

Marssonina Leaf Blight

Midsummer spots and defoliation of aspen

Pathogen—Marssonina leaf blight is caused by at least two fungi in our area: *Marssonina brunnea* (sexual stage *Drepanopeziza tremulae*) and *Marssonina populi* (*Drepanopeziza populorum*). The disease is also commonly referred to as black leaf spot.

Hosts—Aspen is the pre-dominant host, but narrowleaf cottonwood and other poplars are also susceptible.

Signs and Symptoms—Small, brownish spots appear on infected leaves as early as the end of leaf expansion but are especially noticeable in July and August (figs. 1-4). *Marssonina brunnea* often causes small spots, initially about 1/25 inch (1 mm) in diameter, while *M. populi* causes larger spots. The spots later enlarge to various sizes and shapes, turn brownish black, and often have a yellow margin and a white center. Spots may coalesce to form vein-limited, necrotic blotches. Acervuli (asexual fruitbodies) appear as tiny, ring-like blisters in the center of spots when conditions are moist. Infected leaves often fall during the summer. This may be more common when infections are on or near the petiole, even if the rest of the leaf is relatively healthy.

Symptoms intensify throughout the summer and progress upward in the crown as the season advances. From a distance, canopies of heavily infested stands often have a bronze or brown hue. Crowns may appear thin from defoliation, and infected leaves are often seen on the forest floor and roads (figs. 5-6). Fall colors are usually less intense in such stands.

Disease Cycle—Primary infection occurs in spring when spores produced on twig lesions or infected fallen leaves infect developing leaves. Secondary infection occurs throughout the summer when spores from fruiting bodies on primary lesions are released with wet weather. Disease incidence is closely associated with warm, wet conditions. The pathogens overwinter as tiny stromata in fallen leaves and in twig lesions.

Impact—Marssonina leaf blight is the most common leaf disease of aspen in the Rocky Mountain Region. Because of the dependence of the disease on weather, it may be severe one year and difficult to find the next. Infected leaves are often stunted and shed prematurely. Defoliation can be severe, with nearly complete defoliation by early August. Trees may re-foliate in late summer and early fall, but twig dieback often occurs the following winter because late shoots lack sufficient



Figure 1. Marssonina blight on aspen. Photo: William Jacobi, Colorado State University, Bugwood.org.



Figure 2. Close-up of an infected aspen leaf, showing irregularly-shaped spots with yellow margins, probably *Marssonina populi*. Photo: Jim Worrall, USDA Forest Service.



Figure 3. Early stage of infection by *Marssonina brunnea*. Photo: Jim Worrall, USDA Forest Service.

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Figure 4. Close-up of leaf spots on aspen, showing vein-limited margins and tiny blisters (acervuli) in the center. Photo: Jim Worrall, USDA Forest Service.



Figure 6. Fresh leaves on the ground in mid-July due to infection by *Marssonina brunnea*. Photo: Jim Worrall, USDA Forest Service.



Figure 5. Defoliation caused by *Marssonina brunnea* in early July. Photo: Suzanne Bethers, USDA Forest Service.

cold hardiness. Mortality is rare unless the outbreak occurs over consecutive years or is combined with other stresses. However, damaged trees may be more susceptible to other damages, and wood production is reduced for 1 or more years following an epidemic. Clonal variation in susceptibility may be visible during severe epidemics.

Management—Because the disease rarely leads to mortality and management approaches are often impractical, management of *Marssonina* leaf blight is not often contemplated in forests managed for multiple objectives. In high-value sites, the most effective way to manage the disease is by planting or managing for resistant or tolerant clones. Removing and destroying diseased material from trees and the ground may help reduce infections. Increasing space between trees may create a less favorable microclimate for spread and infection. Fungicides can be used to prevent infection, but they must be applied at bud break before infection occurs.

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1. Riffle, J.W.; Peterson, G.W., tech. coords. 1986. Diseases of trees in the Great Plains. Gen. Tech. Rep. RM-129. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 149 p.
 2. Sinclair, W.A.; Lyon, H.H. 2005. Diseases of trees and shrubs. 2nd ed. Ithaca, NY: Cornell University Press. 659 p.