Southwestern Forest Region, 1968 Status of Insects in Lake Simcoe District

Bowser, R.L.

Information Report O-X-86
(Forest Research Laboratory, Ontario Region)

TABLE OF CONTENTS

INFORMATION REPORTS - INSECT AND DISEASE SURVEYS

Ontario, 1968

FOREWORD

The Forest Insect and Disease Survey maintains a continuing interest in improving existing sampling methods and in developing new techniques for rating forest pests and appraising damage. In 1968, a new approach for evaluating incidence and levels of infection of a number of tree diseases was explored. This involved determining degrees of damage in random and non-random plots in relation to the basal area of infected stands, the ultimate objective being to provide information on the impact of the organisms on forest stands in Ontario. Studies during the winter to test the accuracy of the new sampling system will be useful for planning field work in 1969. Improvement of insect survey methods in 1968 was largely directed toward jack-pine budworm sampling with emphasis on egg population studies. To this end, the distribution of egg masses on individual branches and at various crown levels of sample trees was investigated as a basis for determining the nature and size of samples required to assess population levels. The value of these new approaches in disease and insect sampling will be proven with use in forthcoming field seasons.

Marked changes in insect and disease conditions were recorded in large areas of the Province in 1968. A sharp increase in population levels of the spruce budworm and jack-pine budworm occurred in many parts of Ontario. The largest areas of infestation of the spruce budworm were located in the Burchell Lake area in the Port Arthur District, in parts of the Chapleau, Kapuskasing and Swastika districts and in southeastern Ontario. Localized infestations were centered in Parkinson Township in the Sault Ste. Marie District and in Fairbanks Township west of Sudbury. Egg surveys in most of the above areas except Burchell Lake, indicated that infestations will increase in extent in 1969.

The chemical control operation undertaken by the Ontario Department of Lands and Forests against the spruce budworm in the Burchell Lake area dominated insect surveys in western Ontario during several periods from May until September. Technicians were involved in intensive sampling to delineate the area to be treated, to time the spray applications and to assess spruce budworm numbers before and after the control operation.

Infestations of the jack-pine budworm abated somewhat in the Kenora and Fort Frances districts but several years of severe defoliation, particularly on rocky sites, caused considerable crown damage. In parts of the Sault Ste. Marie and Pembroke districts very severe defoliation of both jack pine and red pine was reported. Other insects occurring in particularly high numbers in 1968 included the saddled prominent, larch casebearer and several species of cedar leaf miners.

Devastation of elm by Dutch elm disease continued in southern Ontario and numerous new centers of infection were found throughout a large part of the range of elm in central Ontario. A vector of Dutch elm disease, the smaller European elm bark beetle extended its range eastward along the north shore of Lake Ontario and St. Lawrence River. Hypoxylon canker of poplar proved to be a serious problem in many parts of Ontario. Evaluations revealed particularly high levels of infection in aspen stands in the Sault Ste. Marie and Sudbury districts. Scleroderris canker of pine again caused considerable

...2

mortality in young red pine and jack pine plantations in parts of central and northeastern Ontario. Fomes root rot usually associated with thinning operations, caused varying amounts of mortality in red pine plantations in southern Ontario. Four new centers of infection of this disease were found in Larose forest in the Kemptville District in 1968. Details on the above and other noteworthy insect and disease problems are contained in the report that follows.

J. E. MacDonald

SOUTHWESTERN FOREST REGION

1968

INTRODUCTION

STATUS OF TREE DISEASES (Regional

INTRODUCTION

Southwestern Region

The following report, based on field surveys by Forest Research Technicians, deals with the status of forest insects and tree diseases. Data on insects are presented on a district basis and tree diseases are contained in the regional section of the report.

High populations of the saddled prominent persisted in the region, several new infestations being reported in the Lake Simcoe and Lake Huron districts. In Lake Erie District high populations of the cottony maple scale recurred in the Windsor area. Heavy infestations of the larch sawfly, pine root collar weevil, European pine sawfly, cedar leaf miners and white pine weevil persisted at numerous locations in the region. Infestation intensities of the larch casebearer, black-headed budworm, a tortricid on oak and the maple trumpet skeletonizer increased noticeably at scattered locations. In contrast, larval populations of the spruce budworm, European spruce sawfly, introduced pine sawfly and nursery pine sawfly declined considerably. Medium infestations of a recently described red pine needle midge and heavy infestations of the oak skeletonizer, a periodic pest of oak trees, occurred in the Lake Simcoe District.

A new method was introduced in 1968 for determining the incidence and levels of infection of a number of tree diseases. Quantitative data collected in the region revealed heavy infections of Dutch elm disease, Hypoxylon canker of poplar, white pine blister rust and Fomes root rot. New infection centres of the last named disease were discovered in Lake Simcoe and Lake Erie districts extending the known distribution eastward approximately 10 miles. An ice storm caused notable damage to pine trees in a band between London and the Niagara Peninsula. Girdling by rodents caused widespread mortality in young pine plantations and to a variety of deciduous hosts, particularly open-growing sugar maple saplings. Deterioration of roadside maple appeared to be less severe than in recent years.

Technicians from Lake Simcoe and Lake Huron districts assisted research officers with a termite survey in the Kincardine area and the Lake Erie Technician was involved with information officers gathering material for the new edition of Native Trees of Canada.

Special collections of the fall webworm, larch sawfly, yellow-necked caterpillar and Argyresthia species were made for specific studies. Extension work involving Department of Lands and Forests personnel, plantation owners and others again constituted an important part of the technician field duties.

Technicians in the region wish to take this opportunity to express appreciation for the continued co-operation and assistance extended by Department of Lands and Forests personnel in 1968.

R. L. Bowser

Dutch Elm Disease, Ceratocystis ulmi (Buism.) C. Moreau

This disease continued to be the most serious and publicized forest tree problem in the Southwestern Region in 1968. However, the degree of tree mortality was less evident than in recent years because most townships and municipalities have a programme to remove dead and diseased trees. Elm losses were severe in the Lake Erie District and southern part of the Lake Simcoe and Lake Huron districts, and tree mortality is increasing in the northern part of the region. Incidence and levels of infection for 18 municipalities in the region are shown in Table 1.

TABLE 1

Summary of Incidence and Infection Levels of the Dutch Elm Disease in 18 Municipalities in the Southwestern Region in 1968

District	Municipality	Per cent incidence	Level of infection
Lake Simcoe	Oshawa	62	Heavy
	Aurora	76	"
	Brampton	98	"
	Orangeville	60	"
	Orillia	34	"
	Barrie	40	"
Lake Huron	Kitchener	56	"
	Guelph	28	"
	Galt	18	"
	Chatsworth	16	"
	Teeswater	16	"
Lake Erie	London	92	"
	Adelaide	100	"
	Sarnia	60	"
	St. Catharines	70	"
	Dunville	84	"
	Fonthill	36	"
	Simcoe	82	"

White Pine Blister Rust, Cronartium ribicola J. C. Fischer

Stands with light to heavy infection were observed throughout the region in 1968. The highest incidence occurred in Oro Township in the Lake Simcoe District where 27.5 per cent of the trees were diseased. The highest incidence recorded in both Lake Erie and Lake Huron districts was 10 per cent. Light mortality occurred in Lake Simcoe District. Sample plot data is contained in Table 2.

TABLE 2

Summary of Incidence and Levels of Infection of White Pine Blister Rust in the Southwestern Region in 1968

District (township)	Host	Acres affected	Per cent incidence	Level of infection	Per cent mortality
Lake Simcoe					
Mulmur	wP	20	4.0	Light	1.0
E. Gwillimbury	wP	12	3.0	"	1.0
Whitchurch	wP	20	4.0	"	1.0
Nottawasaga	wP	100	15.0	Medium	1.5
Oro	wP	50	27.5	Heavy	2.5
Albion	wP	10	22.5	Medium	5.0
Lake Erie					
Yarmouth	wP	10	0.0	Trace	0.0
S. Walsingham	wP	5	10.0	Medium	0.0
S. Walsingham	wP	10	0.0	Trace	0.0
Bosanquet	wP	10	9.1	-	0.0
Lake Huron					
Sullivan	wP	10	10.0	Light	0.0
Euphrasia	wP	150	7.5	Medium	0.0
Glenelg	wP	100	7.5	"	0.0
Osprey	wP	100	10.0	"	0.0
Wilmot	wP	100	1.0	Trace	0.0

Fomes Root Rot, Fomes annosus (Fr.) Cke.

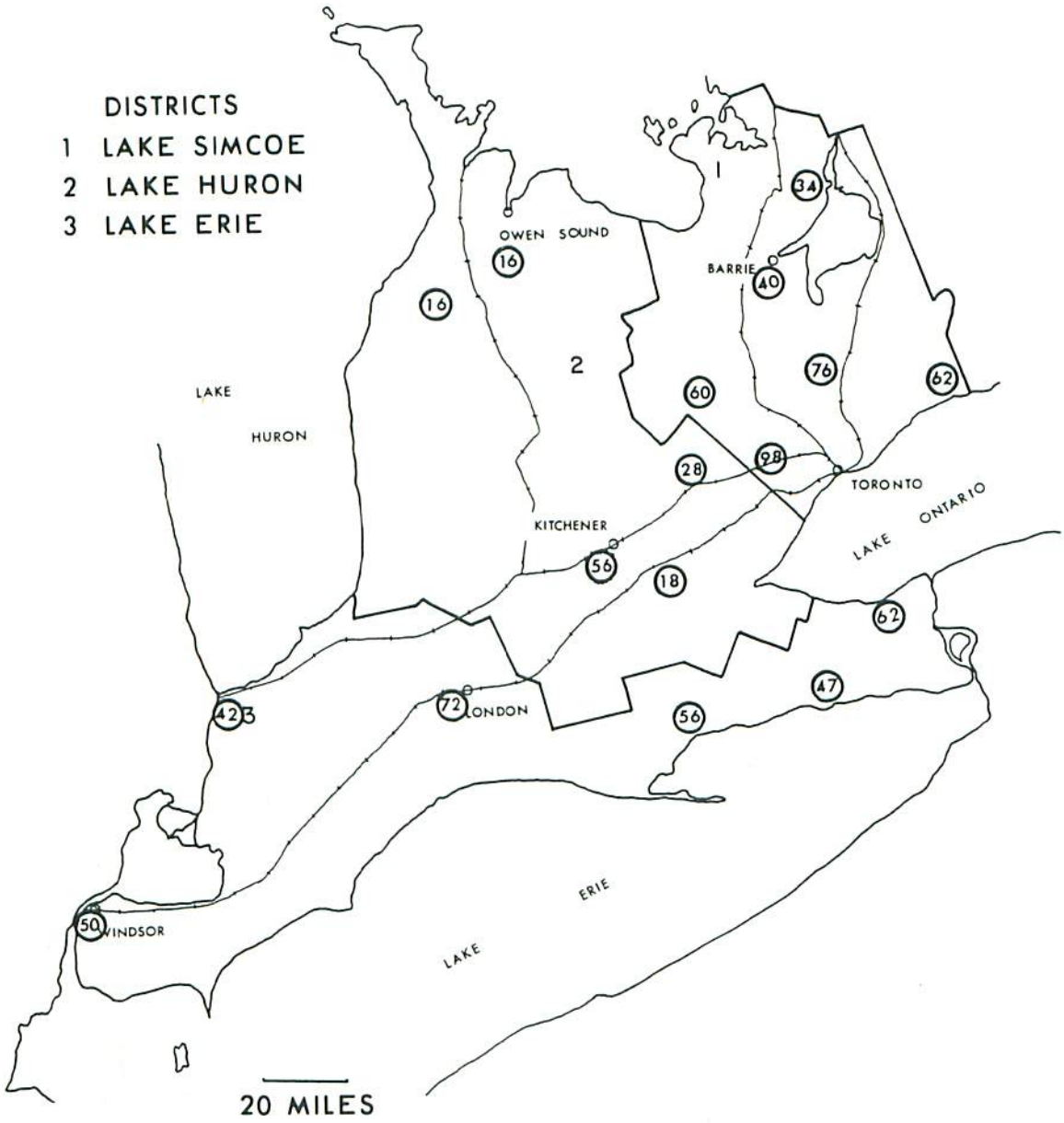
Red and jack pine mortality resulting from this root rot continued in both Lake Simcoe and Lake Erie districts in 1968. The disease has not been recognized in the Lake Huron District to date.

The known distribution was extended approximately 10 miles to the east in the Lake Simcoe District by the discovery of an infection center in Uxbridge Township. Mortality of red pine increased in Flos Township where the disease attacked and killed two trees outside a trench dug in 1966 to prevent spread of infection.

In the Lake Erie District mortality continued in red and jack pine plantations in South Walsingham Township and in a red pine plantation in Charlotteville Township. A new infection center was discovered in a mixed plantation of young white and Scots pine in South Walsingham Township where 2.5 per cent mortality was recorded.

Thinning of stands without proper stump treatment is a major factor contributing to the establishment of root rot.

SOUTHWESTERN REGION



DUTCH ELM DISEASE

Per cent of trees infected in 1968 at sample locations in 17 municipalities

Legend

Per cent of trees infected ---------- (%)

TABLE 3

Summary of Incidence and Levels of Infection of Fomes Root Rot in the Southwestern Region in 1968

District (township)	Host	Per cent incidence	Level of infection	Per cent mortality
Lake Simcoe				
Uxbridge	jP	2.7	Light	0.0
Medonte	rP	2.5	"	0.0
Flos	rP	12.5	Medium	5.0
Lake Erie				
S. Walsingham	rP	37.5	Heavy	15.0
S. Walsingham	wP, ScP	15.0	Medium	5.0
Charlotteville	jP	25.0	Heavy	12.5
Charlotteville	rP	12.5	Medium	2.5

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

Light to heavy levels of infection were recorded in the region in 1968. Current mortality, incidence and infection levels are shown in Table 4. Several factors which appeared to influence the incidence of the disease were poor or excessive drainage, rocky and shallow soils, and mechanical damage caused by hail and ice.

Plots in the Lake Huron District revealed that incidence ranged from 10 per cent in Osprey Township to 100 per cent in Keppel Township. In the Lake Simcoe District the incidence ranged from 12.5 per cent in Mulmur Township to 67.5 per cent in East Luther Township. The majority of plots sampled revealed a high level of infection. The incidence in the Lake Erie District varied from 5 per cent in Maidstone Township to 30 per cent in South Walsingham Township. The level of infection at sample points was equally divided between light and moderate ratings. No current mortality was observed.

TABLE 4

Summary of Incidence and Infection Levels of Hypoxylon Canker of Poplar at 26 Locations in the Southwestern Region in 1968

Location (township)	Tree height in feet	Incidence in per cent	Levels of infection	Per cent mortality
Lake Simcoe				
Mulmur	35	12.5	Light	2.0
E. Luther	30	67.5	Heavy	5.0
W. Gwillimbury	35	15.0	Heavy	5.0
Essa	40	62.5	Heavy	10.0
Medonte	45	42.5	Heavy	2.5
Essa	35	27.5	Moderate	2.5
Lake Erie				
S. Walsingham	25	30.0	Moderate	0.0
S. Walsingham	35	12.5	Moderate	0.0
Aldborough	25	7.5	Light	0.0
Raleigh	15	6.4	Light	0.0
Bosanquet	30	15.0	Moderate	0.0
N. Cayuga	25	7.0	Light	0.0
Oneida	20	11.0	Light	0.0
Houghton	20	13.0	Moderate	0.0
N. Dorchester	30	15.0	Moderate	0.0
Howard	35	6.0	Light	0.0
Romney	30	5.0	Light	0.0
Maidstone	35	5.0	Light	0.0
Lake Huron				
Keppel	40	100.0	Heavy	12.0
Glenelg	35	65.0	Heavy	5.0
Albermarle	35	68.0	Heavy	7.5
Lindsay	35	50.0	Heavy	7.5
Greenock	35	32.0	Heavy	2.5
Osprey	40	10.0	Light	0.0
Puslinch	45	20.0	Light	0.0
Proton	45	25.0	Light	0.0

Valsa Canker, Valsa kunzei Fr.

A high incidence of this disease recurred in white spruce plantations at two points in Lake Huron District. Quantitative data collected at the infection center near Midhurst in Vespra Township revealed 40 per cent incidence and level of infection. Cankers have girdled occasional trees causing a noticeable reduction in growth. Although no mortality was recorded in 1968, light mortality can be expected in 1969. At Base Borden in Essa Township recent pruning in a 40-year old spruce plantation has greatly increased the incidence of the disease.

Deterioration of Roadside Maple

Deterioration of maple continued to be a problem along most major traffic arteries in the region in 1968. Most townships now have a program to remove dead and severely infected trees. This is reflected in the lower numbers of dead trees counted at most sampling locations.

In the Lake Simcoe District conditions remained much the same as in 1967. Maple in the southern part of the district showed the most evidence of deterioration.

In the Lake Huron District incidence of over 90 per cent was recorded in Nichol and East Nissouri townships, however, the only mortality recorded was four per cent in Eramosa Township.

A general decline in incidence and mortality was recorded in the Lake Erie District. Sugar maple was most seriously affected, however, at one location along Welland Road Number 2, 70 per cent of silver maple showed symptoms of deterioration.

Ice Damage

An area extending from approximately 40 miles west of London to the Niagara Peninsula was severely damaged by an ice storm in January, 1968. Scots pine suffered the heaviest damage, in most cases having breakage of both tops and large lateral branches. White pine was damaged to a lesser degree. Light damage occurred on red pine, cedar and deciduous trees. Norway spruce and white spruce in the area suffered only minor damage.

Rodent Damage

Girdling of pines and deciduous trees resulting in widespread mortality was reported in the region in 1968. Of the deciduous species sugar maple suffered the highest mortality but cherry, hawthorn, ash and basswood were also girdled.

In the Lake Simcoe District numerous young Scots pine plantings were heavily damaged. Three-to-five foot Austrian pine suffered 50 per cent mortality in a small plantation in Oro Township.

In the Lake Erie District 20 per cent mortality was recorded in a three-year-old Scots pine plantation in Willoughby Township. A six-year-old Scots pine plantation in McGillivray Township suffered severe girdling and approximately 10 per cent mortality.

In the Lake Huron District numerous 4-to 6-foot Scots pine were girdled in a plantation in West Garafraxa Township. Light mortality of small red pine trees was observed in a plantation in Nassagaweya Township.

TABLE 5

Other Noteworthy Diseases in the Southwestern Region in 1968

Organism	Host(s)	Remarks
Apiosporina collinsii (Schw.) Hoehn.	sPl	Heavy infection on several trees in Sunnidale Township
Armillaria mellea (Vahl) ex Fr. Kummer	rP, eC, wAs	Occurred commonly in the region in 1968. Light mortality recurred in Midhurst Forest Nursery and in an old infection centre in Oro Township
Aureobasidium pullulans (de Bary) Arnaud	rP, scP	Associated with stem and needle mortality in Uxbridge, Matchedash and Charlotteville townships
Botryosphaeria quercuum	rO	Organism collected on dead branches in Nassagaweya Township. Second herbarium record
Camarosporium robiniae (Westd.) Sacc.	Hon	High incidence of branch tip mortality in Lake Huron District
Ciborinia whetzellii (Seaver) Seaver	tA	Infections were noted in Aspen stands ranging from 20 to 500 acres at several points in Lake Simcoe District. Although incidence ranged as high as 100 per cent, level of infection did not exceed light
Coleosporium asterum (Diet.) Syd.	rP, jP	Trace infections in Eramosa, Sullivan, Nottawasaga, Tosorontio, S. Walsingham and Woodhouse townships

TABLE 5 (continued)

Organism	Host(s)	Remarks
Cronartium comptoniae Arth.	jP	Light infection in St. Edmunds Township
Cryptodiaporthe galericulata (Tul.) Wehm.	Be	Associated with light to heavy branch mortality in Nassagaweya Township
Gelasinospora tetrasperma Dowding	wP	Collected in association with Fomes annosus
Gelatinosporium abietinum Pk.	bF	Organism associated with tree mortality in Osprey Township
Gymnosporangium clavipes (Cke. and Pk.) Cke. and Pk.	sPl, rJ	Light and moderate infections in Sunnidale, S. Colchester and Charlotteville townships
Gymnosporangium globosum Farl.	rJ	Light infection in S. Colchester Township
Gymnosporangium sp.	Haw	Heavy on occasional trees in Flos Township
Lenzites trabea Pers. ex Fr.	nS	Found on dead material in Dunwich Township
Peridermium sp.	Scp	Heavy and moderate infections in Flos and Whitchurch townships respectively. Light infections common in Lake Simcoe District
Pollaccia radiosa (Lib.) Bald. & Cif.	tA	Occurred at widely scattered locations in Lake Simcoe District. The highest incidence recorded was 47.5 per cent and infection levels were generally very low
Polyporus schweinitzii Fr.	wS	One large tree infected in shelterbelt at Midhurst nursery
Polyporus tomentosus Fr.	wS, nS	Associated with stem mortality in Vespra, Essa and Charlotteville townships

TABLE 5 (concluded)

Organism	Host(s)	Remarks
Puccinia convolvuli Cast.	Bindweed	Rust common on this host in recent burn area. Second herbarium record
Rhizina undulata Fr. ex Fr.	Ground	Collected from ground in recent burn area in Vespra Township. Not associated with tree mortality
Salt damage	eC, wS, nS wP, nP	Light to severe foliar damage occurred along major highways. Light tree mortality occasionally observed
Sclerophoma pithya (Thuem.) Hoehn.	wP	Organism found on dead branch tips in Lake Erie and Lake Huron districts
Sphaeropsis ellisii Sacc.	ScP	Associated with mortality of 45-foot trees in Sunnidale Township. Second herbarium record
Tranzschelia pruni-spinosae (Pers.) Diet.	pCl	Associated with branch deterioration in Oro Township. First herbarium record
Uncinula salicis (DC.) Wint.	w, bPo	Light to heavy infections in small clumps of trees in Lake Simcoe and Lake Huron districts
Winter drying	wP, Scp	20 to 80 per cent incidence of severe damage observed in central part of Lake Huron District

STATUS OF INSECTS IN LAKE SIMCOE DISTRICT

R. L. Bowser

Black-headed Budworm, Acleris variana Fern.

Medium infestations of this budworm occurred in white spruce plantations in E. Garafraxa and Whitchurch townships. Larval counts gave 132 and 135 larvae per 15-tray sample respectively (Table 6). Small numbers of larvae were observed commonly in beating samples from white spruce and balsam fir trees at several locations in the district.

TABLE 6

Summary of Black-headed Budworm Larval Counts in the Lake Simcoe District in 1968

Location (township)	Tree species	Av. height of trees in feet	Total no. larvae per 15-tray sample 1968
Uxbridge	wS	30	22
E. Garafraxa	wS	20	132
Whitchurch	wS	30	135
Essa	wS	45	15
Nottawasaga	wS	45	7
Essa	bF	30	3
Medonte	bF	45	1

Cedar Leaf Miners, Argyresthia aureoargentella Brower
Argyresthia thuiella Pack. and
Argyresthia freyella Wlshm.

High populations of these three leaf miners caused severe defoliation in numerous cedar stands in the district. Tree and branch mortality increased considerably, particularly in the southeastern part of the district. As in 1967, A. thuiella was generally the most prevalent although larvae of A. aureoargentella were numerous in one cedar stand examined near Brooklin in West Whitby Township. Two other factors contributing to cedar decline were winter drying and the lack of foliage, particularly in the upper crowns, of trees that had produced heavy cone crops in 1967.

The Oak Skeletonizer, Bucculatrix ainsliella Murt.

This skeletonizer has not been reported in infestation proportions in Ontario for several years. In 1968 heavy infestations occurred in red oak stands in Uxbridge and Whitchurch townships. High populations were also reported in Metro Toronto and Oshawa. At one point in Uxbridge Township over 100 moulting pads were counted on one leaf. Small numbers of the insect were observed commonly on oak elsewhere in the district.

Spruce Budworm, Choristoneura fumiferana Clem.

A medium infestation recurred in a private plantation in Essa Township where 27 per cent defoliation was recorded. On the basis of egg counts, a light infestation will occur in this plantation in 1969. The medium infestation in Uxbridge Township declined to light intensity with only 10 per cent defoliation compared with 46 per cent in 1967. Continued light infestation is forecast for 1969. Defoliation at Midhurst increased from four to 14 per cent and light damage was recorded in white spruce stands in Oro, Whitchurch, Brock and Sunnidale townships. Small numbers of the insect were found in beating samples from balsam fir trees in Medonte and Essa townships.

Jack-pine Budworm, Choristoneura pinus pinus Free.

A medium infestation occurred on jack pine and red pine trees in one section of the Baxter Tract in Essa Township and on fringe and open-grown jack pine trees in a mixed plantation in Oro Township. Medium infestations in Albion and Melancthon townships declined to light intensity and new light infestations were recorded in Adjala and Whitchurch townships. The insect was found in very small numbers elsewhere in the district.

Large numbers of adults were noted in the Oro infestation in mid-July.

Larch Casebearer, Coleophora laricella Hbn.

Larval populations increased abruptly at three points and were generally higher throughout the district than in 1967 (see photograph). A heavy infestation caused severe discoloration of 30- to 40-foot European larch trees in a plantation east of Aurora in Whitchurch Township where a medium infestation had occurred in 1967. At quantitative sample points in Whitchurch and Albion townships medium infestations increased to heavy intensity with populations more than doubling (Table 7). A medium infestation recurred in W. Gwillimbury Township where 41 larvae were counted on two 18-inch branch tips. Localized light and medium infestations were observed more commonly in European larch and tamarack stands than in 1967.

Summary of Larch Casebearer Larval Counts in the Lake Simcoe District from 1966 to 1968

Note: Counts were based on examination of four 18-inch branch tips from the mid-crown of each of four trees at each location.

Location (township)	Tree species	Av. d.b.h. in inches	Av. no. larvae per 18-inch branch tip 1966	1967	1968
Medonte	eL	5	2.2	1.0	5.1
Albion	"	5	22.2	34.4	76.9
Whitchurch	"	6	0.9	17.4	42.1
Vespra	"	6	--	0.1	0.5
Uxbridge	"	8	--	2.0	8.5

A Tortricid on Oak, Croesia semipurpurana Kft.

Medium to heavy infestations occurred for the third consecutive year in red oak stands in Oro and Vespra townships (see map). The medium infestation in Dufferin County forest in Mulmur and Tosorontio townships increased to heavy intensity causing up to 100 per cent defoliation of localized groups of trees. New heavy infestations were recorded in woodlots near Maple in Vaughan Township and in the Thunder Bay area in Tiny Township. Moderate defoliation occurred near Balsam in Pickering Township. In Uxbridge Township the heavy infestation declined to medium intensity.

Swarms of adults were observed in areas of heavy infestation during the second week in July. This defoliator is associated with considerable mortality of oak in the northeastern United States and control operations have been carried out there.

Rusty Pine-cone Moth, Dioryctria disclusa Heinr.

Heavy cone damage occurred in red and jack pine plantations at Base Borden for the second consecutive year. In Tiny Township over 50 per cent cone damage was recorded in a large red pine plantation. Medium infestations were noted in Tosorontio, Albion and Mara townships.

Zimmerman Pine Moth, Dioryctria zimmermani Grt.

High larval populations caused moderate to heavy damage to the new shoots of pole-size red pine trees at several points for the second consecutive year (see photograph). At Base Borden shoot damage increased from 50 per cent to 70 per cent on numerous fringe and open grown trees. Heavy damage was also recorded at Midhurst in Vespra Township, the Baxter Tract in Essa Township and in sections of the Dufferin County forest in Mulmur and Tosorontio townships. Light damage was noted in Whitchurch, Tiny, Flos and Medonte townships.

Nursery Pine Sawfly, Diprion frutetorum F.

With a few exceptions, larval populations of this sawfly decreased generally in the district in 1968. The trend was most marked at a sample point in Reach Township where the number of larvae per sample decreased from 109 in 1967 to 25 in 1968 (Table 8).

TABLE 8

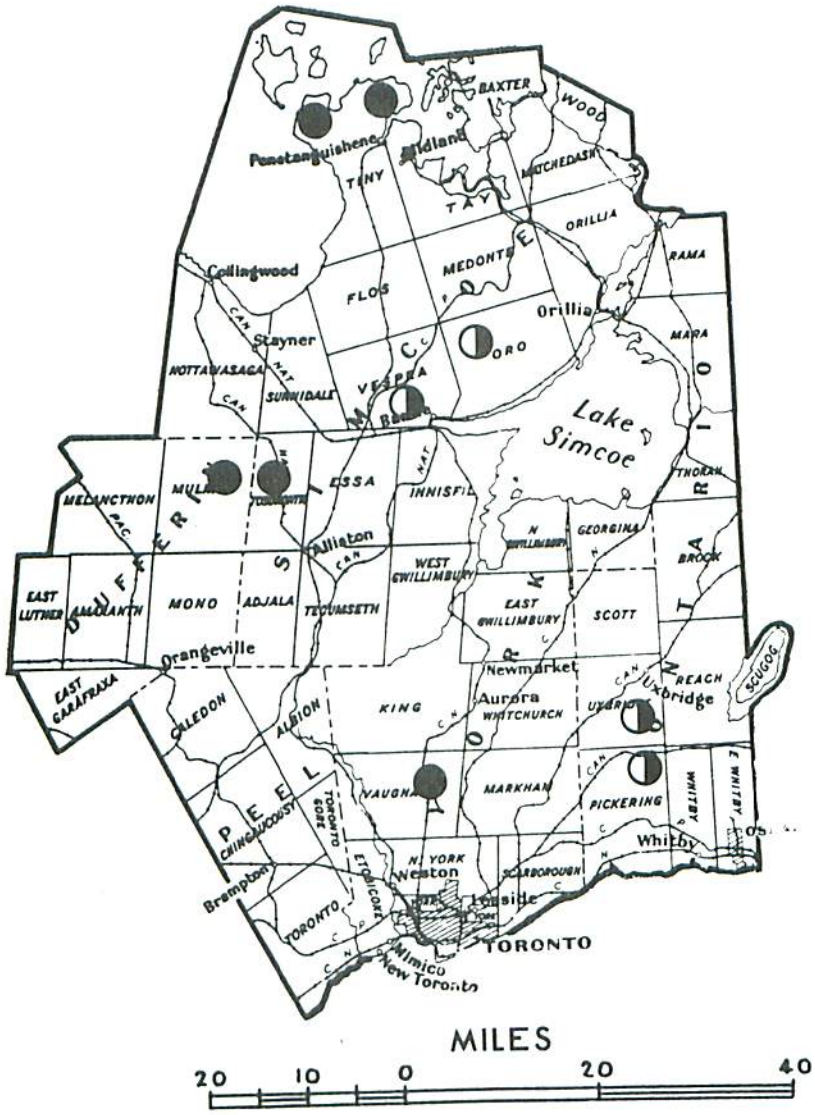
Summary of Nursery Pine Sawfly Larval Counts in the Lake Simcoe District from 1966 to 1968

Location (township)	Tree species	Av. height of trees in feet	Total no. larvae per 15-tray sample 1966	1967	1968
Pickering	ScP	30	0	46	7
Reach	ScP	30	2	109	25
Melancthon	ScP	30	1	4	11
Mono	ScP	20	2	10	6
Vespra	ScP	45	3	10	1
Orillia	ScP	15	2	23	29
Oro	wP	30	4	2	2
Markham	ScP	30	2	16	1

European Spruce Sawfly, Diprion hercyniae Htg.

Notable decreases in numbers of this insect occurred at four permanent sample areas in 1968 (Table 9). In contrast, a total of 74 larvae were counted in a 15-mat sample in Uxbridge Township compared with 19 in 1967. Elsewhere in the district random sampling revealed from one to six larvae per 3' x 3' mat sample.

LAKE SIMCOE DISTRICT



CROESIA SEMIPURPURANA ON OAK

Locations where infestations were observed in 1968

Legend

Medium infestations ----------◑

Heavy infestations ----------●

TABLE 9

Summary of European Spruce Sawfly Larval Counts in the Lake Simcoe District from 1966 to 1968

Location (township)	Tree species	Av. height of trees in feet	Total no. larvae per 15-tray sample 1966	1967	1968
Vespra	nS	45	3	22	0
Medonte	wS	45	5	62	15
Mara	wS	15	1	18	24
Nottawasaga	wS	45	1	63	10
Uxbridge	wS	30	4	19	74
Whitchurch	wS	30	-	39	0

Introduced Pine Sawfly, Diprion similis Htg.

In contrast to 1967 when sharp population increases occurred, this insect was found in relatively small numbers in 1968. This trend was particularly notable in Scots pine plantings in Pickering, Reach and Mono townships and in a white pine plantation in Oro Township (Table 10). Records maintained for a number of years show it is not unusual for larval populations to fluctuate substantially from year to year.

TABLE 10

Summary of Introduced Pine Sawfly Larval Counts in the Lake Simcoe District from 1966 to 1968

Location (township)	Tree species	Av. height of trees in feet	Total no. larvae per 15-tray sample 1966	1967	1968
Markham	ScP	30	2	22	9
Pickering	ScP	30	7	608	78
Reach	ScP	30	3	243	88
Melancthon	ScP	30	4	43	14
Mono	ScP	20	27	359	47
Vespra	ScP	45	3	10	0
Oro	wP	30	53	167	69
Orillia	ScP	15	2	35	31

Pine Shoot Moth, Eucosma gloriola Heinr.

Larval populations of this shoot borer remained virtually the same as in 1967. Shoot damage was evident in all plantations examined. In younger plantations the number of attacks per tree ranged up to five and leader damage did not exceed eight per cent (Table 11).

TABLE 11

Summary of Shoot Damage by the White-pine Shoot Borer in the Lake Simcoe District in 1968

Location (township)	Tree species	Av. height of trees in feet	Per cent of trees infested	Av. no. attacks per infested tree	Per cent of leaders attacked
Vespra	rP	3	69	3	5
Medonte	rP	2	78	3	7
Uxbridge	rP	4	61	2	4
Adjala	wP	6	91	2	5
W. Gwillimbury	wP	10	78	4	6
Whitchurch	ScP	6	100	5	8
Vespra	ScP	6	97	4	8

The Saddled Prominent, Heterocampa guttivitta Wlk.

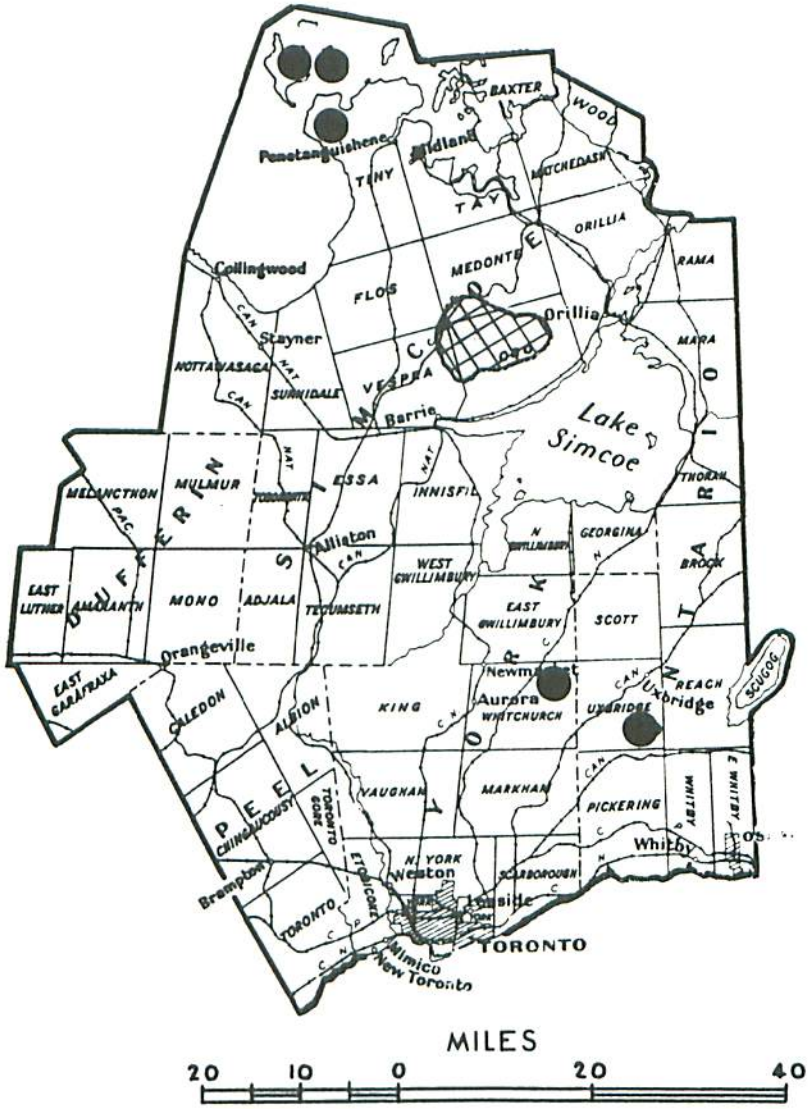
Heavy infestations recurred in parts of Oro and Medonte townships in 1968. New heavy infestations occurred on Beckwith and Christian islands in Georgian Bay (see map). Although sugar maple and beech were the preferred host trees trembling aspen, white birch and ironwood were severely defoliated in some areas. Generally medium infestations with scattered pockets of heavy intensity were recorded in Tiny, Whitchurch and Uxbridge townships and a light infestation was observed in a woodlot east of Orangeville in Adjala Township.

Starvation caused heavy mortality of mid-to-late instar larvae in woodlots where complete defoliation occurred (see photograph). Masses of dead larvae were observed commonly on the ground at the base of heavily infested trees.

Pupal counts in three areas of heavy infestation in Oro Township varied from an average of 2.2 to 6.8 per square foot of duff. Predation of pupae by small mammals approximated 50 per cent in two of the areas examined in mid-September. Further surveys in early May to determine the survival rate of overwintering pupae will be useful in forecasting infestation intensities for 1969. A very low percentage of the pupae were infected and killed by Isaria fungus.

Refoliation of the more vigorous sugar maple trees occurred in areas of severe defoliation. However, severely defoliated beech trees did not refoliate. Plots have been established in two areas to assess the effect of the damage on host stands.

LAKE SIMCOE DISTRICT



SADDLED PROMINENT

Area and locations where infestations were observed in 1968

Legend

Heavy infestation ------ and ●

Pine Root-collar Weevil, Hylobius radicis Buch.

Numerous heavy infestations persisted in Simcoe County causing considerable Scots pine tree mortality. In a small plantation near Gibson in Tiny Township 60 per cent of the trees were infested. Counts in Essa and Flos townships revealed that approximately 20 per cent of the trees were infested.

Eastern Tent Caterpillar, Malacosoma americanum F.

Following a decline for two consecutive years, larval populations in 1968 remained virtually the same as in 1967 (Table 12). The heaviest infestation was recorded east of Sandford in Scott Township where cherry shrubbery was severely defoliated along approximately two miles of roadside. Roadside counts showed only minor fluctuations elsewhere in the district.

TABLE 12

Summary of Eastern Tent Caterpillar Colony Counts in Lake Simcoe District from 1966 to 1968

Location (township)	tree species	No. colonies per mile of roadside 1966	1967	1968
Sunnidale	bCh	14	14	23
Tiny	ecCh	23	26	31
Medonte	bCh	13	11	16
Baxter	ecCh	13	16	11
Flos	bCh	56	31	37
Vespra	ecCh	--	11	8

Jack-pine Sawfly, Neodiprion pratti banksianae Roh.

A small pocket of heavy infestation occurred on scattered jack pine trees in a mixed plantation south of Base Borden in Essa Township. Small medium infestations were recorded in W. Gwillimbury, Orillia and Mara townships. Light damage was observed in Tosorontio and Adjala townships. In Melancthon Township the average number of colonies per infested 20-foot tree declined from five in 1967 to one in 1968 (Table 13).

TABLE 13

Summary of Jack-pine Sawfly Larval Colony Counts in Lake Simcoe District in 1967 and 1968

Location (township)	Av. height of trees in feet	Av. no. colonies per infested tree	
		1967	1968
Melancthon	20	5	1
Tosorontio	10	-	1.5
W. Gwillimbury	10	-	2.0

European Pine Sawfly, Neodiprion sertifer Geoff.

High larval populations caused severe defoliation of 10- to 30-foot Scots pine and red pine trees in Tiny, Vespra and Uxbridge townships. Approximately 100 acres of unpruned three-to ten-foot Scots pine trees were severely defoliated in a plantation near Ballantrae in Whitchurch Township. The heavy infestation in a 40-year-old jack pine plantation in East Whitby Township declined to medium intensity and a new medium infestation occurred near Blackwater in Brock Township. As in 1967 infestations in Dufferin County were generally light with occasional localized pockets of medium intensity. Elsewhere in the district light infestations occurred commonly and moderate damage was observed less frequently than in 1967 (Table 14).

In W. Gwillimbury Township where a small Scots pine plantation was sprayed with virus in 1967 approximately 30 per cent larval mortality occurred as a result of virus carry-over. A virus recovery programme was carried out in the plantation by Department of Lands and Forests personnel.

TABLE 14

Summary of European Pine Sawfly Colony Counts and Degrees of Infestation in the Lake Simcoe District from 1966 to 1968

Location (township)	Tree species	Av. height of trees in feet	Av. no. colonies per infested tree			Per cent of trees infested in 1968	Degree of infestation in 1968
			1966	1967	1968		
Caledon	ScP	20	3	7	2	31	L
Pickering	ScP	15	100+	16	3	100	L
Georgina	rP	7	3	4	3	81	M
Mulmur	rP	10	2	1	0.2	19	L
Orillia	ScP	12	1	0	1	50	L
Tiny	rP	5	-	-	1	67	L
Albion	ScP	10	-	-	3	71	L
Tosorontio	ScP	12	5	2	1	63	L
Tosorontio	rP	12	2	1	0.5	47	L

White-pine Weevil, Pissodes strobi Peck.

A notable increase in leader damage occurred at several points in the district in 1968. Heavy damage recurred in white pine plantations in Mara, Essa and Orillia townships (Table 15). Fifty-six per cent of the 7-foot white pine trees were attacked in a plantation in the Orr Lake Forest where moderate damage occurred in 1967. Heavy damage was also recorded in a Norway spruce plantation in Oro Township where 53 per cent of the leaders were infested. Moderate damage was noted in Mulmur and E. Gwillimbury townships.

TABLE 15

Summary of Leader Damage by the White-pine Weevil in the Lake Simcoe District from 1966 to 1968

Location (township)	Tree species	Per cent of trees weevilled		
		1966	1967	1968
Whitchurch	wP	26	17	19
Matchedash	wP	1	7	16
Essa	wP	45	55	35
Orillia	wP	45	31	35
Oro	wP	10	4	2
Whitchurch	nS	11	6	3
Vespra	nS	17	16	12
King	wP	19	14	20
Mara	wP	61	74	78

Larch Sawfly, Pristiphora erichsonii Htg.

Severe defoliation of European larch trees recurred in plantations in the Orr Lake and Waverley tracts in Medonte and Flos townships respectively and in a section of the Base Borden Reservation in Tosorontio Township. Seventy-five to 90 per cent defoliation of 50-foot trees was also recorded near Tottenham in Tecumseth Township and in the vicinity of Ballantrae in Whitchurch Township. Medium infestations were noted in Adjala, Oro and Mulmur townships. Light infestations were common elsewhere in the district. Data for larch curled tip counts is contained in Table 16.

TABLE 16

Summary of Curled Shoot Counts and Degrees of Infestation of the Larch Sawfly in the Lake Simcoe District from 1966 to 1968

Location (township)	Tree species	Av. d.b.h. in inches	Per cent tips curled			Degree of infestation		
			1966	1967	1968	1966	1967	1968
Oro	eL	8	6	22	18	L	M	M
Uxbridge	eL	9	100	2	3	H	L	L

A Red Pine Needle Midge, Thecodiplosis piniresinosae Kearby

Populations of this recently described insect were last reported from the Lake Simcoe District in 1965 when heavy infestations occurred in five townships. In 1968 medium infestations occurred in pole-size red pine plantations in Uxbridge and Medonte townships. Forty to 50 per cent of the current foliage was killed in some areas. Light damage was recorded at several locations, particularly in Oro and Vespra townships.

TABLE 13

Summary of Miscellaneous Insects Collected in the Lake Simcoe District

Insect	Host(s)	Remarks
Acrobasis betulella Hlst.	wB	Light infestation on young shade trees in Essa Township
Acrobasis juglandis LeBar.	Wa	Medium infestation of case-bearers on open-grown 10-foot trees in Pickering Township
Acrobasis tricolorella Grt.	pCh	Common on open-grown trees in W. Gwillimbury Township
Agonopterix robiniella Pack.	Lo	Heavy infestation in clump of open-grown trees in Oro Township
Altica populi Brown	bPo	Heavy localized infestations in Whitchurch and Uxbridge townships
Aphrophora parallela Say	ScP, jP, rP, wP	Occasional medium and heavy infestations. Light infestations common
Archips argyrospilus Wlk.	bO	Common on several open-grown trees in Pickering Township
Archips cerasivoranus Fitch.	ecCh	Heavy in Rama Township. Light elsewhere
Archips fervidanus Clem.	rO	Low populations in Oro and Tiny townships
Arge pectoralis Leach	wB	Small numbers of colonies in Uxbridge Township
Argyresthia laricella Kft.	eL	Small numbers in Mara Township
Argyresthia oreasella Clem.	ecCh	Common on occasional fringe trees in Oro Township
Argyresthia pygmaeella Hbn.	W	Leaf rollers common in Tiny Township
Caripeta divisata Wlk.	wS	Loopers common in beating sample in Uxbridge Forest

TABLE 13 (continued)

Insect	Host(s)	Remarks
Cecidomyia reeksi Vock.	jP	Heavy infestations caused approximately 50 per cent shoot damage to individual trees in Peel, York and the southern part of Ontario counties and at scattered points in Simcoe County
Coleophora innotabilis Braun	bPo, tA	Low populations of case-bearers in Mono and Whitchurch townships
Coleophora pruniella Clem.	bCh, pCh	Small numbers in Innisfil and Pickering townships
Coleophora ulmifoliella McD.	wE	Heavy in Whitby Township on open-grown trees
Datana integerrima G. & R.	Wa	Caused light, moderate and heavy defoliation of individual trees in the southern part of the district
Datana ministra Dru.	wE, Mo	Medium and light infestations on open grown trees in Pickering and Innisfil townships respectively
Depressaria betulella Busck.	wB	Light to moderate foliar damage in Oro and Flos townships
Dioryctria reniculella Grt.	wS	High numbers of larvae found feeding in association with spruce budworm in Essa and Uxbridge townships
Ectodemia populella Busck.	tA, ltA	Light and medium infestations common in district
Epinotia solandriana Linn.	wB	Caused moderate foliar damage in Uxbridge, Oro, Flos and Tiny townships
Episimus argutanus Clem.	Su	Caused moderate foliar damage in Pickering and W. Gwillimbury townships
Erannis tiliaria Harr.	Ba, wE, sM	Common in small numbers

TABLE 13 (continued)

Insect	Host(s)	Remarks
Exoteleia dodecella Linn.	ScP	Larval populations were generally higher in 1968. Ten per cent bud damage occurred commonly in the central and southern parts of the district. The highest count showed 23 per cent bud damage in a plantation in Pickering Township
Fenusa pusilla Lep.	wB	Medium infestations occurred on young open grown trees in Orillia and Flos townships
Gonioctena americana Schaef.	tA	Small light infestations on understory trees in Flos and Essa townships
Gypsonoma haimbackiana Kft.	bPo	Moderate shoot damage in small clumps of trees in Essa and Mara townships
Hyphantria cunea Dru.	wE, wAs	Medium infestations recurred in Pickering and Orillia townships
Lithocolletis hamadryadella Clem.	bO, rO	Caused severe foliar damage in Toronto Township and light in Flos Township
Messa nana Klug	wB	Light foliar damage in Uxbridge Township
Monoctenus fulvus Nort.	eC	Light infestations common in district. Quantitative sampling in Medonte, Mara, and Tecumseth townships revealed 1, 1.5 and 3.0 larvae per 3' x 3' mat sample respectively
Monoctenus suffusus (Cress.)	J	Small numbers in Sunnidale and Matchedash townships
Nematus limbatus Cress.	W, cPo	Low populations at three locations

TABLE 13 (continued)

Insect	Host(s)	Remarks
Nematus tibialis Newm.	Lo	High population in clump of open grown trees in Oro Township
Neodiprion abietis Harr.	bF	Generally light infestations persisted
Neodiprion lecontei Fitch	rP	Two small pockets of medium infestation in 150-acre plantation in Vespra Township. Light infestation recurred in Matchedash Township
Neodiprion virginianus Roh.	jP	Light infestations in Mara and Oro townships declined to trace population in 1968
Nephopteryx virgatella Clem.	Lo	Heavy infestation of leaf tiers on shelterbelt trees in Pickering Township
Nepticula sp. prob. turbidella H. - S.	tA, bPo	Light, medium and heavy infestations common in the district
Nymphalis antiopa L.	wE	Scattered colonies on a variety of deciduous hosts in the district
Pikonema alaskensis Roh.	wS	Small numbers at scattered locations
Pristiphora geniculata Htg.	Mo	Light to heavy defoliation occurred commonly on single and small groups of trees
Profenusa lucifex Ross	bO	A heavy infestation of this leaf miner persisted on several trees in Pickering Township
Pulicalvaria piceaella Kft.	wS	Light and moderate needle damage noted in Mara, Essa, W. Gwillimbury and Brock townships

TABLE 13 (concluded)

Insect	Host(s)	Remarks
Semioscopis inornata Wlshm.	cPo	Leaf folders common in windbreak in Albion Township
Semiothisa bisignata Wlk.	wP	Small numbers in beating samples at three locations
Thera juniperata L.	J	Small numbers in Sunnidale Township