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# *FOREST INSECT AND DISEASE NOTES*

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# COMANDRA BLISTER RUST OF HARD PINES

by

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Stem rusts of hard pines are commonly found through out the Prairie provinces and the Northwest Territories. One of these rust diseases, comandra blister rust, is caused by the fungus, Cronartium comandrae. This disease can be found on jack, lodgepole, Scots, mugho, and ponderosa pines in this region.

Infected trees have a conspicuous swelling of the bark in the affected area and on large stems a circular canker develops. The canker enlarges yearly (about 1.9 cm/year) and can girdle the stem leading to branch or tree death. The cankers can be easily recognized from late May to mid-July (depending upon locality) by the production of orange-yellow spores near the edge of the canker. Like most rust fungi the comandra blister rust fungus has an alternate host that it must infect in order to complete its lifecycle. There are two common alternate host for comandra blister rust, northern toad-flax (Geocaulon lividum) and bastard toad-flax (Comandra umbellata var. pallida). Spores produced on the pine tree infect the alternate host from late May to mid-July. In August or early September spores produced on the alternate host infect pines through needles. Young seedlings or saplings with main stem infections usually die within a few years of infection. Cankers can be found on mature trees and often cause dead tops or spike tops (Hiratsuka and Powell 1976).

An impact study of stem rusts on hard pines has shown that comandra blister rust caused the greatest mortality of bole infected trees (87.2 %) (Hiratsuka et al. 1988). The disease killed dominant as well as codominant trees. Most branch cankers died out before reaching the main stem.

## Control

Control measures include removing infected stems or branches and in high value plantions removing the alternate host. There are no fungicides currently registered for the control of this disease. Stands that are to be thinned should be visited in June or July of the year before the thinning so that trees with rust can be identified and removed in the thinning operation.

## References

Hiratsuka, Y. Powell, J. 1976. Pine stem rusts of Canada. Canadian Forestry Service, Forestry Technical Report 4. Information Canada, Ottawa.

Hiratsuka, Y.; Powell, J.M.; Van Sickle, G.A. 1988. Impact of pine stem rusts of hard pines in Alberta and the Northwest Territories. Northern Forestry Centre Information Report NOR-X-299.

# SAWYER BEETLES IN SOFTWOOD LUMBER

by
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Among the large variety of woodboring insect species that attack coniferous logs in the prairie provinces and Northwest Territories, members of the genus Monochamus are the most economically important to the forest industry. Larvae of this genus are known as sawyers because of the audible chewing noise they make while tunneling within the wood; hence the name sawyer beetles.

The adults are large robust beetles, 15 - 35 mm long with long antennae and legs and occur within the family Cerambycidae. They breed in various coniferous hosts (Pinus, Picea, Abies, Pseudotsuga and Larix species) and attack mostly freshly cut, recently felled, dead or dying trees. Galleries made by the larvae within processed lumber or logs are often referred to as grubholes or wormholes and can result in down-grading or reduced market value of the finished product.

Five species of Monochamus likely occur in the prairie provinces and Northwest Territories, three of which are rarely collected while the other two species are both common and are widely distributed. These two include the whitespotted sawyer (M. scutellatus) and the northeastern sawyer (M. notatus); together they contribute most of the reported wormhole damage. The species, their hosts and their relative abundance are indicated below (VC = very common; C = common; R = rare).

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Monochamus scutellatus (Say) - whitespotted sawyer (VC)
Hosts: spruces, pines, true firs, Douglas-fir, tamarack

M. notatus (Drury) - northeastern sawyer (C)
Hosts: pines, spruces, balsam fir, Douglas-fir

M. marmorator Kirby (R)
Host: balsam fir

M. mutator Le Conte (R)
Hosts: pines

M. titillator (Fabricius) (R)
Hosts: pines

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The life histories of all five species appear to be similar. The adult beetles may be present in the field from late May to August. They seek out suitable host trees with fresh bark in which they chew small niches and may deposit one to several eggs in each. After egg hatch the legless larvae chew through the bark and feed for several weeks between the bark and wood, engraving the wood surface and producing excelsior-like sawdust. The larvae enter the wood during August and excavate a tunnel in which they overwinter and feed. The tunnel is U-shaped and often penetrates into the heartwood before turning back toward the log surface. In cross section the tunnel is oval, 5-10 mm in diameter and 15-25 cm

long. An enlarged portion near the end of the tunnel serves as a chamber for pupation and from which the new adult chews a circular hole to exit the log. In the Northwest region the life cycle development from egg to adult most commonly requires 2 years to complete but can be completed in only one year or take up to 3 years.

Newly emerged adults undergo maturation feeding on nearby live conifer foliage and bark. This damage may result in branch and twig mortality (ie., flagging), and if intense, it can result in tree mortality. Wormholed lumber cut from sawyer beetle attacked trees may be down-graded in value in accordance with Canadian lumber grading rules, where the density of hole may affect both strength and appearance of the finished product. Grading restrictions for wormhole damage in logs cut for power poles are even more stringent. Most lumber degrade from wormhole damage in the prairies region results from high populations of the whitespotted and northeastern sawyer beetles that are attracted to fresh fire-killed trees and other suitable hosts. Estimated value losses of wormholed dimension lumber salvaged from fire-killed timber may range as high as 30% to 40%.

Recently, there has been a growing concern for wormholed softwood lumber exported from Canada to European markets, mostly in reference to holes caused by Monochamus larvae. Much of this concern centers on the likelihood that adults of Monochamus species may be the prime vectors of the pinewood nematode (PWN) (Bursaphelenchus xylophilus [Steiner & Buhrer] Nickle), a microscopic worm-like organism that is probably indigenous to North America. Although the PWN in Canada has not been implicated as a causal agent of the so-called "pine wilt disease" reported in southeastern United States and Japan, there is a pressing need to reduce the risk of its introduction into countries where PWN has not yet been reported. Consequently, various training and regulatory procedures may have to be implemented in Canada to comply with foreign export market specifications of untreated or nonkiln-dried softwood lumber. Todate the PWN has been isolated from recently dead pine, spruce and balsam fir stems in the three prairie provinces but in neither host has it been implicated as a cause of the mortality.

## Pest Situation Report

by

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### Forest Tent Caterpillar (Malacosoma disstria)

In Alberta, forest tent caterpillar defoliation in aspen stands continued to be a major problem throughout the central part of the province. This general area was bounded in the north by Cherry Point and Cold Lake; south along the Saskatchewan border to the area between Highways' 12 and 9; west through to the Hanna and Red Deer areas continuing northwest to Rocky Mountain House and Jackfish Lake and north to the Valleyview, Sturgeon Lake, Grande Prairie area. Other extensive outbreaks where moderate and severe defoliation of aspen were reported between Twin Butte and

Waterton Lakes National Park and east of the park through to Mountain View. In Waterton Lakes National Park, the outbreak is not expected to be as widespread nor as severe as in 1988 due to the cold spring conditions experienced in the park and very poor egg band development.

Although moderate and severe defoliation was common in most of the aspen areas surveyed, there were signs of a general breakdown in the population with some larval mortality during the early instars in some of the areas that were severely defoliated in 1988. There was also some evidence of polyhedral virus affecting larvae at several locations.

In Saskatchewan, moderate to severe aspen defoliation was present along the Saskatchewan-Alberta border between Cold Lake and Macklin; from this point through to the Battlefords, norteast to the Blaine Lake Prince Albert areas, from Prince Albert northwest to Dore Lake and west of Dore Lake to Cold Lake. Smaller areas of moderate and severe defoliation were evident in the following general areas; Montreal Lake, between Candle Lake and Cumberland House, between Nipawin and Hudson Bay and near Kamsack.

In Manitoba (information provided by Forest Protection, Manitoba Natural Resources) moderate to severe defoliation was present in the Kississing Lake area, from Flin Flon south to Rocky Lake, in the Pelican and Dawson Bay areas of Lake Winnipegosis, in the Wicked Point area on Lake Winnipeg and the Saint Lakes area. Moderate to severe defoliation also occurred in the area of Sippewisk and Cross Lakes south to Norway House, in the Belair provincial forest, in the Elliot Lake area and the along the Berens River west of Little Grand Rapids. Aspen Tortrix defoliation was observed in Riding Mountain National Park and in the Duck Mountain provincial forest.

Spruce budworm
(Choristoneura fumiferana)

In Alberta, moderate and severe defoliation was evident in white spruce stands along the Peace River north of Eaglesham and along the Chinchaga River west of High Level. Light and moderate defoliation was noted in Big Knife and Red Lodge provincial parks and in the Daysland, Donalda, Camrose and Castor areas. Light to moderate defoliation was observed in the vicinity of the House-Athabasca rivers confluence. The area affected has increased dramatically from 225 Ha in 1988 to 4000 Ha this year. Light defoliation was reported on white spruce and Colorado spruce plantings in Edmonton and Red Deer.

In Saskatchewan moderate to severe defoliation of white spruce was again observed in the Red Earth and Usherville - Tall Pines areas. Moderate to severe defoliation was found near Green lake.

In Manitoba (information provided by Natural Resources, Manitoba Natural Resources), spruce budworm damage was reported east of Pinawa in Whiteshell Provincial Park, along Highway 314 in Nopaming Provincial Park, areas along the Winnipeg, Wanipigow, and Manigotagan rivers, and in the Bird River area. Moderate to severe defoliation was also noted in Hecla Provincial Park and Grindstone Peninsula.

Bruce Spanworm
(Operopthera bruceata)

The bruce spanworm was responsible for moderate and severe

defoliation in the following general areas of Alberta; along highway 22 from Lundbreck north to Bragg Creek and in several locations north of Bragg creek to the Didsbury area. Bruce spanworm defoliation was also evident in the Edson, Obed, and Marlboro areas.

In southern Alberta, the bruce spanworm was considered the primary defoliator of aspen stands from Lundbreck to Didsbury, however, other aspen defoliators were contributing to the injury and these were; the large aspen tortrix (Choristoneura conflictans), the leafrollers (Anacampis niveopulvella, Pseudexentera. oregonana) and the leaftier Enargia decolor.

**Jack Pine Budworm**
Choristoneura pinus

Jack pine budworm can cause serious defoliation of jack pine. In 1987 jack pine budworm populations collapsed in Saskatchewan and Manitoba. Very little defoliation occurred in 1988. No jack pine budworm defoliation has been noted in Saskatchewan or Manitoba this year.

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