

Common Plant Diseases

Kentucky GROW



The goals of this module are:

To be able to identify and control the most common infectious diseases found on garden plants.

What you need:

- Guidebooks - See the “Where to go from here” section or “The program” section of this module to assist in identifying diseases.
- 10X hand lens
- Small pocketknife for scraping bark and/or cutting samples

Time needed:

A diverse landscape planting usually has enough diseased plants to keep participants busy for an hour or more.

How to prepare:

The best way to present this module is to walk through a diverse planting (with flowers, vegetables, trees, and shrubs) and identify the diseases found there. If plant pathology is not your strong suit, ask someone from a local university or the Extension office to lead the walk. You will probably find diseases not discussed here, and it would be advantageous to have someone on hand who has the ability to identify them quickly and accurately. If possible, make handouts of the following pages or provide photos of the plant diseases you expect to encounter on your walk. Another way to present this module is to have participants bring in samples of diseased plants from home and have a small identification clinic.

The program:

Following are descriptions of a variety of plant diseases that can be found in this region.

Powdery Mildew

How to identify it: Powdery mildew is a fungus that causes leaves to have a whitish cast or to have powdery gray or white spots. It usually attacks older leaves first. Infected leaves may drop, and the entire plant may be weakened or killed (in lilacs, it usually poses no harm).



Plants it attacks: Lilac, begonia, chrysanthemum, dahlia, phlox, rudbeckia, shasta daisy, yarrow, zinnia, roses, hollyhock, and snapdragons.

How to control it: Unlike most fungal diseases, powdery mildew thrives in dry conditions. It can also flourish during warm summer days with cool nights and in shady conditions. Prune off and destroy infected leaves, and prune out nearby shading vegetation. Spray the plant with a baking soda solution (1 tablespoon per gallon of water), dodemorph, fenarimol, thiophanate-methyl, triadimefon, wettable sulfur, ziram, or mancozeb+thiophanate-methyl.

Verticillium Wilt

How to identify it: The fungus enters the plant through the roots and then proceeds to plug up the water-carrying “veins” of the plant. Especially when stressed, the plant develops yellow and/or wilted leaves, which then drop off and die. Leaf death may start at the bottom of the plant and progress upward, and a cross-section of a stem or branch reveals a brown ring of diseased tissue. Peeling back the bark of woody plants shows brown streaks. Sometimes only one side of the plant is affected, but more often the whole plant dies from this disease. In trees, this wilt is usually first noticed when the crown becomes sparse and branches begin to die.



Plants it attacks: Verticillium wilt affects both woody and herbaceous plants, most notably tomatoes, potatoes, strawberries, maples, catalpa, ash, black locust, and redbud.

How to control it: The fungus is ubiquitous in the soil and there is no way for the average gardener to completely eradicate it. Crop rotation has little effect, because the fungus can survive in the soil for 20 years. The best way to deal with it is to plant verticillium-resistant plants and to plant in raised beds with clean, new soil. Sometimes pruning away infected limbs, fertilizing with ammonium sulfate, and providing adequate soil moisture help the plant to recover.

Black Spot

How to identify it: Roughly circular black spots (which are actually the fungus, not dead plant tissue) with ragged yellowish borders on the upper surfaces of leaves. Severely infected leaves turn yellow and drop.



Plants it attacks: Only roses. Some varieties have better resistance than others.

How to control it: Black spot loves high humidity and spreads easily during misty, foggy, or rainy weather. Water early in the morning so that any moisture on the leaves evaporates quickly. Black spot winters over on canes and fallen leaves, so good sanitation helps, as well as not crowding the plants. After fall cleanup and before the first hard freeze, spray the plants with an antidesiccant to erect a barrier to new spores. Early in the spring, while the plants are still dormant, spray with a flowable sulfur fungicide and then cover completely with dormant oil. From the time the leaves emerge and every seven days thereafter until July 4, spray with flowable sulfur fungicide (do not apply sulfur in the hot sun or when temperatures are above 85 degrees). After July 4, spray with the sulfur fungicide every 10 days until the first frost.

Scab

How to identify it: Usually noticed in midsummer when the tree is defoliated. Before complete defoliation, the leaves develop olive-colored, quarter-inch, velvety spots. The tissue around the spots might be puckered. Similar spots that turn black and corky might also develop on the fruit and twigs



Plants it attacks: Crabapples, apples, peaches, nectarines, pears, and pyracanthas.

How to control it: Fungal scab cannot be treated once it appears on the leaves. In the spring, spores are released from the previous season's dead leaves and are carried by the wind to new leaves and flower buds, so remove dead leaves promptly. Spray protective chemicals such as a copper fungicide in the spring when the buds break and again 10 days apart. Plant disease-resistant varieties.

Crown Gall

How to identify it: Crown gall produces large, lumpy tumors on the plant stem or roots near the soil line.

Plants it attacks: Many plants can be infected, including rose-family plants, chrysanthemums, marigolds, and euonymous.

How to control it: The gall does not kill the plant, but it might weaken or stunt it. It is produced by a soil-borne bacterium, and there is not much you can do other than cut the gall out. Plant crown gall-resistant varieties, or buy varieties that have been treated with bacteria that protect the plant from this disease. Take care not to wound plants when planting or cultivating.

Note: The bacterium that causes crown gall, *Agrobacterium tumefaciens*, has been used to genetically engineer tomatoes and other plants. The bacteria's ability to inject its DNA into a plant has allowed humans to make plants resistant to herbicides and insects.



Fire Blight

How to identify it: Leaves, shoots, and developing fruit wilt and blacken as if burnt by fire. Leaves curl and hang downward.

Plants it attacks: The bacterium that causes fire blight affects only plants from the rose family: apples, crabapples, mountain ash, hawthorne, cotoneaster, roses, pears. Spirea and serviceberry might occasionally be affected.

How to control it: Fire blight enters through the blossoms and then is spread by pollinating insects and splashing water from rain. Prune off the diseased growth, cutting at least 8 inches below the infection. Destroy the infected tissue and disinfect all pruning tools. Spray with copper sulfate or streptomycin before bud-break in the spring, and then repeat every 5 to 7 days until all blooming is completed.

Bacterial Leaf Scorch

How to identify it: Bacterial leaf scorch appears as an irregular scalloped browning along the edges of the leaf. The browning is bordered by a yellow halo, and the leaf tissue nearest the veins remains green. As the brown patches increase in size, the leaves curl up and drop early. As the disease progresses over several years, twigs and branches die back. Scorch symptoms usually appear in mid to late June, becoming more severe as the summer progresses. These symptoms are similar to other diseases, and a serological test is available to confirm the presence of the disease.



Plants it attacks: Several species in the red and black oak group: northern red oak, pin oak, scarlet oak, southern red oak, laurel oak, shingle oak, and water oak. It also affects elm, sycamore, mulberry, and maple.

How to control it: Bacterial leaf scorch is caused by bacteria and spread by sharpshooter leafhoppers. At this time, there is no cure. The lives of sick trees can be prolonged by watering and fertilizing to reduce environmental stress, but as the tree declines, it should be removed.

Notes: Bacterial leaf scorch might seem like a new disease in Kentucky, but it actually has been recognized by plant pathologists for a long time. The public is becoming more aware of it because trees were thought to be displaying leaf scorch due not to bacteria, but from drought, salt burn, or root damage.

Anthracnose

How to identify it: Anthracnose is a catchall term for numerous diseases caused by various fungi that thrive in wet weather. Each fungus attacks a specific group of plants. Sunken brown spots appear on leaves and fruit, and the spots might ooze a pink slime, which actually is a spore mass. In trees, infected leaves drop from the tree, and branches might die.



Plants it attacks: Anthracnose affects beans, cucumbers, watermelon, grapes, maple, sycamore, tomato, dogwood, ash, elm, oak, and walnut.

How to control it: For trees, rake up and burn old leaves and prune out dead twigs below the infection. Spray with maneb or another approved fungicide three times two weeks apart if the spring is wet and humid. Plant resistant varieties and avoid working among wet plants. Destroy infected vegetable plants and rotate the placement of plants.

Phytophthora Root Rot

How to identify it: Plants infected with Phytophthora root rot might exhibit varying symptoms, depending on the age of the plant, environmental stresses, and the degree of infection. Roots become reddish brown and brittle from the fungi, sometimes occurring in only part of the root ball. Advanced root rot can attack the crown, and often girdles the stem at or just above the soil line. On rhododendrons, the leaves rapidly wilt and roll up and are unresponsive to watering. Azaleas infected with Phytophthora will vary in their symptoms, depending on the cultivar, but generally the leaves become yellow between the veins, and the new leaves are much smaller in size. Yews die suddenly with reddish-brown foliage, and in junipers, the lower stems become brown. Older, established plants die slowly, but newly transplanted nursery stock succumbs to the disease quickly.



Plants it attacks: Rhododendron, azalea, juniper, yew, dogwood, *Pieris*, high-bush blueberries, white pine, Fraser fir, and boxwood.

How to control it: Once above-ground symptoms become visible, it is too late to control the disease with chemicals. Remove dead and dying plants. Plant cultivars resistant to the disease. Most importantly, plant at the correct depth in areas with good drainage.

Rust

How to identify it: Rust is a general term for a group of fungi that produce orange- yellow pustules or galls on the leaves of many ornamental plants. The small but numerous pustules appear on the lower surface first, and eventually the upper leaf surfaces become mottled with yellow. Red cedars develop spore-producing orange “horns” up to three-quarters of an inch long, and the fruits of apples become spotted and drop early. Witches’ brooms and cankers in the bark and branches develop when the common juniper is infected with rust.



Plants it attacks: Many plants, including roses, hollyhocks, snapdragons, junipers, red cedar, apples, crabapples, lawn grass, and Rose of Sharon.

How to control it: Plant resistant varieties, and if practical, do not plant apples, junipers, or red cedar within several hundred yards of each other. The spring after identifying the disease, spray apple trees with a fungicide when flower buds turn pink, again when 75 percent of the petals have fallen from the blossoms, and again 10 days later. Clean up all debris around plants and allow for good air circulation. Prune out and destroy any galls.

Accommodations for this program:

As with all Kentucky GROW programs, providing needed accommodations is an individualized process. Below are some ideas to get you started, but the best route to take is to listen to the person, as he or she will usually have the best ideas of all!



For those with mobility impairments, ensure that all materials are placed at an accessible height and reach. If strolling through a planted area to identify plant diseases, make certain that pathways are accessible. Identify flat, level areas for participants to rest along the way if an extended walk is planned.



For those who have cognitive impairments, consider working as a team for this module. Use photos or pictures to show the plant diseases that are being looked for. This would be helpful to everyone participating in this program! If at all possible, have actual examples of healthy plants to compare to those impacted by different diseases. Provide choices for different levels of participation so that some individuals can stroll through the garden and others can remain in the classroom area to see plants if desired.



For those with learning disabilities, provide the information in a variety of methods. Some individuals learn best by hearing about the plant diseases and what to look for; others will prefer to see pictures of the affected plants in order to identify the diseases. Written information will also be helpful for those with hearing impairments.



For individuals with visual impairments, review placement of the needed materials. Don't move items without informing the person. Ensure that the area is well lit. Provide any written information in large print and other alternative formats as requested. A strong magnification lens may be helpful. Provide tactile opportunities for participants to touch affected plants and healthy ones (in instances when this will not spread disease).

Where to go from here:

“Home Vegetable Gardening in Kentucky,” Richard Durham et al., University of Kentucky Cooperative Extension Service publication ID-128.

“Woody Plant Disease Control Guide for Kentucky,” John Hartman et al., University of Kentucky Cooperative Extension Service publication ID-88.

“Guide for Control of Annual and Perennial Flower and Ground Cover Diseases in the Landscape,” John Hartman and Mary Witt, University of Kentucky Cooperative Extension Service publication ID-87.

Sunset Garden Pests and Diseases, Sunset Publishing Corporation, 1993.

Ortho’s Home Gardener’s Problem Solver, Meredith Books, 2001

Rodale’s Landscape Problem Solver, A Plant-by-Plant Guide, Jeff and Liz Ball, Rodale Press, 1989.

American Horticultural Society Pests and Diseases: The Complete Guide to Preventing, Identifying and Treating Plant Problems, Pippa Greenwood et al., DK Publishing, 2000.

Diseases of Trees and Shrubs, Wayne Sinclair et al., Cornell University Press, 1987.

This material is available in alternate formats. Contact Kentucky GROW for more information.