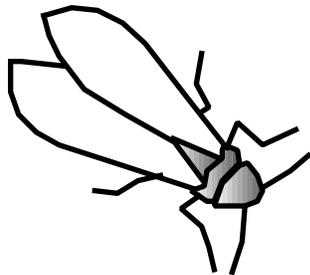
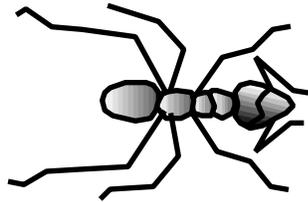


Insects and Related Pests of House Plants



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This publication was formerly a USDA Home and Garden bulletin, Number 67, prepared by the Agricultural Research Service. (This information was originally prepared by Ralph Webb, ARS Research Entomologist, Ornamentals Laboratory, Plant Genetics and Germplasm Institute, Beltsville Agricultural Research Center-West, Beltsville, MD 20705.)

This publication tells how to recognize and control the most common insects and related pests that attack plants in homes and home greenhouses throughout the United States. It has been prepared to answer the thousands of requests for information that come to the Department of Agriculture every year from homeowners and home greenhouse operators. Foliage and flowering plants have become a decorative feature in millions of homes. Commercial growing of these plants is an important segment of the florist industry.

The insecticides recommended are those that are generally available and legally registered for use on indoor plants by the Environmental Protection Agency.

If your insect problem goes beyond the scope of this discussion, you can get additional help from your county Extension agent.

When you write for information, send specimens of the pests in a small bottle of rubbing alcohol well-packed to prevent breakage.

The line drawings in this publication were used with permission from James R. Baker, North Carolina Agricultural Extension Service, North Carolina State University. Drawings were taken from *Insect and Other Pests Associated with Turf*, *Insect and Related Pests of Flowers and Foliage Plants*, and *Insect and Related Pests of Vegetables*.

How to Control Pests

Frank A. Hale, Associate Professor, Entomology and Plant Pathology

Control Strategies

There are a number of methods for controlling insects or related pests of house plants, some using pesticides and some consisting of non-pesticidal alternatives. What the homeowner should use varies with the pest encountered, the number of plants infested, the size of the infestation and the personal inclination of the homeowner.

Preventing infestation — Examine cut flowers and new plants brought into the home to be sure they are free of pests. It's a good idea to isolate new plants for at least a month before you place them with other plants. During this time, you can watch the new plants and discover any infestations that develop.

Using sterilized soil for potting may prevent the development of infestations of such soil pests as spring-tails, psocids and earth worms.

Washing — Washing with soapy water and a soft brush or cloth may be all that is needed to remove aphids, mealybugs and scale insects from broad-leaved plants. Use 2 teaspoons of a mild detergent to a gallon of water. Spraying the plants with a strong jet of water will also dislodge some of the pests.

Handpicking — If one or a few plants are involved, you may be able to control aphids and mealybugs by removing them with a toothpick or tweezers. Caterpillars may be picked off plants by hand and destroyed. Cutworms, slugs and snails may be found in their hiding places during the daytime and destroyed, or picked from the plants at night when they feed.

Use of alcohol — An easy way to control a light infestation of mealybugs or aphids on one or two plants is to wet and remove the insects with a swab that has been dipped in alcohol. Use a swab made from a small, thin stick and a tuft of cotton to dip in rubbing alcohol.

Pressurized insecticide spray — Relatively few insecticides have been registered by the Environmental Protection Agency for use on plants within the home. Those products that have been cleared, often consisting of several active ingredients in combination, are usually specially formulated for this use. Such ready-to-use spray preparations for plants come as pump sprays or as pressurized cans with pushbutton sprayer tops. These preparations are available in department, hardware and garden-supply stores.

When buying either a pump or pushbutton spray, read the label on the container to be sure the spray is one that can be used on plants. Some insecticide sprays in pushbutton cans, which are made for uses other than spraying plants, contain oils or other materials that will kill plants or burn foliage.

Pushbutton plant sprays contain small quantities of pyrethrins or other killing agents. They may be used to kill pests that can be hit readily with the spray, such as aphids and whitefly adults on plants, or whitefly and fungus gnat adults swarming near the plants.

To apply, follow the directions on the container. Horticultural oil comes as a liquid concentrate that must be mixed with water and applied in a pump sprayer. A granular systemic insecticide can be applied to the potting media. Other insecticides and miticides are available as liquid or wettable powder concentrates. These formulations are probably not economical for homeowner use. Some of the formulations that can be used in interiorscapes are not for use in homes.

Insects and Related Pests

Ants

Description — Several species can be troublesome on plants in the home or home greenhouse. Ants are 1/16 to 1/2 inch long; are black, brown, yellow or red; and have small necks and waists. They live in nests as colonies — beneath walks or in flowerbeds of home greenhouses or in window boxes.

Damage — Ants of certain species dig up and carry away newly planted seeds or small seedlings. Plant roots may be injured by the burrowing activities of ants.

Ants of some species are attracted to plants by certain aphids, mealybugs and scale insects that excrete honeydew. The ants feed on this sweetish, sticky liquid.

What to do — When ants are associated with aphids, mealybugs or scale insects, apply control measures for these pests. If ants continue to be a problem, treat infested areas with an insecticide registered for the control of ants in household situations in a manner consistent with directions on the label.



Aphids

Description — Several species are pests of house plants. Common aphids are 1/16 to 1/8 inch long; are green, pink, red or black; and have soft rounded or pear-shaped bodies with long legs and antennae.

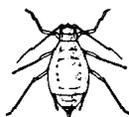
In each species, there are usually both winged and wingless forms, but the wingless form generally is more numerous. The wings are commonly held rooflike when at rest. Some aphids appear powdery because of a waxy covering.

Typically, aphids cluster on the undersides of leaves or on young, tender leaves and stems or flower buds. Some kinds feed on the roots.

Damage — Aphids feed by sucking out the plant juices; this feeding causes poor growth, stunted plants, or curled and distorted leaves. Aphids excrete a sweetish, sticky liquid called honeydew. Honeydew of most species is attractive to ants; it imparts a shiny appearance to the foliage and provides a base for the growth of sooty mold.

What to do — Use an insecticide such as horticultural oil or insecticidal soap, making sure that it lists both “houseplants” and “aphids” on its label. Follow the label directions.

When one or a few plants are infested, handpicking, washing or using alcohol may be a practical way to control aphids.



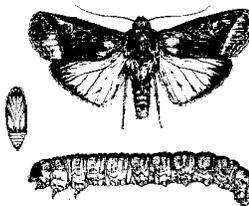
Cutworms and Other Caterpillars

Description — Several species can be troublesome in the home greenhouse. Cutworms and other caterpillars are barely visible to the naked eye when they hatch, but some reach a length of about 1 1/2 to 2 inches when fully grown.

Some species are a solid color, some are striped lengthwise or crosswise, and others are mottled. Colors in shades of green or brown are common for some species, but various combinations of brown, red, yellow, green, gray and black are also found. A few kinds of caterpillars are covered with dense hair.

Cutworms are difficult to find because they usually hide in the soil or deep in the flowers during daytime. Cutworms and some other caterpillars develop from eggs laid by night-flying moths that enter the open ventilators in greenhouses.

Damage — Leaves, buds, or flowers may be entirely or partly eaten. Some worms cut off young plants near the soil level, or the branches or flowers of larger plants. Dark pellets of excrement may be left on the plant or ground.



What to do — Handpicking is often adequate for control of cutworms and other caterpillars.

If handpicking is not practical, use an insecticide listing “caterpillars” as one of the insects controlled, and use according to labeled directions.



Cyclamen Mites

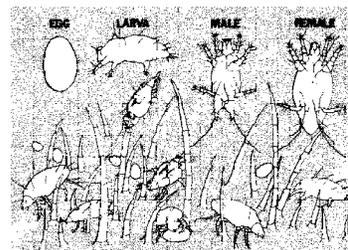
Description — Adult mites are too small to be seen with the naked eye. Under a magnifying glass, the adults are seen as oval, amber or tan-colored, semi-transparent, glistening mites. The young are even smaller and milky white. The eggs are oval and pearly white.

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; another means of spread is transfer of mites on hands or clothing.

Damage — Leaves of infested plants are twisted, curled and brittle. Buds may be deformed and fail to open. Flowers are deformed and often streaked with darker color. Blackening of injured leaves, buds and flowers is common.

Infested ivy will produce stems without leaves or with small deformed leaves. Infested African violets develop small, twisted, hairy leaves that may soon die.

What to do — Trim off badly injured plant parts where practicable. Immerse infested plants, pot and all, for 15 minutes in water held at 110 F. Success of this treatment depends on careful control of the water temperature.



False Spider Mites

Description — A few species can infest plants in the house or home greenhouse. These are flat, oval, dark-red mites too small to be easily seen with the naked eye. The young and eggs are bright red. All stages of false spider mites are found mostly on the undersides of leaves, generally along the veins or other irregularities on the leaves.

Damage — Feeding by these mites causes finely stippled bronze or rusty-brown areas along veins or on entire leaves. Edges of infested leaves may die, or the leaves lose some color and drop off. Infested plants are weakened.

What to do — In home greenhouses, mites can be controlled by making two or three applications of insecticidal soap or horticultural oil at 7-day intervals.

Fungus Gnats

Description — Adult fungus gnats are delicate, gray or dark-gray, fly-like insects about 1/8 inch long. They are attracted to light and when present in the house, swarm over the windows. The immature forms, which live in soil, are thin whitish maggots with a jet black head, and attain a length of about 1/4 inch. Maggots are likely to be found in soils with quantities of decaying vegetable matter.

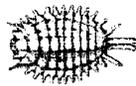


Damage — The maggots cause injury to the root systems by burrowing in the soil. They may feed on the roots and crowns of plants. Severely injured plants make little growth, appear off color and may drop foliage. Adult fungus gnats do no damage but are a nuisance.

What to do — For the control of the maggots in home greenhouses, avoid overwatering the plants. Labeled insecticide sprays can be used to target the adults, while insecticide drenches can be applied to the potting media for control of the maggots.

Mealybugs

Description — Several species are common pests of house plants. Mealybugs are softbodied and appear as though dusted with flour because of their waxy covering. They grow to be about 3/16 inch long. Some species have waxy filaments extending from the rear of the body. Mealybugs are found at rest or crawling slowly on stems, where stems and leaves join, and on leaves (especially along veins on under-surfaces). Their eggs are laid in clusters enclosed in white waxy, cottony or fuzzy material. Mealybugs are sometimes tended by ants. The ground mealybug, a soil inhabitant, feeds on the roots of African violets and other plants.



Damage — Mealybugs suck out the plant juices, thus stunting or killing the plants. Sooty mold grows on the honeydew excreted by some species of mealybugs. The ground mealybug damages the rootlets, causing the plants to grow slowly and to wilt between waterings.

What to do — If one or a few plants are infested, you may be able to control mealybugs by washing, by handpicking or by using alcohol. Isolate treated plants to avoid reinfestation. Use a labeled insecticide spray or systemic granular insecticide.

Millipedes

Description — Several species may become numerous in the home greenhouse. Millipedes grow to a length of about 1 1/2 inches. They are worm-like creatures with many short legs (two pair per body segment). The hard bodies are brown, tan or gray.



Millipedes are found under boards or flowerpots or in other sheltered areas;



they are likely to be most numerous in moist places where there is plenty of organic material. They are most active at night and tend to assume a coil form when disturbed.

Damage — Millipedes may feed on seeds, roots, tubers, bulbs or fleshy stems of plants, but mostly they eat decaying organic material. They become a nuisance when present in large numbers.

What to do — Eliminate hiding places and excessive organic materials where possible.

Drench the soil surface and hiding places of millipedes with a labeled insecticide spray.

Psocids

Description — Psocids have soft oval bodies, grow to about 1/32 to 1/16 inch long, and are pale yellowish white to gray. Some species have wings and others are wingless. Sometimes psocids cluster in numbers of a hundred or more. They feed on dead animal or vegetable matter, lichens and fungi.

Psocids may occur in large numbers in the soil or on pots and benches, especially in undisturbed locations in the home greenhouse. Minute, quick-moving psocids are often found on old books and papers stored in damp places. These are commonly referred to as booklice.

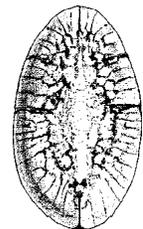
Damage — Psocids may be found on living plants, but so far as known, do not feed on them. When present in large numbers, psocids are a nuisance.

What to do — Control measures are unnecessary.

Scales

Description — Several species are common on plants in the home or home greenhouse. Armored scale insects have a waxy shell-like covering, or armor that protects the entire body.

The soft scale do not have an armor that is separate from the body. Soft scale produce honeydew while armored scale do not. Most species are about 1/16 to 1/8 inch in diameter, but a few species are about 4 times larger. Some are hemispherical in shape, some oval and some are shaped like an oyster shell. Colors range from white to black, but browns and grays predominate.



Some species lay eggs in a whitish sac secreted from under the scale; these can be mistaken for mealybugs if not examined closely for the presence of the shell-like covering. Some kinds of scales infest the leaves of plants, others are found both on stems and leaves and still others attack chiefly the stems.

Damage — Scale insects obtain food by sucking the plant juices; this feeding causes poor growth or stunted plants. As previously stated, the soft scale excrete droplets of honeydew. This sweet substance is attractive to ants. It imparts a shiny appearance to the foliage and provides a base for the growth of sooty mold.

What to do — If only one or a few plants are infected, washing with soapy water may be a practical way to control scale insects. Heavily infested plants should be discarded. If insecticide sprays are to be used, three or more sprays should be made at two-week intervals. A labeled granular, systemic insecticide can also be used.

Slugs and Snails

Description — Several species can be troublesome in the home greenhouse. Both snails and slugs have fleshy, soft, slimy, legless bodies that range in color from whitish yellow to black; most are mottled with shades of gray. These pests are slow moving and grow to lengths of about 1/2 inch to 4 inches.

Snails have a hard spiral shell on the back. Shells range from about 1/4 to 1 inch in diameter, and are off-white to brown or black.

Slugs and snails normally hide during the day under pieces of wood or pottery, fallen leaves or mulches and are active at night, but they may also be active on damp, dark days.

Damage — Slugs and snails feed on the leaves, flowers, stems or roots of plants by scraping off the tissue or eating holes in the leaves or flowers. They leave a glistening trail of slime wherever they crawl.

What to do — Insofar as practicable, eliminate hiding places. Put out a few pieces of shingles or boards for traps. Collect and destroy trapped slugs and snails every day or two; look for them also under the pots and under the pot rims. Collect slugs and snails from the plants at night.

If further control measures are needed, use a commercially prepared slug and snail bait. Apply it as directed on the container.

You can partially control snails and slugs if you place shallow dishes of beer in the vicinity of infested plants. Some species will crawl into the beer and

drown. The dishes should have straight sides to make it easier for the snails and slugs to crawl in.

Sowbugs and Pillbugs

Description — Several species can be trouble- some in the home greenhouse. Sowbugs and pillbugs have segmented, shell-like bodies. They are oval, 1/4 to 1/2 inch long and gray to brown.

Sowbugs and pillbugs are commonly found in places with high humidity. They are most active at night and usually hide in loose soil or under any convenient cover during the day. When disturbed, pillbugs roll up in a ball, and sowbugs scurry for cover.

Damage — Sowbugs and pillbugs usually feed on decaying organic materials, but sometimes eat roots and tender plant parts, especially those of bedding plants and seedlings.

What to do — Eliminate hiding places where possible.

Spray soil surface, under boardwalks and benches, along foundations or other infested areas with a labeled insecticide.

Springtails

Description — Several species can be troublesome in the soil in flowerpots and home greenhouses. Springtails range in size from microscopic to about 1/5 inch long. Some species have slender, segmented bodies; others have globular bodies without distinct segmentation. They are whitish to blackish; some are tinted blue or purple.

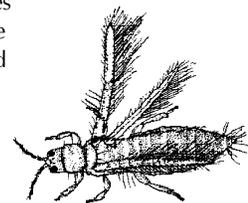
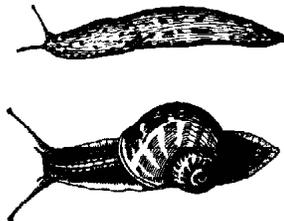
Springtails sometimes become plentiful in moist situations where there is much organic material; large numbers of them can then be seen on the surface of the soil. Mostly they feed on decaying matter.

Damage — Springtails may chew on seedlings or on tender parts of plants, particularly the parts near ground level. They are a nuisance when numerous.

What to do — Spray soil surface, pots, saucers, shelves and affected parts of plants with a labeled insecticide.

Thrips

Description — Several species may infest house plants. Thrips are slender, barely visible to the naked eye. Adults may be tan, brown, blackish brown or black, with lighter markings. The young are whitish to yellow or orange, and



some species carry droplets of black excrement on their backs. The adults fly or leap away, or run rapidly about on the plant when disturbed. The young are less active.

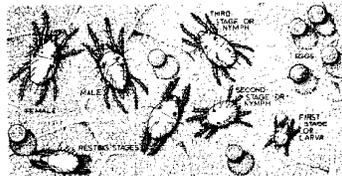
Damage — Both adults and young cause plant injury, most commonly on the leaves or flowers, by sucking out the plant juices. Typical injury appears as irregular or streaked silvered areas that are speckled with little black dots of excrement. Foliage may blotch or drop, and flowers may be streaked or distorted.

What to do — Spray the plant and soil surface three to four times on a four-day interval with a labeled insecticide.

Twospotted Spider Mites

Description — Twospotted spider mites are a common pest of house plants. They are most abundant when conditions are dry and warm.

These tiny, oval, greenish or yellowish mites are barely visible to the naked eye. They are found first on the undersurfaces of leaves; when numerous, they spread to other parts of the plant.



If an infestation is heavy, spider mites form a frail, silky webbing that stretches from leaf to leaf to cover the plant. Mites can be seen as they crawl over this webbing.

Damage — Spider mites injure plants by feeding on the plant juices. Injury is first visible as whitish or yellowish speckled areas on the top surfaces of leaves. As feeding progresses, the leaves take on a bronzed or yellowed appearance and may die or drop from the plant. Heavily infested plants become stunted and may die. Flowers may be faded.

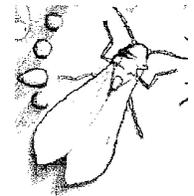
What to do — Syringe tough plants with a forceful spray of water to break up webbing and dislodge spider mites. Then wash plants with soapy water. A day or two later, plants can be sprayed with horticultural oil or insecticidal soap.

Be sure to wet the undersides of leaves.

Several applications at weekly intervals will be required to control spider mites.

Whiteflies

Description — A few species can be troublesome; two of these are important pests of house plants. The adults are about 1/16 inch long, and have white, wedge-shaped wings. When infested plants are moved, the adults take flight; they resemble small snowflakes or bits of paper ash swirling in the air.



The scale-like young are mostly pale green to yellow or whitish, oval in outline and flat on top. Except for newly hatched young, the immature stages are attached to the leaves, mostly on the undersurfaces.

Damage — Both adults and young feed on the leaves of plants by sucking out the juices. Infested leaves become pale, turn yellow and die or drop off. Surfaces of leaves become covered with sticky honeydew excreted by the insects. Sooty mold develops on the honeydew.

What to do — Spray plants, using a labeled insecticide. Wet the underside of the foliage. Several applications at weekly intervals may be required to control whiteflies. The use of a labeled granular, systemic insecticide is another control option.

Federal and state regulations require registration numbers on all pesticide containers. Use only pesticides that carry this designation. Read and follow all directions on the label.

The pesticides mentioned in this publication were federally registered for the use indicated as of the issue date of this publication. Because the registration of a pesticide that you have had in your possession for some time can be changed, you may wish to check with your local Extension office to determine the registration status of the pesticide.

**POISON INFORMATION
POISON CONTROL CENTERS
IN TENNESSEE**

1-800-288-9999 - East Tennessee Poison Control Center

STATE COORDINATOR
(615) 741-2407

Dept. of Public Health
Nashville, TN 37219

CHATTANOOGA (423) 778-6100	Erlanger Health Systems 910 Blackford St. Chattanooga, TN 37403	KNOXVILLE (423) 544-9400	Memorial Research Center 1924 Alcoa Hwy. Knoxville, TN 37920
COLUMBIA (931) 381 - 1111	Maury County Hospital Trotwood Avenue Columbia, TN 38401	JACKSON (901) 425-6000	Madison General Hospital 708 W. Forest Jackson, TN 38301
COOKEVILLE (615) 322-6435	Vanderbilt Univ. Hospital 501 Oxford House 1161 21st Ave., South Nashville, TN 37232	MEMPHIS (901) 528-6048 or 1-800-288-9999	Southern Poison Center University of Tennessee College of Pharmacy 848 Adam Memphis, TN 38103
JOHNSON CITY (423) 461 -6572	Memorial Hospital 400 State of Franklin Road Johnson City, TN 37601	NASHVILLE (615) 322-5435	Vanderbilt University Hospital 501 Oxford House 1161 21st Ave., South Nashville, TN 37232

EMERGENCY NUMBERS

911 - Medical emergency, police-sheriff and fire
1-800-424-9300 - CHEMTREC

ATTENTION

1. Read the label of any pesticide before applying.
2. Do not rely on pesticides alone; employ all cultural methods of control.
3. Regulations and guidelines concerning use of pesticides are subject to change without notice. Consult the label of the product for usages and rates before applying. If recommendations in this manual conflict with the label, please follow the label instructions.
4. When a range of rates and application intervals are recommended, use the lower rate and longer interval for mild-moderate infestations and the higher rate and shorter interval for moderate-severe infestations.
5. Use of trade or brand names in this manual is for clarity and information. The Tennessee Cooperative Extension Service does not imply approval of the product to the exclusion of others which may be similar, suitable composition, nor does it guarantee or warrant the standard to the product.
6. Please read the label before using a product.

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.

DISCLAIMER STATEMENT

Pesticides recommended in this publication were registered for the prescribed uses when printed. Pesticide registrations are continuously being reviewed. Should registration of a recommended pesticide be canceled, it would no longer be recommended by The University of Tennessee. Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others which may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product.

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Agricultural Extension Service
Billy G. Hicks, Dean