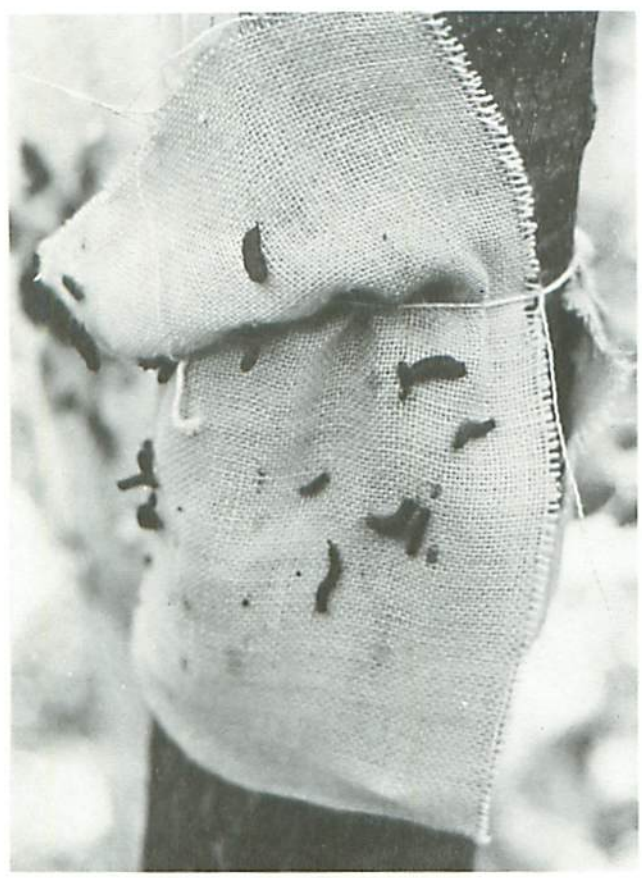


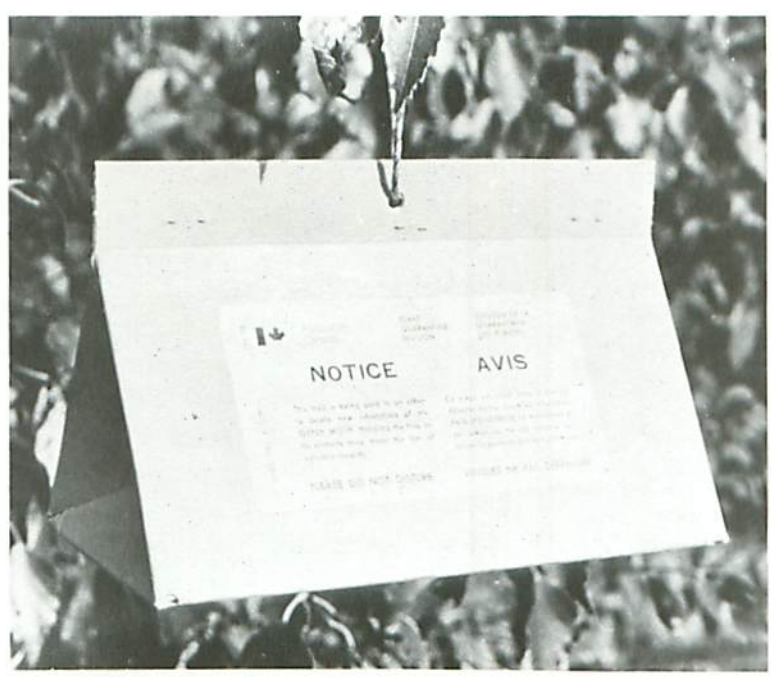
SURVEY BULLETIN

33237

Forest Insect and Disease Conditions in Ontario
 Spring 1983



Gypsy moth larval trap



Gypsy moth pheromone trap

FOREST INSECT AND DISEASE CONDITIONS IN ONTARIO

Spring 1983

The spring Survey Bulletin is the first of three produced annually by the Forest Insect and Disease Survey Unit (FIDS) which detail forest pest conditions in Ontario. The summer and fall bulletins are usually issued in mid-August and October.

SURVEY TECHNICIAN FIELD ASSIGNMENTS FOR 1983

There have been a number of changes in survey technician field assignments this year. Mr. R.J. Sajan has been promoted to Regional Supervisor, replacing K.C. Hall who retired in October 1982, and has been assigned to the Fort Frances District. The vacancy created by the promotion of R.J. Sajan was filled by Alan J. Keizer, a new district survey technician in training who was assigned to the Chapleau District. D.C. Constable was transferred from Chapleau to Sioux Lookout and M.J. Thomson was reassigned from Sioux Lookout to Sault Ste. Marie. C.G. Jones was transferred from Fort Frances to Kapuskasing and W.A. Ingram from Kapuskasing to Kemptville.

A complete list of Survey Field Technicians and their addresses is given below:

<u>Region</u>	<u>Name</u>	<u>Address</u>
Northwestern	R.J. Sajan	210 Butler Ave., Fort Frances, Ont. P9A 2N7 (807) 274-6821
	D.C. Constable	R.R.#1, Site 25, Box 9, Sioux Lookout, Ont., POV 2T0 (807) 737-3630
North Central	W.D. Biggs	R.R. #6, Postal Stn. "F", Thunder Bay, Ont. P7C 5N5 (807) 577-8612
	V. Jansons	Box 495, Geraldton, Ont. POT 1M0 (807) 854-1317
Northern	L.S. MacLeod	Box 267, Temagami, Ont. POH 2H0 (705) 569-3467
	A.J. Keizer	Box 817, Chapleau, Ont. POM 1K0 (705) 864-1042
	C.G. Jones	Box 202, Moonbeam, Ont. POS 1V0 (705) 367-2185

<u>Region</u>	<u>Name</u>	<u>Address</u>
Northeastern	M.J. Thomson	Box 490, Sault Ste. Marie, Ont. P6A 5M7 (705) 949-9461
	E. Czerwinski	S.S. #1, Site 5, Box 7, Sudbury, Ont. P3E 1X2 (705) 674-0453
Algonquin and Eastern	H.J. Weir	c/o OMNR, Minden, Ont. KOM 2K0 (705) 286-2650
	H. Brodersen	PNFI, Chalk River, Ont. KOJ 1J0 (613) 589-2932
	W.A. Ingram	Box 1150, Kemptville, Ont. KOG 1J0 (613) 258-5664
Central and Southwestern	H.J. Evans	Box 100, Angus, Ont. LOM 1B0 (705) 424-5721
	C.A. Barnes	R.R. #1, St. Williams, Ont. NOE 1P0 (519) 586-2041

SPECIAL SURVEYS OF RED PINE AND JACK PINE PLANTATIONS

In 1982 special pest surveys were carried out in red pine plantations in southern Ontario and jack pine plantations in northern Ontario. This was part of an ongoing program to obtain information on the prevalence and impact of pests affecting high-value stands in the province. Both red pine and jack pine were previously surveyed in 1979.

Red Pine Plantations

A total of 30 red pine plantations were examined in southern Ontario, 10 in each of the <2 m, 2-6 m, and >6 m height categories. Two visits were made to each plantation in order to sample for a wide variety of insect and disease pests.

Insects

The most abundant insect was the pine false webworm, *Acantholyda erythrocephala* (Linn.), which was found in eight plantations, most in the <2 m and 2-6 m categories. The most severe damage occurred in the Huronia District of the Central Region where 73% of the trees were attacked and defoliation averaged 25%. The insect was encountered in all regions except the Southwestern, as was the case in the 1979 survey.

The European pine sawfly, *Neodiprion sertifer* (Geoff.), was found in seven plantations, mainly in the Central and Southwestern regions. As in 1979, defoliation was light.

The European pine shoot moth, *Rhyacionia buoliana* (Schiff.), and the eastern pine shoot borer, *Eucosma gloriola* Heinr., were found in five and three plantations, respectively. Both insects were found at very low levels.

Insects which were searched for but not found were the pine root collar weevil, *Hylobius radicis* Buch., and the redheaded pine sawfly, *Neodiprion lecontei* (Fitch).

Diseases

The North American race of Scleroderris canker disease, *Gremmeniella abietina* (Lagerb.) Morelet, was not encountered during the 1982 survey although it was found in two plantations in the 1979 survey. Armillaria root rot, *Armillaria mellea* (Vahl ex Fr.) Kumm., was detected in two plantations where it caused 1% and 2% mortality, respectively. Needle cast, *Lophodermium* sp., was found in two plantations and needle rust, *Coleosporium asterum* (Diet.) Syd., was found in ten plantations. Foliar damage caused by both organisms was either trace (1-5%) or low (6-25%) in all cases.

Jack Pine Plantations

In northern Ontario a total of 54 jack pine plantations were examined. As in the case of the red pine survey, plantations in three height categories, <2 m, 2-6 m and >6 m, were examined. However, in this case each ranger established two permanent sample plots in plantations in the <2 m category. In each of these plantations 300 trees were tagged and will be monitored twice yearly to determine the presence of a number of pest organisms and their effect on these young stands.

Insects

The eastern pine shoot borer was the insect most commonly encountered, being found in 21 plantations. Damage, however, was usually minor, with an average of 1.2% of the leaders destroyed. The only exception was in a plantation in the Timmins District where 9% of the leaders were infested.

The white pine weevil (*Pissodes strobi* [Peck]) was found in 19 plantations with overall leader damage averaging 0.7%. The most severe damage occurred in a plantation in Gogama District where 11% of the leaders were destroyed.

The jack pine tip beetle, *Conophthorus banksianae* McPherson, occurred in 15 plantations, with the highest incidence in a plantation in Thunder Bay District which sustained 11% leader damage. The overall incidence was 0.6%. The prevalence and population levels of the above three insects were very similar to those encountered in the 1979 survey. Other insects which were found in low numbers were the northern pitch twig moth, *Petrova albicapitana* (Busck.), the jack pine budworm, *Choristoneura pinus pinus* Free., and the jack pine sawfly, *Neodiprion pratti banksianae* Roh. Populations of these insects were generally low and damage was insignificant.

Diseases

Scleroderris canker disease was present in five plantations; however, only two of these which were growing on poor sites had significant damage. Although *Armillaria* root rot was found in 11 plantations, infection levels were 1% or lower, except at one location in Thunder Bay District, where 2% of the trees were infected.

Stem rusts, *Cronartium* spp., and needle rust, were found in 11 and 15 plantations, respectively. The overall percentage of trees affected by stem rusts was very low and although 50% were affected by needle rust in several cases, foliar damage was under 3% in all plantations. Globose gall rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirat., was found in a total of 27 plantations, including all those examined in the Northwestern Region.

The needle cast disease, *Davisomycella ampla* (Davis) Darker, occurred in 17 plantations, but with one exception, foliar damage was very low.

CONE AND SEED STUDY

In a continuing program to assess the pest problems associated with tree seed production in Ontario, the FIDS unit carried out a study of red pine and jack pine cones from southern and northern Ontario, respectively, in 1982.

Jack Pine Cones

Each district survey technician in northern Ontario collected 100 second-year cones which were fully developed but still in the green succulent stage. Wherever possible, the cones were collected from seed orchards or seed production areas. The cones were then shipped to the laboratory where they were dissected and checked for insect and disease damage.

The proportion of cones damaged by insects ranged as high as 41%; however, the average for the nine locations sampled was 26%. Overall seed loss averaged 6% but ranged as high as 90% within damaged cones. Some of the insects causing damage could not be identified but the major insects causing seed losses were the webbing coneworm, *Dioryctria disclusa* Heinrich, and some other unidentified species of Lepidoptera. No disease problems were encountered.

Red Pine Cones

The counterpart to the jack pine cone survey described above was a survey of red pine cones in southern Ontario. Survey technicians in southern Ontario collected 100 green but fully developed red pine cones from five seed production areas in the Southwestern, Central, Eastern and Algonquin regions. The cones were then shipped to the Sault Ste. Marie laboratory for examination.

As with jack pine, no disease problems were encountered on the cones but a number of insect pests were identified. The most serious of these, causing the bulk of seed losses, were the red pine cone borer, *Eucosma monitorana* Heinrich, the webbing coneworm and the red pine cone beetle, *Conophthorus resinosae* Hopkins. The following insects were also found in low numbers: the red pine coneworm, *Dioryctria resinosella* n. sp. Mutauura (*D. zimmermani*) Heinrich, the spruce coneworm, *D. reniculoides* Mat. & Mun., the fir coneworm, *D. abietivorella* (Grt.), an undetermined species of *Dioryctria* and a cone midge, *Asynaptera* sp. External feeding damage by larvae of unknown Lepidoptera was also observed.

The overall impact of insects resulted in seed production losses as high as 80%. The proportion of damaged cones ranged from 6 to 99% and seed loss within damaged cones ranged from 54 to 82%.

From the above figures it is evident that insect pests have a significant effect on red pine seed production in southern Ontario.

RESULTS OF SURVEYS FOR THE EUROPEAN RACE OF SCLERODERRIS CANKER DISEASE

In 1982, for the sixth consecutive year, the FIDS unit carried out extensive surveys for the European race of this disease. These included detailed examination of 70 large, strategically located red pine plantations, and an aerial survey of pine in southern Ontario. Suspect areas identified from the air were then ground checked. In addition, a large number of pine plantations were examined in the course of day-to-day survey work.

To supplement the FIDS effort, the Ontario Ministry of Natural Resources contracted a survey in the Eastern Region for the second consecutive year. K.B.M. Forestry Consultants of Thunder Bay carried out the work which involved intensive examination of 246 pine plantations located east of Highway 31 and south of Highway 43. Suspect material was forwarded to the Great Lakes Forest Research Centre where it was checked for the presence of the disease.

All samples from both the FIDS survey and the OMNR contract survey were negative, and consequently it may be assumed that Ontario remains free of the European race of *Scleroderris* canker disease.

SPECIAL PEST SURVEYS PLANNED FOR 1983

Plantation Survey

This year surveys of plantations will concentrate on white pine in southern Ontario and black spruce in northern Ontario. These species were last examined in 1980 and are being looked at again as part of a continuing program to secure baseline data on insect and disease pests of high-value stands in Ontario. In the white pine survey, each technician in the Northeastern, Algonquin, Eastern, Central and Southwestern regions will examine six white pine plantations, two in each of the <2 m, 2-6 m and >6 m height categories. The plantations will each be visited twice in order to check for the presence, abundance and impact of a wide variety of insect and disease pests. The black spruce survey will be similar in that each technician in the Northern, North Central and Northwestern regions will examine six plantations on two occasions, using the height categories listed above.

Cone and Seed Study

Since 1980, the FIDS unit has carried out studies of the various pests affecting cone and seed production in a number of important tree species in Ontario. This field season, surveys will concentrate on white pine in southern Ontario and black spruce in northern Ontario. This is the first time white pine cones have been examined. A survey of black spruce flowers and cones was made in 1980. Survey technicians in southern Ontario will each collect 100 second-year white pine cones, as close to full development as possible but still in the green succulent stage. Wherever possible samples will be taken from seed orchards or seed production areas. In northern Ontario each technician will make two collections of 100 cones. Where possible, one collection will be from a seed orchard or seed production area and the other from black spruce growing on a lowland site. All cones will be shipped to the Sault Ste. Marie laboratory where they will be dissected and assessed for the proportion of cones damaged, the proportion of seeds damaged and the causal agents. In addition, a supplemental study of oak acorns will be conducted this year to determine the species, prevalence and impact of pests.

SPECIAL GYPSY MOTH LARVAL TRAPPING PROGRAM

A special larval and pheromone trapping program will be carried out jointly by the FIDS unit of the Great Lakes Forest Research Centre and the Parks Branch of the Ontario Ministry of Natural Resources this summer. FIDS field technicians will visit each provincial park in southern Ontario early in the field season while gypsy moth larvae are still small, and will instruct parks personnel in the deployment of bur-lap larval traps and pheromone traps. The parks personnel will deploy the traps in appropriate locations within the parks and will monitor them during the larval feeding period. Insects collected in quarantine containers supplied by the field technicians will be forwarded by parks personnel to the Great Lakes Forest Research Centre for identification. Staff at the Centre will then notify both the field technician and parks personnel involved if any positive catches are made. The program should be of benefit to both parties in that FIDS will be able to carry out a much larger larval trapping program to detect the spread of gypsy moth than would otherwise be possible, and parks personnel will be aware at a very early stage of the presence of this insect.

FOREST INSECTS

Spruce budworm, *Choristoneura fumiferana* (Clem.)

A summary of spruce budworm infestation forecasts as set forth in last fall's Survey Bulletin is given below.

In southern Ontario, egg-mass densities decreased by 17%. This is the third successive year of egg-mass decline and it is expected that this will result in a further decrease in the area of moderate-to-severe defoliation in 1983. Generally light defoliation is expected in southern Ontario with the possible exception of the northern part of the Algonquin Region where scattered pockets of moderate-to-severe defoliation will likely persist.

In northeastern Ontario egg-mass densities fluctuated somewhat, and there was an overall decline of 4%. This follows declines of 51% in 1980 and 46% in 1981. Generally, forecasts for 1983 indicate that scattered moderate-to-severe defoliation will occur on white spruce and balsam fir through the southern parts of the Sault Ste. Marie, Blind River and Espanola districts and a large part of the Sudbury and North Bay districts. Moderate-to-severe defoliation will probably recur north of Lake Superior Park in Wawa District and the infestation in the Geraldton and Terrace Bay districts will likely expand slightly to the northwest. Scattered pockets of moderate-to-severe defoliation are expected to persist around Lake Abitibi in Cochrane District and in the southern part of Temagami District. The infestation in Hearst District will probably decline slightly but there are still sufficient egg masses that moderate-to-severe defoliation will likely result. Generally, low

numbers of spruce budworm are expected in the Chapleau, Gogama, Timmins and Kirkland Lake districts.

In 1982 a large increase in egg masses occurred in northwestern Ontario for the second consecutive year. It is possible that the area of moderate-to-severe defoliation will double in 1983 with most of the expansion occurring on the periphery of currently infested areas.

Although winter weather was relatively mild, the unusually cold spring has somewhat retarded insect development. Spruce budworm in the Eastern Region were reported in the needle mining stage the week of 9 May.

The Ontario Ministry of Natural Resources plans to spray a total of approximately 3,500 ha of high-value forest against spruce budworm in 1983. Most of this is located in the Hearst District and the bulk of the area will be treated with the bacterial insecticide *Bacillus thuringiensis* (B.t.). About 300 ha will be treated with Matacil.

Oak Leaf Shredder, *Croesia semipurpurana* (Kft.)

As reported in the fall 1982 Survey Bulletin, egg surveys for this insect indicate that populations should remain generally low in Ontario in 1983. An exception to this is in the Dufferin County Forest and adjacent areas of the Simcoe County Forest in Tosorontio and Mulmur townships, Huronia District. In this area, populations have built up steadily since 1981 and egg counts indicate that moderate-to-severe defoliation will again occur in 1983. The Ontario Ministry of Natural Resources plans to protect high-value oak stands within the Dufferin and Simcoe county forests in late May. Approximately 650 ha will be treated with the chemical insecticides Orthene and Sevin-4-oil and the bacterial insecticide B.t. Preliminary surveys indicate that oak leaf shredder eggs began hatching the week of 9 May and that high populations persist in the above area.

LABORATORY STAFF

Last spring the Survey Bulletin featured photographs of the FIDS field staff. This spring we would like to introduce the FIDS laboratory staff who identify, evaluate and help to solve the many pest problems which occur each year.

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