

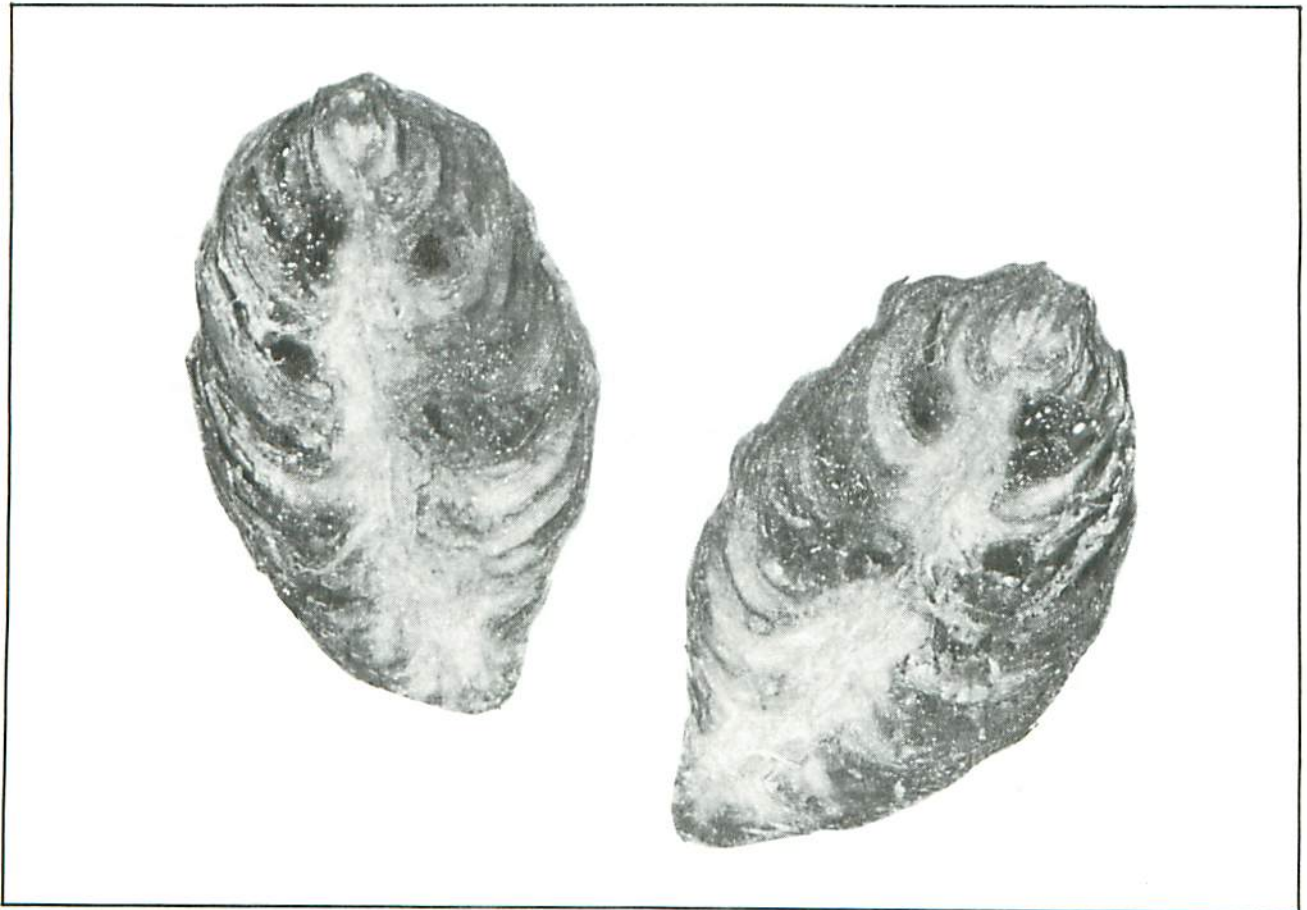
Environment  
CanadaEnvironnement  
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des Forêts

# SURVEY BULLETIN

33231

Forest Insect and Disease Conditions in Ontario

Spring 1981



Black spruce cone showing damage by the spruce cone maggot,  
*Lasiomma* (= *Hylemya*) *anthracina* Czerny.

Region

Northeastern	K.C. Hall	Box 490, Sault Ste. Marie, Ont. P6A 5M7	(705) 949-9461
	E. Czerwinski	SS #1, Site 5, Box 7, Sudbury, Ont. P3E 1X2	(705) 674-0453
Northern	L.S. MacLeod	Box 267, Temagami, Ont. POH 2H0	(705) 569-3467
	D.C. Constable	Box 817, Chapleau, Ont. POM 1K0	(705) 864-1042
	W.A. Ingram	Box 202, Moonbeam, Ont. POS 1V0	(705) 367-2185
North Central	W.D. Biggs	RR #6, Postal Stn. "F" Thunder Bay, Ont. P7C 5N5	(807) 577-8612
	V. Jansons	Box 495, Geraldton, Ont. POT 1M0	(807) 854-1317
Northwestern	M.J. Thomson	RR #1, Site 25, Box 9 Sioux Lookout, Ont. POV 2T0	(807) 737-3630
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RESULTS OF SURVEYS FOR THE EUROPEAN RACE OF SCLERODERRIS CANKER

For the past several years the field arm of FIDS has conducted a search for the European race of Scleroderris canker, concentrating mainly in southern Ontario. To date the disease has not been detected in Ontario, although it has been present for several years in New York state, where it has caused significant damage. It was also found recently in Quebec, New Brunswick and Newfoundland. In 1980, survey field staff intensively sampled 70 pine plantations in southern Ontario. At each location a minimum of 500 trees were scrutinized and any suspect tissue was forwarded to the Great Lakes Forest Research Centre for testing. Also examined were all provincial forest tree nurseries in southern Ontario. An additional 200 plantations were less intensively examined during the course of day-to-day survey work. Aerial surveys of susceptible areas were carried out with negative results.

In 1981 a similar effort is planned with aerial surveys of the southern part of the province, intensive examination of a similar number of selected plantations and general surveys of as many additional areas as possible. An intensive detection survey of pine plantations in the Cornwall district, adjacent to Quebec and New York, is planned.

SCLERODERRIS WORKSHOP AND PEST REVIEW IN EASTERN REGION

On 20 May, 1981 a Scleroderris workshop and forest pest review attended by 50 staff members of the Ontario Ministry of Natural Resources, Domtar, Agriculture Canada and the Canadian Forestry Service (FIDS) was

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This bulletin is the first of three which will be issued during the 1981 field season. The second will be released in early August and the third in early October.

## PERSONNEL CHANGES

Since the fall of 1980, retirements and subsequent competitions to fill positions have resulted in a number of changes in the field staff of the Forest Insect and Disease Survey (FIDS).

M.J. (Mike) Applejohn was appointed Chief of Field Technicians, replacing L.L. (Mac) McDowall who retired in December 1980.

Angus Harnden also retired in December 1980 and his position, now known as that of Insect Control Technician, has been filled by H.D. (Doug) Lawrence. Doug will be working with Joe Meating on timing and assessment of spruce budworm control operations being carried out by the Ontario Ministry of Natural Resources this summer.

The two Regional Supervisor vacancies created by the promotions of Messrs. Lawrence and Applejohn were filled by Hugh Evans and Bill Biggs, who will be stationed at Angus in the Central Region and Thunder Bay in the North Central Region, respectively.

The vacancies created by these promotions in turn were filled by two new recruits, Chuck Jones and Ed Czerwinski, with the former stationed in the Fort Frances District and the latter assigned to the Sudbury District.

V. Jansons was transferred from Fort Frances to Geraldton and H. Brodersen was reassigned from Sudbury to Chalk River.

The names and addresses of Survey Field Technicians are given below:

### Region

Central and Southwestern	H.J. Evans	Box 100 Angus, Ont.	LOM 1B0	(705) 424-5721
	C.A. Barnes	RR #1, St. Williams, Ont.		
		NOE 1P0		(519) 586-2041
Algonquin	H.J. Weir	c/o OMNR, Minden, Ont.		
		KOM 2K0		(705) 286-2650
	H. Brodersen	PNFI, Chalk River, Ont.		
		KOJ 1J0		(613) 589-2932
	R.J. Sajan	Box 1150, Kemptville, Ont.		
		KOG 1J0		(613) 258-5664

held at the White House Motel in Brockville in the Eastern Region. The pest review took place in the morning with presentations by Harvey Weir and Bob Sajan, FIDS field technicians. Subjects discussed included: major regional pest problems in 1980, insect and disease forecasts for 1981, possible future insect and disease problems in the area, and the FIDS field program for 1981. Phil Anslow, Regional Forester, Eastern Region, OMNR, led off the review with an overview of forest resources and forest management in the region.

The Scleroderris Workshop, conducted in the afternoon, was led by Henry Gross of FIDS and Bruce McGauley of OMNR's Pest Control Section. Topics discussed included: identification of the disease, explanation of races, biology of the disease, hosts, damage impact, control, history and current status of the disease in North America, research in progress, and detection surveys being conducted for the European race. Bob Straby and Neil Milroy of Agriculture Canada discussed quarantines and regulatory action for Scleroderris canker.

#### SPECIAL SURVEYS OF WHITE PINE AND BLACK SPRUCE PLANTATIONS

In 1980, white pine plantations in southern Ontario and black spruce plantations in northern Ontario were surveyed to obtain baseline data on a number of pest problems affecting these species.

##### White Pine Plantations

Survey technicians sampled a total of 40 white pine plantations selected at random throughout the Northeastern, Algonquin, Eastern, Central and Southwestern regions. Each technician attempted to sample two plantations in the following height ranges: < 2m, 2-6 m and > 6 m. The results are given below.

##### Insects

The most serious pest encountered was the white pine weevil (*Pissodes strobi* Peck), which was present in 53% of the stands examined. An average of 8% of the leaders were weeviled. Trees more than 2 m high were most affected, probably because populations had not had time to build up on smaller trees. The insect was not encountered in plantations examined in the Eastern Region, possibly because of control programs carried out in this region.

The pine bark adelgid (*Pineus strobi* [Hartig]) was the most commonly found insect: it was present in 58% of the stands sampled. However, in all cases infestations were light and damage was minimal.

Other insects present included the pine spittlebug (*Aphrophora cribrata* [Say]), the pine false webworm (*Acantholyda erythrocephala* [L.]) and the eastern pineshoot borer (*Eucosma gloriola* Heinrich). Although these insects are potentially threatening to white pine plantations, populations were very low and damage was negligible in all instances in which they were collected during this survey.

#### Diseases

Armillaria root rot (*Armillaria mellea* [Vahl ex Fr.] Kummer) was detected in only 10% of the plantations examined, and in these, 2% of the trees or fewer were affected. This suggests that the disease is not at present a significant factor in the management of young white pine plantations in Ontario.

A specific search for Verticicladiella root disease (*Verticicladiella procera* Kendr.) was carried out in each of the plantations inspected and although the disease has been collected previously in Ontario it was not found in the course of this survey. Basal stem cankers, which are usually fatal and are similar to the damage caused by the above disease, were detected in 10% of the stands examined. Generally fewer than 1% of the trees were affected although two plantations in the Algonquin Region had 7% of their trees damaged.

White pine blister rust (*Cronartium ribicola* J.C. Fischer) was the most serious disease present. Incidence ranged from 0 to 15%, with an average of 3.3%. Stem cankers of a type that are usually fatal to the tree were present on about half the infected trees.

The only significant foliar damage was attributed to semimature tissue needle blight, which is the result of air pollution. Two plantations in the Algonquin Region were moderately damaged, and occasional trace levels of damage were detected in a few other plantations. Otherwise, damage by foliage diseases was insignificant.

#### Black Spruce Plantations

As in the case of the white pine plantation survey, technicians in the Northwestern and North Central regions attempted to sample two plantations in each of the < 2 m, 2-6 m and > 2 m height classes. A total of 34 plantations were sampled with the following results.

#### Insects

The most important insects collected were the spruce budworm (*Choristoneura fumiferana* [Clem.]) and the spruce coneworm (*Dioryctria reniculelloides* Mut. & Mun.). In plantations situated within the current spruce budworm infestation, 47% of the trees were infested, with defoliation averaging 5% and ranging as high as 35%. The spruce coneworm, on

the other hand, was detected only in the North Central Region in stands more than 2 m tall, and fewer than 10% of the trees were attacked. Both insects, however, caused considerable cone and flower damage even at these low population levels. In the Northern and North Central regions, 55% and 18% of the cones, respectively, were damaged. Small numbers of the fir coneworm (*Dioryctria abietivorella* [Grote]) were also present at these locations. Other insects which caused significant cone damage in the Northwestern Region were the spruce cone maggot (*Lasiomma* [= *Hylemya*] *anthracina* Czerny) and the spruce cone axis midge (*Dasyneura rachiphaga* Tripp), which were present in 19% of the cones examined.

Potentially destructive insects which were encountered in low numbers were the yellowheaded spruce sawfly (*Pikonema alaskensis* [Roh.]), which caused 10% defoliation in one plantation, and the white pine weevil, which was present in 22% of the stands. The latter caused insignificant damage in all cases except one, in which 9% of the leaders were destroyed. Feeding damage by adult sawyer beetles (*Monochamus* spp.) was negligible.

#### Diseases

No serious disease damage was found in the black spruce plantations surveyed. Spruce needle rust was present at low levels in three stands, and although *Armillaria* root rot was observed in four plantations, associated mortality was less than 1% in all cases. No other diseases were found.

#### Abiotic

Frost and cold damage was widespread in northern Ontario in 1980. In the plantations sampled in the North Central and Northwestern regions, 27% of the trees were affected by frost, with an average of 13% of the foliage damaged. Frequently the terminal shoot was killed, and the form of the trees was affected considerably in consequence. In the Northern Region, cold weather accompanied by snow in mid-June damaged 84% of the trees examined, and an average of 23% of the foliage was affected.

### CONE AND SEED STUDY

In 1980, in response to concern expressed by foresters and others about the quantity and quality of black spruce cone and seed production in Ontario, the FIDS Unit undertook a special survey to assess the impact of insects and diseases on seed production. In northern Ontario special collections of black spruce flowers and cones were made to assess damage by insects and diseases to the current seed crop. Collections were timed to coincide with the feeding periods of known cone insects. They were taken from upland and lowland sites

from within and outside the boundaries of the current spruce budworm infestation and, where possible, from budworm-infested and budworm-free trees.

Four major insects were found to be causing significant damage to black spruce flowers and cones. These were the spruce budworm, the spruce coneworm, and two dipterous pests, the spruce cone maggot and the spruce cone axis midge. The types of damage caused by these insects varied. The spruce budworm and spruce coneworm damage the seed crop by feeding on the tissue of the flowers and developing cones. The spruce cone maggot feeds inside the developing cones, consuming the seeds themselves, whereas the spruce cone axis midge bores a hole through the axis of the immature cone, thereby interrupting nutrient supply to the developing seeds.

In the Northern Region medium populations of the spruce budworm and spruce coneworm damaged as many as 92% of the female flowers from upland sites and up to 53% from lowland sites. The resulting cones showed a similar pattern of lepidoptera damage, with 44% of those on upland sites and 27% of those on lowland sites being attacked. The spruce cone maggot and the spruce cone axis midge caused somewhat less damage in this region, with 18 and 5%, respectively, of the cones attacked on lowland sites and insignificant damage on upland sites. In addition, in nine samples from this region, female flowers were almost completely destroyed by a combination of frost and/or spruce budworm, and the cone crop was virtually wiped out in these locations.

In the North Central Region, the spruce budworm and in some places the spruce coneworm damaged up to 92% of the flowers and conelets. The resulting cones suffered between 11 and 88% damage, mainly from the spruce budworm.

In the Northwestern Region damage to flowers by both budworm and coneworm was insignificant. However, up to 41% of the developing cones were attacked by spruce budworm and other lepidopterous insects, with those from upland sites being most severely damaged. Damage by the spruce cone maggot and spruce cone axis midge ranged up to 17 and 23%, respectively.

To sum up, damage to the black spruce flower crop by the spruce budworm and spruce coneworm, in combination with later damage to developing cones by these two insects as well as the spruce cone maggot and spruce cone axis midge, caused significant losses of black spruce seed in northern Ontario. Losses were particularly high in the Northern Region where insect damage occurred in combination with severe frost damage to flowers.

## SPECIAL PEST SURVEYS PLANNED FOR 1981

### High Value Plantation Surveys

Since 1978, the FIDS field program has included surveys to obtain baseline data on various insect and disease pests affecting high-value forest stands or plantations of various tree species. In 1978, white spruce plantations were surveyed in northern Ontario, and jack pine and red pine plantations were sampled in northern and southern Ontario, respectively, in 1979. Black spruce and white pine were examined in northern and southern Ontario, respectively, in the 1980 field program.

This year, high-value white spruce stands in both northern and southern Ontario will be investigated. These will be stands in which some form of investment has been made either in establishment or in stand improvement. Each field technician will attempt to sample six stands, two each in the 0.5-2, 2-6 and > 6 m height classes. Two visits are scheduled for each stand so that trees can be screened for a broad spectrum of insects and diseases, including flower and cone insects and root and butt rot diseases.

### Cone and Seed Study

In a continuing effort to respond to concern expressed by foresters about cone and seed production, the FIDS field program will feature a study to determine the impact of insects and diseases on white spruce seed production. Because of concern expressed about the influence of spruce budworm on flowers and cone production, technicians will sample selected white spruce trees when they are in the late flowering stage, after the flowers are fertilized but before conelets have begun to form. This should make it possible to monitor the effect of spruce budworm and other early pests on white spruce flowering and early cone formation. A second visit will take place as close as possible to the period when cones are picked for seed extraction. This will enable determination of the effect of pests which are active later in the growing season. It is expected that these collections and field observations combined with laboratory analysis of submitted material will enable determination of the insects and diseases present in white spruce flowers and cones and their impact on the seed resource.

### Gypsy Moth Survey

In 1981 the gypsy moth (*Lymantria dispar* [L.]) detection survey will again be carried out in northern Ontario parks, with increased emphasis on trapping operations in the Rabbit Blanket Lake campground in Lake Superior Provincial Park, about 50 km south of Wawa. This is the site where two male moths were captured in 1980. The survey

involves the placement of pheromone traps near the entrances and in the camping areas of major parks. The traps are deployed during the period of male moth flight and all moths captured are examined and identified at the laboratory in Sault Ste. Marie. The program was initiated in 1979 and is carried out with the cooperation of the Plant Quarantine Division of Agriculture Canada.

#### FINAL HANDBOOK NEARS COMPLETION

"Insects of Eastern Hardwood Trees", the final publication in a series by A.H. Rose and O.H. Lindquist which describes insects in eastern Canada, is nearing completion. The handbook, by far the largest in the series, gives detailed information on some 450 insects found on eastern broad-leaved trees and is illustrated with some 500 color photographs. It follows the same format as other publications in the series, providing a means of identifying insects causing damage, biological notes on these insects, and color illustrations. Previous handbooks in the series are "Insects of Eastern Pines", "Insects of Eastern Spruce, Fir and Hemlock", and "Insects of Eastern Larch, Cedar and Juniper". Release is scheduled for late 1981 or early 1982.

#### FIRST RECORD OF A NEW PINE DISEASE IN ONTARIO

Brown spot needle blight of pines caused by the fungus *Scirrhia acicola* (Dearn) was first recorded in Ontario in the fall of 1980 when the fungus was identified on material submitted to the Sault Ste. Marie laboratory by personnel of the Ontario Ministry of Natural Resources. The disease was found to be damaging a number of ornamental mugho pines at Sauble Falls Provincial Park, about 40 km northwest of Owen Sound. At present this represents its only known occurrence in Ontario. In 1981, FIDS technicians will make a concentrated search in the Sauble Falls area to determine the extent of the present infection, and a more general survey across the remainder of southern Ontario to determine if the disease is more widespread than is indicated by this single collection.

The fungus is characterized by straw-yellow spots which appear on the needles from May through October. These later turn dark brown, the needle begins to die, and is usually shed in the fall. In severe cases branches may be killed but usually buds of infected branches will remain healthy and produce foliage the following year. While brown spot needle blight is not usually fatal, it causes extensive losses to Christmas tree growers and producers of ornamental pine planting stock, as the browning and shedding of foliage often renders trees unmerchantable.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Egg-mass counts, carried out in the fall of 1980, showed an overall decrease of some 45%. As a consequence the total area infested in 1981 will probably diminish although egg counts are still high enough to cause moderate-to-severe defoliation throughout most of the area defoliated in 1980.

In southern Ontario there will probably be a general decrease in populations, although large areas in the Algonquin Region are expected to remain infested. In northeastern Ontario, although egg-mass densities showed an overall decline, little change is expected in the area infested since residual populations are still sufficiently high to cause moderate-to-severe defoliation. In contrast to the general trend, increased numbers of egg masses were found in the Geraldton and Terrace Bay districts of the North Central Region and infestations there are expected to expand westward in 1981. In northwestern Ontario, modest expansion of infested areas is expected in spite of some decline in egg mass densities in the Thunder Bay and Atikokan districts.

In spite of warm weather in late February and in March, unseasonably cool weather in April and early May has slowed budworm development considerably. As a result, except in southern Ontario, the insects are still in the needle mining stage, and indeed had not yet emerged from hibernation in more northerly locations such as Geraldton and Hornepayne as of 19 May.

The Ontario Ministry of Natural Resources is carrying out aerial spraying operations to protect approximately 10 000 ha, mainly in the Northern Region. The agents employed are Matacil and B.t. and virus formulations. Spraying began on 20 May in the Temagami area.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Forecasts based on overwintering egg masses indicate that infestations will persist in three regions in 1981. In northwestern Ontario, light infestations are expected in the Fort Frances District and medium-to-heavy infestations in the vicinity of Thunder Bay will probably persist at about the same level as in 1980. In the Northeastern Region, small infestations in each of the Sudbury, Espanola and North Bay districts are expected to expand considerably. In the Northern Region, the infestation near Englehart in the Kirkland Lake District will increase in size and several pockets of severe defoliation are expected in the Cochrane District. Barring unusual environmental conditions these predictions should be reasonably accurate. Examination of forest tent caterpillar egg masses in the Sudbury District on 15 May revealed that egg hatching was under way at that time.

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

Preliminary reports from southern Ontario indicate that egg hatch has occurred and larval feeding is under way. Forecasts at all locations in the Central Region that were treated with Orthene in 1980 indicate that residual populations are quite low and consequently no control operations are planned for 1981. Elsewhere in the Central Region populations are expected to remain high.

Cedar Leaf Miners, *Argyresthia aureoargentella* Brower,  
*A. canadensis* Free.,  
*A. thuiella* Pack. and *Pulicalvaria thujella* Kft.

While early reports from southern Ontario are still somewhat sketchy it is evident that high populations persist at many locations. Substantially increased numbers are present in the Lindsay District of the Central Region and in a number of areas in the Southwestern Region.

More detailed information on these and other early forest pests will be provided in the summer issue of the Survey Bulletin.

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