PEST PROBLEMS

Definition of a pest: Any organism that feeds on and causes destruction of plant tissue.

The **big three are**:

1. Insects
2. Mites
3. Fungi

Less common pests are:

4. Bacteria,
5. Nematodes
6. Viruses

INSECTS

1. Chewing types - *beetles, *caterpillars, *earwigs etc.

   - usually only encountered when plants are moved outdoors
   - damage is easily seen: holes in leaves, missing leaf pieces, etc
   - usually large and easy to see
   - relatively easy to control by physical removal

2. Piercing and sucking types - *whiteflies, *aphids, *mealybugs, *scales, *leafminers etc.

   - causes most serious damage
   - damage usually not very obvious until infestation is severe
   - difficult to see until large numbers have reproduced
   - have ability to develop resistance to chemical pesticides due to rapid reproduction rate and large reproduction numbers

   - aphids, whiteflies, and scales secrete sticky "honeydew" deposit, which serves as nutrient for black, sooty mold (fungi); mold grows over plant surface, clogging leaf pores, blocking light reception and reducing photosynthesis

MITES - Eight-legged organisms, closely related to insects that also damage plants by piercing the tissue and extracting the sap; most of the same characteristics previously noted for piercing and sucking insects apply to mites as well.

FUNGI - pathogens that causes certain infectious diseases

- causes a variety of diseases on leaves, crowns and roots
- fungal diseases tend to be enhanced by: poor air circulation, overwatering, poor drainage, high humidity, overmisting, low light levels

  - Ex. Damping-off, Powdery Mildew, Leaf Blights, Root and Crown Rots, Black Sooty Mold

BACTERIA - pathogens that causes certain infectious diseases

- found on leaves, stems and roots
- symptoms vary depending on whether infection is localized (dark-green, water soaked spots with yellow halo) or systemic (general leaf yellowing)

NEMATODES - tiny, almost microscopic roundworms, which infect leaves and roots and cause disease

- leaf feeding nematodes cause brown to black dead areas, usually between leaf veins
- root-feeding nematodes cause a variety of symptoms such as plant stunting, yellow leaves, root swelling

VIRUSES - among the smallest forms of life and can only be seen under an electron microscope; one of the most serious plant pathogens

- symptoms often appear as patches of yellow and green areas in leaves (mosaic pattern) and distorted leaf growth
- viral diseases usually prevented through seed propagation or in plants propagated by tissue culture techniques

Some pathogens attack many different plants while others are host-specific. Through breeding efforts and "natural selection" (where individuals best adapted to their environment are favored over those less adapted), a number of plants are available that have resistance (not immunity) to certain of these pathogens.

MANAGEMENT/CONTROL MEASURES

1. Cultural - easiest to implement; prevention of insect and disease problems is the key

- use clean containers and media
- avoid overwatering and overfertilizing
- provide proper light and heat

- provide good air movement; avoid overcrowding

By keeping plants clean and healthy, they have a better chance of overcoming a pest attack or infestation.

2. Mechanical - safe, inexpensive and environmentally friendly

- pick off large insects
- apply forceful spray of water to remove some pests
- wash plant with dilute, soapy water, rinse off soap thoroughly
- scrape off with fingernail or blunt knife
- use alchol-drenched cotton swabs, which penetrate protective "armor" of certain insects
- remove infected parts with scissors or pruning shears (bleach-dipped)

3. Chemical - use as last resort; make sure specific pest has been identified before application

- read label for dose, application method and warnings
- best to apply outdoors

Common Types of Chemicals

Pesticides are used to destroy pests or protect plants from pest damage.

1. Insecticides - control insect pests.
   a. Natural
      1. Pyrethrin-based
         Ex. Scott "Bug Spray"
      2. Insecticidal Soaps
         Ex. Safer Insecticidal Soap
   b. Synthetic - Ex. Malathion

2. Miticides - controls spider mites and other mites. Some also control insects;
   Ex. Kelthane

3. Fungicides - control disease causing fungi
   a. Sulfur-based; Ex. "Safer" Garden Fungicide
   b. Synthetic; Ex. Captan

4. Bacteriocides (Ex. Streptomycin) - their use on indoor plants is not feasible.

5. Nematocides – their use on indoor plants is not feasible.

6. Viricides - not available to control viral diseases of "any" plant.

Pesticide Application: Best conditions to apply pesticides include *low light ,*dry foliage ,*normal room temperature and *adequate water (i.e. not stressed/wilted). Pesticides thatare applied incorrectly or excessively can cause a PHYTOTOXIC response that may appear as: leaf margin burn/necrosis, chlorosis, necrotic spotting, distorted or abnormal growth, leaves dropping.

Pesticide Formulations:

Inert ingredients may be:
1. substances that dilute the active ingredients
2. dispersing agents
3. stabilizers
4. spreader-stickers and wetting agents

Common formulations:

WP - wettable powders (must be constantly agitated)
SP - soluble powders
L - liquid
EC - emulsifiable concentrates (allow nonsoluble liquid to become soluble in water)
Spray Cans

STEPS TO TAKE WHEN A PEST OR SYMPTOMS OF A PEST (DISEASE) IS SEEN OR SUSPECTED:

1. Immediately isolate the plant.
2. ID the problem
3. Try mechanical control first, chemical control as last resort
4. If problem is severe or widespread or unable to control - DISPOSE OF PLANT

Many plants when purchased are infected with pests. It is best to isolate new plants for at least 2 weeks before being placed with other plants!