PLANT DISEASE CONTROL NOTES
EXTENSION DIVISION ● VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

IDENTIFICATION AND CONTROL OF DISEASES OF HOUSEPLANTS

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There are several different groups of plants that fit the general category of houseplants. They may be referred to as indoor plants, foliage plants, flowering plants, and ferns. As well as being susceptible to attack by various insects and mites, they are also susceptible to infection by plant pathogenic fungi, bacteria, viruses, and nematodes.

Frequently, improper cultural practices or unfavorable environmental conditions predispose houseplants to infection by plant pathogenic agents. Improper cultural practices include too much water, too little water, too much light, insufficient light, low humidity, overhead watering, excess fertilization, and pathogen infested growing media. Containers that are placed on the ground are frequently contaminated with soil-borne plant pathogens that wash or splash into the growing media.

Diseases caused by plant pathogenic organisms can be divided into three major categories: (1) foliar and flower fungal, (2) foliar and stem bacterial, and (3) soil-borne root and stem fungal.

The majority of houseplants sold in Virginia garden centers are grown in a sub-tropical environment that promotes rapid plant growth. Many of the flowering plants such as gloxinias, African violets, chrysanthemums, begonias, and fuchsias are also grown in southern states. Unfortunately, the sub-tropical environment is not only optimum for plant growth but is ideal for plant disease development. In order to prevent disease from developing on indoor plants, it is essential that plants be inspected carefully before purchase for freedom from disease. Plants with dark-green older leaves, new shoots, or buds free of leaf spots are usually free of root as well as leaf and stem diseases.

Because some commercial growers have failed to consider the importance of growing media that are well drained, steam pasteurized, or chemically fumigated, many plants have arrived in Virginia infected with soil-borne root, stem, and crown rotting disease organisms. If small plants are purchased from out of state sources, they should always be growing in a soilless media (one containing mixtures of peat moss, Perlite, Vermiculite, washed sand, pine bark, etc.). Top soil or so called "garden top soil" frequently is infested with soil-borne fungi and bacteria. Small quantities of soil can be sterilized. Clay or plastic pots and other potting tools

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and utensils can be sterilized by boiling them in water for thirty minutes or washing and rinsing them in a solution of household bleach and water. A satisfactory disinfecting solution contains one part of household bleach in nine parts of water.

Fungus Root Rots

If plants are suspected of suffering from root rot, they should be separated from the growing media, the roots washed with running water, and examined visually. A healthy root system will appear fibrous with white root tips. A diseased root system will show blackened root tips with various degrees of soft watery rot.

One of the most critical factors in the development of Pythium and Phytophthora root rot is the amount of water in the pore spaces of the growing media. Houseplants differ in their moisture requirements, ranging from tolerant to very intolerant. Therefore they should be given individual attention as to the type of container, drainage from the bottom, and the potting mix. The ease with which water drains from the container and the growing media will determine the necessary frequency of watering. It is very important that the potting media should be light and porous so that water moves through the container quickly wetting the entire container of medium. Excessive watering results in oxygen deficiency in the media, predisposing roots to infection by Phytophthora and Pythium. Garden soils that contain clay particles frequently are poorly drained and carry soil-borne fungi. See the last page "Guide to Chemical Control" for recommendations on chemical control.

Fungus Leaf Spots

There are a variety of fungi infecting leaves of house plants. The size, shape, and color of the leaf spot is determined by the particular fungus. The spots may have a distinctive margin and be liberally sprinkled with minute black fungus fruiting bodies (black dots). These fruiting bodies may be overlooked because of their small size. If the spots are numerous on the leaf and if they enlarge, diseased areas of the leaf coalesce to form irregular blotches. As a result, the entire leaf may wither and die.

Because the fungi require free water on the leaves for infection it is very important that the foliage be kept as dry as possible. Syringing the leaf should be done carefully, especially if fungus leaf spots are apparent. If the leaf spot infection is limited to a few leaves, the diseased leaves should be picked off and removed from the vicinity of the plant. Because fungus leaf spots are favored by a persistent film of moisture on the leaves, it is important that indoor plants are not crowded closely together so that they remain wet. If the foliage is excessively dense, lightly thin the plant. Separate diseased plants from healthy ones to isolate the infection.

Bacterial Diseases

There are numerous bacterial leaf spots and stem rots caused by plant

pathogenic bacteria. Bacterial spots differ from those caused by fungi in that they typically have a pale green to yellow "halo" around the outer margin of the spot. The spots themselves appear as dark green, water-soaked spots. Petiole or leaf stem bacterial diseases, as typically seen in Philodendron Selloum, appear as soft watery rots. Occasionally, large stems are affected by bacterial disease organisms. These stems will appear soft and watery and occasionally turn dark black. The bacteria are readily spread by splashing water, pruning tools, and infected plants. For this reason diseased plants should be grown as dry as possible without going through excessive wilt, making sure that as little water as possible is applied over the top of the plant. Pruning shears should be sterilized in a diluted household bleach in water solution (1 part household bleach in nine parts water).

Virus Diseases

Several different flowering houseplants, foliage plants, and orchids are infected by plant pathogenic viruses. Frequently, symptoms of virus infection appear as circular spots or rings, light green to yellow in color, with a diffuse mottled pattern (mosaic) of light and dark green areas. Leaves on infected plants are frequently yellow and the plants themselves stunted with fewer than normal flowers.

There are no chemical treatments recommended for virus control. Therefore, in order to prevent its spread to healthy plants, infected ones should never be used for cuttings or seed production.

Abiotic Diseases (No living plant pathogen)

Nutrient Deficiency

Houseplants that have light pale-green or yellow leaves may be suffering from lack of nitrogen or a nutrient deficiency. If the leaves are turning brown along the margins, the plant may be showing a deficiency of potash. Phosphorus may be deficient if the leaves turn excessively dark green or a dull green or bluish-green.

Excessively Hot or Dry Air

This problem is most severe during winter months when the humidity in the house drops due to heating and reduced atmospheric humidity. Ferns and tender-leafed plants are especially sensitive to low humidity. Those plants requiring humidity will survive if grown on wet gravel or sand. Avoid placing them on or near radiators, heat ducts, or vents.

Insufficient Light

Plants with pale-yellow, smaller-than-normal leaves with generally poor growth may need more light. Loss of dark coloration is indicative of low

light. It is important to know the particular light requirements for each specific plant.

Accumulated Salts

Plants grown in the same pot for long periods of time may have a white or yellow crust on the soil or media surface. This residue signifies an accumulation of unused salts from previous fertilization or "hard water." If the salt accumulation reaches toxic levels, plant injury occurs with marginal leaf burn and root destruction. A monthly leaching to leach excess salt through the bottom of the pot through the drainage holes is beneficial. The soil can be leached readily if the growing media is porus.

When accumulated salts are an immediate problem, the pot should be completely immersed in fresh water, thoroughly saturating the soil. When the air bubbles cease rising from the container remove it and drain. This procedure should be repeated at least twice, or until the water draining out of the pot holes appears clear.

Water from some water de-salting systems may contain high amounts of calcium. Distilled water, rain water, or water from dehumidifying machines is usually saltfree.

Sudden Change in Environment

If the leaves drop suddenly from a plant, look into the possibility of a rapid change in temperature, cold or hot drafts of dry air, or changing from sunny to dark locations.

KEYS TO PROPER USE OF PESTICIDES

1. Read the label on each pesticide container before each use. Follow instructions to the letter; heed all cautions and warnings, and note precautions about residues.
2. Keep pesticides in the containers in which you bought them. Put them where children or animals cannot get to them, preferably under lock and away from food, feed, seed, or other material that may become harmful if contaminated.
3. Dispose of empty containers in the manner specified on the label.

SEE YOUR DOCTOR IF SYMPTOMS OF ILLNESS OCCUR DURING OR AFTER USE OF PESTICIDES.

GUIDE TO CHEMICAL CONTROL IN GARDEN CENTERS

DISEASES AND HOST PLANTS	Fungicide**	Rate/100 gal.	Rate/gal.
Fungus Root Rots			
Pythium, Phytophthora, Rhizoctonia, Thielaviopsis Fusarium			
Agalonema Peperomia Philodendron	Banrot* (40%WP)	8-12 oz.	1½ tsp.
Pythium, Phytophthora Agalonema Anthurium Chinese Evergreen Dieffenbachia Nephthytis Peperomia Pilea Pothos Philodendron spp.	Truban* (30%WP) or Terrazole*(35%WP)	10 oz. 10 oz.	1½ tsp. 1½ tsp.

*Not cleared by E.P.A. for household use.

**See container for information on application.