

FPL 65 – Canker Diseases of Spruce

The information accessed from this screen is based on the publication: Funk, A. 1978. Canker Disease of Spruce. Forestry Canada, Forest Insect and Disease Survey, Forest Pest Leaflet No. 65 4p.

Cytospora kunzei is now known as *Leucostoma kunzei*

Introduction

Spruce in British Columbia suffers from fewer bark maladies than most other conifers. Most canker diseases of spruce are caused by native fungi that are rather weak pathogens. These can cause deformations, dieback, growth reductions and occasionally death. This report gives a brief description of the most common canker diseases of spruces in the Pacific region. Cankers are localized lesions in stems and branches, usually caused by fungi.

Botryosphaeria Canker (*Botryosphaeria piceae* Funk)

This fungus produces perennial swellings of excess outer bark (cork). The fungus progresses longitudinally and radially in the bark, so that the swellings gradually get longer and usually girdle the stem. Round, black fruiting bodies are densely formed in the swellings. Branches have been found in which almost half of the surface area is covered by the fungus.

The disease has been found on all native spruces in British Columbia except black spruce. It is widespread but spotty or localized throughout the province. In one area near Wells Gray Park all trees over several acres are heavily infected, but trees nearby are completely free of the disease. This pattern of occurrence reflects some unknown environmental preconditioning in the areas of heavy infection.

Botryosphaeria attacks trees of all ages. Small seedlings less than 15 cm high have been found with multiple lesions on stem and branches. Mature trees of Sitka spruce (over 30 m high) may have branches in the crown with very numerous cankers. However, young trees on poor sites are most frequently and most heavily attacked. Branches or trees may die from fungus girdling or attack by secondary agents.

Spread of the fungus is by ascospores forcibly shot from the black fruiting bodies covering the cankers. Although little is known of the infection process, the ascospores are present for most of the year in the perennial fruiting bodies and so could infect at any favorable period throughout the year.

Discocainia Canker (*Discocainia treleasei* (Sacc.) Reid & Funk)

The disease is characterized by fusiform, cankered swellings of mainstems and branches. Although the bark over the canker is killed, it does not slough off. There is increased production of wood around the infection, producing the tapered, flattened swelling.

Frequently a dead branchlet is found in the centre of the canker and this is probably the entry point of the fungus.

The disease occurs only on Sitka spruce in the genus *Picea*, but is also found on western hemlock. *Discocainia* occurs along the coast from Alaska to the state of Washington.

The disease is commonly found in young trees of overcrowded stands or in unthrifty trees of almost any age. The fungus acts as a natural selective agent in removing poor and weakened trees and also as a natural thinning agent. Very frequently, if the tree is weak, the fungus will eventually spread from the canker into the bark above and below it, killing the tree completely. When this happens, the fungus may produce thousands of apothecia (fruiting bodies) which entirely cover the stem.

The conspicuous black apothecia are approximately 3 mm in diameter. The fungus spreads only by ascospores which are forcibly shot from moistened apothecia. When moist, the apothecia open by an irregular split to expose the whitish spore-producing layer.

Target Canker (cause unknown).

The canker is characterized by a deep, target like lesion on one side of the stem that is usually encrusted with dried pitch ([Fig](#)). The lesions are found throughout the Pacific region on all native spruces, but are of infrequent occurrence. The canker is perennial, producing a weakened area in the stem that is subject to breakage.

Cytospora Canker of Ornamental Spruces (*Cytospora* [*Leucostoma*] *kunzei* Sacc.)

Cankers are inconspicuous, with little or no bark deformation. Dying branches are usually the first symptoms, but the infection often spreads to the trunk of the tree where large cankers are produced. A heavy pitch flow is characteristic of the disease, often producing a solid coat over the cankers, or dripping from the branches.

All exotic and native spruces, as well as certain other conifers are attacked. The disease may appear wherever spruce is used for ornamental purposes, but rarely, if ever, occurs in natural spruce forests.

Trees with stem cankers are almost certain to die eventually, but branch cankers may only produce limited deformation with survival of the tree.

The fungus is spread by spores that ooze from fruiting bodies (pycnidia) which are immersed in the diseased bark. The conidia are dispersed by rain drops and probably also by insect and bird vectors which contact the sticky mass. The fungus also has an airborne ascospore state, but it is rarely found.

Control

The diseases of natural stands are not of sufficient importance to warrant control measures. Proper silvicultural practices in new plantations will prevent establishment of the diseases under forest conditions.

Cytospora canker of ornamentals may be controlled by pruning out and burning the dying branches in entirety. Trees may be protected by early spring and summer sprays with Bordeaux mixture, or any good fungicide soluble in water. Fertilizing, and thorough watering during dry periods is helpful in giving trees natural resistance to disease. Trees with trunk cankers are almost sure to die, so they should be removed and burned to prevent spread of spores which form in the killed bark.

References

Funk, A, 1965, A new parasite of spruce from British Columbia. *Can. J. Botany* 43: 45-48.

Reid, J. and A. Funk, 1966. The genus *Atropellis* and a new genus of the Helotiales associated with branch cankers of western hemlock, *Mycologia* 58: 417-439.

Preparation of Bordeaux Mixture

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 pounds) 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.

Figures



Figure 237-0057. Exploding canker on Douglas-fir stem.