



GARDEN INFORMATION SERIES



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PLANT DISEASES



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AN OVERVIEW

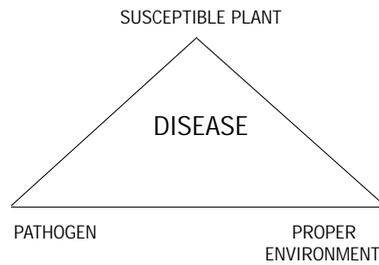
When your plants or lawn start to decline, either suddenly or over a period of time, it usually indicates that something is hampering their growth. For example, yellowing leaves are often an indication of nitrogen deficiency while high salts in the soil may cause leaf edges to turn brown. These are environmental or nutritional disorders. Improper watering (too much or too little water) may also hamper growth or cause foliage to yellow. Other causes of plant injury that fit in these categories are air pollution, wind, cold, heat, too much light or shade, and improperly used pesticides. Insects may also cause these problems.

However, sometimes disease-causing micro-organisms are responsible for these problems. Some forms of fungi, bacteria, viruses, and nematodes (tiny worm-like creatures usually found in the soil) cause plant diseases. These are called "pathogens". Depending on the type, pathogens can spread by wind, in water, in soil, by contacting another plant, by insects, on seeds or cuttings, or on contaminated equipment.

Three factors must be present for a disease to occur: 1) the pathogen; 2) a susceptible plant; 3) the proper environment for the pathogen to infect the plant. Disease will develop when all three

factors are present (see Fig. 1). Disease will not occur when any of the three factors is absent.

Fig. 1. The Disease Triangle.



Disease symptoms can include wilting, rotting, and dead spots. When looking at a sick plant closely, you may actually see the pathogen. Examples are rust (raised reddish or brown spots on leaves or stems), spores (often black and powdery), or mycelium (fine whitish threads).

The following are some common diseases you may encounter:

- **Powdery mildew.** A fungus causes this disease. While powdery mildew will rarely kill landscape plants, it can kill some vegetable crops.

Signs and symptoms: Leaves and sometimes stems and flowers of plants are covered with what looks like a gray or white powder. Sometimes tiny black dots can be seen if you look at the infected parts through a magnifying glass. Roses, sycamore trees, and some vegetable plants are particularly susceptible to powdery mildew. *Control:* Wind spreads powdery mildew; therefore, do not prune out infected stems or leaves when windy. Watering the plant at night reduces powdery mildew growth.

Sulfur or systemic fungicides can be applied when you first notice the disease.

- **Rust.** Fungi cause this disease. Wind and splashing water from rain or sprinklers spread rust. Rusts usually do not kill established landscape plants.

Signs and symptoms: Numerous dry, small bumps occur on the undersides of leaves. The bumps or pustules are usually red, bright orange, or yellow-brown. The tops of the leaves usually have brown spots. Rusts are common on roses, hawthorn, pine, and fescue grass.

Control: Rusts grow best in moist conditions, so avoid overhead watering that keeps leaves wet for a longer period of time. Some fungicides applied in the spring can be helpful. Pruning out infected parts will also reduce spread. Lawns and groundcovers can sometimes outgrow rust damage if they are fertilized as soon as the disease is noticed.

- **Wilts.** A number of pathogens can cause wilts. Wilt diseases often kill the plant, and there are often no effective treatments after the disease has set in.

Signs and symptoms: Usually, bacteria or fungi plug the water-conducting tissue in the plant, or fungi or nematodes destroy the roots. Initially, you may think that the plant is not being watered enough because the leaves or stems droop. If the plant does not recover after a good soaking, you probably have a wilt disease. Many pathogens that cause wilt disease are in the soil.

Control: Avoid overly wet soil or potting mix; use resistant varieties (for example use tomato seeds or plants with 'VFN' designation); use only clean potting mix; and avoid wounding the roots and bases of stems.

- **Cankers.** Certain fungi, bacteria, or even environmental stresses such as under-watering or sunscald, can cause cankers. Cankers are most damaging to trees.

Signs and symptoms: A canker is a dead sunken area on a stem surrounded by live tissue.

Control: Keeping plants healthy and planting species that are adapted to local conditions will help reduce the incidence of cankers. Depending on the cause of the canker, pruning out infected limbs at least six inches below the canker may also be beneficial.

- **Damping off.** Several different fungi cause damping off, which affects seeds, germinating seeds, and seedlings. Damping off is often mistaken for insect damage. Seedlings rapidly die and collapse.

Signs and symptoms: Seeds rot and fail to germinate. Germinated seeds rot and turn black. Often, seedlings will rot at or just above the soil line.

Control: Avoid overly wet soil. Plant seedlings or seeds when soil temperatures are optimal for rapid growth or germination. Use only clean potting mixes and pots. Clean used pots in a solution of nine parts water to one part household bleach. Avoid splashing soil when watering. Do not place potted plants on the ground. Sometimes a fungicidal soil drench will help control the disease.

- **Sooty mold.** This disease is not particularly harmful to plants but does make the plant look unappealing. In rare instances, sooty mold can be so extensive and thick that it blocks sunlight from reaching the leaves. Then, leaves may drop and the plant slowly declines.

Signs and symptoms: Leaves are covered with a dark gray or black fungus, giving them a "sooty" appearance. Sooty mold is an indication that there is a heavy infestation of aphids or other sucking insects. The fungus grows on honeydew that falls onto leaves while these insects are feeding.

Control: Wash leaves with a strong stream of water. Control insects with insecticidal soap.

- **Root Rot.** Several different fungi cause root rot, a disease that affects groundcovers, bedding plants, vines, shrubs, and trees.

Signs and symptoms: The plant looks like it does not have enough water. Leaves and new shoots or twigs may wilt. Leaves turn yellow, dry up, and drop from the plant. Shoots, twigs, and branches may die back. Eventually, the entire plant may die.

Control: Avoid over-watering. Provide a well aerated soil with excellent drainage. Avoid practices that damage roots or reduce their activity. Plant disease-resistant varieties wherever possible. Sometimes a fungicidal soil drench will help control the disease.

Remember that the best strategy is to prevent diseases. It is easier to prevent than to correct or treat diseases. To prevent diseases, eliminate one or more of the three factors to break the disease triangle described earlier. Select plants that are environmentally well adapted for the intended planting site. Consider soil, light, temperature, wind, water, fertilizer, and insect and disease susceptibility. Use disease-resistant varieties wherever possible. Follow the recommended cultural practices for the selected plants to keep them growing in a healthy manner. It is also important that the problem is correctly diagnosed so that you can apply the best corrective treatment. For example, insects or a disease may cause brown patches in the lawn. Knowing whether it is an insect or disease is essential before considering treatment.

Ask your nursery or garden center professional for additional information and assistance about controlling diseases.

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