Forest Insect and Disease Notes

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Contents

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ELYTRODERMA NEEDLE CAST

by

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One of the most important needle cast diseases of pine in western Canada is Elytroderma needle cast caused by the fungus Elytroderma deformans (Weir) Darker. This disease is found throughout western Canada and in Ontario. Its principle hosts are lodgepole and ponderosa pine but it has also been recorded on jack pine. The disease is particularly prevalent in the lodgepole pine forests of the eastern slopes of the Rocky Mountains.

Diseased trees can be recognized by the reddish brown discoloration of the second year needles (flagging) that begins in the late spring and early summer. The third year needles turn straw color and have minute black stripes (the fungal fruiting bodies, perfect stage) and run length-wise on the needle. As typical with most needle cast diseases, the second and third year needles are shed from the tree prematurely. Diseased trees look barren with tufts of green current year foliage at the growing tips. However, Elytroderma needle cast also causes the branching pattern to become somewhat distorted and the branches deformed. Branches on lodgepole pine take on a near witches broom appearance. Often the shoots are shortened and curve upwards resembling a lion's tail because of the tuft of needles at the end. Trees of all age classes and sizes can be attacked. Infection is usually greatest on pole-sized trees. It is often found in moderately dense to very dense stands. It has been observed that infection is usually heaviest at higher altitudes, in ravine bottoms and gentle slopes; generally where there are high moisture conditions and low temperatures. Conidia (imperfect stage) from the fungal fruiting bodies are released in the spring. It is thought that these spores act as pycnidiospores (gamates) and do not cause infections. From studies done in the United States it appears that the ascospores (perfect stage) are released in the fall. It is uncertain whether infection occurs in the fall or the following spring. Once inside the needle the fungus grows quickly down into the branches and grows systemically throughout the tree. Rate of spread internally may vary from 12 cm to 24 cm per year depending on location in the trees. It is uncertain how the fungus disrupts the trees growth and branching pattern. Infected trees are often stunted and show poor height and diameter growth. The phloem of infected shoots is often killed and filled with the fungal mycelium.

The impact of the disease has not been well studied in Canada; however, it is known from work done in the United States that significant growth losses and mortality can occur. Mortality cannot be directly attributed to the needle cast disease as Armillaria root rot and bark beetles are often found in association with Elytroderma attacked trees.

Control of Elytroderma needle cast must rely on forest management techniques such as early harvest of heavily infected stands. On high value trees, brooms or infected branches may be pruned out to try and prevent subsequent infections either by spores or by internal movement of the fungus within the tree.

Further Reading

Childs, T.W. 1968. Elytroderma disease of ponderosa pine in the Pacific Northwest. USDA Forest Service Research Paper PNW-69

Hiratsuka, Y. 1987. Forest tree diseases of the prairie provinces. Canadian Forestry Service, Northern Forestry Centre. Information Report NOR-X-286.

Hunt, R.S. 1978. Elytroderma disease of pine. Environment Canada, Canadian Forestry Service, Pacific Forest Research Centre, FPL 27.

MAJOR FOREST INSECT PESTS 1991 CONDITIONS AND 1992 PREDICTIONS*

by
Daryl J. Williams

*Extracted from: Cerezke, H.F.; Gates, H.S. 1992. Forest insect and disease conditions in Manitoba, Saskatchewan, Alberta, and the Northwest Territories in 1991. For. Can., Northwest Reg., North. For. Cent., Edmonton, Alberta. Inf. Rep. (In review).

SPRUCE BUDWORM Choristoneura fumiferana (Clem.)

Spruce Budworm infestations in the Northwest Region increased in extent in all areas except Saskatchewan in 1991. Operational aerial spraying of Bacillus thuringiensis var. kurstaki was carried out in Alberta by the province in the Footner Lake, Grande Prairie and Lac La Biche forests using Dipel 132 and Foray 48B. Experimental sprays were carried out in the Peace River and Footner Lake forests using Dipel 13, Dipel 132, Dipel 176, Foray 48B and Foray 75B. No aerial sprays were done in Saskatchewan, Manitoba or the Northwest Terretories.

Summary of spruce budworm defoliation in the Northwest Region, sketch-mapped from aerial and ground surveys in 1990 and 1991

Location	Area of defoliation (ha) 1990	1991	Change
Manitoba	18,985	30,000	+ 58%
Saskatchewan	18,780	15,600	- 17%
Alberta	109,150	141,000	+ 29%
Northwest Territories	113,625	130,000	+ 14%
Totals	260,540	316,600	+ 22%

Results of surveys for spruce budworm defoliation, egg-mass densities, second instar larval (L2) densities, and expected defoliation levels in 1992 for Manitoba and Alberta*

Location	Average defoliation 1991 (%)	Avg. no. egg masses per 10 m^2	Avg. no. moths per trap or avg. L2 per 10 m^2 foliage	Expected defoliation for 1992[a]
MANITOBA				
Birds Hill Prov. Park	13	10 (11)[b]	98[c]	Light
Spruce Woods Prov. Forest	13	76 (76)	290[c]	Moderate
Red Deer River	<1	0 (0)	25[c]	Nil
Duck Mt. Prov. Park	2	0 (0)	5[c]	Nil
Riding Mt Nat'l Park	1	0 (0)	13[c]	Nil
Northwest Angle Prov. Park	2	4 (0)	29[c]	Light
Whiteshell Prov. Park	30	279 (218)	455[c]	Severe
Wanipigow	30	138 (77)	197[c]	Moderate
Hecla Island Prov. Park	5	4 (36)	38[c]	Light
Lake Ste. George	2	0 (0)	32[c]	Nil
Rocky Lake	8	30 (12)	44[c]	Light-moderate
Simonhouse	2	0 (0)	18[c]	Nil
Pisew Fall	3	0 (0)	6[c]	Nil
ALBERTA				
Footner Lake Forest				
Untreated areas	--[d]	--[d]	464*	Moderate-severe
Bt treated areas	--	--	115*	Light
Lac La Biche Forest				
Untreated areas	--	--	419*	Moderate-severe
Bt treated	--	--	47*	Light

[a] Based on egg-mass densities where Light = <25% defoliation (1-15 egg masses); Moderate = 26-50% defoliation (50-100 egg masses); and Severe = >50% defoliation (200+ egg masses).

[b] Values in brackets are for 1990.

[c] Indicates average number of moths per trap.

[d] No data available.

* Indicates average numbers of L2 larvae, estimated over all sample sites; data collected by Alberta Forest Service.

*Information not available for Saskatchewan and Northwest Terretories

ASPEN DEFOLIATORS
FOREST TENT CATERPILLAR Malacosoma disstria Hbn.
LARGE ASPEN TORTRIX Choristoneura conflictana (Wlk.)
BRUCE SPANWORM Operophtera bruceata (Hulst)

The extent of Aspen defoliation continued to decline in 1991 in Alberta, with the primary pest being Forest Tent Caterpillar. Several scattered patches of Large Aspen Tortrix were noted near Twin Lakes, Hawk Hills, Camrose and Bentley. Two moderate to severe areas of Bruce Spanworm were recorded, near Manning and Obed. In Manitoba the extent of moderate to severe defoliation increased significantly in 1991, primarily due to an increase in Forest Tent Caterpillar populations. No significant areas of Aspen defoliation were noted in Saskatchewan or the Northwest Territories. Predicted defoliation for 1992, based on egg band surveys of the Forest Tent Caterpillar, is none or light for most areas. Moderate to severe defoliation is predicted for two areas only, in Alberta south of Bonneyville, and in Manitoba near Centre Three Rivers.

Summary of moderate-severe defoliation of trembling aspen by the forest tent caterpillar and large aspen tortrix in 1991

Province	Area of defoliation in 1990 (ha)	Area of defoliation in 1991 (ha)
Manitoba	15,178	58,082[a] 12,691[b]
Saskatchewan	260,922[c]	--[d]
Alberta	609,272[c]	129,200[c]

[a] Estimated area of defoliation by forest tent caterpillar.
[b] Estimated area of defoliation by large aspen tortrix.
[c] Estimated as 20% of the total land area mapped.
[d] Areas of aspen defoliation were not mapped in 1991.

DUTCH ELM DISEASE Ophiostoma ulmi (Buis.) Nannf.

It has been shown in 1991 that Dutch Elm Disease is continuing to spread into the Northwest Region. This disease is now firmly established in southern Manitoba and has been confirmed in numerous urban centres throughout this area. In Saskatchewan, eleven new sites with DED-infected trees, ranging across the southern and eastern parts of the province, were detected through ground and aerial surveys. In 1990 this disease had only been recorded from a single site near Estevan. However, some of the new sites may be several years old and previously overlooked. There are no predicitons for DED for 1992. No Dutch Elm Disease has been recorded in Alberta or the Northwest Territories.

GYPSY MOTH Lymantria dispar L.

Adult male Gypsy Moths were caught in eight locations in 1991, five in Manitoba across the southern end of the province, one in Saskatchewan at Moose Jaw, and two in Alberta, at Calgary and Drumheller. This is in contrast to the single record of Gypsy Moth

in 1990 at Whiteshell Provincial Park in Manitoba. Surveys have not yet discovered established larval populations. No predictions can be made for 1992.

NEW APPOINTMENTS

Two new technicians have been appointed to the Forest Insect and Disease Management Systems and Surveys Project at NoFC. Colin Myrholm was appointed to the position of Forest Pathology technician on October 10, 1991. Colin is a graduate of the NAIT Biological Sciences program and has spent several years as a term technician at NoFC in the Forest Pathology Studies.

Daryl Williams was appointed to the position of Insect Biosystematics technician on December 2, 1991. He is a graduate of the University of Alberta with a specialization in insect taxonomy and has spent several years as a term technician in the Forest Insect and Disease Management Systems and Surveys Project.

Both Colin and Daryl will serve as FIDS Rangers in the Northwest Region during the spring and summer field season.

Compiled by K.I. Mallett

This note, if cited, should be referred to as a personal communication with the author(s).

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