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Status of Insects in the Fort Francis District

Thomson, M.J.

Information Report O-X-26
(Forest Research Laboratory, Ontario Region)

FOREWORD

J. E. MacDonald

Outbreaks of the forest tent caterpillar have highlighted reports dealing with forest insect surveys for the past several years. In 1965, the outbreak in Western Ontario reached its peak and poplar stands within an area of about 34,000 square miles were severely defoliated. Egg surveys in the fall revealed that a marked decline in infestation intensity will occur in Sioux Lookout and Kenora districts but high larval populations will persist in Fort Frances and Port Arthur districts in 1966. Trends in infestation intensities will vary from area to area in eastern Ontario, with the most noteworthy increase in the extent of infestations occurring in the Lake Nipissing outbreak.

The development of new infestations of Bruce spanworm and the European pine sawfly were of particular interest in 1965. Infestations of the former occurred in Sault Ste. Marie, Sudbury and Pembroke districts. Severe defoliation of hardwoods that resulted in relatively large areas represented first records of extensive infestations in Ontario. A major extension in the known distribution of the European pine sawfly was recorded when the insect was found in two Scots pine plantations on Manitoulin Island. This extension places the insect much closer to major stands of jack pine in northern Ontario.

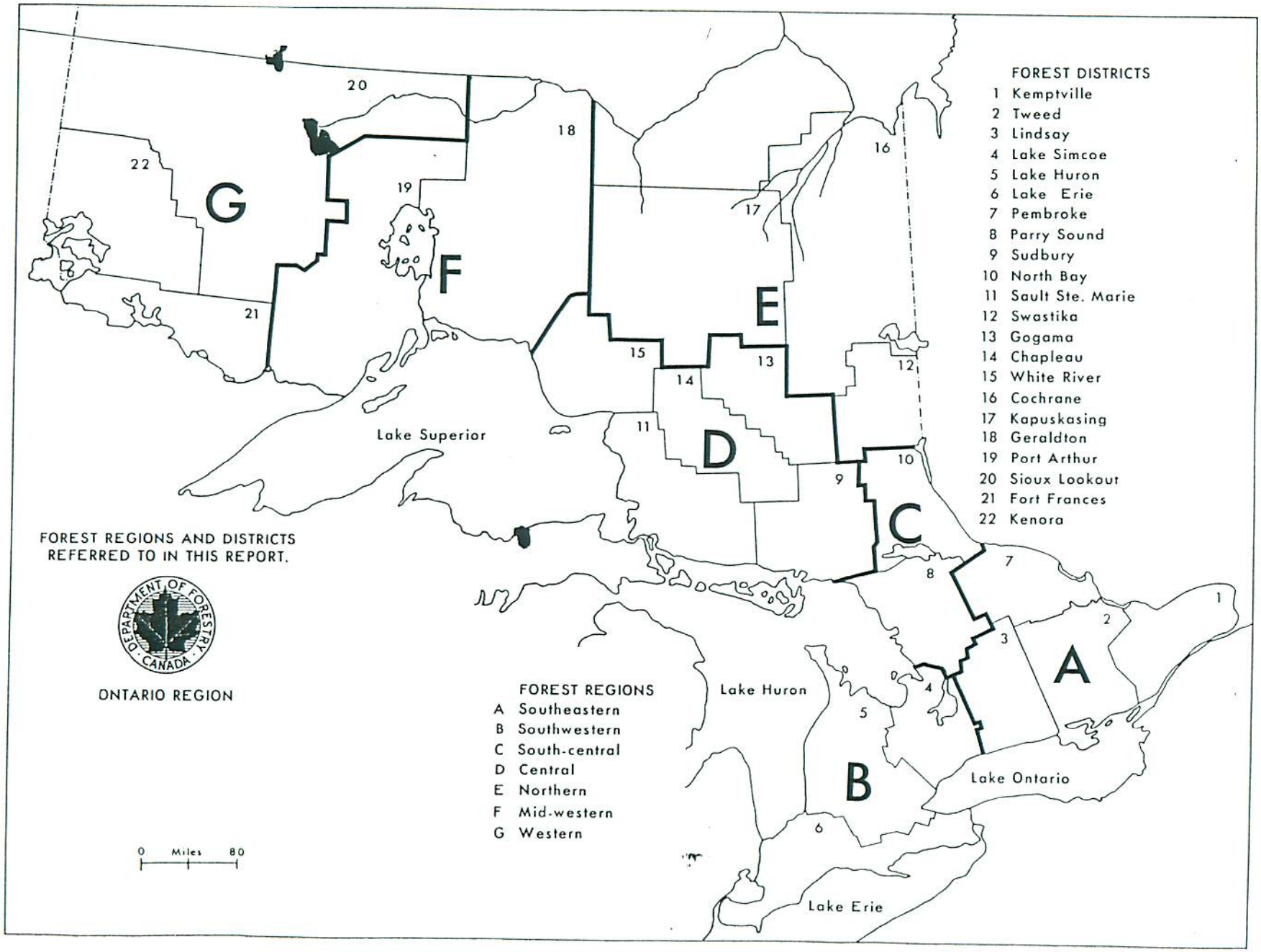
For the third consecutive year low temperatures in the spring caused considerable mortality of the current year's shoots of balsam fir and white spruce at many locations in Ontario. Continued cold weather throughout the summer delayed the development of many insects and in some instances larvae failed to reach maturity before freezing temperatures occurred in the fall.

Tree disease surveys continued to reveal serious losses of white elm resulting from Dutch elm disease in southern Ontario. In northern Ontario two centers of infection occurred on Manitoulin Island and infected elm were found at one location near Spanish on the North Shore of Lake Huron. Intensive surveys to determine the distribution and incidence of this disease will be continued in 1966.

During the early years of the Survey in Ontario Field Technicians were largely concerned with determining the distribution and abundance of forest insects and appraising losses in forest stands. As a consequence the detection aspect of survey work was of a high order. Later, added responsibility for disease surveys and the development of more elaborate sampling procedures, reduced the time available for purely detection work. To compensate for this, greater emphasis has been placed on systematic aerial reconnaissance throughout the vast forested areas of central and northern Ontario.

The Survey welcomed the addition of a Forest Research Technician to its staff in 1965. This appointment now provides one field representative for each district in the Southeastern Region where formerly three men were responsible for survey work in four districts.

In the reports that follow, insects and tree diseases that are of interest in adjoining districts are dealt with on a regional basis. Others are dealt with in detail on a district basis.


FOREST DISTRICTS
1 Kemptville
2 Tweed
3 Lindsay
4 Lake Simcoe
5 Lake Huron
6 Lake Erie
7 Pembroke
8 Parry Sound
9 Sudbury
10 North Bay
11 Sault Ste. Marie
12 Swastika
13 Gogama
14 Chapleau
15 White River
16 Cochrane
17 Kapuskasing
18 Geraldton
19 Port Arthur
20 Sioux Lookout
21 Fort Frances
22 Kenora
FOREST REGIONS AND DISTRICTS REFERRED TO IN THIS REPORT.
DEPARTMENT OF FORESTRY CANADA
ONTARIO REGION
FOREST REGIONS
A Southeastern
B Southwestern
C South-central
D Central
E Northern
F Mid-western
G Western
0 Miles 80
Lake Superior
Lake Huron
Lake Ontario
Lake Erie

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REPORTS OF FOREST RESEARCH TECHNICIANS

Ontario

* Regional Supervisors

1965

Information Report No.	Subject	Author
O-X-5	Forest Insect & Disease Surveys --Lindsay District	W. J. Miller
O-X-6	--Tweed District	F. Livesey
O-X-7	--Kemptville District	J. Hook
O-X-8	--Pembroke District	H. J. Weir
O-X-9	--Lake Simcoe District	A. A. Harnden
O-X-10	--Lake Huron District	R. L. Bowser
O-X-11	--Lake Erie District	J. R. Trinnell
O-X-12	--North Bay District	L. S. MacLeod
O-X-13	--Parry Sound District	C. A. Barnes
O-X-14	--Sault Ste. Marie District	H. G. McPhee
O-X-15	--Sudbury District	J. R. McPhee
O-X-16	--Chapleau District	D. Ropke
O-X-17	--Gogama District	R. A. Trieselmann
O-X-18	--White River District	D. C. Constable
O-X-19	--Cochrane District	H. R. Foster
O-X-20	--Kapuskasing District	G. T. Atkinson
O-X-21	--Swastika District	M. J. Applejohn
O-X-22	--Port Arthur District	K. C. Hall
O-X-23	--Geraldton District	V. Jansons
O-X-24	--Sioux Lookout District	P. E. Buchan
O-X-25	--Kenora District	G. G. Jackson
O-X-26	--Fort Francis District	M. J. Thomson

STATUS OF INSECTS IN THE FORT FRANCES DISTRICT

M. J. Thomson

Spruce Budworm, Choristoneura fumiferana Clem.

Although an increase in numbers of this insect occurred at three points in the southern part of Quetico Park population levels generally were low in the district.

New pockets of light infestation were found at Basswood Lake on the International Border and at Trout Lake south of Dawson Portage. Examination of balsam-fir foliage at four sample points in this area showed an increase in defoliation at one location at Lac La Croix (Table 11). Small numbers of larvae were collected at only two points elsewhere in the district.

TABLE 11

Summary of Defoliation of Balsam-fir by the Spruce Budworm in Fort Frances District from 1961 to 1965

Location	Per cent defoliation				
	1961	1962	1963	1964	1965
Cache Bay, Saganaga Lake	87	26	9	7	2
French Lake	33	12	4	3	2
Lac La Croix	14	5	6	2	8
Beaverhouse Lake	23	26	4	2	1
Basswood Lake	-	-	-	-	3
Trout Lake	-	-	-	-	5

Based on egg mass sampling, endemic populations will occur in 1966 (Table 12).

TABLE 12

Summary of Spruce Budworm Egg Mass Counts in Fort Frances District from 1961 to 1965

Location	Av. no. egg masses per 100 sq. ft. of foliage				
	1961	1962	1963	1964	1965
Cache Bay, Saganaga Lake	265	867	256	0	0
French Lake	567	197	0	0	0
Lac La Croix	76	25	33	0	1
Beaverhouse Lake	77	232	0	0	0
Basswood Lake	-	-	-	-	0
Trout Lake	-	-	-	-	0

Mortality of balsam-fir resulting from defoliation by the spruce budworm occurred in sample plots in Quetico Park for the fifth consecutive year. Cumulative mortality in these plots is summarized in Table 13.

TABLE 13

Summary of Balsam-fir Mortality Caused by the Spruce Budworm in Fort Frances District, 1961 to 1965

Location	Size of plot in acres	Per cent defoliation					Cumulative per cent mortality by volume				
		1961	1962	1963	1964	1965	1961	1962	1963	1964	1965
Sturgeon Narrows Sturgeon Lake	.20	57	15	2	0	0	23.2	46.3	58.1	66.3	71.5
Cache Bay Saganga Lake	.20	87	26	9	7	2	11.1	36.4	68.0	75.5	86.0

Larch Casebearer, Coleophora laricella Hbn.

Populations of this casebearer have remained at a low level since first discovered in the district in 1961, but an increase in distribution has been recorded each year. In 1965 casebearers were found in Morson Township, 30 miles northwest of the most westerly collection point in 1964. To date no casebearers have been found east of Rainy Lake. Quantitative sampling was carried out at five points in Division 22 (Table 14).

TABLE 14

Summary of Larch Casebearer Larval Counts in Fort Frances District in 1964 and 1965

Note: Counts are based on examination of sixteen 18-inch branch tips, four from each of four trees at each point.

Location (township)	Av. d.b.h. in inches	Av. no. of larvae per 18-inch branch tip	
		1964	1965
Potts	3	1.0	0.1
Miscampbell	2	0.2	0.6
Dobie	2	0.1	0.6
Crozier	2	0.6	0.1
Morley	2	-	0.2

European Spruce Sawfly, Diprion hercyniae (Htg.)

Populations of this spruce defoliator were at a low ebb in 1965. Although two generations occur each year in the district and host trees were examined at many points during both generations, a total of only nine larvae were found.

White-pine Shoot Borer, Eucosma gloriola Heinr.

A marked decline in population levels of this shoot borer occurred in Morson and Kingsford townships in Division 22 and near Williamson Lake north of Atikokan

where varying degrees of infestation were observed on jack pine regeneration in 1964. Quantitative sampling results are shown in Table 15. No damage was observed in Kingsford Township in 1965.

TABLE 15

Summary of Shoot Damage by the White-pine Shoot Borer on 100 Regeneration Jack-pine Trees at Each of Two Points in 1965

Location	Av. d.b.h. in inches	No. of shoots damaged				Total number shoots damaged	
		Leaders		Laterals			
		1964	1965	1964	1965	1964	1965
Morson Township	2	41	19	111	58	152	77
Williamson Lake	2	-	1	-	2	-	3

Hemlock Looper, Lambdina fiscellaria fiscellaria (Gn.)

An upward trend in population levels of this looper was detected in 1965 (see photograph). In recent years only small numbers of larvae were collected from balsam-fir, spruce, and eastern cedar at widely scattered points. In 1965 a light infestation occurred on fringe balsam-fir trees along Highway 11, east of the French River and larvae were collected more commonly than in 1964 in beating samples elsewhere in the district.

Balsam-fir Sawfly, Neodiprion abietis complex

A further decline in numbers of this sawfly occurred in the district as a whole. One small pocket of heavy infestation was found on a clump of open-grown black spruce trees in Pratt Township. Single colonies were observed at widely-scattered points elsewhere in the district. Black and white spruce were the preferred hosts, only one colony being found on balsam in Morley Township.

Red-pine Sawfly, Neodiprion nanulus nanulus Schedl.

Smaller numbers of colonies of this insect occurred at sample points than in 1964 (Table 16). Single colonies were observed on jack pine trees at five locations elsewhere in the district.

TABLE 16

Summary of Red-pine Sawfly Colony Counts at Four Points in the Fort Frances District in 1964 and 1965

Note: Counts are based on examination of ten red-pine trees at each sample point.

Location	Av. d.b.h. in inches	No. of trees infested		Av. no. of colonies per tree	
		1964	1965	1964	1965
Basswood Lake	8	1	1	0.4	0.1
Lac La Croix	4	4	1	1.5	0.1
Winkle Lake	6	4	3	0.9	0.7
Russell Lake	4	6	0	0.8	0.0

Swaine Jack-pine Sawfly, Neodiprion swainei (Midd.)

New light infestations occurred on shoreline trees at Brule Narrows, Rainy Lake and in a stand of jack pine regeneration on a high rocky site in Morson Township. Only small numbers of colonies were found at Rocky Islet Bay, Rainy Lake where a clump of light-to-moderate infestation was recorded in 1964 and along shorelines in the Lake Despair-Jackfish Lake area. Colony counts at quantitative sample points are summarized in Table 17.

TABLE 17

Summary of Swaine Jack-pine Sawfly Colony Counts in the Fort Frances District in 1964 and 1965

Note: Counts are based on examination of ten jack pine trees at each point.

Location	Av. d.b.h. in inches	No. trees infested	Av. no. colonies per tree	
			1964	1965
Jackfish Lake	5	2	0.2	0.6
Footprint Lake	6	0	0.3	0.0
Bad Vermilion Lake	4	0	0.3	0.0
Morson Township	4	10	-	4.1

Red-headed Jack-pine Sawfly, Neodiprion virginianus complex

Generally, population levels of this sawfly were similar to 1964. A heavy infestation recurred in a mixed jack and red pine plantation at the French Lake Road on Highway 11. New heavy infestations were found on clumps of regeneration along the highway between the Nym Lake road and the east boundary of the district. Small pockets of medium infestation were observed on clumps of open-grown jack pine trees in Devlin and Richardson townships west of Fort Frances. Small numbers of trees were lightly infested at widely-scattered points elsewhere in the district. Colony counts are summarized in Table 18.

TABLE 18

Summary of Red-headed Jack-pine Sawfly Colony Counts
in the Fort Frances District, 1961 to 1965

Location	No. of trees sampled	Av. d.b.h. in inches	Av. no. colonies per tree				
			1961	1962	1963	1964	1965
Richardson Twp.	5	5	0.2	4.0	9.4	1.4	5.6
Menary Twp.	10	4	-	-	-	-	0.3
Dobie Twp.	10	3	0.2	0.2	2.1	0.4	0.1
Morley Twp.	10	4	-	-	-	-	0.1
Kaiarskons Lake	10	3	-	-	-	0.3	0.1
Manitou Sound	10	6	-	-	-	0.7	0.2
Rainy Lake Highway 11 and French Lake Road	10	2	-	-	-	-	6.1

Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

The status of this defoliator remained unchanged. Small open-grown white spruce trees were heavily infested at Basswood Lake, at the entrance to Quetico Park from Highway 11, and in Lash Township in Division 22. Light defoliation was observed at Turtle, Bad Vermilion, Little Ottertail, and Findlayson lakes. Small numbers of larvae were found in beating samples at 17 widely-scattered points elsewhere in the district.

White-pine Weevil, Pissodes strobi (Peck)

As in 1964, small numbers of white pine and jack pine trees were weevilled in plantations and regeneration areas (Table 19). Elsewhere open-grown and roadside trees were most commonly attacked.

TABLE 19

Summary of Leader Mortality by the White-pine Weevil
at Four Points in Fort Frances District

Note: Counts are based on examination of 100 trees at each point.

Location	Tree species	Av. d.b.h. in inches	Per cent of leaders killed		
			1963	1964	1965
Morson Twp.	jP	1	6	6	2
Miscampbell Twp.	wP	1	4	8	4
Williamson Lake	jP	2	-	9	0
Pickerel River at Highway 11	jP	1	-	5	7

Larch Sawfly, Pristiphora erichsonii (Htg.)

Populations of the larch sawfly have been present in the Fort Frances District for at least two decades. Survey records show that medium infestations of this insect occurred in the district in 1946 and heavy infestations prevailed from 1947 to 1955. Following this period, population levels declined in the district as a whole, reaching a low ebb in 1964.

In 1965 a spectacular increase in infestation intensity was recorded with pockets of heavy infestation occurring in Potts, Sifton, and Nelles townships and near Rocky Islet Bay, Rainy Lake in Division 22 and at Foresburg, Crystal, Niobe, and Jackfish lakes in Division 38. Light-to-moderate infestations were observed in scattered clumps of larch throughout the remainder of the district.

Defoliation ranged from approximately 10 per cent in many areas to nearly 90 per cent at Crystal Lake, east of Atikokan (see photograph).

One hundred sawfly cocoons from the Crystal Lake infestation were submitted to the Forest Insect Laboratory to determine the incidence of insect parasitism in this stage. The results of cocoon dissection will be contained in the 1966 report.

Spruce Bud Gall Midge, Rhabdophaga swainei Felt

No appreciable change in the frequency of damaged buds has occurred in the past five years. Only small numbers of infested buds were found at five quantitative sample points and at numerous locations elsewhere in the district in 1965 (Table 20).

TABLE 20

Summary of Counts of Terminal Buds Infested by the Spruce Bud Gall Midge in Fort Frances District 1961 to 1965

Note: Counts are based on examination of 50 branch tips, five from each of ten trees at each location.

Location	Tree species	Av. d.b.h. in inches	No. of buds examined 1965	Per cent of buds infested 1961	1962	1963	1964	1965
Menary Twp.	wS	4	141	-	-	-	-	1
Sifton Twp.	bS	1	134	4.0	0.0	0.0	0.6	2
Factor Lake	wS	4	137	2.3	0.0	0.0	1.4	12
Hwy. 11 at east district boundary	wS	3	147	2.3	2.7	1.3	0.0	1

Pine Tortoise Scale, Toumeyella numismaticum P. & McD.

Populations of this insect were at a low ebb between 1962 and 1964. However, in 1965 high populations were found on a jack pine hedgerow in the town of Atikokan and on Mugho pines at French Lake (see photograph). Light infestations were observed on jack pine trees along shorelines of Greytrout and Eye lakes north of Atikokan.

TABLE 21

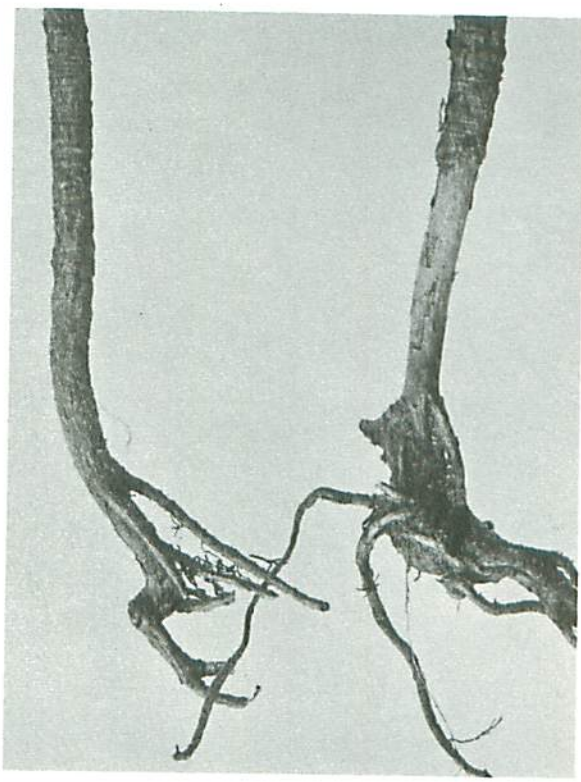
Summary of Miscellaneous Insects Collected in Fort Frances District

Insect	Host(s)	Remarks
Acleris variana Fern.	wS, bS, bF	Found commonly in Division 38 but scarce in Division 22.
Anisota virginiensis (Drury)	bO	Infestation reported on shore of Lake-of-the-Woods in 1962 has declined to a low ebb in 1965.
Aphrophora parallela (Say)	jP, scP	More common than in previous four years.
Archips cerasivoranus (Fitch)	cCh, pCh	Colonies common on roadside trees in northern part of Division 22.
Datana ministra Dru.	Juneberry	At low ebb in 1965 when compared with two previous years.
Hemichroa crocea (Four.)	wB, Al	White birch on an island in Nym Lake heavily infested; scattered colonies on alders in Division 22.
Hyphantria cunea Dru.	Al, W	Scattered tents along Highway 11 east of the Nym Lake road.
Itoplectis conquisitor Say.	rP	A parasite of forest tent caterpillar; numerous at Quetico Lake.
Lithocolletis salicifoliella Chamb.	tA	Population at low ebb; small numbers found at Saganagons Lake.
Malacosoma pluviale (Dyar)	pCh	Scattered colonies along roadsides north of Atikokan.
Monoctenus fulvus (Nort.)	eC	Small numbers in the north part of Division 22.
Neodiprion maurus Rohwer	jP	More common than in past several years.
Neodiprion nigroscutum (Midd.)	jP	Numerous colonies at widely-scattered points.
Neodiprion pratti banksianae (Roh.)	jP	This common sawfly at very low ebb.
Petrova albicapitana Busck.	jP	More common and widespread than in previous years.
Pikonema dimmockii (Cress.)	wS, bS	More common in beating samples.

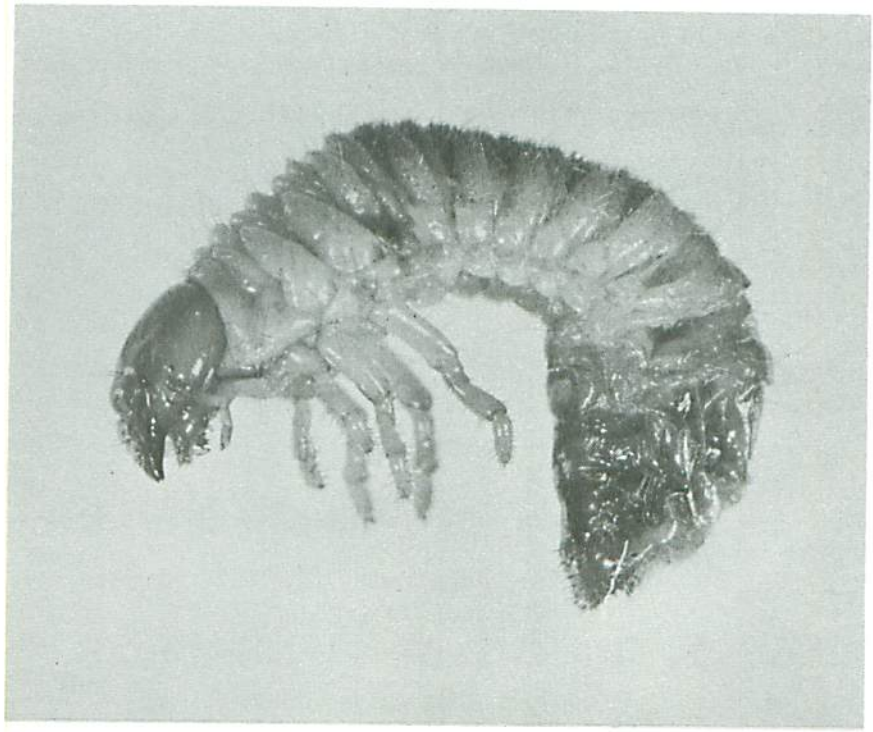
TABLE 20 (continued)

Insect	Host(s)	Remarks
Profenusa canadensis (Marlatt)	Haw	Roadside trees heavily infested in Crozier Township.
Profenusa thomsoni (Konow)	wB	Very small number found although extensive surveys carried out.

Severe defoliation of an ash tree by white grub adults



Damage to the roots of seedlings by white grub larvae



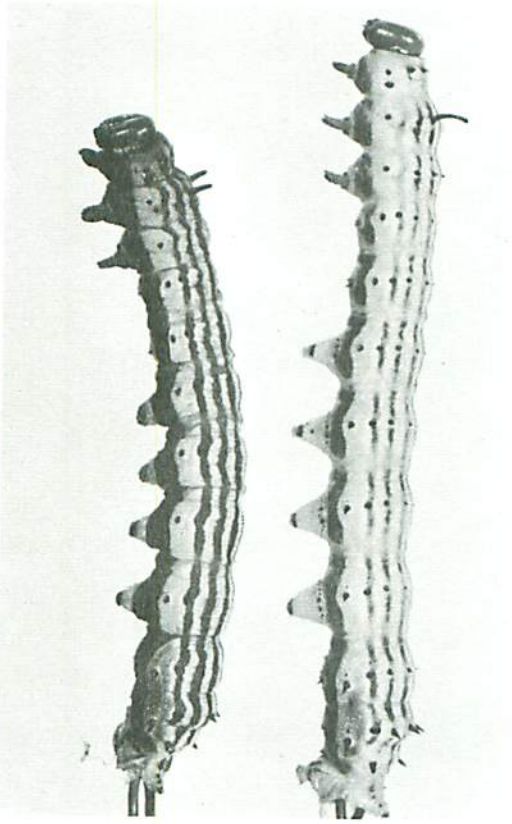
White grub taken from the ground

SUGAR MAPLE BORER
Glycobius speciosus (Say)

Feeding gallery of the borer

Feeding gallery on the opposite side of tree

GREEN-STRIPED MAPLEWORM,
Anisota rubicunda (F.)

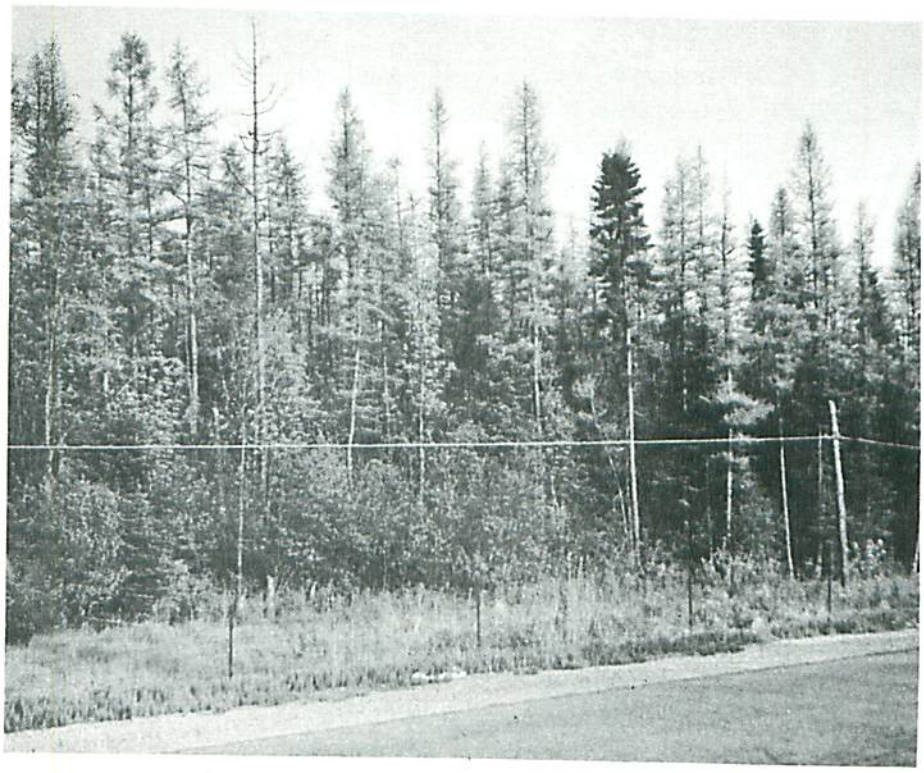


Larvae

Defoliation of sugar maple trees

Adult

LARCH CASEBEARER, Coleophora laricella Hbn.

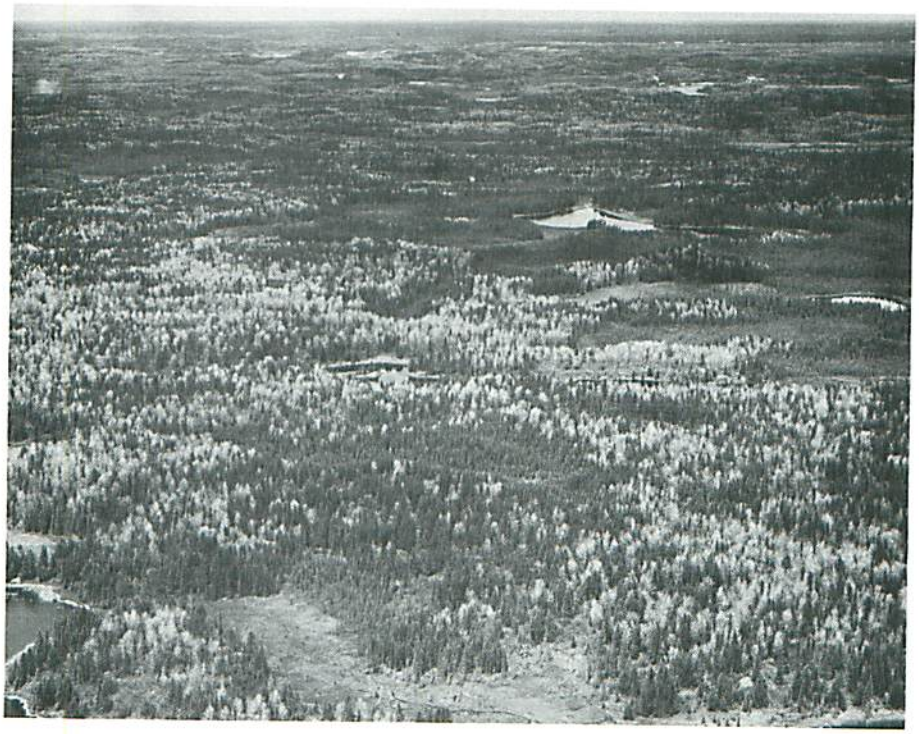


Severe damage to foliage in a tamarack stand.

Cases on a branch resembling old needles.

FOREST TENT CATERPILLAR,
Malacosoma disstria Hbn.

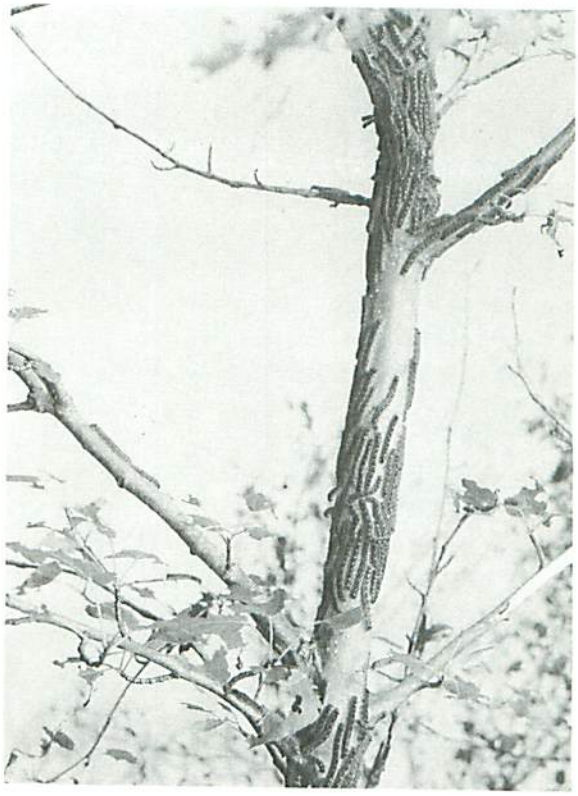
Severe defoliation of aspen trees



Aerial view showing extensive severe defoliation

FOREST TENT CATERPILLAR, Malacosoma disstria Hbn.

Newly-hatched larvae on an egg band.



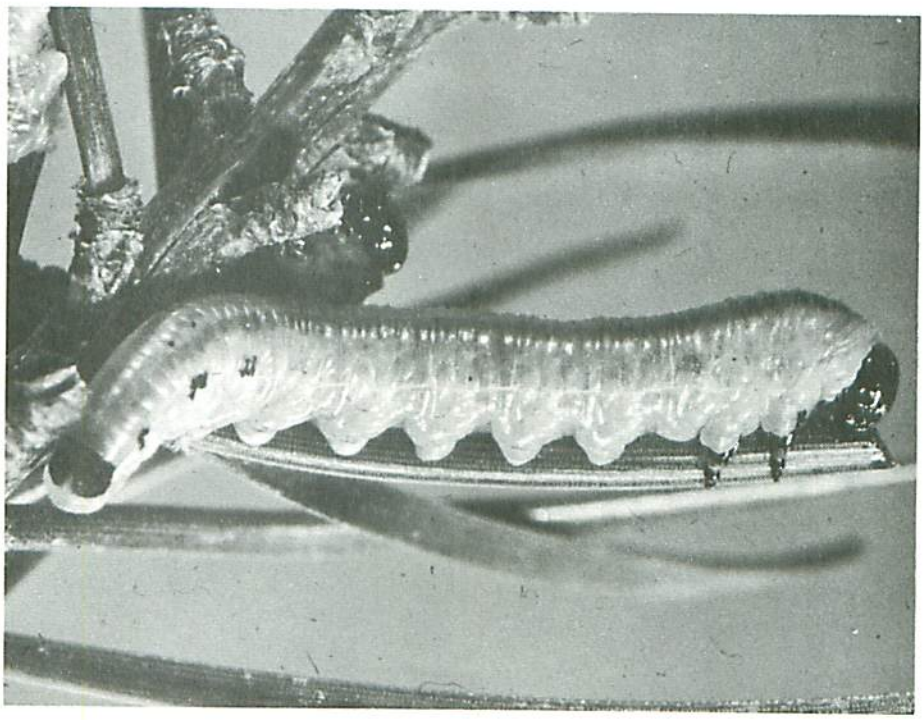
An inactive colony of larvae on trembling aspen.

Cocoon in rolled leaves.

A male moth.

JACK-PINE SAWFLY,
Neodiprion pratti paradoxicus Ross

Severely defoliated jack pine trees



Full grown larva

CEDAR LEAF MINERS

Defoliation of cedar tree

Severe defoliation of white cedar trees

EASTERN TENT CATERPILLAR,
Malacosoma americanum (F.)

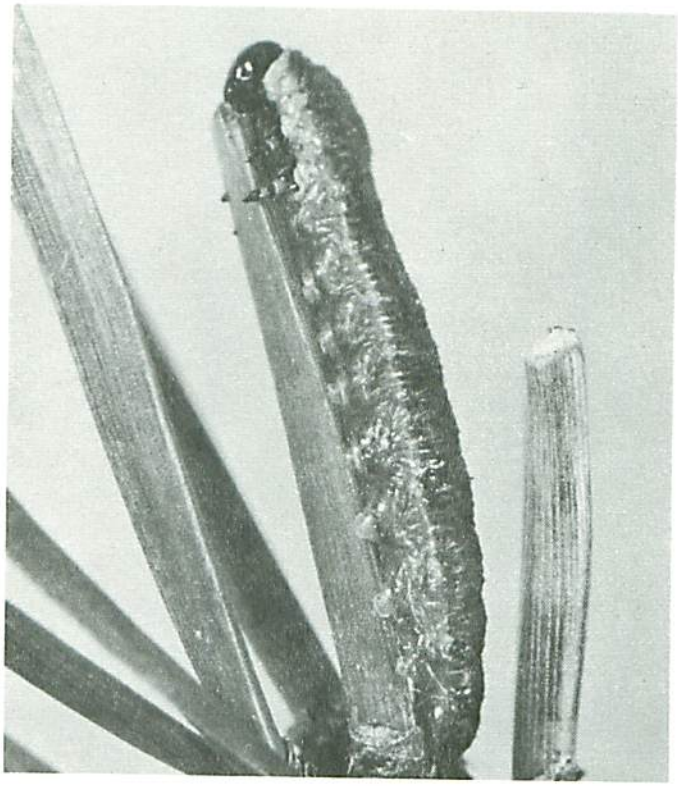
Larva

FOREST TENT CATERPILLAR,
Malacosoma disstria Hbn.

Larva

Feeding colonies of eastern tent caterpillar on cherry bushes, with severe defoliation of aspen trees in the background

RED-PINE SAWFLY, *Neodiprion nanulus nanulus* Schedl



Larva

Severe defoliation of 25′ red-pine trees

LARCH SAWFLY, Pristiphora erichsonii (Htg.)

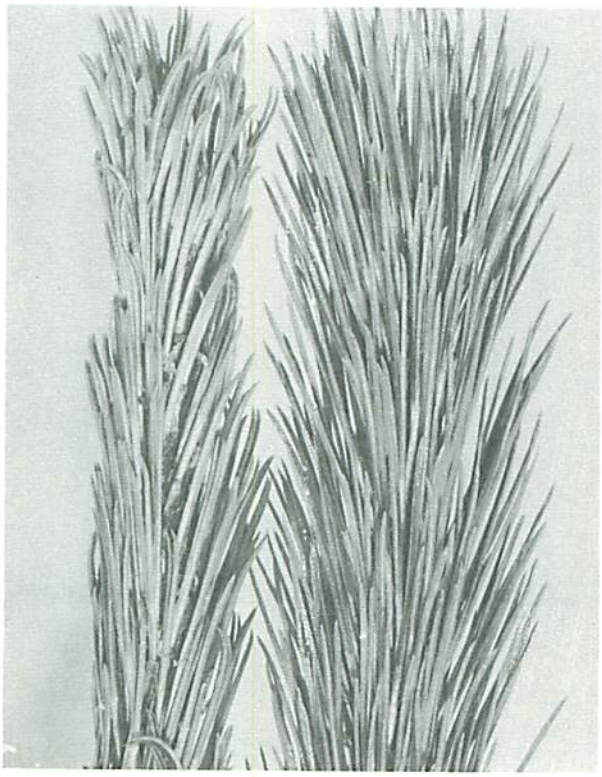
A tamarack shoot curled as a result of adult oviposition. The curl is caused by damage to the growing tissue on one side of the tip.

A colony of the sawfly on a tamarack twig.

Severe defoliation of a tamarack stand.

WHITE-PINE SHOOT BORER, Eucosma gloriola Heinr.

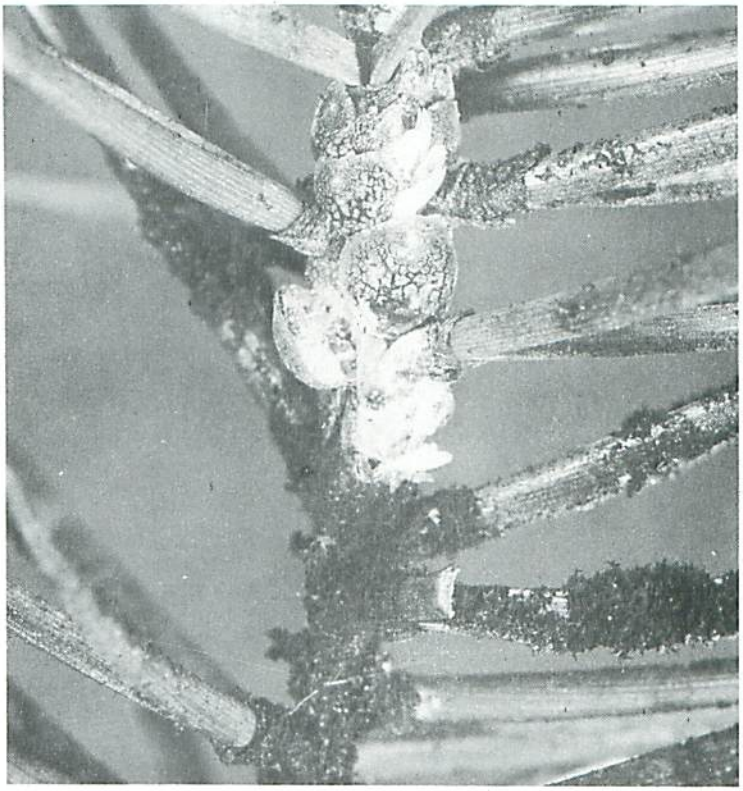
Infested shoot showing frass-filled tunnel



Infested shoot showing stunted needles on the left; normal shoot on the right

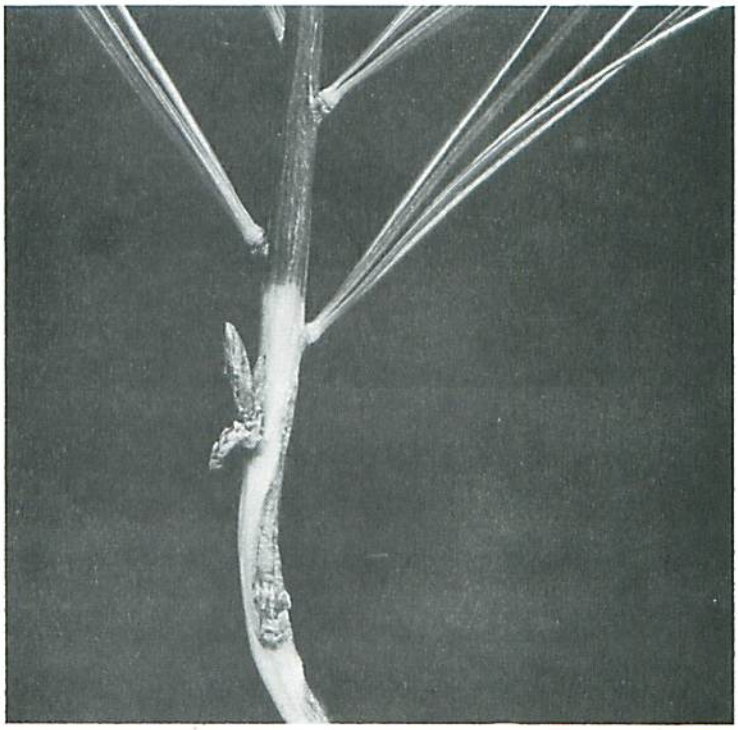
Deformed crown of jack pine tree

PINE TORTOISE SCALE, Toumeyella numismaticum (P.&.M.)



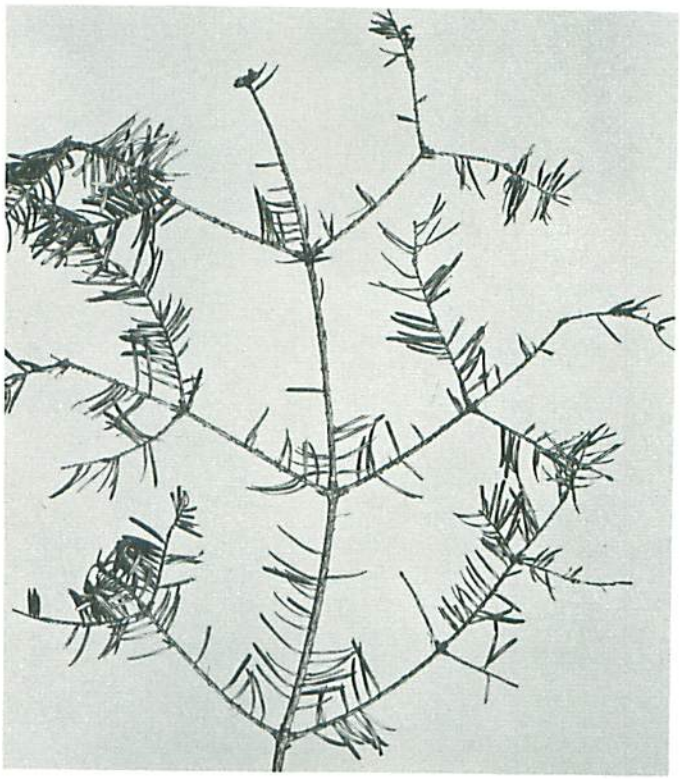
Scales on a jack pine twig and black sooty fungus growing on honey dew dropped by them.

A PINE MITE, Trisetacus pini (Nal.)

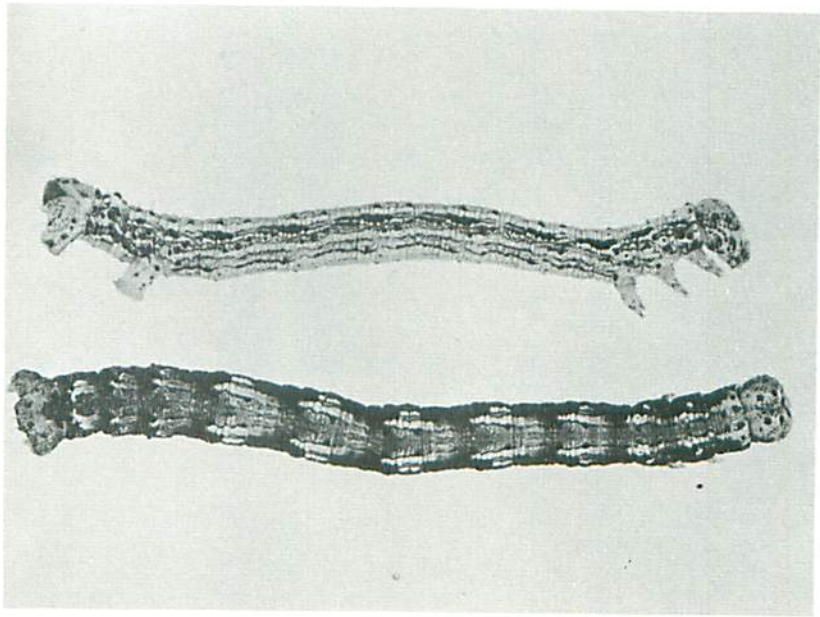


Typical damage symptoms, discoloration, distortion of new growth, and an abortive needle fascicle.

HEMLOCK LOOPER,
Lambdina fiscellaria fiscellaria (Guen.)

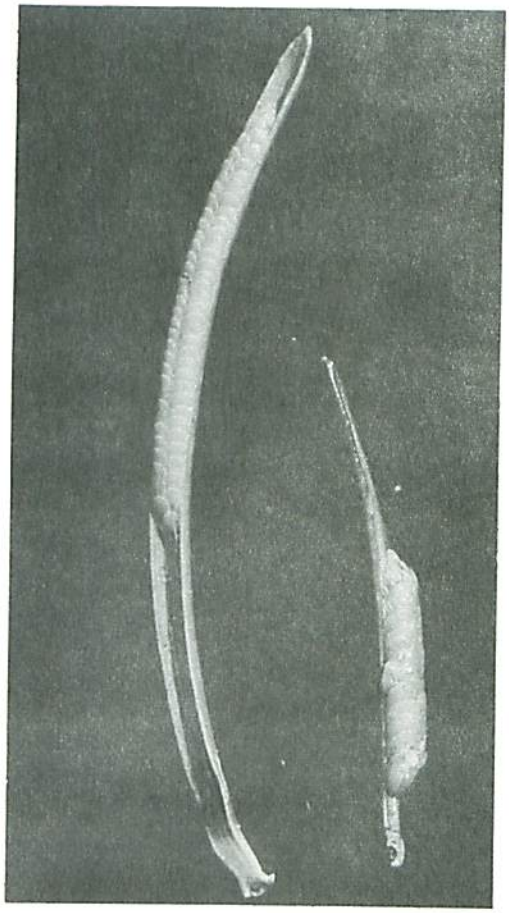


Defoliation of balsam fir



Larva

JACK-PINE BUDWORM, Choristoneura pinus Free.

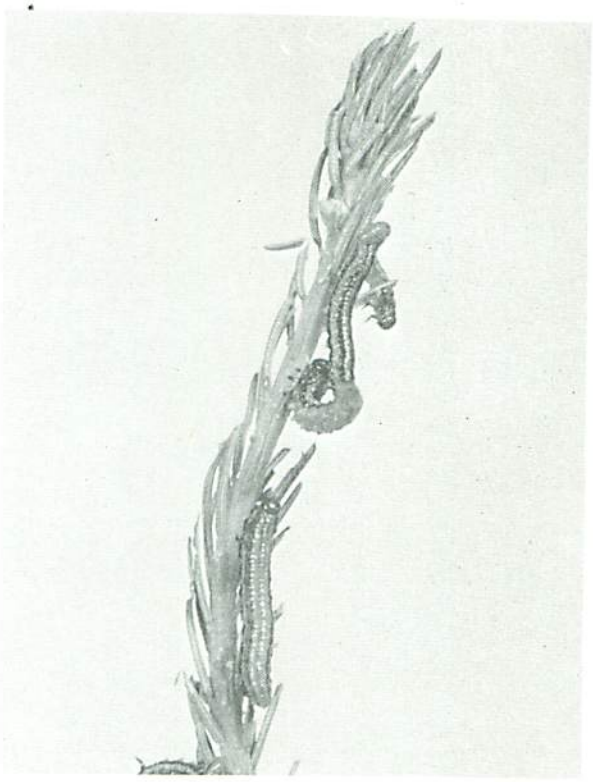


Egg clusters.

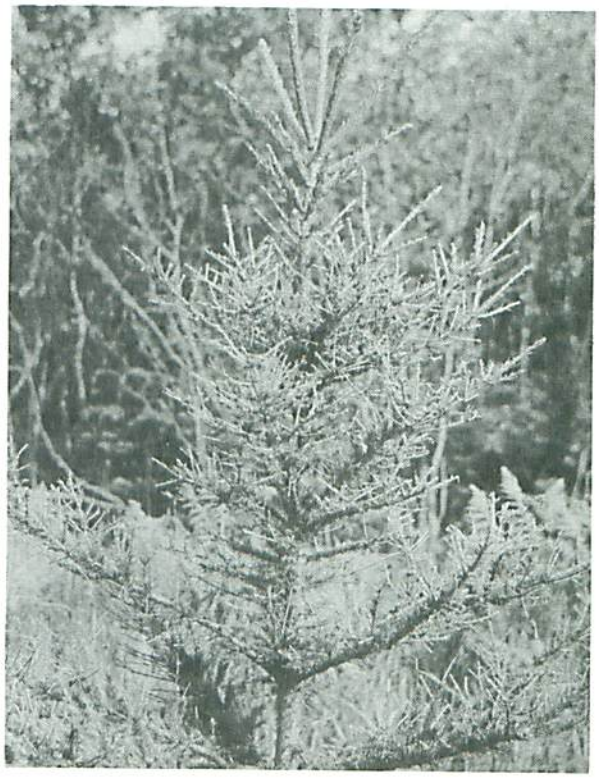
Larva among male flowers of jack pine.

Severe current defoliation of jack pine.

YELLOW-HEADED SPRUCE SAWFLY, Pikonema alaskensis (Roh.)



Full-grown larvae

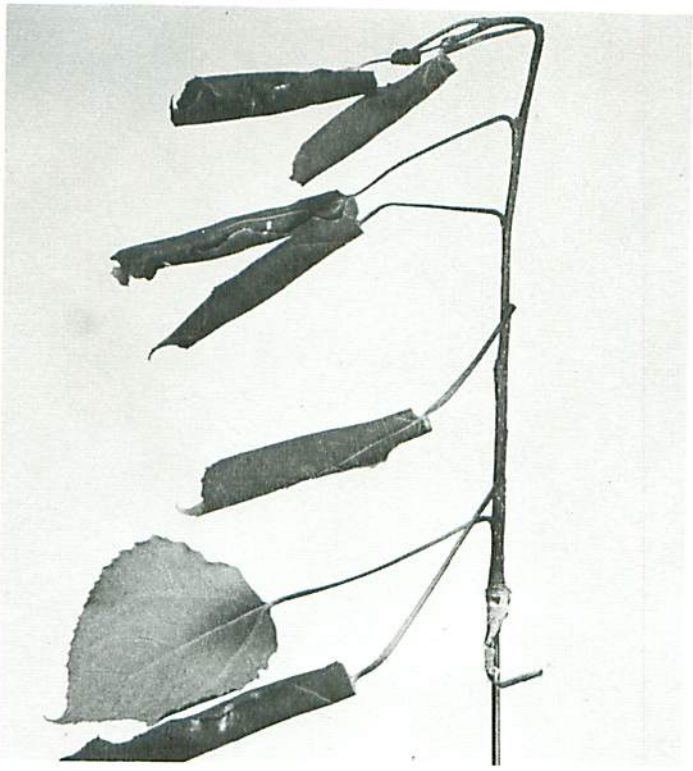


Severely defoliated spruce tree

A PINE TIP MOTH, Rhyacionia adana Heinr.

On the left, a normal red pine tree; on the right, a tree showing infested shoots and earthen pupal cells at the root collar.

POPLAR LEAF-ROLLER,
Pseudexentera oregonana Wlshm.



Leaf rolls on trembling aspen

Damage to roadside trees

PINE ROOT COLLAR WEEVIL, Hylobius radicis Buch.

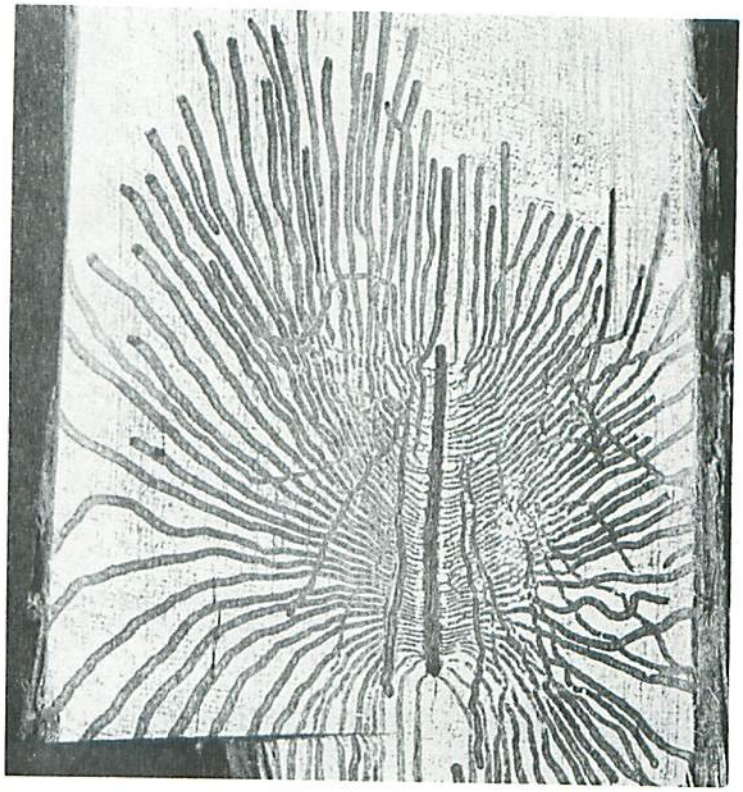
Larva

Infested red-pine are commonly wind-thrown

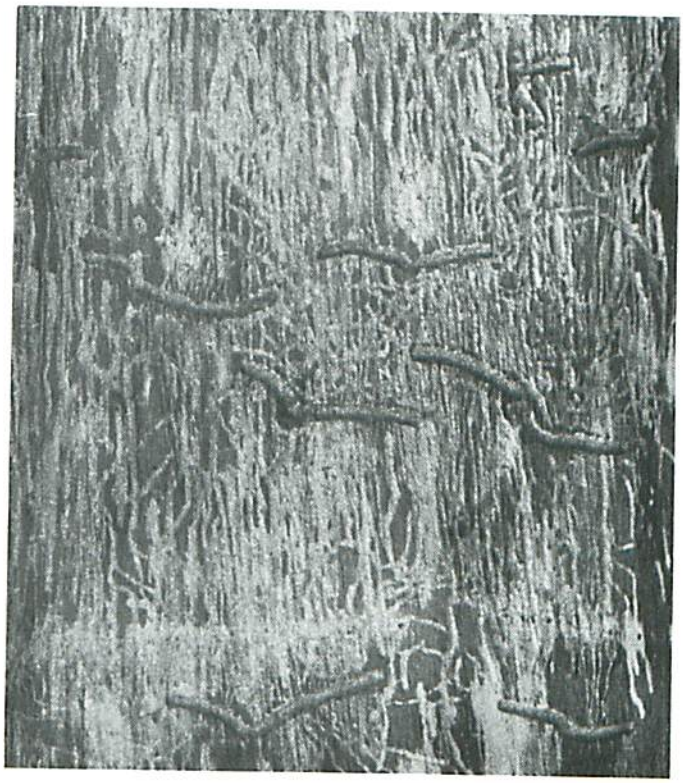
Typical damage of root collar

Cross section of root collar showing repeated attacks

ELM BARK BEETLES



Brood gallery of smaller European elm bark beetle, *Scolytus multistriatus* (Marsh.)



Brood galleries of native elm bark beetle, *Hylurgopinus rufipes* (Eichh.)

Deterioration of roadside sugar maple

Stand of white elm showing damage and tree mortality caused by Dutch elm disease *Ceratocystis ulmi* (Buism) C. Moreau

SWEET FERN BLISTER RUST

Fruiting of sweet fern blister rust on living jack pine

HYPOXYLON CANKER OF POPLAR

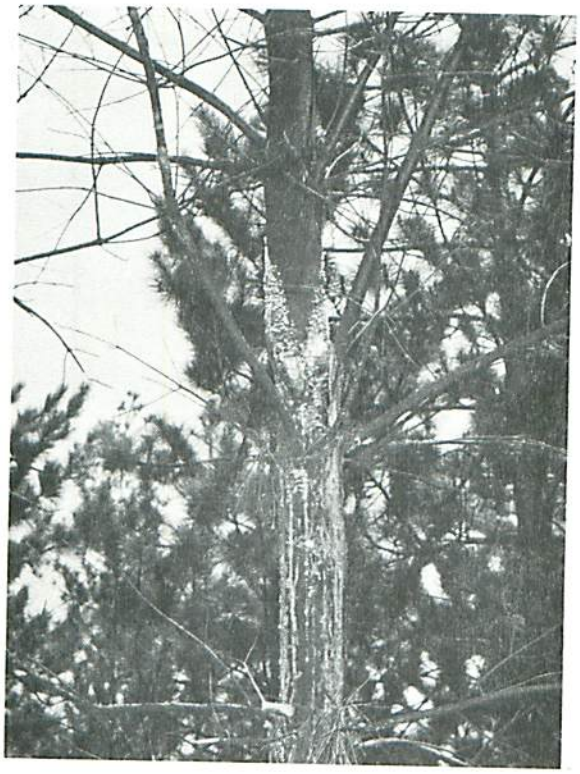
Hypoxylon canker on trembling aspen

FOMES ROOT ROT,
Fomes annosus (Fr.) Cke.

Fruiting body

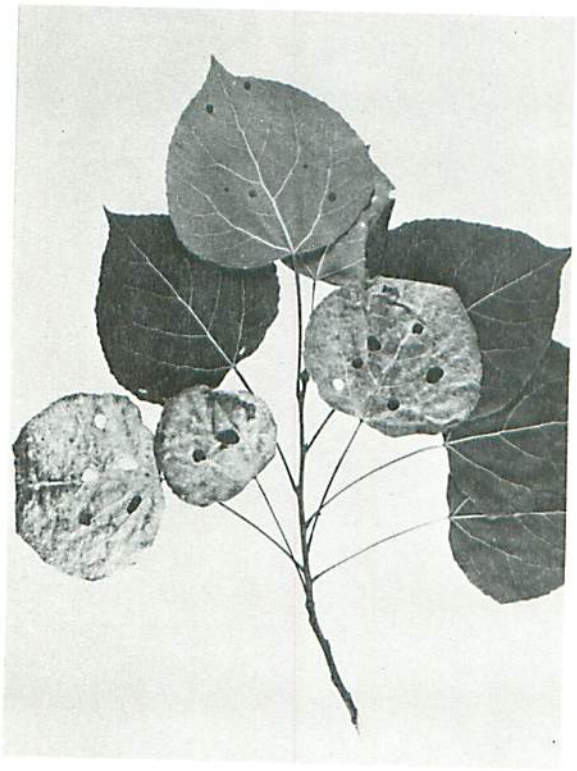
Opening in pine plantation caused by root rot

WHITE PINE BLISTER RUST,
Cronartium ribicola
J. C. Fischer



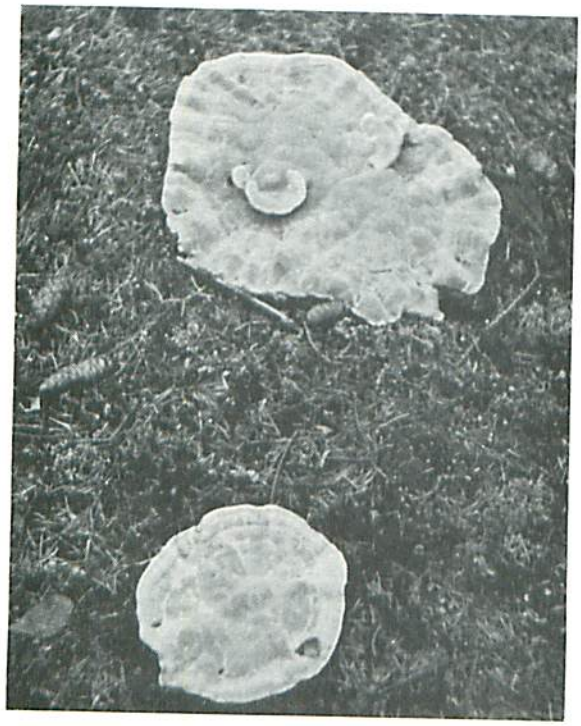
Mortality of white pine tree caused by rust

INK SPOT OF ASPEN,
Ciborinia whetzelii
(Seav.) Seav.



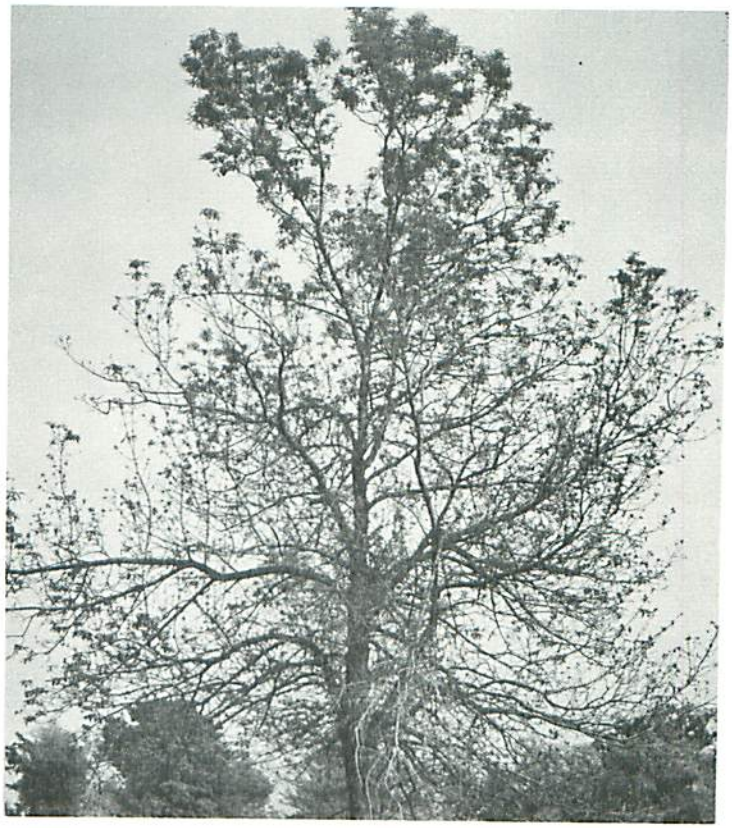
Leaf mortality caused by Ink Spot

Root Rot of Conifers, *Polyporus tomentosus* Fr.

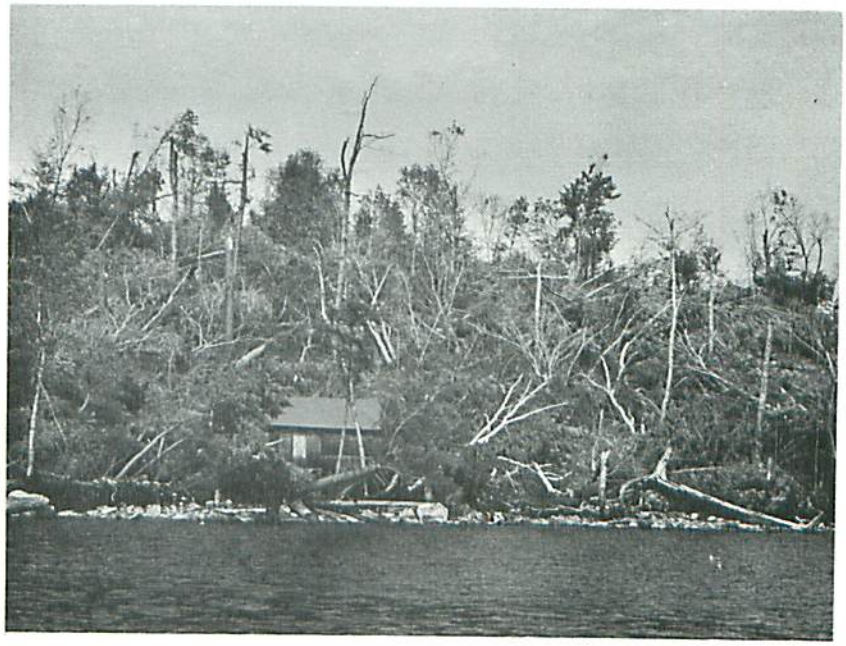


Fruiting body

Damage to roadside spruce trees



Frost damage



Wind damage in hardwood forest Haliburton County