

FPL 42 – Poplar Shoot Blight

The information accessed from this screen is based on the publication: Hunt, R.S. 1978. Poplar Shoot Blight. Forestry Canada, Forest Insect and Disease Survey, Forest Pest Leaflet No. 42 3p.

Introduction

Poplar shoot blight in British Columbia and the Yukon Territory is usually caused by members of the genus *Venturia* (Ascomycetes) or, less commonly, by invading canker fungi or the bacterium *Pseudomonas syringae* van Hall.

Venturia spp. are reported attacking all species of *Populus* throughout the geographic range of the genus. In some areas, the disease becomes severe, particularly during seasons of wet weather, which favors fungus development and spread.

Hosts and Distribution

Trembling aspen (*P. tremuloides* Michx.) is attacked by *Venturia macularis* (Fr.) E. Muell. & von Arx (= *V. tremulae* Aderh.), while two other native species, balsam poplar (*Populus balsamifera* L.) and black cottonwood (*P. trichocarpa* Torr. & Gray) are attacked by *Venturia populina* (Vuill.) Fabric. Exotic poplars may also be attacked by these fungi.

General surveys (4) reveal: 1) that the disease has been particularly noted in British Columbia since 1966; 2) it is most severe and common in the Prince George and Prince Rupert districts, infrequently severe in the Nelson and Cariboo districts, while there are only minor reports from the Vancouver and Kamloops districts and Yukon Territory; 3) trembling aspen ([Fig](#)) is more frequently damaged than are the other two poplar species.

Life History

These fungi produce both a sexual ascospore stage and an asexual conidial stage. In the past, several different names for both stages of these organisms have existed. Currently, we recognize *Venturia macularis* (conidial stage *Pollaccia americana* Ondrej) attacking aspen, and *V. populina* (conidial stage *P. elegans* Servazzi) attacking black and balsam poplars (1, 5). In our region, the sexual stage *V. macularis* is sometimes difficult to distinguish from *V. populina* (1), which adds to the taxonomic confusion.

Ascospores and conidia develop as the primary inoculum in overwintered cankers on twigs. The ascospores are forcibly discharged and the conidia rain-splashed to new spring leaves (2, 3). Ascospores also develop in fallen leaves, and may contribute to the primary inoculum (8). Conidia develop as secondary inoculum on the newly blighted leaves throughout the spring. Once formed, conidia are continually dispersed in the rain, so the epidemic increases with the duration of the spring rains, and subsides with the onset of warm, dry summer days. Mature leaves are more resistant than young leaves, which also helps end the epidemic (2, 3).

Recognition

Initial symptoms are black leaf spots which coalesce to produce a blighted leaf (Fig). Infections spread from the leaf blade down the petiole into succulent branchlets. These infected new shoots blacken and curl into a hook bearing withered, blackened leaves (Fig). Signs of the fungus are the mats of olive-green conidia produced within the blackened tissues (2, 3, 7). These signs readily distinguish *Venturia* blight from a similar leaf blight caused by the fungus *Marssonina*. In addition, mature *Marssonina* has characteristic small circular lesions on the underside of the leaf.

A bacterium, *Pseudomonas syringae*, produces symptoms similar to those of *Venturia* shoot blight, but frequently has associated resinosis. *Venturia spp.* usually damage a large stand of trees (Fig), while *P. syringae* affects only small groups of trees, frequently in residential settings. Damage to poplars in our region has been attributed to *Pseudomonas syringae* only on the basis of symptoms, so this diagnosis is only tentative. Such a diagnosis for our poplars is uncommon. This disease is not the same as bacterial canker of poplar in Europe which is caused by a special form of *P. syringae* (7).

When severe, the new growth of a tree can appear to be burnt, making trees unsightly. Usually a complete stand is damaged, especially along river valleys. Such symptoms have been the concern of the traveller and rancher. Likewise, the inferred growth loss has been the European forester's concern in managed stands. The most important damage done by this disease is to seedlings and saplings which may die-back severely, creating an important restocking problem (7).

Control

Pruning out the overwintering stage of the fungus or the bacterium in the branch cankers is the best control. As a precaution, fallen leaves should be gathered and disposed of in the autumn. Diseases of apples and pears caused by *Venturia spp.* can be effectively controlled by fungicides in British Columbia. Europeans have found that copper fungicides such as Bordeaux mixture(1), if frequently applied, provide effective control of *V. macularis* and *V. populina* (6, 8). The copper protects the foliage from being infected, but it may be washed off by rain, so it has to be re-applied. Such controls in the forest are currently impractical, but may be useful in nurseries or on landscape trees. There is variability among species and clones in their susceptibility to *Venturia spp.*; if poplars are to be planted, the ones most resistant should be selected and utilized (2,7).

(1) Home-made Bordeaux mixture weathers well through rain storms. It contains three ingredients, copper sulphate, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, hydrated lime, $\text{Ca}(\text{OH})_2$, and water. The copper sulphate and hydrated lime are measured in pounds and the water in gallons. The relative amounts of these ingredients vary with different preparations and the respective proportions are always written in the same order after the name, such as Bordeaux 10-15-100 (refers to 10

pounds of copper sulphate, 15 pounds hydrated lime, and 100 gallons of water). For a few trees, the amounts can be reduced and be prepared as follows: overnight let 230 grams (1/2 pound) of copper sulphate dissolve in 4.5 litres (1 gallon) of water. Stir 350 grams (3/4 pound) of hydrated lime into 18 litres (4 gallons) of water, then sieve this through a fine screen. Stir the copper sulphate solution into the hydrated lime solution to obtain the ready-to-use Bordeaux. Prepare and use at your own risk.

References

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Figure 237-0046. Foliar browning of trembling aspen caused by *Venturia* leaf blight.



Figure 237-0047. Shepherd's crook and discoloration caused by shoot blight.



Figure 237-0048. Shepherd's crook caused by shoot blight.



Figure 237-0045. Leaf blight of trembling aspen caused by *Venturia* sp.
