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Pembroke District, 1969
Reports of Forest Research Technicians

Trieselmann, R.A.

Information Report
(Forest Research Laboratory, Ontario Region)

O-X-123



OUR FILE NO.
NOTRE DOSSIER N°

YOUR FILE NO.
VOTRE DOSSIER N°

DEPARTMENT OF FISHERIES AND FORESTRY
CANADIAN FORESTRY SERVICE

MINISTÈRE DES PÊCHES ET DES FORÊTS
LE SERVICE CANADIEN DES FORÊTS

FOREST RESEARCH LABORATORY
BOX 499
SAULT STE MARIE, ONT.

25 May 70

Dear Sir:

This is a composite of 18 individual Information Reports of Forest Insect and Disease Surveys which were issued and mailed several weeks ago to district foresters and other key forestry personnel in the various districts across Ontario. These reports were numbered consecutively as listed under the table of contents beginning with Lindsay District as O-X-115 and continuing to Fort Frances District as O-X-134, with Geraldton and White River combined as O-X-131. The content is confined to the results of field surveys of insect and disease conditions exclusive of those directly associated with aerial spraying operations carried out by the Ontario Department of Lands and Forests in 1969. Brief resumés of these operations as prepared for the Interdepartmental Committee on Forest Spraying operations in November are provided for your information as supplement reports at the back.

Yours very truly,

W.L. Sippell,
Head, Insect and Disease Survey,
Ontario Region.

WLS/ar



TABLE OF CONTENTS

REPORTS OF FOREST RESEARCH TECHNICIANS

Ontario, 1969

Foreword, L.S. MacLeod	Page
 <u>A. SOUTHEASTERN FOREST REGIONS</u>	
Lindsay District, M.J. Thomson*	A 1 -10
Tweed District, F. Livesey	A 11-18
Kemptville District, M.J. Applejohn	A 19-32
 <u>B. SOUTHWESTERN FOREST REGION</u>	
Lake Simcoe District, R.L. Bowser*	B 1 -13
Lake Erie District, G.T. Atkinson	B 14-25
Lake Huron District, V. Jansons	B 26-36
 <u>C. SOUTH-CENTRAL FOREST REGION</u>	
North Bay District, L.S. MacLeod*	C 1 -9
Parry Sound District, D. Lawrence	C 10-19
Pembroke District, P.A. Trieselmann	C 20-28
 <u>D. CENTRAL FOREST REGION</u>	
Sault Ste. Marie District, K.C. Hall*	D 1 -14
Sudbury District, E.L. Houser	D 15-29
Chapleau District, W. Ingram	D 30-42
 <u>E. NORTHERN FOREST REGION</u>	
Cochrane District, H.P. Foster*	E 1 -13
Kapuskasing District, J. Baker	E 14-22
Swastika District, J. Lombard	E 23-33
 <u>F. MIDWESTERN FOREST REGION</u>	
Port Arthur District, H.J. Weir*	F 1 -8
Geraldton District, C.A. Davis	F 9 -17
White River District, H.J. Weir	F 18-24
 <u>G. WESTERN FOREST REGION</u>	
Sioux Lookout District, C.A. Barnes*	G 1 -8
Kenora District, J. Mason	G 9 -15
Fort Frances District, J. Hook	G 16-22

Supplement Reports on Aerial Spraying Operations

Regional Supervisors *

FOREWORD

The Forest Insect and Disease Survey Unit carried out their annual damage detection and censusing program in Ontario between May 1 and September 12, 1969. The results are reviewed in detail for the area shown in the title of each specific report. The following is a general summary of the more important insect and disease situations in the Province.

The spruce budworm was the dominant forest insect problem in 1969. In northeastern Ontario, new or enlarged infestations occurred in the forest districts of Chapleau, Kapuskasing, Cochrane, Sudbury, Swastika, and Sault Ste. Marie. In southeastern Ontario heavy infestations persisted in parts of Pembroke, Tweed and Kemptville districts, and in the western part of the Province two small areas of severe defoliation appeared in the Port Arthur District. Jack pine budworm population levels increased sharply; heavy infestations recurred in the Sault Ste. Marie and Pembroke districts and new areas of severe defoliation were recorded in the districts of Sudbury, North Bay, and Parry Sound.

Aerial spraying operations were carried out against the spruce budworm by the Ontario Department of Lands and Forests in the Port Arthur and Fort Frances districts and against the jack pine budworm and white pine weevil in the Sault Ste. Marie District. Jack pine budworm infestations on the Canadian Forces Base (Petawawa) and on the Petawawa Forest Experiment Station were sprayed by the Canadian Forestry Service. Field technicians were heavily involved in the delineation of areas to be treated, in the timing of spray applications, and in the assessment of populations before and after spraying. Separate reports of these operations are in preparation.

Disease surveys emphasized the evaluation of incidence, infection levels and degree of damage by various pathogens on infected stands. Although no extensive changes in the distribution of the Dutch elm disease occurred in 1969, the pathogen caused considerable mortality of elm, particularly in southern Ontario. Two important diseases of poplar were ink spot and Hypoxylon canker. Scleroderris canker of pine continued to be a major problem in pine plantations. Cankers of pines and hardwoods were evaluated in many stands and details on these and other problems are discussed in the following report.

On January 16, 1970 the Unit lost the valuable services of its Chief Field Technician, J.E. MacDonald, who retired after guiding the Survey Field Service in its various programs and in the compilation of annual district reports for the past 25 years.

The objectives and working principles of the Insect and Disease Survey are currently being thoroughly reviewed and re-evaluated, and it is now clear that fewer technicians will be involved in carrying out surveys of forest insect and disease conditions in Ontario in 1970. Future reports on the details of these surveys will probably cover five regions or sections of the Province.

L. S. MacLeod
Acting Chief Technician

April, 1970.

PEMBROKE DISTRICT

1969

INTRODUCTION

INSECTS

	Page
Black-headed Budworm <u>Acleris variana</u>	C 20
Spruce Budworm <u>Choristoneura fumiferana</u>	C 20
Jack-pine Budworm <u>Choristoneura pinus pinus</u>	C 22
Larch Casebearer <u>Coleophora laricella</u>	C 24
Saddled Prominent <u>Heterocampa guttivitta</u>	C 24
Balsam Fir Sawfly <u>Neodiprion abietis</u> complex	C 24
White-pine Weevil <u>Pissodes strobi</u>	C 25
Other Noteworthy Insects	C 25

TREE DISEASES

Sweet-fern Blister Rust <u>Cronartium comptoniae</u>	C 26
Cytospora Canker of Poplar <u>Cytospora chrysosperma</u>	C 26
Globose Gall of Poplar <u>Diplodia tumefaciens</u>	C 27
Hypoxyton Canker of Aspen <u>Hypoxyton mammatum</u>	C 27
Other Noteworthy Diseases	C 28

INTRODUCTION

The following report summarizes the status of forest insects and diseases in the Pembroke forest district. In 1969 tree diseases are dealt with on a district basis rather than regionally as in recent years.

Priority during the field season was given to the serious problems posed by the jack-pine and spruce budworms. Increases in population levels of these two insects resulted in spectacular damage at many locations. The threat to white spruce and balsam fir stands in the Petawawa - Deep River area was greatly aggravated by a massive influx of spruce budworm moths which was followed by extremely high egg populations. Successful aerial control measures against the jack-pine budworm were carried out in the Petawawa Forest Experiment Station and the Canadian Forces Base, Petawawa. The heavy infestation of the saddled prominent, Heterocampa guttivitta Wlk., in the western part of Algonquin Park persisted and extended eastward to Airy and Nightingale townships.

New methods of evaluating tree diseases were introduced in 1968, and after two field seasons have proven useful for the collection of more precise data on the incidence and level of infection of forest pathogens. In this context, "incidence" refers to the number of trees which are diseased and "level of infection" the degree to which trees in the stand sampled are infected; the former is expressed as per cent or basal area, the latter is always given as a percentage.

During the past field season, emphasis was placed on surveys of canker diseases. Hypoxylon canker of aspens caused appreciable damage in trembling aspen stands at many locations. A basal stem canker caused by the sweet-fern blister rust fungus, Cronartium comptoniae Arth., was reported for the first time from the district.

During the 1969 field season, forty-seven extension and service calls were answered, and short courses of instruction were given to junior rangers in three camps. A large proportion of the season was allotted to assistance to forest research officers.

The author wishes to acknowledge the generous assistance and co-operation extended by the personnel of the Petawawa Forest Experiment Station and the Ontario Department of Lands and Forests.

R. A. Trieselmann

Black-headed Budworm, Acleris variana Fern.

Small to medium numbers of larvae were collected at many points in the district, usually in association with spruce budworm larvae. Small pockets of light infestation occurred in balsam fir and white spruce stands in Bronson, McKay, and Wylie townships. Elsewhere in the district, infestations of the black-headed budworm were overshadowed by the heavy defoliation caused by the spruce budworm.

Spruce Budworm, Choristoneura fumiferana (Clem.)

The total area infested by the spruce budworm increased considerably in 1969, and several well-defined areas of infestation now exist in the district.

South-east of Pembroke in Bromley, Ross, Stafford, Westmeath, and Wilberforce townships balsam fir and white spruce in woodlots were again severely defoliated. This infestation has persisted for four years and some top mortality was apparent on repeatedly defoliated trees. Examination of foliage from several locations in the area indicates continued high population levels for 1970 (Table 1).

Two large pockets of heavy infestation occurred in the eastern part of the Algonquin Park in Barron and Stratton townships near Achray. Defoliation was severe and egg mass counts indicate a recurrence of high population levels in 1970. In the Round Lake area, several balsam fir and white spruce stands in Alice and Richards townships were severely infested.

Balsam fir and white spruce plantations and natural forest stands in the Petawawa - Deep River area were lightly to moderately defoliated. Three white spruce plantations on the Petawawa Forest Experiment Station sustained 53.6 per cent, 56.8 per cent, and 59.8 per cent defoliation respectively. During the night of July 13 to 14 a massive influx of adults occurred in Buchanan, Petawawa, Rolph, and Wylie townships. Subsequent egg counts at 25 locations in this area indicate that severe damage will occur in 1970 (Table 1).

TABLE 1

Summary of Spruce Budworm Defoliation Survey and Egg Mass Counts
in 1969 and Defoliation Forecasts for 1970

Location (township)	Tree species	Per cent defoliation of current year's growth	No. of branches examined	Number of egg masses per 100 sq. ft. of foliage	Defoliation forecast for 1970
Bromley	WS	87	1	1448	S
Bromley	WS	78	1	390	S
Ross	WS	74	1	900	S
Ross	WS	91	1	1038	S
Stafford	WS	3	6	66	M
Stratton	WS	76	3	313	S
Stratton	WS	73	1	778	S
Westmeath	WS	61	1	1200	S
Wilberforce	WS	71	1	1543	S
Buchanan	WS	7	6	265	S
"	bF	17	1	366	S
"	WS	6	6	142	M-S
"	WS	6	1	400	S
"	nS	3	6	118	M-S
"	WS	1	6	31	L-M
"	WS	Nil	6	16	L
"	rS	4	6	166	M-S
"	WS	10	6	117	M-S
"	WS	Nil	6	206	S
"	WS	10	6	752	S
"	WS	5	1	654	S
"	WS	60	6	1332	S
"	bF	2	6	44	L-M
"	WS	.5	6	37	L-M
"	WS	5	6	259	S
"	WS	12	6	511	S
Rolph	WS	21	6	293	S
Wylie	bF	38	6	217	S
"	bF	5	6	55	M
"	WS	18	6	537	S
"	WS	57	6	866	S
"	WS	54	6	382	S
"	WS	3	6	76	M
"	WS	11	6	215	S

S - Severe; M-S - Moderate to Severe;
M - Moderate; L-M - Light to Moderate.

Jack-pine Budworm, Choristoneura pinus pinus Free.

Jack pine forest stands and plantations throughout the district were again infested with the jack-pine budworm. Damage was generally light to moderate in the Petawawa - Deep River area, but one large pocket of heavy defoliation occurred along the Ottawa River south of the Village of Petawawa, and a small pocket of severe defoliation was observed near Brennan Lake north of the Petawawa River in the vicinity of Highway 17. Considerable top killing and tree mortality was apparent in stands which were severely defoliated in 1967 and 1968 in the Petawawa Plains. An aerial spray program which was carried out on the Petawawa Forest Experiment Station and the Canadian Forces Base, Petawawa resulted in extremely low defoliation in this area.

The Lake Traverse infestation doubled in size and encompassed the area to Radiant Lake in the west. The eastern infestation boundary remained unchanged. Defoliation was moderate to severe at most locations and considerable top killing was evident at many points where trees were severely defoliated for the third consecutive year.

Foliage samples, consisting of one 24-inch branch tip from the mid-crown of each of six trees, were taken at 27 locations and examined for the presence of egg masses and the degree of current defoliation. The egg mass counts indicate that light to medium infestations will occur in the Petawawa - Deep River area, and that medium to heavy infestations will continue in the Lake Traverse infestation (Table 2).

TABLE 2

Summary of Jack-pine Budworm Defoliation Survey and Egg Mass Counts
in the Pembroke District in 1969

Note: Based on the examination of six 24-inch branch tips
at each location.

Township & location	Av. height in feet	Degree of current defoliation	Total no. of egg masses	Defoliation forecast for 1970
<u>Buchanan</u>				
AECL Main Gate	45	L-M	3	L-M
Sturgeon Lake Plains	55	L	1	
Sturgeon Lake Plains	45	L	2	
Sturgeon Lake Plains	6	L	0	
Deluthier Road	30	L	2	
Landry's Crossing	25	L	0	
Landry's Crossing	25	L	0	
Orange Road	50	L	0	
Pine Graft Arboretum	15	L	0	
Young's Creek	20	L	0	
Young's Creek	50	L	3	
<u>Petawawa</u>				
N. of Stewart Crossing	17	L	1	L-S
Stewart Crossing	65	M	6	
Lutheran Church	45	L	2	
<u>Rolph</u>				
Ski Hill Road	38	L	0	
<u>Stratton</u>				
Survey Lake Road	55	L	11	L-S
Montgomery Gate	25	L	2	
<u>Edgar</u>				
Pole Peeler	40	S	6	M-S
S/E end of infest'n.	35	L-M	10	
Shaw's Gate	25	M	14	
<u>White</u>				
P.L.C. Bridge	35	M	16	M-S
P.L.C. Road	45	M	44	
Horse Stable	60	M-S	54	
CNR Road	40	S	42	
Traffic Light	50	M	17	
N/W of Lake Traverse	60	L	4	
5 Mi. N/W of	30	L	4	
Lake Traverse				

L - Light; M - Moderate; S - Severe.

Larch Casebearer, Coleophora laricella Hbn.

This insect occurred in all larch stands in the district. Population levels were generally low, except in Bromley and Westmeath townships where light defoliation was observed (Table 3).

TABLE 3

Summary of Larch Casebearer Counts in the Pembroke District
from 1967 to 1969

Note: Based on the examination of four 18-inch branch tips
from each of four trees at each point.

Location (township)	Av. d.b.h. of sample trees in inches	Av. no. of larvae per 18-inch branch tip		
		1967	1968	1969
Airy	3	2.1	0.4	0.1
Bromley	3	1.2	0.7	10.0
Buchanan	6	2.0	0.1	0.0
Cameron	6	-	-	1.2
N. Algona	4	0.9	0.0	1.2
Westmeath	5	1.1	0.0	5.2

Saddled Prominent, Heterocampa guttivitta Wlk.

Sugar maple and yellow birch stands in the west end of the Algonquin Park were again heavily infested by the saddled prominent and a complex of hardwood defoliators (see map). Defoliation was variable and was most pronounced on high ground and the upper parts of slopes, where tolerant hardwoods predominated. There were numerous areas of severe defoliation. Damage in the northern part of the infested area, in Ballantyne, Biggar, Paxton, and Wilkes townships was lighter than in 1968. A large area of new infestation with light to severe defoliation was observed west of Whitney in Airy and Nightingale townships.

Balsam-fir Sawfly, Neodiprion abietis complex

A further increase in population levels occurred in 1969. Numerous clumps of balsam-fir of all size classes were infested throughout the district. A large pocket of heavy defoliation was observed west of Opeongo Lake in Bower Township. Elsewhere in the district, defoliation was confined to upper crowns, especially of pole-sized balsam fir. Regeneration and saplings generally harboured only small numbers of larvae. Individual white spruce trees were lightly infested at scattered locations.

White-pine Weevil, Pissodes strobi (Peck)

Injury to leaders of pines and spruces was observed in forest stands and plantations at many points. Population levels of this insect tend to fluctuate somewhat from year to year as shown in Table 4.

TABLE 4

Summary of White Pine Shoot Damage by the White-pine Weevil
in the Pembroke District from 1967 to 1969

Note: 100 trees examined at each location.

Location (township)	Av. height of sample trees in feet	Per cent trees weevilled		
		1967	1968	1969
Alice	13	5	12	14
Bronson	13	14	12	11
Buchanan	9	28	14	8
Sproule	15	19	16	14
White	12	10	6	9

TABLE 5

Other Noteworthy Insects Collected in the Pembroke District

Insect	Host(s)	Remarks
Adelges lariciatus Patch	wS	Heavy infestation in Wylie Twp.
Fenusa pusilla (Lep.)	wB	Small infestations common throughout the district
Neodiprion lecontei (Fitch)	rP	Occasional colonies in plantations at several points in the district
Neodiprion nanulus nanulus Schedl	rP	Occasional colonies in Petawawa and Westmeath twps.
Neodiprion pratti paradoxicus Ross	jP	Small numbers of colonies in Buchanan and Petawawa twps.

TABLE 5 (continued)

Insect	Host(s)	Remarks
<i>Pikonema alaskensis</i> Roh.	WS	Infestations in Buchanan and Lyell twps. collapsed, small numbers of larvae in association with spruce budworm
<i>Pristiphora erichsonii</i> (Htg.)	tL	Small numbers of colonies at various points in the district
<i>Thecodiplosis piniresinosae</i> Kearby	rP	Continued infestations in the district

Sweet-fern Blister Rust, Cronartium comptoniae Arth.

This disease causes a basal stem canker of jack pine at many locations in Ontario. Its known range of distribution was extended in 1969 to include the Pembroke District.

An evaluation of a stand of mature jack pine in the Duke Plains, Petawawa Township, resulted in the following information: fifteen per cent incidence, severe level of infection, no mortality. About 800 acres are affected by the disease in this location. An adjacent stand of immature jack pine, comprising approximately 2,000 acres, is apparently free of infections.

Subsequent to the evaluation of the infected stand in the Duke Plains, numerous symptomatic trees were observed at scattered locations in Buchanan, Petawawa, Rolph, and Wylie townships; however, no effort could be made at the time to establish incidence and level of infection.

Cytospora Canker of Poplar, Cytospora chrysosperma (Pers.) Fr.

Cytospora cankers were commonly observed in trembling aspen stands along Highway 62 in Alice, Fraser, and Richards townships, near Stonecliffe in Maria Township, and along Highway 17 in Cameron Township. An evaluation of a trembling aspen stand comprising about 600 acres in Alice Township indicated that 17.5 per cent recent mortality had occurred and that 55 per cent of the surviving trees were infected. Very low incidence was observed in approximately 4000 acres of adjacent trembling aspen stands.

Globose Gall of Poplar, Diplodia tumefaciens (Shear) Zalasky

This fungus causes the formation of more or less globular galls up to $1\frac{1}{2}$ inches in diameter on the branches and twigs of poplars. Frequently, the parts distal to the galls are killed. In the Sturgeon Lake Plains, Buchanan Township, a stand of trembling aspen saplings of fire origin was infected. The galls occurred on the main stems, commonly below the crowns, and caused partial or entire crown mortality. An evaluation of the problem revealed that 10 per cent recent mortality had occurred and that 30 per cent of the surviving trees were infected. The potential for spread is approximately 600 acres.

Hypoxylon Canker of Aspen, Hypoxylon mammatum (Wahl.) Miller

This is one of the most virulent and common diseases of trembling aspen and largetooth aspen, although the latter does not appear to be as frequently infected. Cankered trees were observed in most aspen stands visited. The cankers girdle branches and stems and cause branch, partial crown, or entire tree mortality; furthermore, they promote wind-snap of infected trees. The impact of the disease was evaluated in five trembling aspen stands and the results are summarized in Table 6.

TABLE 6

Summary of Incidence and Levels of Infection of the Hypoxylon Canker of Poplar at Five Points in the Pembroke District in 1969

Location (township)	Tree height in feet	Basal area	Level of incidence	Level of infection	Per cent mortality
Buchanan	60	70	Heavy	Heavy	2.5
Burns	55	58	Heavy	Heavy	15
Fraser	40	48	Heavy	Heavy	5
McKay	55	51	Heavy	Heavy	2.5
Wylie	63	52	Heavy	Heavy	10

TABLE 7

Other Noteworthy Diseases

Organism	Host(s)	Remarks
<i>Ceratocystis ulmi</i> (Buism.) C. Moreau	wE	Common throughout the district
<i>Cronartium quercuum</i> (Berk.) Miyabe ex Shirai	rO	Abundant fruiting on lower leaf surfaces of red oak saplings in Buchanan Twp.
<i>Cronartium ribicola</i> J. C. Fischer	wP	Occurs throughout the district
<i>Polyporus tomentosus</i> Fr.	Forest floor	Occasional basidiocarps on floor of white spruce planta- tion in Buchanan Twp.
<i>Pucciniastrum epilobii</i> Otth	bF	Fruiting on a few needles of balsam fir regeneration in White Twp.
<i>Scolecnectria cucurbitula</i> (Tode ex Fr.) Booth	wP	In association with witches' broom in Buchanan Twp.