



Plant Disease Control

Common Spring-Time Diseases of Woody Ornamentals in the Landscape

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Many disease problems in the landscape and on home grounds occur in the spring. These problems are worse when plants are under stress, have suffered extensive winter damage, or when the weather is cool and rainy. The selections that follow briefly describe some common problems that occur in the spring in the landscape.

It is important to remember that trees and shrubs in poor health are more susceptible to disease. **Improving plant vigor** is the most important aspect of disease control in the home landscape.

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Specific Spring-Time Diseases Caused By Fungi

Leaf Spots



Fungal leaf spot on sugar maple.
(Courtesy B.B. Clarke)

Leaf spots are very common and can occur on many species of ornamental plants. **Leaf spots** are caused by leaf-inhabiting fungi that discolor and kill small, discrete regions of tissue between or on the leaf veins. Frequently, these spots have a light-colored

center with a distinct dark-colored border. Individual spots may grow together to form larger **leaf blotches**. Most leaf spot fungi produce spores in dead leaf litter on the ground. Spores are splashed or carried by wind to developing leaf tissue at budbreak. The development of **leaf spots** is favored by abundant moisture and cooler temperatures. Severe spotting can occur when moisture remains on leaf surfaces for long periods of time. Fungicides are effective only if they are present on leaf surfaces at the time the fungi are producing spores. Fungicides applied after **leaf spots** are visible are ineffective. Most damage caused by the fungi that cause **leaf spots** is merely cosmetic.

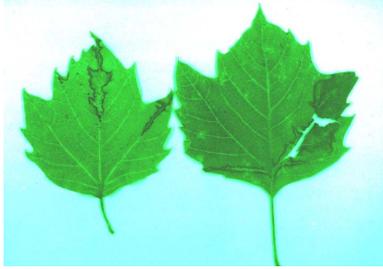
Proper Management

Improve plant vigor and reduce inoculum by removing leaf litter. Irrigate in the early morning hours and avoid overhead watering to prevent excessive moisture from remaining on foliage.

Chemical Control

Apply chlorothalonil, mancozeb, thiophanate-methyl, or mancozeb plus thiophanate-methyl according to label recommendations.

Anthracnose



Anthracnose lesions on veins of sycamore leaves.

Anthracnose is a common disease of many shade tree species, particularly sycamore, ash, oak, maple, and walnut. Diseased leaves appear “scorched” along veins and leaf margins. Twigs and branches may die back if infection is severe or if the

tree is in poor health. Leaves infected with **anthracnose** are often shed. As with leaf spot diseases, **anthracnose** is more severe when moisture remains on leaf surfaces for long periods of time. Since **anthracnose** does not usually cause serious damage to healthy trees, application of fungicides is recommended only when it is necessary to keep trees as blemish-free as possible.

Proper Management

Improve plant vigor, prune dead branches, avoid planting highly sensitive plants, and remove leaf litter to reduce inoculum. Irrigate in the early morning hours and avoid overhead watering to prevent excessive moisture from remaining on foliage.

Chemical Control

Chlorothalonil, copper, mancozeb, thiophanate-methyl, or mancozeb plus thiophanate-methyl provide fair control of the leaf spot phase of this disease only. Apply fungicides according to label recommendations.

Apple Scab



Apple scab lesions on the foliage of crabapple.

Apple Scab (caused by the fungus *Venturia*) is the most common disease of apple and crabapple. **Apple Scab** and related **scab** diseases can also be a problem on other rosaceous ornamentals such as mountain ash, hawthorn, cotoneaster, and pyracantha. Olive-

colored spots (1/4 inch in diameter) with fuzzy borders can be seen on leaves and petals. Corky-looking lesions may appear on twigs and fruit. Severely infected leaves, petals, and fruit may turn brown and drop prematurely. There are cultivars of crabapple and other ornamentals with good resistance to this disease.

Proper Management

Improve plant vigor, use resistant cultivars, and remove leaf litter to reduce inoculum.

Chemical Control

Apply chlorothalonil, mancozeb, thiophanate-methyl, or mancozeb plus thiophanate-methyl according to label recommendations.

Cedar-Apple and Quince Rusts



Gall and spore clusters of cedar-apple rust on eastern red cedar.



Hawthorn fruits infected with quince rust. (Courtesy E. M. Dutky)

Rust diseases are unique because the fungi that cause them often require more than one host plant to survive. **Cedar-apple rust** and **quince rust** affect two groups of highly utilized landscape plants.

The **cedar-apple rust** fungus overwinters in galls that may grow to several inches in diameter on eastern red cedar and several other junipers. In the spring, brightly-colored, gelatinous horns emerge from the galls during wet weather. These horns consist of masses of spores that

are spread by wind to newly-emerging apple, crabapple, and hawthorn leaves and fruit. By mid-summer, rusty or orange-colored spots appear on infected leaves. In mid-to late-summer, spores produced in these spots are carried by the wind to cedar and juniper. On susceptible crabapple cultivars, rust causes premature defoliation, stunted growth, and poor-quality fruit.

The disease cycle of **quince rust** is similar to cedar-apple rust. The galls of **quince rust** on eastern red cedar and other junipers are small and spindle-shaped. **Quince rust** affects fruit, young stems, and petioles on rosaceous

hosts such as apple, crabapple, hawthorn, quince, mountain ash, and cotoneaster. Fruits are stunted and killed, and twigs and petioles become swollen and distorted, often resulting in death.

Proper Management

On coniferous hosts, prune affected branches 6 to 8 inches below galls during dry weather with sterilized pruning tools. Use cultivars of crabapple and other rosaceous plants that are resistant to **rusts**. If practical, remove the alternate host within a 1/4-mile radius.

Chemical Control

On juniper, apply mancozeb, or mancozeb plus thiophanate-methyl according to label recommendations. On rosaceous hosts, apply chlorothalonil, mancozeb, triadimefon, or mancozeb plus thiophanate-methyl according to label recommendations.

Juniper Tip Blights



Twig dieback of juniper caused by the fungus *Kabatina*. (Courtesy B.B. Clarke)

Juniper tip blights are caused by the fungi *Phomopsis* and *Kabatina*. Tips of newly developing branches become infected with *Phomopsis* in the spring and turn brown by summer. Infected growth is killed back to the previous season's wood. Mature tissue is resis-

tant to **Phomopsis tip blight**. **Kabatina blight** symptoms can occur throughout the year and only on wounded twigs older than one year. Plants stressed by moisture extremes, insect infestations, and winter injury are susceptible to *Kabatina*. Environmental stress and high humidity in the canopy due to close spacing increase the severity of **tip blight**.

Proper Management

Improve plant vigor, avoid wounding, prune affected tissue, and space plants adequately to ensure good air circulation. Control insect pests when present.

Chemical Control

To control *Phomopsis*, apply thiophanate-methyl or thiophanate-methyl plus mancozeb at budbreak according to label recommendations. There are no fungicides recommended for the control of *Kabatina*.

Oak Leaf Blister



Oak leaf blister symptoms on pin oak. (Courtesy E. M. Dutky)

Light green pockets or blisters, about 1/4 inch in diameter, occur on the leaves of many different species of oak. These blisters resemble galls caused by insects; however, with **oak leaf blister**, the upper leaf surface is swollen and the underside of the blister is depressed. As

the blisters age, they become dry and brown, resembling leaf spots. The development of **oak leaf blister** is favored by wet weather. This disease does not seriously harm healthy trees and control with fungicides is not recommended.

Proper Management

Improve plant vigor.

Chemical Control

None recommended.

Dogwood Anthracnose or Decline



Foliar symptoms of dogwood anthracnose. (Courtesy J. L. Peterson)

Dogwood anthracnose or decline caused by the fungus *Discula*, is primarily a disease of flowering dogwood (*Cornus florida*). Tan-colored leaf spots with purple margins form on developing leaves and flower bracts. These spots grow together, forming large blotches

on leaf blades and along leaf margins. Infected leaves eventually die. The fungus may continue to grow down into the petioles and branches, resulting in the death of twigs and branches. Brown, elliptical cankers may form at the base of dead branches. Drought, winter injury, and environmental stress predispose dogwood to anthracnose. Kousa dogwood (*Cornus kousa*) is resistant to this disease.

Proper Management

Improve plant vigor, avoid moisture stress, avoid wounding, and prune affected branches 6 to 8 inches below diseased tissue during dry weather with sterilized pruning tools. Avoid planting dogwoods in shady or crowded areas.

Chemical Control

Chlorothalonil provides fair control of the leaf spot phase of this disease only. Apply the fungicide according to label recommendations.

Nectria Cankers



Nectria canker on improperly pruned maple. Note orange spore clusters in affected bark.

(Courtesy B.B. Clarke)

Nectria cankers are common on a wide variety of shade trees and other woody ornamentals. *Nectria* is an opportunistic fungus that infects twigs, branches, and trunks through wounds and at the base of dead branches. This fungus can cause both annual and perennial cankers. Annual cankers are common on twigs and branches injured by freezing, drought stress, mechanical injuries, or other diseases. As cankers enlarge, twigs are girdled and killed in a single season. A cut made into the wood with a pocket knife reveals a sharp transition between white, healthy

wood and brown, infected wood. Perennial cankers enlarge yearly, encircling the branches and eventually killing tissue beyond the canker. With each successive year of infection, a “bull’s-eye” pattern may develop. **Nectria canker** can be identified by the bright orange fruiting bodies that form in the center of the cankers.

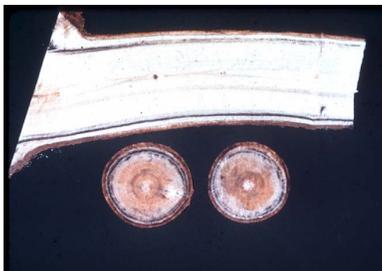
Proper Management

Improve plant vigor and avoid moisture stress, wounding, winter injury, and mechanical injury. Prune affected branches (when practical) 6 to 8 inches below infected tissue, during dry weather, with sterilized pruning tools.

Chemical Control

None recommended.

Verticillium Wilt



Dark streaking in vascular tissue is diagnostic of Verticillium wilt.

(Courtesy S. Davis)

Verticillium wilt is a disease of many species of shade trees in the landscape, particularly maple. The fungus *Verticillium* lives in the soil and penetrates small roots. Spores of the fungus are carried up to developing tissue in the canopy via water-

conducting vessels in the wood. The vessels become clogged and affected branches wilt and die. Verticillium wilt is part of a syndrome known as maple decline, where environmental stress, attack by insects, and poor growth contribute to an over-all decline in older trees.

Proper Management

Improve plant vigor and avoid moisture stress.

Chemical Control

None recommended.

Diplodia (or Sphaeropsis) Shoot Blight and Canker



Symptoms of Diplodia shoot blight of pine usually begin on the lower branches.

(Courtesy J. L. Peterson)

Diplodia (or Sphaeropsis) shoot blight and canker affects 2- and 3-needle pines and is most devastating on Austrian, mugo, and Scots pines. The fungus *Sphaeropsis* infects and kills developing needles, resulting in dead candles that are much shorter than healthy ones. Sunken cankers may form on branches and stems, killing the tissue beyond the cankers. The lower branches of pines are usually affected first. Tiny, black, spore-producing structures called “fruiting bodies” can be seen with the aid of a hand lens at the base of dead needles and on cones.

Spores are released from these fruiting bodies in cool, rainy weather and are transmitted to susceptible tissue. This disease is more severe on trees that are stressed. Japanese black pine is tolerant of this disease and offers an attractive alternative where **Diplodia shoot blight** has been a problem in the past.

Proper Management

Improve plant vigor and prune affected branches 6 to 8 inches below diseased tissue during dry weather with sterilized pruning tools. Remove as much plant debris as possible and use tolerant species.

Chemical Control

Apply Tersan 1991 WP or Cleary 3336 WP according to label recommendations.

Pachysandra Leaf and Stem Blight



Pachysandra leaves infected with *Volutella*. Note the target-shaped lesions. (Courtesy S. Davis)

Pachysandra leaf and stem blight is caused by the fungus *Volutella*. Pachysandra is most susceptible to this disease when it has suffered from winter injury, moisture or heat stress, mechanical injury, or has a problem with scale insects. Large leaf spots, which have a “bull’s-eye”

pattern, appear on leaves. Cankers form on petioles and stems that produce characteristic pink-colored fruiting bodies within several weeks in wet weather. Occasional thinning and removal of leaf litter reduces humidity and helps to keep disease severity to a minimum.

Proper Management

Improve plant vigor and avoid moisture stress, winter injury, and mechanical injury. Remove leaf litter to reduce humidity and control scale insects, if present.

Chemical Control

To control leaf and stem blight, apply chlorothalonil or mancozeb plus thiophanate-methyl according to label recommendations. If scale insects are present, apply 2% dormant oil, acephate, malathion, diazinon, or dimethoate according to label recommendations.

Black Knot of Plum and Cherry



Black knot on wild cherry.

Black knot of plum and cherry. This disease is widespread on garden plums, sweet and sour cherries, and chokecherry. Knot-like swellings, which are black, roughened, and spindle-shaped, form on twigs and branches.

These knots, which live for many years, continually increase in size. Spores of the causal fungus *Apiosporium* are released from the knots during rainy weather in the spring and infect green, susceptible tissue. These new swellings will grow for two seasons before producing spores of their own.

Proper Management

Improve plant vigor and prune infected limbs 6 to 8 inches below all visible knots before new shoots develop. Remove and destroy the clippings.

Chemical Control

None recommended.

Ovulinia Petal Blight



Dried flowers infected by *Ovulinia* petal blight cling to rhododendron foliage. Note the dark, round sclerotia (resting structures) imbedded in the dried flower. (Courtesy J. L. Peterson)

Ovulinia petal blight, one of the most common diseases of rhododendrons and azaleas, affects only the flowers. Small, water-soaked spots appear on infected petals. These spots rapidly enlarge until the flower becomes slimy, limp, and turns prematurely brown. Entire trusses may become diseased almost simultaneously.

Most infected petals adhere to the plant but some may fall to the ground. Six to eight weeks following infection, small, black sclerotia (resting structures) develop on infected petals. These sclerotia germinate in the spring and produce fruiting structures called apothecia. Spores are forcibly ejected from the apothecia, striking blossoms close to the ground. Wet weather at flowering time enhances disease development.

Proper Management

Remove dead trusses and fallen petals as soon after bloom as possible to reduce disease spread. Maintain plant vigor.

Chemical Control

Mist chlorothalonil, triadimefon, thiophanate-methyl, or mancozeb plus thiophanate-methyl onto plants from the time flowers begin to show color until flowering has ceased at intervals stated in label recommendations.

Specific Spring-Time Diseases Caused By Bacteria

Crown Gall



Crown gall on rose. (Courtesy B. B. Clarke)

Crown gall is caused by the soil-borne bacterium *Agrobacterium tumefaciens*. More than 600 species of plants are susceptible to **crown gall**. This bacterium enters plant roots and stems through wounds near the soil line. Infection by the bacterium causes tissue

at the crown gall area to grow rapidly, resulting in the formation of galls. These galls consist chiefly of host tissue. Following the initial infection, galls soon form on other parts of the plant. To prevent **crown gall**, avoid wounding during transplanting and cultivation. Once the disease is present in a plant, pruning individual galls will not prevent galls from forming on other parts of the plant.

Proper Management

Improve plant vigor, avoid wounding, and remove entire plants when galls are observed. Utilize resistant plants in spots where diseased plants have been observed previously.

Chemical Control

None recommended.

Fire Blight



Fire blight on mountain ash. (Courtesy B. B. Clarke)

Fire blight, caused by the bacterium *Erwinia amylovora*, can occur on many rosaceous plants, including crabapple, cotoneaster, hawthorn, mountain ash, pyracantha, and pear. In the spring, bacteria ooze from existing cankers on infected plants. The bacteria are carried to

healthy blossoms and branches by insects that are attracted to the ooze. The bacteria are also spread by splashing rain. Twigs and branches infected with the **fire blight** bacterium die rapidly and appear scorched. Cankers form at the base of infected branches.

Proper Management

Improve plant vigor, avoid heavy spring fertilization, and use resistant cultivars. Prune affected branches during dry weather. Remove branches 6 to 8 inches below diseased tissue using sterilized pruning tools.

Chemical Control

Copper or streptomycin according to label recommendations.