoor spray</td>
<td>Brassia actinophylla (Schlefflera), Carnation, Chamaedorea elegans, Chrysanthemum, Ficus triangularis (Triangle fig), Fittonia verschaffeltii argyronura, Maranta spp., Nephrolepis exaltata (Florida Ruffle fern), Saintpaulia spp., Geranium, Poinsettia, Tolmiea menziesii.</td>
<td>0,S-Dimethyl acetylphosphoramidothioate</td>
</tr>
</tbody>
</table>

¹ Repeat applications may be needed. Be sure to carry out the same spray precautions during every additional treatment.
² Condensed from S. M. Richman and A. G. Gentile, “Florogram,” 9:3 (1976), Massachusetts Cooperative Extension Service. Also check the product label for other plants that may be damaged.
³ If common or trade names do not identify a material for you, you will have to use the chemical name. Read it carefully, syllable for syllable, comparing it to this list to be sure what you have is what you want.
⁴ Control of whiteflies may require several sprays at 5-7 day intervals. Direct spray toward underside of leaves.
⁵ Systemics translocate to aerial plant parts. Pets and children sometimes chew on leaves, creating a potential hazard, even though the concentration of this material is low in house plant formulations.
The accompanying chart shows the materials that are registered for controlling pests on flowers and other ornamental plants. Not all of them can be used indiscriminately on any ornamental plant, and not all of them are registered for indoor use. Be certain to check labels for use on specific plants for control of specific pests and for specific directions for use. If the label does not indicate indoor use, then use the material out of doors only. Take plants out of doors only when conditions are mild (severe changes in temperature and humidity can cause considerable stress to sensitive types of house plants).

Many products in the chart are sold under a trade name that often does not conspicuously indicate the active ingredient or common name of the insecticide. Look closely at the active ingredients list for the generic or chemical name, or seek professional assistance.

**Spray preparation.** Most labels give general directions for use based on teaspoons or tablespoons of material per gallon of water. It is unlikely that you will ever use this much at any one time, and saving made up sprays is inadvisable since they usually break down rapidly and present a safety hazard. It is more likely that you will need only a small amount, so remember these equivalents:

- 1 tablespoon = 3 teaspoons
- 1 gallon = 4 quarts = 8 pints
- 1 cup = ½ pint

**EXAMPLE:** The label calls for 2 teaspoons per gallon of water and you want only a pint of mixed spray. Remember, 1 pint is ½ gallon, so you will need ⅛ of 2 teaspoons or ¼ teaspoon of material per pint.

**Plant damage.** Injury to plant material from pesticide applications has several common symptoms: total burn, marginal burn, or spotting of leaves or flowers; cupping, curling, and yellowing of leaves; and distortion of leaf and flower buds. Usually, these injuries will not kill the plant. Leaves may drop but new leaves will form and the plant usually recovers. Soil applications may also produce these symptoms as well as stunting of growth because of injury to the root system. Severe root injury will cause sudden wilting and death of the aerial parts of the plant. As a rule, flowers and flower buds in advanced stages of development are most susceptible to pesticide injury.

You can reduce the possibility of damage by applying the pesticide during the cooler hours of the day and by drying the plants in a well ventilated place. Powders and dusts are generally less injurious to plants than are spray concentrates, although they may leave an unsightly residue.

To avoid plant damage, carefully read the pesticide label. In many cases, it will indicate specifically which plants are sensitive to the pesticide and those for which it is specifically recommended.

None of the chemicals presently marketed has been evaluated for plant injury on all available ornamentals. Moreover, variations in growing conditions may produce different damage from use of the same chemical. When you use a new pesticide or a well-known one on new plants, evaluate it on a trial basis on a small number of plants—preferably those that are expendable. Any toxic effects should become evident within 5 to 10 days, and may be apparent in 48 hours.