

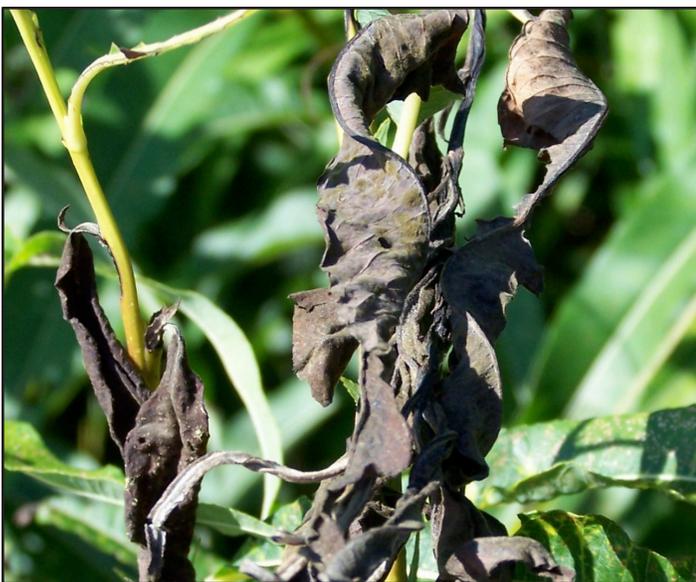
# Willow Scab

## Introduction

Willow scab, caused by the fungus *Venturia saliciperda* (Pleosporales: Venturiaceae), affects *Salix* species throughout Europe and the eastern United States. Common relatives of the willow scab fungus (i.e., *Venturia* spp.) cause leaf and shoot blight diseases on woody-plants including apple (*Malus* spp.), pear (*Pyrus* spp.), or poplar (*Populus* spp.). However, unlike its relatives, the willow scab fungus frequently interacts with an unrelated pathogen, the black canker fungus (*Glomerella miyabeana*), to produce a destructive blight of willow. Both fungi, *V. saliciperda* and *G. miyabeana*, likely were introduced from Europe by way of Asia prior to or shortly after the turn of the 20<sup>th</sup> century. Their introduction into the U.S. may explain, at least in part, the willow blight epidemics of the 1920s and 1930s that affected native willow populations throughout New England and the Hudson River Valley, New York.



Leaf- and shoot-blight of *Salix eriocephala* caused the willow scab fungus, *Venturia saliciperda* (Tully, NY).



Willow scab, caused by *Venturia saliciperda*, on *Salix eriocephala* (Tully, NY). Note the olive, velvety-mass of spores (conidia) on the underside of the leaves.

## Host (s) and distribution

Willow scab is widespread throughout New England and New York State. The disease also occurs in Pennsylvania, New Jersey, North Carolina, and Washington State. Most species of indigenous and naturalized *Salix* species - including *S. alba* (white willow), *S. amygdaloides* (peachleaf willow), *S. aurita* (eared willow), *S. bebbiana* (Bebb willow), *S. caprea* (goat willow), *S. discolor* (pussy willow), *S. fragilis* (crack willow), *S. lucida* (Pacific willow), *S. nigra* (black willow), *S. pentandra* (laurel willow), *S. purpurea* (purpleosier willow), and *S. sericea* (silky willow) – are susceptible. Several willow genotypes/species grown in NY short-rotation willow plantations also are susceptible to scab. *Salix eriocephala* (Missouri River willow), *S. purpurea*, *S. miyabeana* (Japanese willow), and hybrid-progeny of *S. purpurea* and *S. miyabeana* are confirmed hosts.

## Identification

The willow scab fungus is identified by the morphological characteristics of its asexual state. Conspicuous olive-brown masses of naked conidiophores develop on infected leaves, petioles, and/or twigs following wet weather (April-August). These fruiting bodies are often found on the lower-leaf surface and along the mid-rib and/or lateral veins. When infection is severe, many individual pustules may coalesce to form continuous olivaceous layers of spores on infected tissues. The asexual spores (conidia) are dark, 12-26  $\mu\text{m}$  long and 6-9  $\mu\text{m}$  wide, 2-celled (rarely 3-celled), and obpyriform (i.e., pear-shaped) with a narrow apex and a truncate base.

## Disease Cycle

The willow scab fungus overwinters (November-March) as vegetative cells and dormant spores in leaves and twigs that were infected the previous year. Spores are dispersed in the early spring (late March-April) by rain-splash and wind to unfurling buds or young willow leaves. The fungus grows within new leaves, colonizing the tissues immediately beneath the cuticle, and through the petiole and into the twig. Infected leaves die and fall to the ground while infected twigs often remain attached. Conidia released from new lesions, particularly twig cankers, can continue to cause disease during wet weather throughout the growing season. However the severity of disease generally lessens during the summer when warm, dry weather prevails. Although the sexual phase of the scab fungus has been reproduced in the laboratory, it has not been found in nature. Therefore, the role of sexual spores in the pathogenesis of the willow scab fungus remains unclear.

## Damage

In plantations, willow scab causes only slight damage to current season's shoots and leaves. However, when heavy infections repeatedly occur over a period of years, the disease can reduce growth and vigor, resulting in twig or

branch dieback and predisposing the plants to insects, other pathogens, and drought stress. When both willow scab and the aforementioned black canker fungus affect trees, the likelihood of stem and stool mortality is much higher.

Although willow blight is a common disease on native trees and shrubs in the eastern U.S., epidemics leading to plant mortality are rare and no record exists of a significant outbreak occurring in an established willow plantation in New York State. However, outbreak conditions – especially in monoculture plantations - are possible if both fungi are present and cool, wet weather prevails throughout the spring or early summer. When both biotic and environmental conditions are met in successive years, growth and biomass yield can be adversely affected.

## Selected References

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Funding provided by New York Farm Viability Institute to LB Smart.