

Dothistroma Needle Blight

Yukon Forest Health —
Forest insect and disease

8



Yukon

Energy, Mines and Resources
Forest Management Branch

Introduction

Dothistroma needle blight (*Mycosphaerella pini*) is a fungal disease affecting a wide range of species within the genus *Pinus*. The known limit of the disease's range is currently just south of the Yukon-British Columbia border. It has recently been found on lodgepole pine (*Pinus contorta*) at the Highway 37 crossing of the Dease River and can be expected to reach Yukon within the next few years.

A warming climate may favour the northerly expansion of the range of *M. pini*. An extensive fire history has created a continuous coverage of pine from known areas of infection in B.C. to Yukon.

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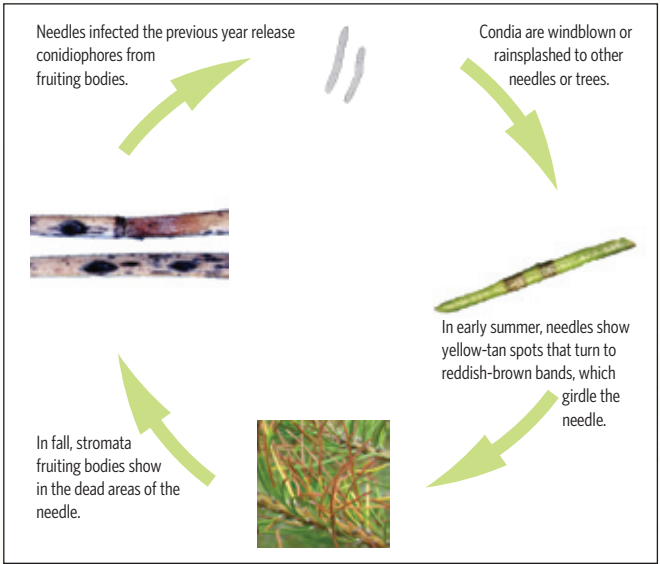
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Disease Cycle

In general, needle blights differ from needle casts because they affect all ages of foliage. The disease cycle of the needle blight is completed in one or two years depending on temperature and moisture. *Dothistroma* reproduces both sexually and asexually but generally the disease is spread asexually. The asexual disease cycle is as follows:

1. Needles infected the previous year produce conidiophores which release asexually produced spores or conidia during periods of precipitation and/or high humidity in early spring.
2. The conidia are windblown or rain splashed to other trees or other needles within the same tree where new infections begin.
3. By early summer infected needles begin to show yellow tan spots that enlarge and turn to reddish brown bands that encircle the needle. Within 2-3 weeks the bands essentially girdle the needle killing it from the band to the needle tip. The base of the needle remains green and the contrast is abrupt.
4. In the fall, tiny black spots (stromata fruiting bodies) begin to show in the bands or dead areas of the needle and appear as tiny depressions in the needles. By the following spring these black spots (or depressions) release conidia that continue the cycle as per step 1.



Definitions:

Conidiophores: specialized stalks that develops at the tip of a fungai hypha and produces conidia.

Conidia: asexual, non-motile spores of fungus.

Host Species Attacked and Damage

Tree species attacked: Lodgepole pine is highly susceptible.

Early symptoms of *Dothistroma* consist of deep green bands and yellow spots on the needles. The green bands do not last; however, and quickly turn reddish-brown. These bands girdle the needles, which change from yellow-green to red and finally straw colour. The infection is typically most severe in the lower crown. When environmental factors are optimal the disease can spread rapidly leading to successive years of infection. Trees can be defoliated within weeks which will lead to decreased growth and eventually even death. Severely infected trees may exhibit "lions tailing" in which only the current year's needles remain.

Similar damage

Most needle infections in Yukon are currently caused by pine needle cast (*Lophodermella concolor*). It can be distinguished from *M. pini* because infected needles lack the red bands and only current years needles are susceptible to infection. Abiotic disturbance agents such as winter-kill, drought, roadside dieback and air pollution can cause similar foliage discolouration and needle drop. The absence of oval shaped depressions on the needle surface would distinguish this damage from that of *M. pini*.

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