



DISEASES

Aspen and Poplar Leaf Spots

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Quick Facts...

Five fungi cause most foliage diseases on aspen, cottonwoods and other poplar species.

Foliage diseases develop readily in wet, cool weather.

Foliage diseases decrease a tree's aesthetic value and can cause premature defoliation.

Severe outbreaks can affect the general health of the tree.

To reduce future disease problems, rake up and dispose of leaves and prune out branches with cankers.

Timely fungicide application can prevent severe outbreaks.

Foliage diseases can reduce the aesthetic value of aspen and cottonwood. Occasionally, a severe disease outbreak causes premature defoliation or dieback of parts of the tree.

If a tree loses its leaves early in the season, it may grow new ones and its health is not seriously affected. If it loses them in midsummer, however, growing new leaves may prevent the tree from fully hardening off before cold weather or reduce the amount of stored food. This leads to increased danger of frost damage, reduced growth, and predisposition to other diseases or insects. If it loses its leaves late in the season, it will not grow new ones or lose much vigor.

Marssonina Leaf Spot

The fungus *Marssonina* causes the most common foliage disease on aspen and poplars in urban and forested areas of Colorado.

Marssonina leaf spots are dark brown flecks, often with yellow halos (Figure 1). Immature spots characteristically have a white center. On severely infected leaves, in wet weather, several spots may fuse to form large black dead patches (Figure 2). Spots also may develop on leaf petioles and succulent new shoots.

Marssonina survives the winter on fallen leaves that were infected the previous year (Figure 9). With spring and warmer, wet weather, the fungus produces microscopic "seeds" or spores that are carried by the wind and infect emerging leaves. Early infections are rarely serious, but if the weather remains favorable, spores from these infections can cause a widespread secondary infection. Heavy secondary infections become visible later in the growing season and cause premature leaf loss on infected trees.



Figure 1: *Marssonina* leaf spot on cottonwood.



Figure 2: *Marssonina* leaf spot on aspen, late symptoms.

Septoria Leaf Spot

The fungus *Septoria* causes a common foliar disease mainly on cottonwoods and occasionally aspen in urban areas of Colorado.

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Figure 3: *Septoria* leaf spot showing tan circular spots.



Figure 4: *Septoria* leaf spot showing irregular brown to black spots.



Figure 5: Ink spot disease on aspen in early summer.



Figure 6: Ink spot disease on aspen in midsummer.

The appearance of *Septoria* leaf spots varies considerably between tree species and with time. Symptoms include a distinct tan circular spot with black margins and small black pimples in the center (Figure 3), and irregular brown to black spots that coalesce into large areas (Figure 4).

The disease is rarely a problem on plains and eastern cottonwoods but can cause considerable damage on lanceleaf cottonwoods. In wetter climates, the fungus also causes cankers on twigs and main stems.

Septoria survives the winter on fallen leaves that were infected the previous year (Figure 9). With spring and warmer, wet weather (70 to 75 degrees F), the fungus produces microscopic spores that are carried by the wind and infect emerging leaves. Early infections are rarely serious. If the weather remains favorable, spores from these infections can cause a widespread secondary infection. Heavy secondary infections become visible later in the growing season and cause premature leaf loss on infected trees.

Ink Spot of Aspen

The fungus *Ciborinia* causes a leaf disease of aspen commonly known as ink spot. It is found mainly in the mountains of Colorado.

The first symptoms of ink spot appear in late spring to early summer as tan to brown areas on the upper leaf surfaces. Concentric, discolored ring patterns may become visible as the fungus advances through the leaf (Figure 5). These concentric patterns can be confused with leafminer attacks. Infected leaves may be totally brown by midsummer, while adjacent uninfected leaves remain green. Raised black bodies begin to appear on affected brown leaves. These hard masses of fungal material are oval and nearly 1/4 inch long. These are the "ink spots" that give the disease its common name (Figure 6). In late summer, these spots fall out, leaving a characteristic "shot hole" effect on leaves that remain on the tree. This disease is especially prevalent in dense aspen stands. Early defoliation may reduce growth.

The hard fungal tissue masses that fall from infected leaves are the overwintering stage of the fungus. Wet spring weather stimulates spore production. Spores are blown and splashed from the ground to developing leaves.

Leaf and Shoot Blight

Leaf and shoot blight, caused by the fungus *Venturia*, is a disease affecting young aspen and cottonwood tissue primarily in the mountains.

In the spring, symptoms first become visible on leaves near shoots infected the previous season. Brown to blackened, irregularly shaped areas spread through the leaves, causing them to dry and become distorted. Typically, the fungus spreads down through the succulent new shoot, causing cankers that blacken and curl the stem tip until it resembles a shepherd's crook (Figure 7). Death of new shoots causes distorted, shrubby growth.

The leaf and shoot blight fungus survives the winter mainly on shoots infected the previous season. Spores are windblown early in the season and infect newly expanding leaves and shoots. As the season progresses, uninfected tissue becomes more resistant to the disease.



Figure 7: Shoot blight on aspen showing black and curled stem.



Figure 8: Leaf rust.

Leaf Rusts

A rust disease caused by the fungus *Melampsora* is often seen on aspen and cottonwood. Though common, this disease rarely causes serious problems.

The disease is easily recognized by small, yellow-orange pustules that are scattered on the lower leaf surfaces (Figure 8). These orange pustules are most visible in late summer and early fall.

The life cycle of this fungus requires two different tree hosts. During wet spring weather, spores are released from the fungus, which has overwintered on fallen cottonwood or aspen leaves. These spores infect evergreen needles, such as Douglas-fir, pine, fir or spruce, where they cause little damage. After two to three weeks, spores are produced on these evergreen hosts and are blown to aspen or cottonwood leaves. Once the rust is established on aspen or cottonwood hosts, it can multiply rapidly under favorable wet conditions throughout the summer.

Several years of heavy infections can cause some growth losses, especially on younger trees. Fallen infected leaves shelter the fungus until the next year's disease cycle.

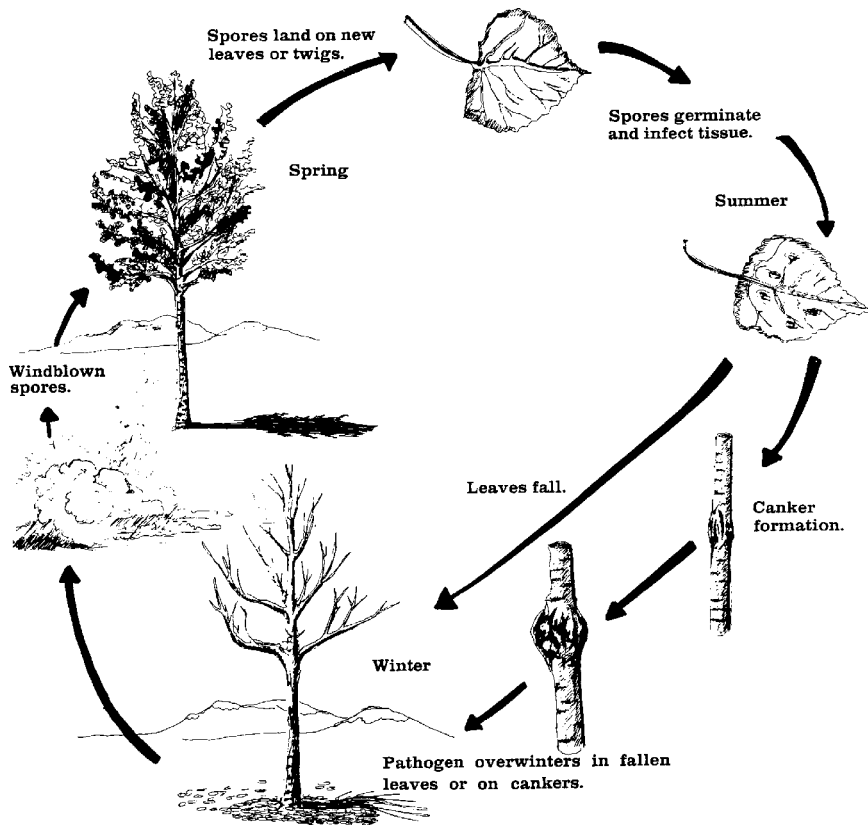


Figure 9: Generalized disease cycle of aspen and poplar leaf spots. Cankers form only on trees with shoot blight.

Disease Management

Tree resistance is the best way to prevent foliar diseases. Several poplar hybrids or species are resistant to one or more of these diseases. Ask your local nursery for a resistant variety. Some aspens are resistant to leaf spots, but aspen production methods make it difficult to select trees for resistance.

Sanitation is an effective control for some foliar diseases. Fall removal of infected leaves, twigs and branches can reduce the amount of disease the next spring. Raking and destroying infected leaves can reduce *Marssonina* leaf spot, ink spot and leaf rust. The shoot blight fungus overwinters in diseased stems and twigs, so it can be pruned out to reduce new infections.

Keep leaves as dry as possible to reduce the incidence of leaf spots:

- Water in early morning so leaves can dry out.
- Keep sprinkler patterns adjusted so leaves don't stay wet.
- Space trees apart to reduce humidity to help prevent leaf diseases.

Fungicides, if applied early enough, can prevent foliage diseases. Spraying will prevent only new infections; it will not cure leaves already infected. If an infection is developing on particularly valuable trees, or if there is good reason to believe an infection is imminent, the trees can be sprayed with fungicides. Trees that perennially have foliar diseases should be sprayed at bud break and then two or three times during the growing season at 12- to 14-day intervals. Check with your Colorado State University Cooperative Extension county office or Colorado State Forest Service district forester for specific fungicide recommendations.

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