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Michigan State University

Cooperative Extension Service

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IN CARING FOR HOUSE PLANTS many people do not recognize the presence of a problem until one or more plants have been severely damaged. Most of the common insects and diseases of house plants are inconspicuous initially, and recognition of early damage symptoms may be the easiest way to tell if you have a problem. The use of a hand lens to examine a plant is often all the magnification you need to identify the problem¹, provided you know what to look for, and where it is likely to be on the plant.

INSECT PESTS

There are two general types of insect problems on house plants: those caused by (1) soil related pests and (2) leaf and stem related pests. The first group contains the springtails and fungus gnats. These pests are easily controlled and are usually not a serious problem.

The second group consists of leaf and stem feeders and contains several kinds of plant tissue feeders. Spider mites are one type. A second type, the sucking insects, contains three members of the insect group called the Homoptera—aphids, mealybugs, and whiteflies. A third type of sap feeder is the thrips. These

¹Most houseplant problems are caused by improper care; that is, too much or too little water, light, heat or fertilizer, or improper soil. These factors are not identifiable with a hand lens, but should also be checked for when diagnosing houseplant problems. (See Extension Bulletin E-1077, "Houseplant Problems.")

tiny insects rasp the plant tissue and suck up the sap that exudes from the damaged plant cells.

DISEASE PROBLEMS

Disease problems associated with houseplants can also be divided into two groups: (1) leaf and stem and (2) root disorders. A number of fungi and bacteria have the ability to cause disease in either category.



Several conspicuous fungi, algae and mosses also grow on the soil surface in pots when moisture conditions are adequate. These organisms pose no problem to plants unless their growth becomes so dense that water is kept from penetrating the soil.

CONTROLS


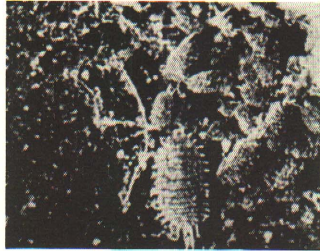
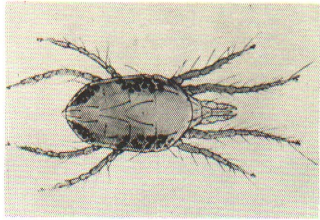

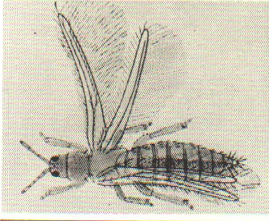
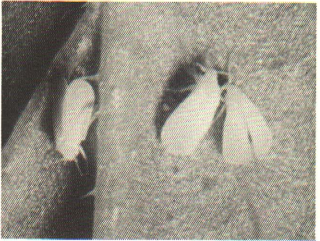
The following chart describes the common pests and problems, and suggests various control measures.

When a pesticide is specified for control, follow all directions listed on the label of the container. The label has the force of a legal document, and tells you the legal and proper way to use the pesticide.

Some pesticide chemicals are harmful (phytotoxic) to plants if improperly applied or applied under adverse conditions. Of the chemicals recommended in this bulletin, malathion is known to be phytotoxic to some plants. Plants which should not be sprayed with malathion are listed at the bottom of the insect control guide. Always use chemicals properly, do not misuse or mishandle pesticides.

Insect Problem	Description and Damage	Control Measure
Aphids 	Soft bodied insects, about 3 mm (1/8 in) long. Cluster on undersides of leaves, buds and other tender plant parts. Feed by sucking plant juices, causing poor growth and distorted leaves. Aphids excrete honeydew which can build up on leaves and promote growth of sooty mold.	Dip or spray plants, using malathion.* A pyrethrum or rotenone spray may also be used.
Scales 	Common species is Brown Soft Scale; soft, oval, with flat upper surface, yellowish brown and about 3 mm (1/8 in) long. Other species have different shapes but all have sessile feeding stages, and mobile crawler stage the life stage to control. Heavy infestations weaken and stunt plants.	Dip or spray plants using malathion.* A pyrethrum or rotenone spray may also be used. Repeat applications at 10-14 day intervals to control crawlers.

*Do not use on Boston, Maidenhair, and Pteris ferns, Canaerti Juniper, some species of Crassula, Hydrangea, Gloxinia, Saintpaulia, petunias, violets, African violets, orchids, some red carnation varieties, and begonias.

Insect Problem	Description and Damage	Control Measure
Fungus gnats 	Larvae are thin, whitish, worm-like maggots about 6mm ($\frac{1}{4}$ in) long. They are most likely to occur in soils high in organic matter. Larvae feed on roots and crowns of plants, stunting growth and ultimately causing leaf drop. Adults are dark fly-like insects about 3 mm ($\frac{1}{8}$ in) long. They are attracted to light. They cause no damage but are a nuisance.	Larval control: Drench soil with 2% malathion water emulsion.* Adult control: If adults are numerous, a pyrethrum fly spray will control them.
Mealy bugs 	Soft bodied wingless insects. Most types have waxy filaments extending from edges of body. Young and adults look similar, with adults about 5 mm ($\frac{3}{16}$ in) long. Eggs are laid in a cottony mass on the plant. Adults can be found at rest or slowly crawling on stems, and on undersides of leaves. Damage is caused by sucking plant sap resulting in stunted growth or death of plant. These insects secrete honeydew, and sooty mold may develop.	Dip or spray plants, using malathion.* To insure wetting of mealybugs, add mild household detergent (not soap) at a rate of $\frac{1}{2}$ teaspoon per gallon of solution.
Spider mites 	Minute spider-like mites. May be greenish, yellowish or reddish. Found most often within silky webbing on underside of leaf; may be found over entire plant in heavy infestation. Damage done by feeding on plant juices. Injury shows up first as yellowish blotching on leaves. Progressive feeding results in bronzed leaves, leaf drop, and possibly plant death.	Dip or spray plants with dicofol (Kelthane) or malathion.* Before spraying, mist plant with water to highlight webbing. Pick off webbing to insure good coverage of insecticide.
Springtails 	Different types may infest soil of potted plants. They are generally whitish, about 2-4 mm ($\frac{1}{16}$ - $\frac{3}{16}$ in) long. They can jump into the air with the aid of a forked appendage located at the tip of the abdomen. They are most easily seen after watering when wet soil forces them to come to the surface. They feed mainly on decaying matter, but in large numbers can prune root systems to cause wilting.	Drench soil with malathion.* On sensitive plants, water soil to bring springtails to surface and then use a pyrethrum spray.
Thrips 	Very small, cream to dark brown insects. Adults have two pair of feathery wings; immature forms are wingless. They are active if disturbed, and adults fly readily. Leaf surfaces become whitened and may appear flecked. Leaf tips wither, curl up and die. Buds fail to open normally.	Dip or spray plants using malathion.* A rotenone spray, with repeated applications, may also be used.
Whiteflies 	Adults are white, have wedge-shaped wings and are about 2 mm ($\frac{1}{16}$ in) long. When infested plants are moved, flies take flight and look like pieces of ash floating in the air. Larvae are scale-like, oval in outline and flat on top. They are immobile and attach themselves to leaves. Both adults and larvae cause damage by sucking plant juices. Infested leaves yellow and may drop off. These secrete honeydew, and sooty mold may develop.	Dip or spray plants with malathion.* A rotenone spray may also be used. Control of this pest is difficult; hence repeated applications may be necessary.

*See footnote * on page 1.

Disease Problem**Description and Damage****Control Measure**

Saprophytic fungi, algae and mosses on soil surface

If a pink, white, light orange or tan growth appears on the soil surface, suspect saprophytic (non pathogenic) fungi. If a green to near black, sometimes slimy growth appears, suspect algae; and if a green, velvet-like mat develops, suspect a moss to be the cause of your problem. These organisms may develop such a dense mat over the soil that water is excluded and/or water penetration is very slow.

Plant symptoms may be poor growth or wilting even when adequate water has been provided.

Excessive growth of algae and mosses indicates high air and soil moisture conditions. Let surface of soil dry between waterings. Also cultivate soil surface to break up the mat which has developed due to the growth of the organism. A spray or drench with a copper fungicide† will kill most fungi algae, and mosses.

Powdery mildews (several species)

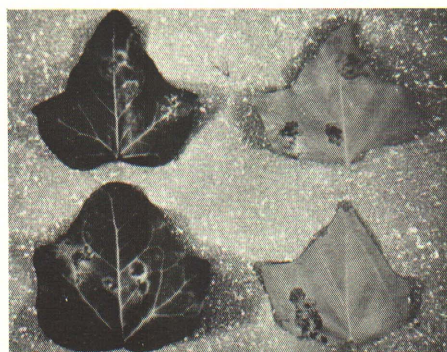


White to grayish, fuzzy or powdery, circular spots appear on leaves, petioles, stems, or flowers. The tissue in spots may become crusty or scab-like.

Wash leaves with mild detergent water to help reduce disease. Spray or dust with fungicides such as sulfur†, benomyl, cycloheximide†, dinocap, folpet.

Powdery, white growth on leaves and stems indicates powdery mildew infection.

Bacterial leaf and stem rots (*Xanthomonas* or *Erwinia* spp.)

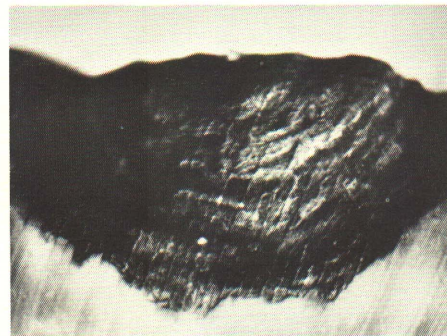


Irregular to circular, brownish spots surrounded by watersoaked margins and/or yellow halos are found on leaves or stems. As the spots enlarge, centers dry out, and become brown to near black. Under high humidity conditions, small droplets of milky or amber colored ooze can be found in the spots.

Affected plant tissues should be removed and destroyed. Disinfect tools between cuts and remove tissues only when plants are dry. Do not mist or spray leaves with water, as this tends to spread the bacteria. Avoid handling plants. Copper and streptomycin sulfate sprays help prevent disease spread.

Water-soaked lesions with brown to near black centers surrounded by yellowing tissues indicate possible bacterial infection.

Anthraxnose (*Gloeosporium* sp.)



Small, circular brown spots develop on leaves. As spots enlarge, a concentric ring pattern develops as the fungus grows in the tissues.

Affected leaves or portions of leaves should be removed and destroyed. Spray plants with maneb, zineb, folpet, benomyl, mancozeb, or captan to prevent further infection.

Concentric rings of brown leaf tissue often containing small raised, beiged pustules are most likely caused by anthracnose fungus.

†Fungicides which may be phytotoxic to some plants. Read the label for specific precautions.

Disease Problem**Description and Damage****Control Measures**

Oedema (Physiological)

Small blister-like eruptions appear on underside of leaves. Affected tissues appear water-soaked and soon develop tan to brown corky centers. As spots become numerous leaf yellows and falls. Once affected, leaves do not recover.

Excessive soil moisture and retarded transpiration cause this disorder. Oedema usually develops when soil is moist and warm, the air is moist and cool, and available light is much reduced.

Reduce watering. Improve soil drainage, light conditions, and air circulation.

These conditions occur frequently during the cloudy, winter months.

Blister-like eruptions with tan, corky centers are symptoms of oedema.

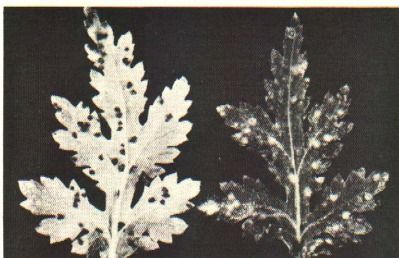
Root rots (*Rhizoctonia*, *Pythium*, *Phytophthora* spp.)

Plants grow poorly and leaves may yellow and drop prematurely. The basal stem and roots show brown to black lesions and sections of root may be collapsed. In advanced stages, severe wilt accompanies other symptoms.

Poorly drained soil, high soil moisture and poor aeration favor root rot development.

Potting soil should be porous and well drained. Do not overwater. Drench soil and roots with thiram and/or captan. Benomyl may be used for control of *Rhizoctonia* root and stem rot.

Poor growth, wilted foliage, premature leaf drop, and discolored roots are some of the symptoms of root rot (left - good root system, right - diseased).

Rust

Leaves develop small, blister-like eruptions usually on the underside. The pustules burst to expose a yellowish-orange or brownish-orange mass of powdery spores.

Remove and destroy infected leaves. Apply wettable sulfur, zineb, maneb, or mancozeb to prevent infection of healthy leaves.

Small, circular yellow spots on upper leaf surface (right) with a powdery yellow-orange to brown pustule present on the lower surface (left) indicates a rust infection.

Botrytis blight (Gray mold)

Flowers or leaves develop brown, mushy spots usually where healthy tissues are in contact with dead petals or leaves. Under humid, moist conditions a gray to brownish-gray fuzzy growth develops on the dead plant tissues.

Reduce humidity, keep foliage dry. Remove dead foliage and flowers. Captan, benomyl, Daconil, or zineb used as a spray or dust will help control Botrytis blight.

A gray mold growing on dead or dying flower or leaf tissue is most likely due to a Botrytis infection.