

Preventing Plant Disease in Your Garden and Landscape

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Many garden and landscape plants are susceptible to one or more plant diseases. Diseases can reduce the yield of fruit and vegetable crops and disfigure ornamental trees, shrubs, and flowers.

There are several things you can do to prevent plant diseases from developing, and there are a number of ways to treat diseases if they do occur. Generally prevention is much easier, and more effective, than treating a disease after it has affected a plant. There are three key topics related to disease prevention:

- Preparing the site and planting
- General plant care and maintenance
- Yard and garden cleanup

Preparing the Site and Planting

Select a suitable location for planting. Putting the right plant in the right place goes a long way toward preventing diseases. Some plants like sunny locations, while others prefer more shade. Most plants do not do well in soils that are excessively wet for a prolonged period of time. This type of soil environment favors many plant diseases. Adding organic matter to clay soil improves drainage and aeration and helps the soil dry out more quickly, especially in the spring.

Change the location of your vegetables regularly. Practice rotation within your vegetable garden to avoid the buildup of disease-causing organisms. Rotate your crops on a 4-year rotation (Figure 1). This practice also helps prevent the soil from being depleted of nutrients, which in turn can make plants less vigorous and more susceptible to disease. A good rotation plan is as follows:

- Year 1—root crop
- Year 2—leaf, seed, or fruit crop
- Year 3—a crop from the cabbage family (Cruciferae, also known as Brassicaceae)
- Year 4—legume crop

Select disease-resistant varieties.

Tomatoes, roses, and fruit trees are susceptible to a number of diseases, but certain varieties are resistant. Plant tags often give information on whether a particular plant is disease resistant. For example, tomato tags often are marked with V, T, F, or F. V signifies resistance to *Verticillium*, which causes premature wilt and reduced fruit production. N refers to plants with nematode resistance. T signifies resistance to tobacco mosaic virus, and F means resistance to *Fusarium* wilt. Tomato varieties known

to be resistant to all of these diseases include Carmen, Carnival, Casino Royale, Cavalier, Celebrity, First Lady Milagro, and President.

The fungal diseases rust, powdery mildew, and black spot are common problems on roses. By choosing the right rose, you can avoid the problems associated with these diseases. The hybrid teas Election, Keepsake, and Las Vegas; the floribundas European, Liverpool Echo, and Play Girl; and climbers Edmund and Dublin Bay have proven to be resistant to these diseases in the Pacific Northwest.

Apples and crabapples are susceptible to a number of diseases, including apple scab, fire blight, and powdery mildew. Apple varieties such as Akane (Tokyo Rose), Chehalis, Liberty, Prima, and Tydeman Red have shown disease resistance and good flavor. Thanks to breeding programs, a number of disease-resistant crabapples are available. Some of the best include David, Indian Summer, Red Jewel, and White Angel.

Nurseries and seed or plant catalogs are good sources of more information on disease-resistant varieties.

Use only disease-free seeds and transplants. Many disease-causing organisms are found in seeds saved from the previous year or are carried to gardens on new seeds and transplants. Buy from a reputable seed company, greenhouse, or nursery. Do not accept any plants (even at bargain prices) that seem unhealthy.

Watch for leaf diseases that occur nearly every year on the same plant. Some trees, such as willow, sycamore, hawthorn, and apple, are infected each year with the same disease(s). If you have a tree that repeatedly has problems, you might want to remove it and replace it with a species that is disease resistant.

Root crops	Leaf, seed, and fruit crops
<ul style="list-style-type: none"> • carrots • radishes 	<ul style="list-style-type: none"> • lettuce, spinach • tomatoes, peppers, eggplants • cucumbers, melons, squash • corn
Cabbage family crops	Legume crops
<ul style="list-style-type: none"> • cabbage • broccoli • cauliflower • Brussels sprouts • bok choy 	<ul style="list-style-type: none"> • beans • peas

Figure 1.—A 4-year rotation designed to prevent disease buildup in a garden.

Fungicides can control these diseases, but proper timing, adequate coverage, and selection of the correct fungicide are essential. You need to understand the disease life cycle to know when to spray. Most fungicides work by protecting healthy plant tissue and should be applied before the disease infects the plant or shortly thereafter. Fungicides cannot revive heavily diseased plants. Thus, applications must be made at the correct time of the year. Follow label directions for reapplication intervals if you need to reapply.

Hiring a professional tree service company might be a good idea since they have the equipment and tools necessary to thoroughly apply fungicides to a large tree.

Both "organic" and nonorganic fungicides are available to home gardeners.

General Plant Care and Maintenance

Fertilize your garden on the basis of soil test results. Plants that are too weak or too vigorous as a result of improper fertilization can be more subject to diseases. A soil test will tell you what nutrients are lacking and will help you make an educated decision about which type of fertilizer to apply. Plants respond well to both "organic" fertilizers (e.g., manure, grass clippings, blood meal) and "chemical" fertilizers.

Do not overcrowd plants. When plants are planted too close together, air circulation around the plants is greatly reduced. The resulting high humidity favors development of diseases such as downy mildew and Botrytis blight. Thin plants, particularly vegetable seedlings, to allow for better air circulation and faster drying.

Avoid overplanting perennial and shrub beds. Allow for some space between the plants so air can circulate. Some shrubs, such as roses, might benefit from light pruning to open up a canopy and allow better air circulation.

Water properly. Maintain an even water supply and avoid dry-wet fluctuations in your garden. It's important to adjust your watering to the weather conditions; water less when it is cool and wet and more when it is hot and dry. Plants that do not receive enough water can become drought stressed, which will weaken them and might make them

more susceptible to disease. On the other hand, too much moisture favors several root and foliage diseases.

If you use an overhead sprinkler, water in the morning so foliage has a chance to dry during the day. Consider installing a drip irrigation system, which will apply water directly to the soil rather than wetting the entire plant.

Control weeds in and near the garden. Weeds can become infected with fungal and bacterial diseases, which then can spread to your garden plants via wind or splashing rain. Weeds also can be the source of viruses and can harbor insects that spread these diseases. Destroying weeds can remove the source of some garden disease problems.

Control insect pests. Aphids, cucumber beetles, and leafhoppers are common in gardens and can spread certain viral and bacterial diseases. There are a number of ways to control these pests, including hand-picking and destroying them, using a stream of water to wash them off the plant, using beneficial insects (see *On the Web*) and applying chemical pesticides. (Refer to the current edition of the *Pacific Northwest Insect Management Handbook* for specific recommendations.)

Yard and Garden Cleanup

Destroy diseased plants. Remove infected plants as soon as you notice them; otherwise, the disease might spread to nearby plants. It usually is easier to spot disease problems in trees and shrubs in the summer or fall when leaves are present.

When removing diseased branches, prune 2–3 inches below the infected area. If you do cut into the infected part of the limb, sterilize your pruning equipment by wiping the blades with rubbing alcohol or a mixture of 1 part household bleach and 9 parts water.

Avoid composting diseased plants, including fallen leaves from diseased trees or shrubs, since several disease-causing organisms can survive in compost unless the pile reaches 160°F.

Spade under, compost, or remove and destroy crop refuse soon after you harvest your garden. Removing plant refuse eliminates places where disease-causing organisms can overwinter, so you can start with a clean slate the following spring.

For More Information

Following these practices should help you avoid many disease problems. For more information, see the following Oregon State University Extension Service publications:

Controlling Diseases and Aphids on Your Roses, EC 1520 (2000). \$2.00

Controlling Insects and Diseases in Home Orchards, EC 631 (revised 1998). \$1.00

Fertilizing Your Garden, EC 1503 (published 1998, reprinted 2000). \$1.50

Pacific Northwest Plant Disease Management Handbook (revised edition available March 15 annually). \$25.00 (On the Web at: <http://plant-disease.orst.edu/>)

Pacific Northwest Insect Management Handbook (revised edition available March 15 annually). \$25.00

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Use fungicides safely!

- Wear protective clothing and safety devices as recommended on the label. Bathe or shower after each use.
- Read the label—even if you've used the product before. Follow closely the instructions on the label (and any other directions you have).
- Be cautious when you apply fungicides. Know your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from fungicide use.