Forestry Leaflet 25: Spruce needle rusts
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Canada

Spruce needle rusts

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Distribution and Hosts

Spruce needle rusts are very common and easily recognizable diseases of the spruce species (white spruce, black spruce, and Englemann spruce) in the prairie provinces of Canada. Introduced species such as Colorado blue spruce and Norway spruce are also susceptible. Rust diseases are found mainly on spruce in natural stands.

Symptoms, Signs, and Damage

When spruce trees are affected by needle rusts, heavily infected current-year shoots look pale and yellowish from a distance. Spruce needle rusts can be distinguished from other fungal diseases, insect damage, and climatic or physiological damage by the presence of orange-yellow elongated pustules on the current year's needles. The pustules, which are usually found in two rows, produce yellow-orange powdery spores (aeciospores) and are surrounded by white membranous structures (peridia). Signs and symptoms of *Chrysomyxa* needle rusts are most visible from late July to early August, while those of *Pucciniastrum* appear from late June to mid-July. Infection of individual trees by needle rusts can be very heavy, and all or most of the current year's needles may be infected and drop prematurely. Heavy infections seldom occur in successive years, however, and trees do not seem to be damaged significantly by single heavy infections. Heavy infections for 2 or more consecutive years would lead to tree disfigurement, with possible significant economic consequences for commercial stands.

Causal Agent

Eight species of spruce needle rusts are known in the prairie provinces. Among them, *Chrysomyxa ledicola* and *C. ledi* are the most common and cause the most damage. Several species of *Pucciniastrum* are less common and cause little damage. Both species of *Chrysomyxa* need the presence of plants (alternate hosts) that are varieties of Labrador tea (in the genus *Ledum*) to complete their life cycles. Heavy infections of these species on spruce occur, therefore, only when large populations of alternate hosts are present in or adjacent to spruce stands. Needle rusts rarely become a problem in urban settings because of the lack of alternate host populations. Alternate hosts of *Pucciniastrum* species are plants such as raspberry, blackberry, dewberry, etc., belonging to the genus *Rubus*. Spores produced on spruce needles cannot reinfect the spruce and are only viable in the current year.

Prevention and Control

Timely sprays of fungicides are known to be effective in preventing rust infections on spruce. This strategy is economically feasible only for high-value stands, such as those found in Christmas tree farms or tree nurseries that grow ornamental spruce. These diseases cannot spread from spruce to spruce; therefore, infected trees transplanted from natural to urban environments can be moved safely without risking the spread of disease. The diseases on infected spruce should disappear because the pathogens cannot overwinter in spruce.

For the most recent information on chemicals available for control of these diseases, call Agriculture and Agri-Food Canada's Plant Industry Directorate in Ottawa (toll-free) at 1-800-267-6315.

Chemical pesticides are toxic to humans, animals, birds, fish, and beneficial insects. Follow all instructions and precautions listed by the manufacturer.