



# Black Canker

## Introduction

Black canker of willow (*Salix* spp.) is caused by the fungus *Glomerella miyabeana* (Glomerellaceae). In North America and Europe, the black canker pathogen is consistently associated with the willow scab fungus (Venturiaceae: *Venturia saliciperda*) and together they combine to produce a serious disease of willow known as “willow blight”. The relative importance of *G. miyabeana* and *V. saliciperda* as primary pathogens within the willow blight complex is unresolved even though several inoculation studies have previously compared the pathogenicity of these fungi. The black canker fungus becomes apparent on diseased plant tissue midway through the growing season (July, August) and is often found on leaves and twigs affected previously by the willow scab fungus. However, *G. miyabeana* generally is considered by plant pathologists to be a more virulent pathogen of willow than *V. saliciperda* and is capable of killing young leaves and twigs within a very short time.



Shoot blight caused by the black canker fungus, *Glomerella miyabeana*, on *Salix eriocephala* (Belleville, NY)

## Host(s) and Distribution

The black canker fungus previously has been reported to occur throughout the eastern U.S., Great Lakes, Pacific Northwest, and the province of British Columbia. The majority of information regarding host susceptibilities in N. America applies to willows grown as forest and shade trees with little attention paid to “wild” or plantation-grown shrubs. Reported hosts of the black canker fungus include: *S. alba* (white willow); *S. amygdaloides* (peachleaf willow); *S. aurita* (eared willow); *S. babylonica* (weeping willow) *S. bebbiana* (Bebb willow); *S. caprea* (goat willow); *S. discolor* (pussy willow); *S. eriocephala* (Missouri River willow); *S. fragilis* (crack willow); *S. lucida* (Pacific willow); *S. nigra* (black willow); and, *S. sericea* (silky willow). Laurel (*S. pentandra*) and purple osier (*S. purpurea*) willows are considered to be resistant to the black canker fungus. Weeping willow (*S. babylonica*) also is said to be resistant to infection; however, willow blight on weeping willow has become problematic in many areas of the Oregon, Washington State, and southern British Columbia. In willow plantations of New York State, the occurrence of black canker disease appears to be rare and has only been found affecting hybrids of *S. viminalis* and *S. miyabeana*.

## Symptoms and Signs

Symptoms associated with black canker disease first appear on leaves in the late spring and early summer (April-June) as brown to black lesions with an irregular outline. Infected leaves usually shrivel and die as the fungus grows rapidly from the leaf blade to the petiole, then into the twig. Each invasion of the twig results in a canker of variable size depending on the relative resistance of the host. Resistant plants rarely become infected but when infection occurs, a discrete canker (length: 1-3 cm) often forms at the twig-petiole junction. In contrast, large cankers (length: 5-8 cm) are produced on twigs of susceptible willows. Cankers may remain localized at the point of infection or expand and encircle the twig. Tips of girdled twigs often have a conspicuous droop or crook caused by the wilting and death of tissues distal to the canker.

Sunken cankers resulting from necrosis of the invaded bark tissue quickly become covered with erumpent, saucer-shaped fruiting bodies (acervuli) bearing asexual spores (conidia). In culture, conidia of *G. miyabeana* are 1-celled, 12-24 µm x 3-6 µm, and colorless (hyaline). However, conidia exuded from acervuli appear pink *en masse*. Sexual fruiting bodies (perithecia) develop in the fall (late August-October) in cankers that contain or previously produced acervuli. Perithecia are subglobose, 140-200 µm wide, and bear thin-walled sacs (asci) that contain hyaline, 1-celled ascospores.

## Disease Cycle

Conidia and/or ascospores produced on twigs infected the previous year incite primary infections in the spring. However, the spread and intensification of disease is caused by repeated cycles of infection by conidia. During warm and humid weather, conidia ooze out of acervuli and are spread by splashing rain and, perhaps, insects. Disease progress increases with the creation of new cankers and secondary cycles of conidia throughout the summer and fall.

## Damage

As previously noted, *G. miyabeana* as a primary pathogen appears to be rare in willow plantations and little information is currently available relative to the damage it may cause on commercial willow shrubs. However, the occurrence of black canker disease may increase as more large-scale plantings are established. The pathogen could cause defoliation, extensive dieback, and stunted growth if several repeating cycles of infection occur over the course of 1-2 growing seasons.

## Selected References

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