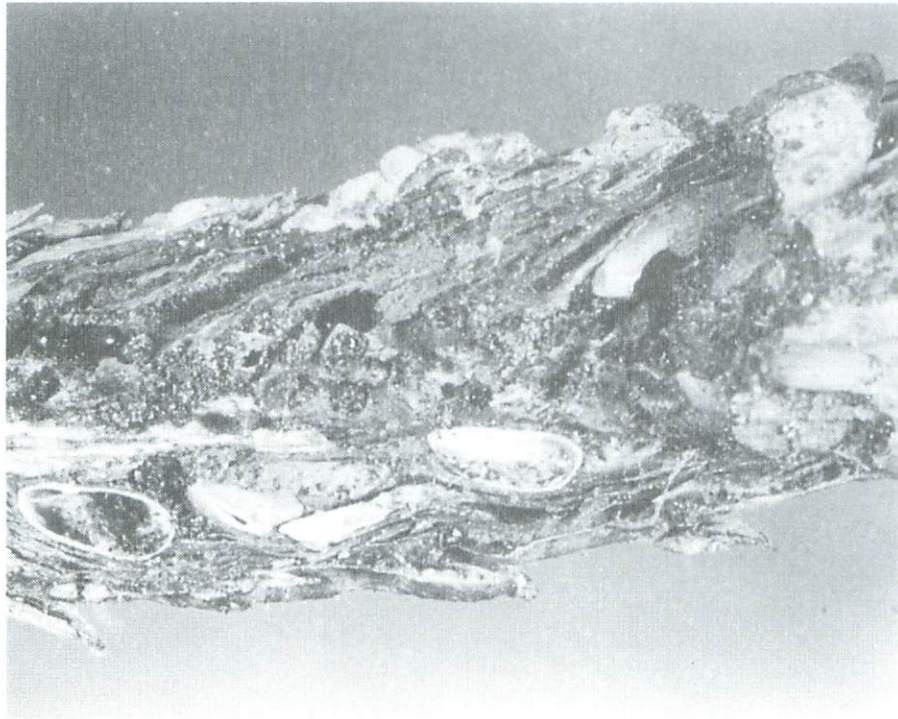


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SURVEY BULLETIN

Forest Insect and Disease Conditions in Ontario
Spring 1990



Damage caused by the white pine cone beetle (*Conophthorus coniperda* Schw.)

FOREST INSECT AND DISEASE CONDITIONS IN ONTARIO

Spring 1990

This is the first of three bulletins to be issued by the Forest Insect and Disease Survey Unit (FIDS) of Forestry Canada, Ontario Region, describing pest conditions in Ontario's forests in 1990.

STAFF CHANGES

The retirement of Lyall MacLeod in November of 1989 resulted in a couple of staff changes in 1990. Wayne Ingram was the successful candidate in a competition for regional supervisor and he will replace Lyall as the regional supervisor for the Northern Region. Tim Bouwmeester, a newly recruited ranger-in-training, will replace Wayne Ingram in the Sudbury work area. Following is a complete list of FIDS field staff and their area assignments in 1990:

<u>REGION</u>	<u>CONTACT</u>	<u>ADDRESS</u>
Northwestern	R.J. Sajan	R.R. #1, Site 25, Box 9 Sioux Lookout, Ontario POV 2T0 (807) 737-3630
	H. Brodersen	210 Butler Avenue Fort Frances, Ontario P9A 2N7 (807) 274-6821
North Central	H.J. Evans	R.R. #6, Station F Thunder Bay, Ontario P7C 5N5 (807) 939-1142
	S. Melbourne	P.O. Box 495 Geraldton, Ontario P0T 1M0 (807) 854-1317
Northern	L.S. MacLeod	P.O. Box 267 Temagami, Ontario POH 2H0 (705) 569-3467
	S. Payne	P.O. Box 817 Chapleau, Ontario POM 1K0 (705) 864-1042

(cont'd)

<u>REGION</u>	<u>CONTACT</u>	<u>ADDRESS (concl.)</u>
Northern	B. Smith	P.O. Box 202 Moonbeam, Ontario POL 1V0 (705) 367-2185
Northeastern	D.C. Constable	P.O. Box 490 Sault Ste. Marie, Ontario P6A 5M7 (705) 949-9461
	W. Ingram	R.R. #1, Site 5 Box 7 Sudbury, Ontario P3E 1X2 (705) 674-0453
Algonquin and Eastern	C.G. Jones	P.O. Box 550 Minden, Ontario KOM 2K0 (705) 286-2650
	P. Bolan	Petawawa National Forestry Institute Chalk River, Ontario K0J 1J0 (613) 589-2932
	A. Keizer	P.O. Box 1150 Kemptonville, Ontario K0G 1J0 (613) 258-5664
Central and Southwestern	W.D. Biggs	P.O. Box 100 Angus, Ontario LOM 1B0 (705) 424-5721
	E.J. Czerwinski	P.O. Box 148 St. Williams, Ontario NOE 1P0 (519) 586-2041

SPECIAL SURVEYS IN 1989

The plantation survey program is a long-term project that has been carried out to gather baseline data on the various pests influencing the development of conifer plantations in Ontario. The species examined

in 1989 were black spruce (*Picea mariana* [Mill.] B.S.P.) in northern Ontario and white pine (*Pinus strobus* L.) in southern Ontario. As usual, each ranger attempted to examine two plantations in each of the height categories <2 m, 2-6 m and >6 m. At each plantation, 150 trees were examined. Two visits were made to each site, timed to coincide with the periods during which various pests were active. In all, 82 plantations were examined, 41 for each species, with a total of 6,150 trees of each species examined. Results were as follows.

Black Spruce Plantations

Insects: The only insect that was encountered in significant numbers was the spruce budworm (*Choristoneura fumiferana* Clem.), which was found in 17 of the 41 plantations, and affected 1,777 trees (29% of the total). All but one of the affected plantations were in the North Central or Northwestern regions, which is where the current spruce budworm outbreak is located. The most severe damage was recorded in single plantations in the Sioux Lookout and Nipigon districts, where 66% of the trees were infested and average defoliation was 60 and 50%, respectively. The overall average defoliation on infested trees in these districts was 5%. The white pine weevil (*Pissodes strobi* [Peck]) infested 137 trees (2.2% of the total). The most severe damage was in a plantation in Ignace District, in which 19.3% of the trees were weevilled. In all other instances, damage was less than 10%. The yellowheaded spruce sawfly (*Pikonema alaskensis* [Roh.]) was found on 6 trees (<1% of the total) and feeding damage by adult sawyer beetles (*Monochamus* sp.) occurred on six trees.

Diseases: The only diseases found in any abundance were the spruce needle rusts, (*Chrysomyxa ledi* [Alb. & Schwein.] de Bary and *C. ledicola* [Peck] Lagerh.), which were found on 1,552 trees (25% of the total). The average defoliation caused by the rusts was approximately 1%. The most severely affected plantation was in the Chapleau District, where 72% of the trees were infected with an average of 14.5% defoliation. Frost damaged an average of 3% of the new shoots on 583 trees (9% of the total).

White Pine Plantations

Insects: Insect population levels were generally low in the white pine plantations examined. The most numerous insect was the pine spittlebug (*Aphrophora cribrata* [Wlk.]), which was found infesting 492 trees (8% of the total). Of this total, 150 trees (100% of the trees examined in one plantation) were located in South Walsingham Township, Simcoe District. Actual damage caused by this pest was quite low. The second most abundant insect was the pine bark adelgid (*Pineus strobi* [Htg.]), which occurred in 5 plantations on 308 trees (5% of the total). The white pine weevil destroyed the leaders on 185 trees (3% of the total) in 21 plantations and the eastern pine shoot borer (*Eucosma gloriola* Heinr.) was recorded in 12 plantations, infesting a total of 61 trees (1% of the total).

Diseases: White pine blister rust (*Cronartium ribicola* J.C. Fischer) was the most abundant disease, occurring in 22 plantations on 185 trees (3% of the total). Of these, 123 supported stem cankers caused by the organism. No other diseases were found in any significant numbers. Armillaria root rot (*Armillaria mellea* [Vahl:Fr.] Kummer) occurred in five plantations on <1% of the trees and basal stem cankers of undetermined origin were observed in five plantations on <1% of the trees. Mortality of undetermined cause was recorded in eight plantations, affecting <1% of the total trees.

Cone and Seed Studies in 1989

This long-term project focused on white pine in southern Ontario and black spruce in northern Ontario. For the black spruce survey, each ranger collected 100 cones from an upland site, preferably a seed-production area, and 100 cones from a lowland site. The cones were mature and fully developed but still green and not yet hardened off. The samples were dissected and analyzed at the Sault Ste. Marie laboratory. The methodology was similar for white pine cones in that 100 mature second-year cones were collected by each ranger, preferably from a seed orchard or seed-production area. These cones were also dissected and analyzed at the Sault Ste. Marie laboratory.

Black Spruce

In the black spruce survey, 443 (34%) of the 1,300 cones were damaged by various agents. The proportion of damaged cones ranged from a low of 8% in Marson Township, Fort Frances District, to a high of 87% at a site on the Vermilion Road, Sioux Lookout District. Seed loss within damaged cones averaged 3.3% and ranged from a low of 0.5% in Hoey Township, Chapleau District, to a high of 72% at the site on Vermilion Road, Sioux Lookout District. The principal agents causing the damage and seed loss were as follows: the spruce cone axis midge (*Dasineura rachiphaga* Tripp), the spruce cone maggot (*Lasiomma anthracinum* [Czerny]), the spruce micro moth (*Endopiza piceana* [Free.]), the spruce cone rust (*Chrysomyxa pirolata* [Körn] Winter), unknown lepidoptera, unknown agents, and the spruce seed moth (*Cydia strobilella* [L.]).

White Pine

A total of 600 white pine cones was dissected in this part of the survey. Forty-one of these were damaged, with an average seed loss within damaged cones of 37%. The proportion of damaged cones ranged from a low of 19% in Kirkwood Township, Blind River District, to a high of 76% in Hungerford Township, Tweed District. The principal agents causing the damage were the white pine cone borer (*Fucosma tocullonana* Heinr.), the white pine cone beetle (*Conophthorus coniperda* [Schw.]), a cone midge (*Resseliella* sp.), unknown lepidoptera, unknown agents and the fir coneworm (*Dioryctria abietivorella* [Grt.]).

SURVEYS PLANNED FOR 1990

Following are some of the specific surveys being carried out in 1990. It should be noted that these studies are in addition to normal surveillance for major insects and diseases, introduced pests and other regular FIDS work.

Seed Orchard Surveys

This field season, FIDS will begin a preliminary study to determine what pests (insect or disease) and abiotic problems are present in seed orchards in Ontario. Accordingly, each ranger in northern Ontario's Northwestern, North Central and Northern regions will examine four seed or clonal orchards. These examinations will consist of at least one orchard of each of black spruce, white spruce (*Picea glauca* [Moench] Voss) and jack pine (*Pinus banksiana* Lamb.). Two visits will be made to each orchard in order to observe the various pests and other problems that might be expected in these types of plantations. Cones will also be collected for dissection and analysis in order to determine the effects of pest damage on seed production and the agents responsible for the damage.

Maple Health Studies

Since 1987, the FIDS unit has established a network of 131 plots throughout the range of sugar maple (*Acer saccharum* Marsh.) to determine the health of this species and to detect whatever changes may occur. The plots are sited in urban, rural-roadside and woodlot situations. Evaluations of the trees in these plots will continue in 1990 and a few extra plots will be established to fill out the total planned survey.

In addition to the above, FIDS will continue to participate in the North American Maple Project. This is a joint Canada-United States project to study sugar maple throughout its range in sugar bush and undisturbed maple stands within various acid-deposition zones. A number of parameters are measured that relate to site and stand conditions as well as the current condition of each tree and insect and disease conditions in each stand. The data collected will be analyzed to determine the rate of change, if any, over the 3-year period from 1988 to 1990.

Pheromone Studies

Studies aimed at developing the use of insect pheromones will continue for a variety of insects. These include the spruce budworm, oak leaf shredder (*Croesia semipurpurana* [Kft.]) and black army cutworm (*Actebia fennica* [Tausch.]).

Surveys for the European Race of Scleroderris Canker

Surveys for the European race of this canker (*Ascoalyx abietina* [Lagerb.] Schläpfer-Bernhard) will continue in 1990. These consist of a large-scale aerial survey and detailed examination of a number of select-

ed plantations in southern Ontario. These surveys were extended to the North Bay District of Northeastern Region this year because of its proximity to known locations of the European race in Parry Sound District. All sites where the European race is known to occur will again be examined to determine the effect of sanitation procedures and to see if any spread of the disease has occurred.

G.M. Howse
Chief, FIDS

M.J. Applejohn
Head FIDS Ranger

13 August 1990