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Southwestern Forest Region, 1966
Status of Insects in Lake Simcoe
District

Harnden, A.A.

Information Report O-X-38
(Forest Research Laboratory, Ontario Region)

1966

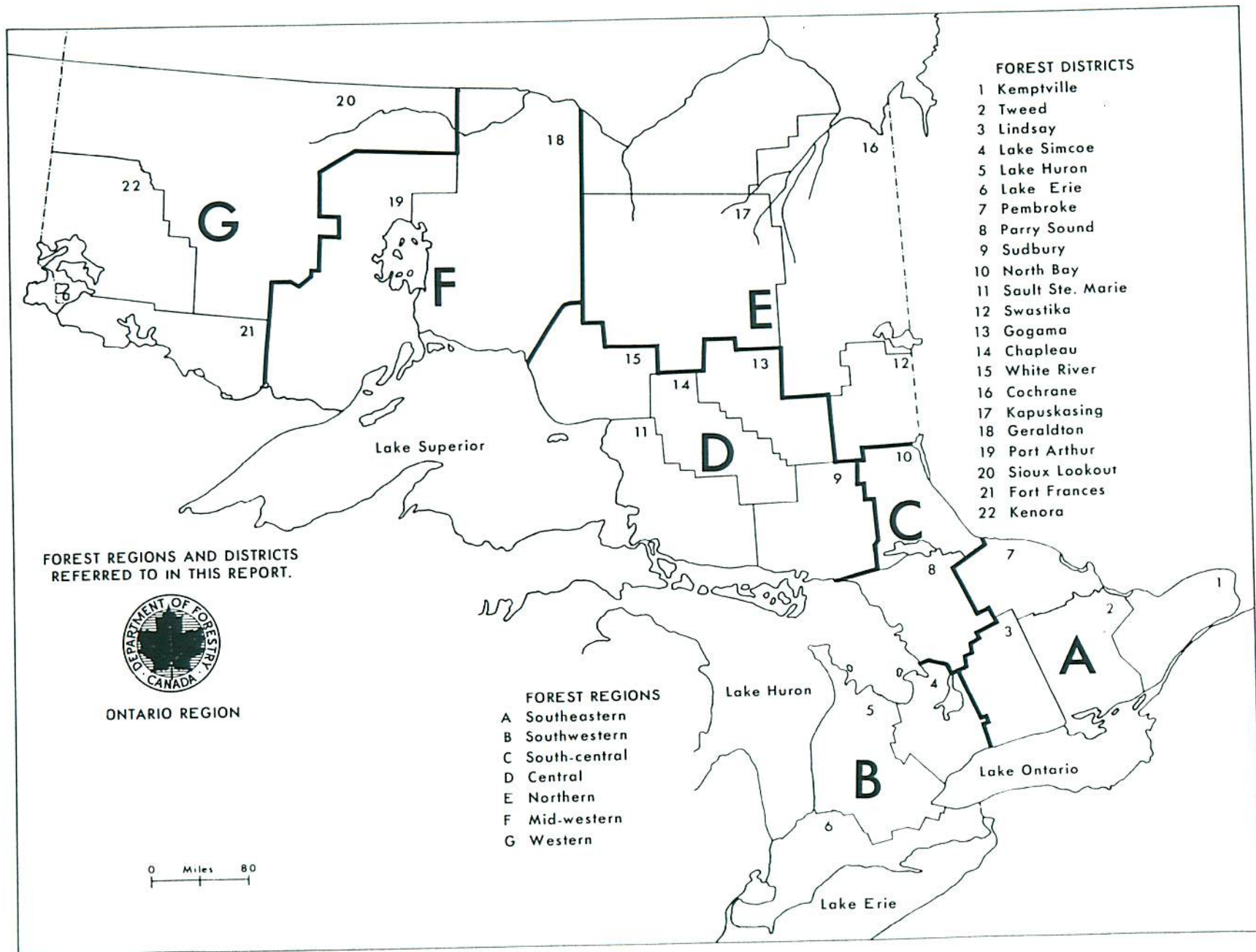
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O-X-36	--Kemptonville District	J. Hook
O-X-37	--Pembroke District	R. A. Trieselmann
O-X-38	--Lake Simcoe District	A. A. Harnden
O-X-39	--Lake Huron District	R. L. Bowser
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Photographs

* Regional Supervisors



FOREWORD

J. E. MacDonald

A prolonged period of drought, extending from May until August, seriously affected the growth and survival of forest stands on shallow sites and in plantations, particularly in central and southern Ontario. This was evidenced in August when hardwoods on rocky sites in many areas turned brown and shed their foliage. Serious losses of conifers planted in 1966 were reported in the Sault Ste. Marie, Lake Huron, Lake Simcoe and Lindsay districts.

Intensive surveys were carried out in 1966 to determine the distribution and incidence of Scleroderris canker of pine and of Dutch elm disease. These revealed that Scleroderris canker is widely distributed in northern Ontario. Incidence and tree mortality was highest in young red and jack pine plantations, however, significant losses of jack pine reproduction were also observed in several areas. Incidence of the disease was low in southern Ontario. Dutch elm disease is well established throughout southern Ontario and in localized areas in North Bay and Sudbury districts in northern Ontario. The incidence of infection was particularly high in the Toronto, London and Windsor areas. Over 50 per cent of the elm trees in many areas in southwestern Ontario were infected and the disease has taken a heavy toll of trees in older areas of infection.

Noteworthy changes in the extent and intensity of infestations of the forest tent caterpillar and jack pine budworm occurred in 1966. Weather conditions in the spring brought about a collapse of the forest tent caterpillar outbreak that had occurred over a vast area in Sioux Lookout, Kenora and Port Arthur districts in recent years. Heavy infestations persisted in Fort Frances District and in numerous areas in central and southeastern Ontario, but no outstanding changes in their extent and intensity occurred. Forest tent caterpillar defoliation forecasts for 1967 are contained in the district reports that follow.

Jack pine budworm infestations were reported in three widely-separated parts of Ontario. The largest of these occurred in the western part of Fort Frances and Kenora districts. Pockets of infestation occurred in the southern part of Sault Ste. Marie District and on Manitoulin Island.

The European pine sawfly continued to be a serious pest in pine plantations in southern Ontario. Since its discovery in a Scots pine plantation on Manitoulin Island in 1965, it has been found in five additional plantations on the Island. The results of control measures using virus sprays to contain the sawfly in this northern location will be followed with interest in 1967.

Expansion of the forest research program of the Department of Forestry and Rural Development in Sault Ste. Marie and the establishment of new positions in the Insect and Disease Survey Section has resulted in many changes of duties for Survey technicians. Five new district technicians will be required for the 1967 field season and numerous district re-assignments will be made. A list of technicians and their district assignments will be issued to key personnel of the Department of Lands and Forests and Industry early in the field season.

SOUTHWESTERN FOREST REGION

1966

INTRODUCTION

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STATUS OF INSECTS (District)

INTRODUCTION

Southwestern Region

This report deals with forest insect and tree disease surveys in the southwestern Region. Two major insect pests and several disease organisms are dealt with on a regional basis. Other currently important insects are written on a district basis.

Several common species of sawfly (see photographs) caused from light to almost complete defoliation of pines. Infestations of the most destructive species, the European pine sawfly, increased in extent and intensity causing widespread heavy defoliation. Pockets of heavy infestation of two jack pine sawflies and the red-headed pine sawfly recurred and light infestations of other species were common in the region. Population levels of larch sawfly, larch casebearer and spruce budworm increased in some areas and decreased in others. Infestations of a birch leaf miner, walnut caterpillar, yellow-necked caterpillar, jack-pine needle miner, fall webworm and balsam fir sawfly increased in intensity.

Dutch elm disease was widespread in the region. The root diseases, Fomes annosus (Fries) Cke, Armillaria mellea (Vahl ex Fries) Kummer, and Polyporus tomentosus Fries continued to cause mortality of their respective host trees. Prolonged drought and high temperatures caused heavy mortality of a variety of tree species at widely-separated points.

Infestations of eastern subterranean termites, Reticulitermes flavipes (Kollar) persisted in Toronto and were reconfirmed in Kincardine and Oxley.

The control program against the European pine sawfly was greatly expanded. Phosphamidon was applied by helicopter to approximately 3000 acres of Christmas trees and a polyhedral virus culture was used in numerous unpruned plantations. The quantity of virus infected larvae collected for future control of the insect was tripled in 1966.

Life history studies of the ironwood leaf miner, Chrysopeleia ostryaella Cham. and a needle miner on spruce, Epinotia nanana Treit. have been completed and were published. Extension work increased considerably as a result of problems caused by the European pine sawfly, Dutch elm disease and extreme weather. The co-operation given by Department of Lands and Forests personnel is gratefully acknowledged.

A. A. Harnden

STATUS OF INSECTS (Regional)

European Pine Sawfly, Neodiprion sertifer (Geoff.)

This sawfly (see photograph) increased in intensity at many locations and decreased at others in 1966 (Table 1). Moderate to severe defoliation of the old foliage of Scots, red and jack pine occurred commonly in young plantations and for the second consecutive year severe defoliation was observed in older plantations in which the crowns were closed. Small pockets of medium and heavy infestation occurred in widely-separated Austrian pine plantations. The northeastern limit of known distribution advanced approximately 15 miles to a line extending between Orillia and Coldwater and infestations advanced northwards approximately eight miles on Bruce Peninsula (see map). When severe defoliation is caused by this insect for more than two consecutive years the growth of host trees is noticeably reduced. In addition, larval feeding on the tender bark of current shoots causes considerable wilting, breakage and stem distortion.

In Lake Simcoe District, new light infestations occurred in Scots pine plantations along Highway 400 in Medonte Township and along Highway 11 near Orillia. Occasional colonies were observed elsewhere in the areas. Scattered light to heavy infestations persisted in the old area of infestation in Tiny, Flos, Innisfil, Essa, Vespra, Sunnidale and Nottawasaga townships in Simcoe County, the north half of York County and in Scott, Brock, Uxbridge and Reach townships in Ontario County. Heavy infestations causing almost complete defoliation of the old foliage persisted in unsprayed plantations in most of Dufferin County, in the north half of Peel County, the south half of York County and Pickering and Whitby townships in Ontario County.

In Lake Huron District, although defoliation was generally less severe than in 1965 heavy infestations occurred at numerous locations. High populations persisted in several Scots pine plantations in the Durham area and at several points in Huron, Wentworth and Halton counties. Seventy-five to 90 per cent defoliation occurred in a young Scots pine plantation in Nassagaweya Township where a count showed an average of seven colonies per 5-foot tree. Moderate defoliation was common on jack pine and Scots pine in mixed plantations in the Galt and Hamilton areas whereas red pine suffered generally light damage.

In Lake Erie District, medium to heavy infestations were observed in numerous plantations, particularly in Norfolk and Haldimand counties. Medium to heavy infestations recurred on mature red pine trees at St. Williams Nursery. Fifteen jack pine trees in Canborough Township were severely defoliated for the third consecutive year. Medium infestations were observed in red pine plantations in Charlotteville Township and on Scots pine trees at numerous points elsewhere in the district. Although not a favoured host, severe defoliation of Austrian pine occurred at Petrolia and light infestations were recorded at several other locations.

TABLE 1

Summary of European Pine Sawfly Colony Counts and Degrees of Infestation
in the Southwestern Region in 1965 and 1966

Location (township by district)	Host	Av. height of trees in feet	Av. no. colonies per infested tree		Per cent of trees infested in 1966	Degree of infestation in 1966
			1965	1966		
<u>Lake Simcoe</u>						
Caledon	scP	18	8	3	90	Light
Toronto	scP	30	14	10	100	Medium
Pickering	scP	15	23	100 plus	100	Heavy
E. Gwillimbury	scP	6	1	8	100	Medium
W. Gwillimbury	scP	8	0.5	2	80	Light
Georgina	rP	6	-	3	80	Light
Mulmur	rP	8	-	2	80	Light
Orillia	scP	10	0	1	80	Light
Melancthon	rP	20	3	2	90	Light
Tosorontio	scP	10	3	5	90	Light
Tosorontio	rP	8	1	2	75	Light
<u>Lake Huron</u>						
Stanley	scP	16	1	2	16	Light
E. Wawanosh	scP	20	12	14	100	Medium
Goderich	scP	10	6	10	100	Medium
Brant	scP	17	2	2	35	Light
Nassagaweya	scP	5	-	7	100	Heavy
Sullivan	scP	20	-	1	60	Light
Holland	scP	13	-	8	100	Medium
<u>Lake Erie</u>						
Adelaide	scP	7	4	5	75	Medium
Aldborough	scP	7	1	4	80	Medium
Euphemia	scP	11	4	8	100	Medium
McGillivray	rP	6	5	6	95	Medium
Mosa	rP	3	-	2	70	Medium
S. Cayuga	scP	11	5	4	80	Medium
Romney	scP	11	2	3	75	Medium
Willoughby	scP	12	3	6	90	Medium

A large scale control program was carried out in Dufferin and Peel counties where approximately 2500 acres was treated with Phosphamidon. The insecticide was applied by helicopter at the rate of 1.2 ounces per gallon of water per acre. Spraying started on June 1st when larval hatch was completed and surveys showed that good control was obtained in sample areas within three days of application of the insecticide. However, when applied at the same concentration a week or more later, approximately 50 per cent of the larval population survived. As a result, all plantations treated after June 7 were resprayed with DDT. Chemical control of the adults in 1965 were encouraging so controlled experiments on a larger scale were carried out in September 1966. Several plots in Christmas tree plantations in Mulmur Township were sprayed with one part of 25 per cent emulsifiable concentrate DDT to three parts of water by mist blower. The results will be assessed in 1967.

A polyhedral virus disease was used against the insect in many plantations in the region. Examination of treated areas after spraying revealed that excellent control was obtained when the virus was applied before the fourth larval instar. In Lake Simcoe District, sufficient virus to treat 550 acres in ten townships was distributed in private plantations, County forests and shelterbelts (Table 2). An extensive virus recovery program was repeated in 1966 by Department of Lands and Forests personnel in co-operation with the Forest Research Technician. Twenty-two quarts of diseased larvae were collected for virus extraction.

TABLE 2

Summary of Distribution of Polyhedral Virus Disease to Control
Neodiprion sertifer (Geoff.) Populations in Lake Simcoe District
in 1966

Location (township)	Number of acres sprayed by				Virus by oz. distributed
	Pack sprayer	Mist blower	Aircraft	Hydraulic	
Albion	48	50	50	-	56
King	54	-	-	20	24
Mulmur	20	-	-	-	8
Adjala	12	36	-	-	20
Uxbridge	60	-	-	-	22
Whitchurch	10	-	85	-	38
Nottawasaga	-	30	-	-	12
Tecumseth	-	10	-	-	5
Tosorontio	-	5	-	-	2
W. Gwillimbury	-	60	-	-	24

Normally larvae in cocoons transform to the pupal and adult stages in the fall. In June 1966, up to 80 per cent of cocoons examined at points in Mulmur and Keppel townships contained larvae in prolonged diapause. As a result it may be necessary to carry out control operations in more than one year. Marked increases in numbers of parasites were recorded at several locations. Swarms of adults of two species, Exenterus canadensis Prov. and Exenterus amictorius (Panzer) were observed attacking late instar N. sertifer larvae at points in Tiny, Vespra, Mulmur, Melancthon, Mono and Albion townships. Approximately 40 per cent of overwintering cocoons collected in mid-May were killed by these species at one location in Tosorontio Township.

Larch Sawfly, Pristiphora erichsonii (Htg.)

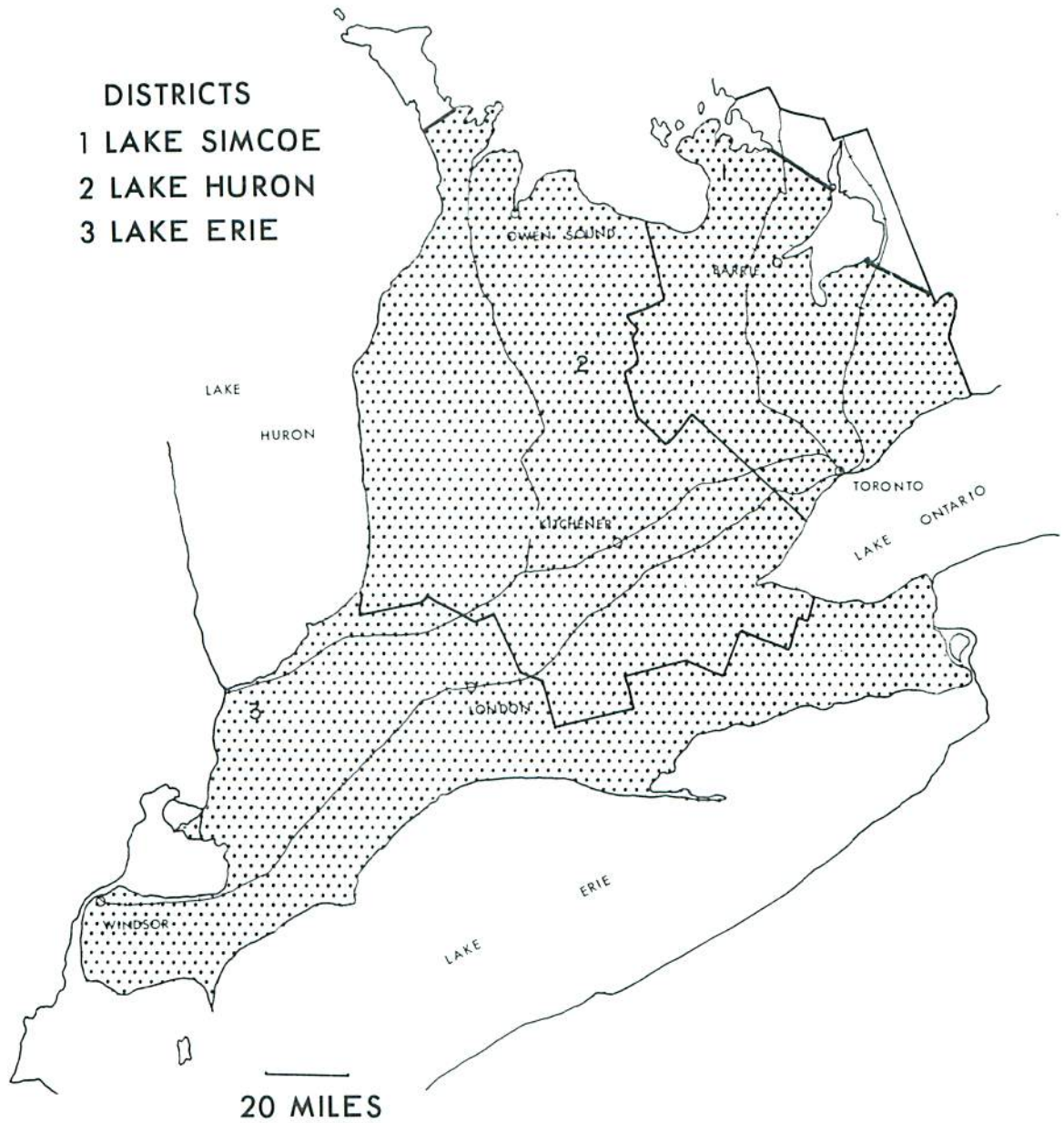
High populations of this insect prevailed in older European and Japanese larch plantations in Lake Simcoe and Lake Erie districts and in tamarack stands in the northern part of the Bruce Peninsula (see map). Seventy-five to 100 per cent defoliation occurred commonly in Lake Simcoe District and at scattered points elsewhere in the region.

Infestations were generally light to medium in younger plantations in Lake Simcoe District, except in Orr Lake and Wildman forests where heavy infestations recurred. At a sample point in Uxbridge Forest oviposition occurred on 100 per cent of the current shoots examined and 80 per cent tip mortality resulted. In contrast, a sharp decline in population levels occurred in Oro Township where only six per cent of the tips were affected compared with 60 per cent in 1965 (Table 3). Defoliation was light and only two cocoons were found in two, 3-foot traps compared with over 100 in recent years. Infestations in natural tamarack stands were generally light with occasional small pockets of medium intensity. Various species of birds fed extensively on late instar larvae near Orr Lake in Medonte Township.

In Lake Huron District medium to heavy infestations occurred in numerous pockets of tamarack in St. Edmund and Lindsay townships. Sequential sampling in St. Edmund Township revealed that 48 per cent of the new shoots were curled as a result of oviposition. Moderate defoliation was common in Eastnor Township and light damage, with occasional pockets of moderate damage, occurred generally in Albemarle and Amabel townships. Heavy infestations in small clumps of tamarack and European larch caused 50 to 75 per cent defoliation at numerous locations in Artemesia, Derby, Howick and Grey townships.

In Lake Erie District a heavy infestation recurred in South Walsingham Township for the fourth consecutive year and medium infestations persisted in Howard Township. Medium infestations recurred on mature European and Japanese larch at St. Williams forest nursery. Population levels were very low in the Turkey Point Nursery where heavy infestations were sprayed with Malathion in 1965. However, one mile south of this area a new infestation occurred in a European larch plantation causing moderate defoliation.


SOUTHWESTERN REGION



EUROPEAN PINE SAWFLY

Known distribution in the Region
in 1966

Legend

Known distribution 

Sequential sampling to determine population densities was carried out at five points in the region. The results, based on the percentage of curled tips caused by adult oviposition, are summarized in Table 3.

TABLE 3

Summary of Curled Shoot Counts and Degrees of Infestation
of the Larch Sawfly in the Southwestern Region
from 1964 to 1966

Location (township by district)	Host	Av. d.b.h. in inches in 1966	Per cent of tips curled			Degree of infestation		
			1964	1965	1966	1964	1965	1966
<u>Lake Simcoe</u>								
Oro	eL	7	65	60	6	H	H	L
Uxbridge	eL	9	35	70	100	H	H	H
<u>Lake Huron</u>								
St. Edmund	tL	8	16	50	48	M	H	H
<u>Lake Erie</u>								
Howard	eL	10	4	20	22	L	M	M
S. Walsingham	eL	10	60	44	28	H	H	H

STATUS OF TREE DISEASES

Eastern Dwarf Mistletoe, Arceuthobium pusillum Pk.

The status of this disease was unchanged in 1966. Moderate branch mortality and light stem mortality recurred on white spruce and black spruce trees in the northern part of the Bruce Peninsula and heavy infections were noted on white spruce trees in Flos and Orillia townships for the second consecutive year.

Armilaria Root Rot, Armilaria mellea (Vahl ex Fries) Kummer

This disease was associated with tree mortality at several locations in the region. An infection centre in a plantation in Oro Township continued to advance in all directions from an old maple stump, killing several red pine saplings and causing a typical circular opening in the stand. A new infection centre at Midhurst Nursery spread from an old maple stump located in a cedar hedge and killed cedars for about 25 feet on both sides of the stump.

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

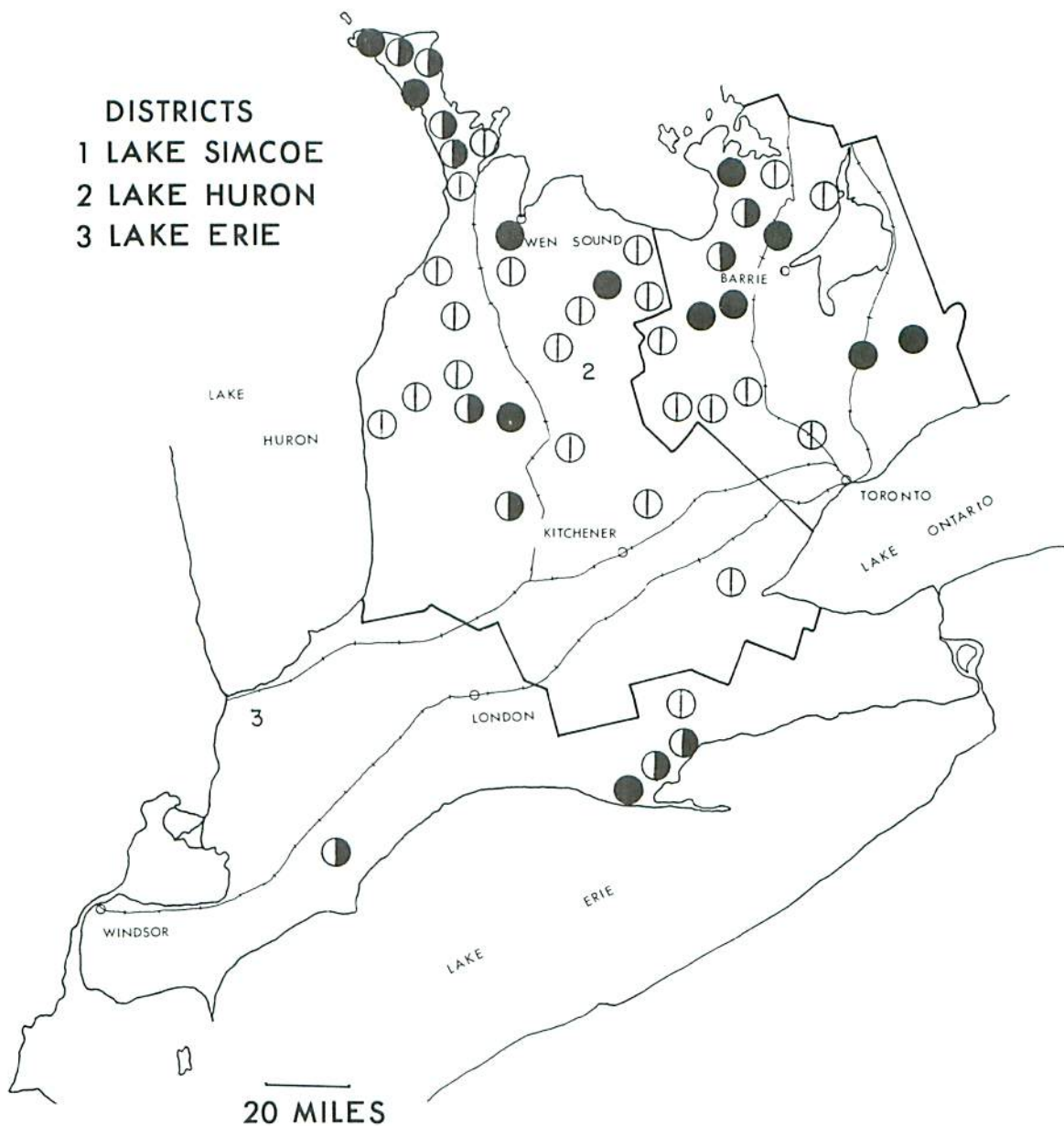
The incidence of infection and mortality of elm trees caused by the Dutch elm disease increased alarmingly in 1966. This increase seemed to be closely related to the vectors, the smaller Elm Bark Beetle, Scolytus multistriatus (Marsh.) and the Native Elm Bark Beetle, Hylurgopinus rufipes Eich. (see photographs). Extensive surveys conducted in the region showed the incidence of infection varied widely, and that mortality reached 100 per cent in pure stands at several points (Table 3). Tree mortality and incidence of infection were generally highest in the Toronto-Hamilton-London area. This condition possibly resulted from inadequate sanitation of trees killed by mechanical disturbance and attraction of adult vectors by city illumination. Generally, the degrees of infection varied greatly between swamp, field and roadside trees, averaging 83, 68 and 46 per cent respectively. Rapid advance of the disease from tree to tree through root grafts probably resulted in the higher degree of infection in fence row and dense stands.

In Lake Simcoe District, surveys at 45 locations showed that the incidence of infection increased generally in 1966 particularly between Lake Ontario, Orangeville and Markham in the southern part of the district. For example, the incidence of infection increased from 25 to 80 per cent at a sample point west of Toronto. As in recent years, the degree of infection gradually diminished from heavy in the south, to pockets of medium and heavy in the central parts of the district, and to light levels of intensity in the northern part of Simcoe and throughout most of Ontario County.

Surveys at 54 locations in Lake Huron District showed that the most notable increases of disease incidence occurred in the south and west-central parts of the district and in Bruce and Grey counties. Damage appraisals at points of relatively high infection throughout the district revealed that on the average, 73 per cent of the trees were either dead or infected. The average degree of infection in the southern part of the district was approximately 50 per cent and in the north 10 per cent.

Surveys at 41 locations in Lake Erie District showed that the incidence of infection averaged 60 per cent. A high percentage of the elm trees in the district have died and been removed in the past 10 years and few healthy elm trees remain. New infections were observed in young stands developing in the Windsor area, and surveys of 29 English elm trees at Port Stanley showed that 15 were dead and that five others were infected.

SOUTHWESTERN REGION



LARCH SAWFLY

Locations where infestations were observed in 1966

Legend

- Light infestation ⊕
- Medium infestation ⊙
- Heavy infestation ●

TABLE 3

Summary of Dutch Elm Disease Surveys carried out at 140 Locations
in the Southwestern Region in 1966

District	Stand type	No. of locations	Total trees	No. living trees infected	No. dead trees	Incidence infection by per cent
Lake Simcoe	Roadside	35	1524	261	296	37
	Swamp	9	530	132	238	70
	Field	1	60	21	39	100
Lake Huron	Roadside	11	425	197	55	59
	Swamp	19	1005	324	481	80
	Field	24	981	473	219	70
Lake Erie	Roadside	10	537	87	139	42
	Swamp	3	100	4	96	100
	Field	16	382	57	227	74

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

No significant changes were recorded in the status of this disease in 1966. Heavy and medium infections recurred in Melancthon and Euphrasia townships respectively. Although the incidence of infection approximated 75 per cent in some areas stem mortality generally remained light. Pockets of moderate and light infection occurred in numerous white pine plantations in the Lake Simcoe and Lake Huron districts. Ribes spp. were generally prevalent in areas of infection.

Cytospora Canker of Spruce, Cytospora kunzei Sacc.
and the perfect stage, Valsa kunzei Fries

The rate of tree mortality lessened in a small Norway spruce plantation near Shelbourne due to this pathogen in 1966. Cumulative tree mortality approximated 40 per cent at the end of September, compared with 35 per cent in 1965. Studies of the development of stem cankers on white spruce trees in a 35-year old plantation at Midhurst were continued. Cankers outlined on ten sample trees in 1965 were remeasured and their current periphery marked. Since 1965, the cankers have increased 20 per cent in length and 34 per cent in width. Some sample trees were almost girdled. For example, one canker measured 19.5 inches radially on a tree 22 inches in circumference at breast height. These studies will be continued in 1967. Branch and stem cankers were common on all species of spruce in the region.

Black-knot of Cherry, Dibotryon morbosum (Schw.) Theiss. & Syd.

For the third consecutive year severe local infections occurred commonly in clumps of eastern choke cherry, particularly in Lake Simcoe and Lake Huron districts. Stem mortality approximated 75 per cent in Amabel, Ashfield, Collingwood, Nottawasaga and Toronto townships, and branch mortality was heavy at numerous locations elsewhere in the region.

Fomes Root Rot, Fomes annosus (Fries) Cke.

This root rot disease continued to cause tree mortality in a 30-year-old red pine plantation in Orr Lake Forest, Medonte Township where 18 trees died in 1966. Trees continued to die in an old infection centre at St. Williams Forest Nursery but no new tree mortality was observed at an old infection centre in Vivian Forest, Whitchurch Township. Widespread use of sodium nitrite solution painted on newly-cut stumps to control the disease was continued.

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

No noticeable change occurred in the status of this disease in 1966. Light, medium and heavy infections were common in trembling aspen stands and damage exceeded 75 per cent in some areas. Stem cankers either girdle and kill pole-sized trees in three to four years, or predispose them to windthrow.

This disease organism was previously known as H. pruinatum (Klotsche) Cke.

A Pine Rust, Peridermium sp.

Severe infections caused moderate branch mortality of numerous Scots pine trees in East Wawanosh, Glenelg, Colborne, Essa and Tosorontio townships. Light infections were common on Scots pine and jack-pine trees at one point in Arran Township.

Butt Rot of Conifers, Polyporus tomentosus Fries.

This organism continued to cause deterioration and mortality of white spruce trees at four known locations in the Barrie area. Two large trees died and several others showed advanced symptoms of infection in shelter rows in the Midhurst Nursery. In late September, sporophores attached to the roots of infected trees were common at points in Vespra, Innisfil, Tosorontio and Essa townships.

Deterioration of Roadside Maples

For the second consecutive year the per cent of trees affected by this condition along major highways remained very high. Counts were made at 25 widely-scattered points to determine the levels of incidence and the degrees of mortality. The overall incidence of infection was 71 per cent in the region. A notable increase occurred in Lake Huron District where 84 per cent of the trees at sampling points were affected, compared with 45 per cent in 1965. Little change in incidence occurred in the Lake Simcoe District (79 per cent) and in the Lake Erie District (43 per cent). Average mortality increased from seven to 17 per cent in 1966. Highest mortality 96, 67 and 30 per cent occurred in Yarmouth, Caledon and McKillop townships respectively.

Symptoms of disease such as leaf scorch and premature defoliation were abnormally late. This unusual delay was attributed to prolonged drought reducing the uptake and translocation of road salt which seems to play an important role in roadside maple decline. Although sugar maple trees are by far the most sensitive species to salt injury, silver maple, red maple and Norway maple are commonly affected. The results of observations made at 25 sampling points are summarized in the following Table.

TABLE 4

Summary of Sugar Maple Deterioration in the Southwestern Region
in 1966

Location (township)	No. of trees	No. of infected trees	Per cent trees infected	Mortality by per cent
<u>Lake Simcoe</u>				
Vespra	30	30	100	23
Caledon	60	58	97	67
Tosorontio	20	20	100	0
Amaranth	30	30	100	0
E. Garafraxa	45	9	20	0
<u>Lake Huron</u>				
N. Dumfries	17	11	65	6
E. Zorra	22	11	50	0
E. Missouri	45	42	93	7
E. Wawanosh	60	36	60	0
Goderich	36	36	100	3
Usborne	60	60	100	10
McKillop	20	20	100	30
Glanford	39	23	70	0
Nichol	54	52	96	0
Erin	29	27	93	4
Wellesly	15	14	93	7
<u>Lake Erie</u>				
Bertie	40	4	10	0
Caradoc	47	47	100	2
Gore of Camden	19	0	0	0
Grantham	20	0	0	0
Malahide	25	18	72	20
Plymton	13	3	19	0
Townsend	16	0	0	0
Warwick	22	3	7	4
Yarmouth	20	20	100	96

Drought Injury

Prolonged drought and high temperatures caused heavy tree mortality at numerous locations in 1966. In Lake Simcoe District up to 95 per cent mortality occurred in late spring pine and spruce plantings and up to 60 per cent in several one and two-year-old plantations in Simcoe County. Mortality of six per cent was recorded in a 5-year-old red pine plantation in Base Borden, and 13 per cent of the current shoots were severely damaged on living trees. Up to 60 per cent mortality of seedlings and transplants occurred in some nursery beds at Midhurst. Natural growing pole-sized white pine, white spruce, red cedar, white cedar, red oak, white oak, bur oak, sugar maple and other tree species growing on shallow soils were severely damaged in the Severn River - Georgian Bay area.

In Lake Huron District 75 to 90 per cent mortality of spring planted coniferous trees occurred commonly. In many instances, only those trees that were shaded by bordering stands survived. Approximately 50 per cent mortality of 6-year-old white pine and white spruce trees was recorded in a 15-acre plantation in Puslinch Township. White pine mortality was also observed at widely-scattered points elsewhere in the southern part of the district. Drought conditions were evident on Bruce Peninsula where white birch, trembling aspen and tamarack shed their foliage prematurely.

Scorch

Although this condition was widespread on a wide variety of deciduous hosts, it was less severe than in recent years. Severe foliar discolouration and premature leaf drop was observed on sugar maple, red oak, white elm and basswood trees at several locations.

Frost Injury

In 1966, frost injury was lightest on record since 1964.

Moderate damage to white ash trees was observed at several points in the region, and to sumac shrubs and red oak foliage at widely-scattered locations. Bud damage to white spruce and balsam fir averaged about five per cent in low-lying areas.

Salt Damage

Due to salt spray drift from paved highways, the foliage of several species of pine, cedar and spruce was severely damaged in several areas in the region. In Lake Simcoe District the condition was particularly prevalent along the east side of Highway 400.

In Lake Huron District the condition was especially noticeable in the central and northern parts. Influenced by prevailing winds, damage was generally heavier on the east side of highways and on trees growing near sharp curves and hills. Several other coniferous tree species suffered light to moderate damage.

Storm Damage

A severe wind storm on July 12 caused notable damage to trees along the Lake Erie shoreline in the southern part of Essex County. At Caboto's private park in South Colchester Township, 12 mature Manitoba maple trees were blown over and numerous silver maples suffered severe branch damage. In the immediate area mature walnut, honey locust and other ornamental trees were uprooted.

TABLE 5

Other Noteworthy Organisms in the Southwestern Region in 1966

Organism	Host(s)	Remarks
<i>Caliciopsis pinea</i> Pk.	wP	Common in one plantation in Adjala Township
<i>Camarosporium robiniae</i> (West.) Sacc.	Hon, Lo	Causing light and severe branch damage in Oakland and Mulmur townships respectively
<i>Ciborinia whetzellii</i> (Seaver) Seaver	tA	Heavy and moderate leaf damage in Scott and Flos townships respectively
<i>Coccomyces hiemalis</i> Higgins	pCh	Common in Charlotteville Township
<i>Coleosporium asterum</i> (Diet.) Syd.	rP, jP	Light and medium infections common on foliage on lower crowns
<i>Cryptodiaporthe salicina</i> (Curr.) Wehm.	W	Light and moderate branch damage in Amabel Township
<i>Cytophoma pruinosa</i> (Fries) Hoehn.	wAs	Associated with branch mortality in Orillia Township
<i>Cytospora chrysosperma</i> (Pers.) Fries	W, cPo, tA	Cankers associated with tree mortality at several locations
<i>Dermea balsamea</i> (Pk.) Seaver	bF	Common on dead branches of living trees at one point
<i>Diaporthe eres</i> Nit.	Do	Continued to cause light and moderate branch mortality at scattered locations
<i>Diplodia pinea</i> (Desm.) Kickx = <i>Macrophoma sabinea</i> (Fries) Petrak	rP, eL	Light infection in Adjala and Whitchurch townships
<i>Dothichiza populea</i> Sacc. & Briard.	lPo, sPo	Caused heavy mortality in the region
<i>Endothia parasitica</i> (Murr.) A. & A.	sChe	Light infections common
<i>Eutypella parasitica</i> Dav. & Lor.	sM, siM	Cankers common throughout the region
<i>Exosporium tiliae</i> Link	Ba	Common at one point in Medonte Township
<i>Fomes pini</i> (Thore) Lloyd	wS	Fruiting abundant on dead stem at one point
<i>Fomes pinicola</i> (SW.) Cke.	wS	Fruiting observed at one point in Uxbridge Township

TABLE 5 (continued)

Organism	Host(s)	Remarks
<i>Fomes roseus</i> (Alb. & Schw. ex Fr) Cke.	wS	Fruiting on dead stumps
<i>Gymnosporangium claviforme</i> (Pers.) D.C.	J	Heavy infections in localized pockets in St. Edmund Township
<i>Gymnosporangium juniperi - virginianae</i> Schw.	J	Heavy infections common in St. Edmund Township
<i>Gymnosporangium</i> sp.	rC, Haw	Light infections in several areas
<i>Lenzites saepiaria</i> Wulf. ex Fries	wS	Fruiting on dead stumps
<i>Lophodermium juniperinum</i> (Fr.) de Not.	J	Severe foliar damage at one point in Matchedash Township
<i>Lophodermium pinastri</i> (Schrad. ex Fr.) Chev.	scP, nP	Associated with severe tree damage in Mono and Vespra townships
<i>Ophionectria cylindrospora</i> (Sollm.) Berl. & Vogl.	mP	Fruiting abundant on dead branches at one point
<i>Pestalotia funeria</i> Desm.	eC	Heavy cast in Vespra and Melancthon townships
<i>Pezicula ocellata</i> (Pers.) Seaver	W	Fruiting common on dead stems in Ashfield Township
<i>Pollaccia radiosa</i> (Lib.) Bald & G.F.	tA, ltA	The heaviest infection was noted in Euphrasia Township where 75 per cent of the new shoots in the upper third of crowns of large tooth aspen were damaged. Light infections were common in trembling aspen stands elsewhere
<i>Polyporus odustus</i> Willd. ex Fries	nS	On dead trees in Melancthon Township
<i>Polyporus hirsutus</i> (Wulf.) ex Fries	wB, wAs	Infections observed at two points in Notawasaga Township
<i>Polyporus perennis</i> (L.) Fries	wS	Fruiting at one point in Essa Township
<i>Poria obliqua</i> (Pers. ex Fr.) Bres.	E	Conk at ground level on one living tree
<i>Puccinia graminis</i> Pers.	Barberry	Foliar rust and fruiting on foliage and branchlets in E. Gwillimbury Township
<i>Rehmiellopsis balsamea</i> Wat.	bF	Light in Glenelg Township
<i>Rhizosphaera pini</i> Corda (Mauble)	bF	Associated with needle cast in Medonte Township

TABLE 5 (continued)

(continued)

Organism	Host(s)	Remarks
<i>Scolecnectria scoleospora</i> (Bref.) Seaver	wP	Infections severe on few ten-foot trees. Incidence less than 1 per cent
<i>Septomyxa tulasnei</i> V. Hoehn.	mM	Heavy damage to small branches at one location
<i>Tubercularia vulgaris</i> Tode	sM, cE	Fruiting common on dead and dying branches at scattered locations
<i>Tympanis pinastri</i> Tul.	rP	Fruiting common on recently killed branches at one point
<i>Valsa friesii</i> (Duby) Fckl.	bF	Commonly associated with branch cankers
	mp	<i>Opiconectria cylindrospora</i> (Schrad. ex Fr.) Chev.
	ec	<i>Pestalotia fumaria</i> Desm. (Salm.) Berl. & Vogl.
	W	<i>Pestalotia ocellata</i> (Pers.) Seaver
	TA, TA	<i>Pollackia radiosa</i> (Lib.) Salm & C.F.
	TA	<i>Polyporus obtusus</i> Willd. ex Fries
	wh, wa	<i>Polyporus hirsutus</i> (Willd.) ex Fries
	ws	<i>Polyporus perennis</i> (L.) Fries
	E	<i>Poria obliqua</i> (Pers. ex Fr.) Bres.
	Barberry	<i>Puccinia prunella</i> Pers.
	bF	<i>Puccinia balsamiae</i> West.
	BF	<i>Rhizosphaera brassicae</i> (Harkn.)

STATUS OF INSECTS IN LAKE SIMCOE DISTRICT

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Black-headed Budworm, Acleris variana Fern

Light to medium infestations of this insect have persisted in white spruce plantations in Uxbridge Forest Headquarters Tract since 1959. The number of larvae counted on 20-tray beating samples ranged from 15 in 1962 to 75 larvae in 1961. Forty-six larvae were counted on one 20-tray sample in 1966.

Cedar Leaf Miners, Argyresthia thuiella Pack, and
Pulicalvaria thujaella Kft.

Little change in the status of these leaf miners was noted in 1966. Pockets of medium and heavy infestation caused conspicuous discoloration and premature shedding of the foliage of cedar in a large part of the district. Heavy infestations since 1962 in a 40-mile wide band through the central part of the district have caused severe branch mortality and some tree mortality.

Strawberry Root Weevil, Brachyrhinus ovatus Linn.

Root damage by larvae of this weevil is usually confined to seedlings. However, in a plantation in Mulmur Township the rootlets of 4-foot white spruce trees were severely damaged in 1966. Examination of the roots of small trees revealed that most of the rootlets were eaten. Heavy root damage resulted in drooping of the current year's shoots and tree mortality. Fifteen larvae were counted in a 4-square-foot soil sample taken from under a severely damaged tree.

Jack-pine Resin Midge, Cecidomyia reeksi Vock.

Moderate to heavy damage of jack pine shoots was caused by this insect at many points in older plantations in the district. In the townships of Whitchurch, East Gwillimbury, Innisfil, Essa, Vespra, Sunnidale and Tosorontio up to 75 per cent of the current shoots were killed and the remainder severely damaged. Heavy infestations in recent years have retarded and distorted the growth of infested trees.

A Midge on Red Pine, Cecidomyia sp.

A little-known midge caused medium to heavy damage to the current year's foliage of red pine trees in late summer in plantations in Vespra, Essa, Tosorontio, Sunnidale and Oro townships for the second consecutive year. Approximately 50 per cent of the needles were killed and prematurely shed in 1966 compared with 75 per cent in 1965. Noticeable thinning of the crowns of host trees has resulted.

Spruce Budworm, Choristoneura fumiferana (Clem.)

Infestations of this insect occurred at three locations in the district in 1966. Infestations annually causing about 50 per cent defoliation of new foliage for the past 14 years in a 35-to-45-year old white spruce plantation in Uxbridge forest persisted. Egg surveys in the fall revealed an increase in numbers from 68 in 1964 to 200 and 332 clusters per 100 square feet of foliage in 1965 and 1966 respectively. Medium infestations recurred in younger adjacent compartments where defoliation increased from 40 per cent in 1965 to 55 per cent in 1966.

Population levels remained low in a 35-year old white spruce plantation at Midhurst. A medium infestation that occurred on blue spruce ornamentals along Highway 400 in West Gwillimbury Township in 1965 declined to light intensity, and defoliation dropped from 45 per cent to 15 per cent.

A new heavy infestation occurred in a 25-year old white spruce plantation in Tosoronto Township. Defoliation averaged approximately 75 per cent and typical discoloration of the foliage was evident.

Larch Casebearer, Coleophora laricella Hbn.

A heavy infestation of this insect declined to medium intensity in a small European larch plantation in Vivian County Forest in 1966. However, discoloration of the foliage was noticeable over the entire crown of infested trees. As in 1965, no larvae were found in plots at sample points in Vespra and Uxbridge townships. In Albion Township the average number of larvae counted per 18-inch branch tip increased from 2 in 1965 to 22 in 1966 (Table 6).

TABLE 6

Summary of Larch Casebearer Larval Counts in Lake Simcoe District
in 1965 and 1966

Location (township)	Av. d.b.h. in inches in 1966	Av. no. of larvae per 18-inch branch tip	
		1965	1966
Medonte	4	1	2.2
Albion	5	2	22.2
Whitchurch	8	0	0.9

Pitted Ambrosia Beetle, Corthylus punctatissimus (Zimm.)

Infestations of this beetle persisted in sugar maple coppice growth at approximately the same levels as in 1965. Light infestations were common and medium to heavy infestations were observed at widely-separated points in the district. In a recently thinned stand in East Gwillimbury Township approximately 30 per cent of the reproduction was infested and most of the infested stems were killed.

Sample plots were established in 1962 to study the effects of infestations on sugar maple reproduction. Results revealed that stems with root-collar diameters between 2 and 17 millimeters were selected by the adult for brood trees. The incidence of attack was considerably lower in shaded areas than in the open. Conversely, accumulative mortality was higher in the shade where due to slow growth the trees were susceptible to attack for several years. Although infestations were heavier in the open areas, rapid growth shortened the susceptible stage and a high percentage of the trees escaped.

A Tortricid on Oak, Croesia semipurpurana Kft.

Following an interval of four years, heavy infestations of this insect occurred at several points in the district in 1966. Up to 70 per cent of the foliage of red oak trees was destroyed in the townships of Malmur, Medonte and Whitchurch. A new medium infestation occurred at one location in Oro Township, and light infestations were common in the district.

Zimmerman Pine Moth, Dioryctria zimmermani Grt.

A noteworthy infestation of this insect persisted in the current shoots of red pine in a 25-year old plantation in Base Borden. Approximately five per cent of the shoots were mined and shed. Heavy infestations recurred in the trunks of 8-inch Scots pine trees at one point near Meadowvale.

Nursery Pine Sawfly, Diprion frutetorum (F.)

Population levels of this sawfly declined for the second consecutive year at most sample points in the district in 1966. Both first and second generation larval populations (see photograph) were generally very low in 1966 (see map).

TABLE 7

Summary of Nursery Pine Sawfly Larval Counts in Lake Simcoe District
in 1965 and 1966

Location (township)	Tree species	Av. d.b.h. in inches	Total number of larvae per 15-tray sample	
			1965	1966
Pickering	scP	6	3	0
Reach	scP	6	27	2
Melancthon	scP	5	0	1
Mono	scP	7	3	2
Vespra	scP	5	14	3
Orillia	scP	5	11	2
Oro	wP	5	2	4
Caledon	scP	4	2	0
Markham	scP	4	5	2

European Spruce Sawfly, Diprion hercyniae (Htg.)

Populations of this sawfly declined to very low levels in 1966. The number of larvae per sample in Uxbridge Township declined from 21 in 1965 to four in 1966 (Table 8).

TABLE 8

Summary of European Spruce Sawfly Larval Counts in Lake Simcoe District in 1965 and 1966

Location (township)	Tree species	Total number of larvae per 15-tray sample	
		1965	1966
Vespra	nS	0	3
Medonte	wS	18	5
Mara	nS	6	1
Nottawasaga	wS	0	1
Uxbridge	wS	21	4

Introduced Pine Sawfly, Diprion similis (Htg.)

This sawfly (see photograph) fluctuated considerably in 1966, declining sharply in intensity at some locations and increasing at others, (see Table 9). The most noteworthy decline occurred at a sample point in Pickering Township where 7 larvae were counted on a 15-tray sample in 1966 compared with 67 larvae in 1965. The most notable increase occurred on young white pine trees at one point in Oro Township where 53 larvae were counted on a 15-tray sample in 1966 compared with 8 larvae in 1965. The northeastern boundary of known distribution advanced about 15 miles from a point in Oro township to Orillia in 1966 (see map).

TABLE 9

Summary of Introduced Pine Sawfly Larval Counts in Lake Simcoe District in 1965 and 1966

Location (township)	Tree species	Av. d.b.h. in inches	Total number of larvae per 15-tray sample	
			1965	1966
Markham	scP	6	0	2
Pickering	scP	6	67	7
Reach	scP	5	41	3
Melancthon	scP	4	0	4
Mono	scP	7	3	27
Vespra	scP	5	2	3
Oro	wP	5	8	53
Orillia	scP	4	0	2

Jack-pine Needle Miner, Exoteleia pinifoliella (Cham.)

Heavy infestations of this needle miner have persisted for several years in jack pine plantations in Flos, Vespra, Whitchurch, Uxbridge, Caledon, Adjala and Albion townships. At one point in Albion Township surveys showed 52 per cent of the current year's needles were killed by primary mining compared with 46 per cent in 1965. Approximately 75 per cent of the old needles were mined in the spring by the overwintering generation.

Birch Leaf Miner, Fenusa pusilla (Lep.)

Marked increases in the extent and intensity of infestations of this insect occurred for the second consecutive year. In recent years damage was largely confined to weeping birch and white birch ornamentals but in 1966, heavy infestations occurred in white birch stands over a large part of Nottawasaga Township where approximately 90 per cent of the foliage was heavily mined. Elsewhere in the district most ornamental birch trees were heavily infested and small pockets of heavy infestation occurred at numerous locations in forested areas.

Pales Weevil, Hylobius pales (Hbst.) and the Northern Pine Weevil, Pissodes approximatus Hopk.

These weevils continued to be major pests in Scots pine plantations wherever Christmas trees were harvested for three or more consecutive years and wherever tree mortality was high due to infestations of the root collar weevil, Hylobius radicis Buch. As in past years, the extent of branch damage by adult weevil feeding was related to the amount of brood material in the form of stumps that was available. In Uxbridge Township about 15 rows of young red pine trees bordering a 2-acre clear cut area were severely damaged or killed by P. approximatus adult feeding. A brush mowing machine was used to clear cut and chip the 10-year old trees in this area. The debris and 8-to-10-inch stumps resulting from this operation were highly attractive to adult weevils.

Experimental control measures were carried out against the adults of these weevils in the fall of 1964. Results were encouraging and a large scale control program using two parts of 25 per cent emulsifiable concentrate D.D.T. to three parts of water applied to the trees with a mist blower was undertaken in several Christmas tree plantations in September, 1965. Examination of the plantations in June, 1966, revealed little weevil feeding in the treated sections but severe damage occurred in untreated parts of the plantations.

Pine Root-collar Weevil, Hylobius radicis Buch.

Heavy infestations persisted in Scots pine plantations in seven townships between Thunder Bay Beach north of Penetanguishene and Highway 89 in Simcoe County. Severe mortality of Christmas trees, 55 per cent at one location in Tiny Township, occurred at widely-separated points. In addition, root-collar damage caused discoloration of the foliage and reduced the market value of many other trees.

Populations declined slightly for the second consecutive year in an unpruned 15-year old Scots pine plantation in Base Borden. An average of three larvae per tree were counted in 1966 compared with six larvae in 1965.

Eastern Tent Caterpillar, Malacosoma americanum (F.)

A marked decline in numbers of colonies of this insect occurred in the district as a whole in 1966. For example, at sample points in Tiny Township the number of colonies counted along one mile of roadside declined from 141 to 23 in 1966 (Table 10). Parasitism and predation by birds, were major control factors.

TABLE 10

Summary of Eastern Tent Caterpillar Colony Counts in Lake Simcoe District in 1965 and 1966

Location (township)	Type of plot	Number of tents	
		1965	1966
Sunnidale	One mile	15	14
Tiny	" "	141	23
Medonte	" "	129	13
East Luther	" "	0	30
Baxter	" "	132	13
Flos	10th "	154	56

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Infestations of this insect declined for the third consecutive year. Light infestations in Tosorontio, Medonte and in the Severn River area declined to very light intensity. No egg bands were found in the fall on 18 trees examined at widely-separated points in previously infested areas in Simcoe County. Therefore, no infestations are expected to occur in the district in 1967.

Balsam-fir Sawfly, Neodiprion abietis Complex

Infestations of this defoliator have persisted on balsam fir trees in the district for several years. As in previous years, infestations were generally light with heavy defoliation confined to the upper six to eight feet of the crown (see photographs).

Red-headed Pine Sawfly, Neodiprion lecontei (Fitch)

Infestations of this insect (see photograph) declined to low levels in Matchedash and Orillia townships but pockets of heavy infestation persisted in Baxter and Mara townships (see map). In Mara Township a Polyhedral virus disease was used for the second year in the late larval stage to promote carry-over of disease. In spite of heavy larval mortality defoliation of infested trees was severe.

Two Jack-pine Sawflies, Neodiprion pratti paradoxicus Ross and N. pratti banksianae Roh.

A medium infestation of N. pratti paradoxicus (see photograph) which had persisted in Nottawasaga Township for two years declined to light intensity in 1966. Defoliation decreased from about 40 per cent in 1965 to 15 per cent in 1966. Parasites probably played a major roll in the decline since swarms of parasite adults were observed attacking colonies in the late larval stage. A medium infestation of N. pratti banksianae (see photograph) recurred on six jack pine trees at one point in Mara Township. A new light infestation occurred in a jack pine shelterbelt near Orillia and scattered colonies were found at widely-separated points in the district (see map).

Spring Cankerworm, Paleacrita vernata (Peck)

Infestations of this looper declined in extent and intensity for the second consecutive year. Small pockets of medium and heavy infestation, largely on fencerow elm trees in Vespra, Medonte and Oro townships caused between 40 and 80 per cent defoliation of host trees (see map). A sharp decline in populations occurred in the late larval period. No pupae were found in a 9-square-foot soil sample taken at one point in Vespra Township where defoliation averaged approximately 75 per cent.

Leaf-folding Sawflies, Phyllocolpa spp. on Poplar

Populations of this leaf-folding sawfly declined at most sample locations in the district in 1966 (Table 11). The heaviest infestation occurred on Carolina poplar at one sample point in West Gwillimbury Township where leaf folds per 100 leaves increased from 53 in 1965 to 80 in 1966.

TABLE 11

Summary of Leaf-folding Sawfly Counts in Lake Simcoe District
in 1965 and 1966

Note: Counts were based on the examination of 100 leaves
from four trees at each location

Location (township)	Tree species	Number of leaf-folds per hundred leaves	
		1965	1966
Orillia	tA	4	0
Albion	tA	31	14
Tosorontio	tA	24	12
W. Gwillimbury	cPo	53	80
Adjala	tA	-	22
Tecumseth	tA	-	12

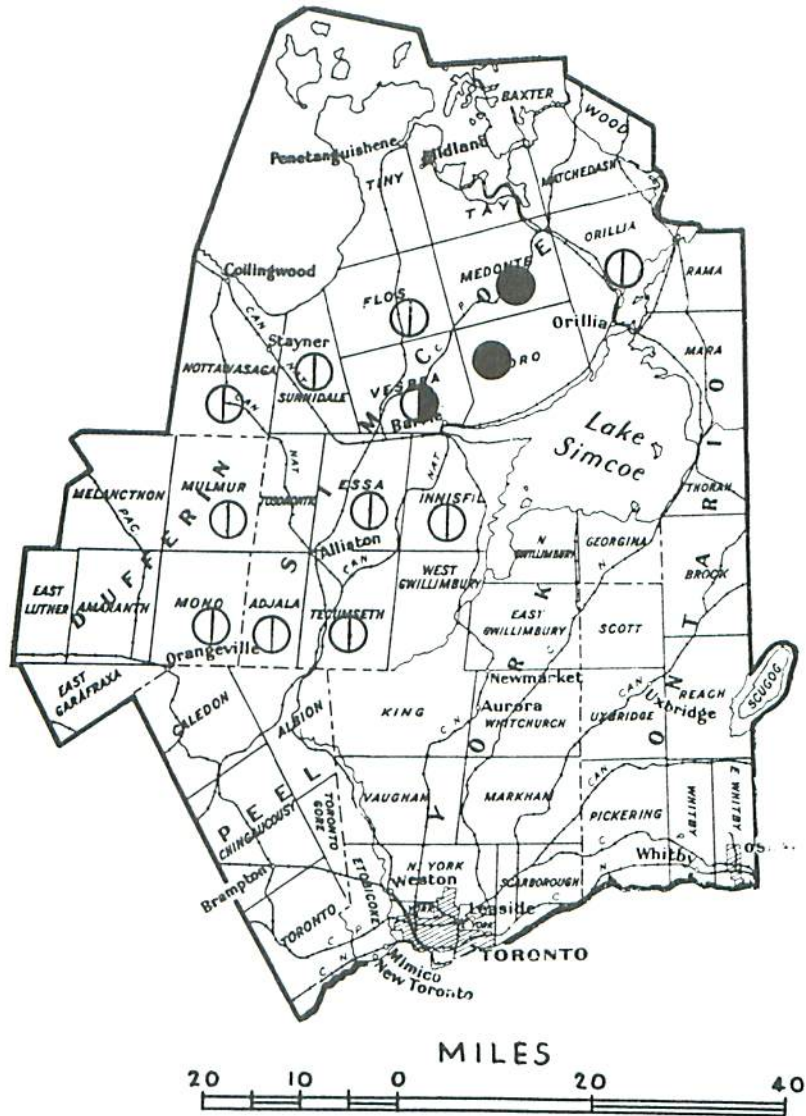
A Leaf Miner on Poplar, Phytomyza populicola (Hal.)

Heavy infestations of this leaf miner occurred on Carolina and Lombardy poplar wherever examinations were carried out in the district in 1966. In Oro, Amaranth, West Gwillimbury, Tosorontio and Medonte townships as high as 90 per cent of the foliage was infested and 75 per cent of the leaf surface mined.

White-pine Weevil, Pissodes strobi Peck

The incidence of leader damage caused by this weevil varied considerably at sample points and in the district generally (Table 12). The most notable decline in leader damage occurred at one sample point in Whitchurch Township where 26 per cent of the leaders were killed in 1966 compared with 54 per cent in 1965. The incidence of leader attack increased at a sample point in Orillia Township from 11 per cent in 1965 to 45 per cent in 1966 (see map and photographs).

LAKE SIMCOE DISTRICT



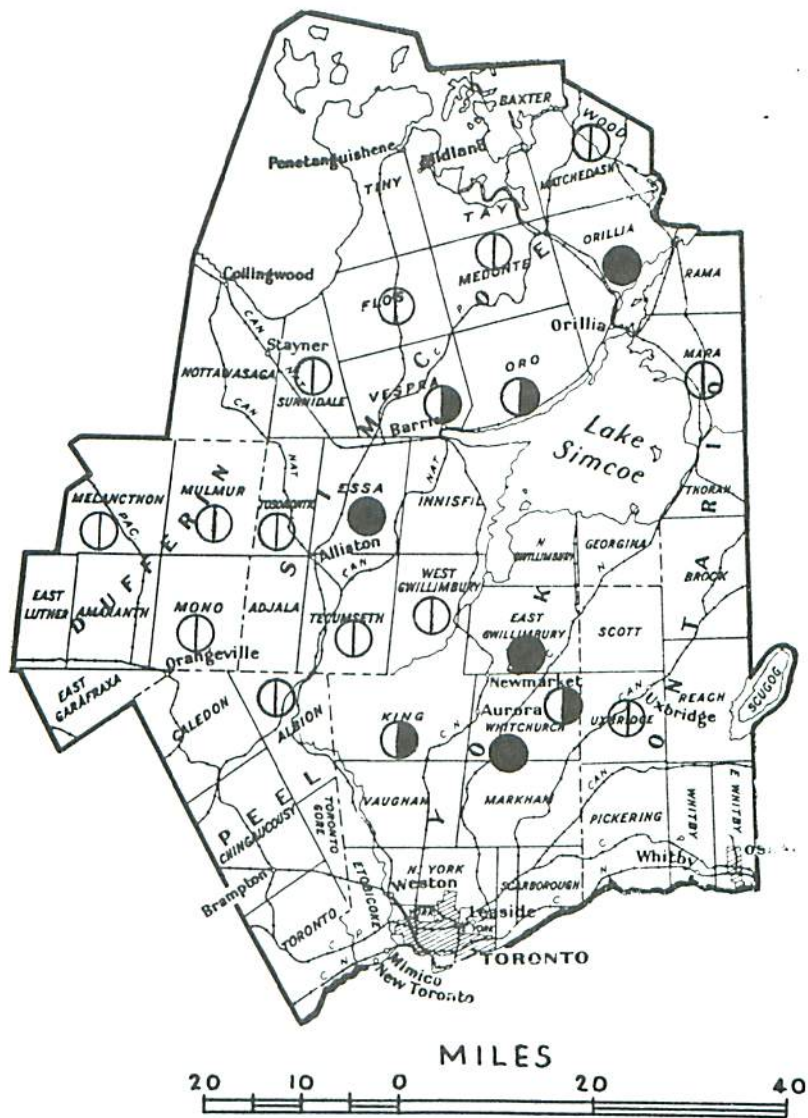
SPRING CANKERWORM

Locations where infestations were observed in 1966

Legend

- Light infestation ⊙
- Medium infestation ◐
- Heavy infestation ●

LAKE SIMCOE DISTRICT



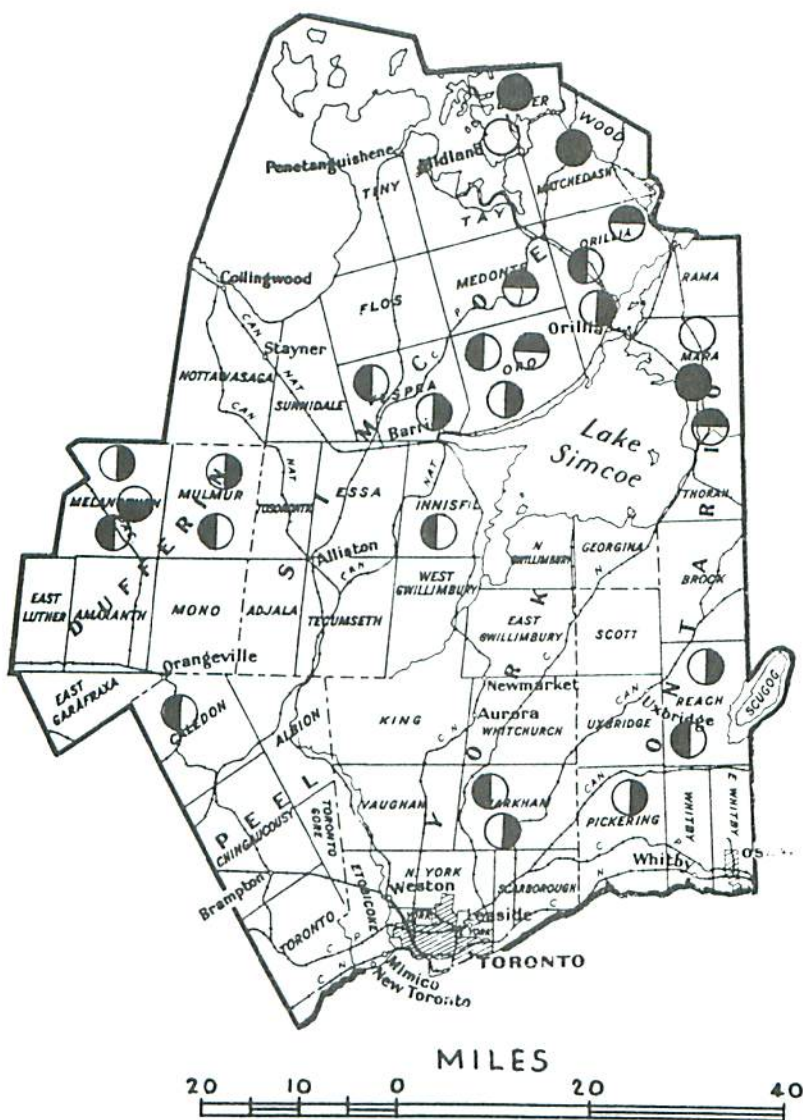
WHITE PINE WEEVIL

Locations where leader damage was observed in 1966

Legend

- Light damage ⊕
- Moderate damage ◐
- Heavy damage ●

LAKE SIMCOE DISTRICT



PINE SAWFLIES

Locations where infestations of six species of pine sawflies were observed in 1966

Legend

- | | |
|---|--|
| <u>Neodiprion lecontei</u> (Fitch) . . . ● | <u>Neodiprion virginianus</u> complex . ○ |
| <u>Neodiprion pratti banksianae</u> Roh . ◐ | <u>Diprion similis</u> (Htg.) ◑ |
| <u>Neodiprion pratti paradoxicus</u> Ross ◑ | <u>Diprion frutetorum</u> (F.) ◒ |

TABLE 12

Summary of Leader Damage by the White-pine Weevil in Lake Simcoe District in 1965 and 1966

Location (township)	Tree species	Per cent of trees weevilled	
		1965	1966
Whitchurch	wP	54	26
Matchedash	wP	9	1
Essa	wP	30	45
Orillia	wP	11	45
E. Gwillimbury	wP	65	60
Oro	wP	13	10
Whitchurch	nS	10	11
Vespra	nS	30	17
King	wP	24	19
Mara	wP	65	61

A Poplar Leaf Roller, Pseudexentera oregonana Wlsh.

Pockets of medium and heavy infestation of this leaf roller persisted for the seventh consecutive year in trembling aspen stands in Baxter, Matchedash, Wood, Orillia, Medonte, and Mara townships. Scattered medium infestations recurred in the central part of the district in Adjala, West Gwillimbury, East Gwillimbury, North Gwillimbury, Georgina and Scott townships. Light infestations were common throughout the north half of the district. Heavily infested trees did not re-leaf.

Elm Bark Beetles, Scolytus multistriatus (Marsh.) and Hylurgopinus rufipes Eich.

Populations of the Smaller European Elm Bark Beetle, Scolytus multistriatus, increased in the southern part of the district in proportion to numbers of elm trees dying from Dutch elm disease infection (see photographs). Heavy infestations occurred in the area between Lake Ontario, Orangeville and Markham, declining in intensity northwards to a line between Midland and Hawkestone in Simcoe County and northeastward to Lake Simcoe, and to a line between Port Bolster and Cannington in Ontario County. In the southern part of the district competition with the Native Elm Bark Beetle, H. rufipes for brood material was keen. In the remainder of the district heavy infestations of the native species in dying elm trees were common.

TABLE 13

Summary of Miscellaneous Insects Collected
in Lake Simcoe District

Insect	Host(s)	Remarks
<i>Adelges abietis</i> Linn.	nS, wS	High numbers of galls on some trees
<i>Adelges laraciatus</i> (Patch)	wS	Galls common on many trees
<i>Adelges strobilobius</i> Kalt.	nS, eL	Heavy foliage damage of European larch at many points. Galls common on Norway spruce
<i>Agrilus liragus</i> Bary. & Br.	tA	Sucker growth mortality common in most areas
<i>Alsophila pometaria</i> (Harr.)	E, Ba	Light populations at a few points
<i>Altica ulmi</i> Woods	E	Heavy infestations in Baxter Township
<i>Anacampsis innocuella</i> Zell.	tA, ltA	Heavy populations at points in Flos, Mulmur and Medonte townships
<i>Anoplonyx canadensis</i> Hgtn.	eL	Light populations common
<i>Aphrophora parallela</i> Say	scP, wP	Small heavy infestations common, as many as six nymphs per mass
<i>Archippus packardianus</i> Fern	wS, blue	Light infestations along Highway 400
<i>Argyrotaenia pinitubana</i> Kft.	wP	Low numbers seen in the district
<i>Choristoneura pinus</i> Freem.	scP, jP	Light infestations in the flowers of some trees
<i>Chrysopeleia ostryaella</i> Cham.	I	Light infestations declined to low levels
<i>Coleophora ulmifoliella</i> McD.	E	Heavy infestations recurred in North Gwillimbury and Georgina townships
<i>Dasyneura balsamicola</i> (Lintn.)	bF	Heavy infestations recurred at points in Mulmur and Medonte townships
<i>Datana integerrima</i> G. & R.	Wa	Complete defoliation of several trees in Vaughan Township
<i>Datana ministra</i> Dru.	wB, W	Scattered colonies seen at widely separated points
<i>Dendroctonus valens</i> Lec.	rP, scP	Adults common in the lower stem of dying trees.
<i>Dioryctria disclusa</i> Heinr.	scP, jP	Seventy-six per cent of red pine cones infested at Midhurst, light to medium infestations common

TABLE 13 (continued)

Insect	Host(s)	Remarks
<i>Elaphidionoides parallelum</i> Newm. <i>Epinothia nanana</i> Treit	rO, bO nS, wS	Branch damage generally light Light infestations recurred at Midhurst
<i>Erannis tiliaria</i> Harr. <i>Eriophyes populi</i> Nal. <i>Exoteleia dodecella</i> Linn. <i>Fenusa ulmi</i> Sund.	Ba tA, bPo scP E	Larvae rarely seen Galls numerous at some points Light infestations recurred Small pockets of heavy infestation recurred in Chinguacousy, Vespra, and Nottawasaga townships
<i>Gretchena delicatana</i> Heinr. <i>Hyphantria cunea</i> Dru.	I decid- uous	Populations were very low Slight increase to light infestation
<i>Ips chagnoni</i> Sw.	rP	Heavy infestations in dying trees at several locations
<i>Ips pini</i> Say <i>Leucoptera albella</i> Cham. <i>Lithocolletis aceriella</i> Clem.	rP, wP bPo sM, rM	Heavy populations in dying trees Light infestations common Light infestations general in the district
<i>Lithocolletis ostryarella</i> Cham.	I	Light infestations common in Simcoe and Dufferin counties
<i>Lithocolletis salicifoliella</i> Cham. <i>Macrophya punctum-album</i> (L.)	tA Privet	Light infestations persisted Heavy infestations recurred in North York Township
<i>Neodiprion virginianus</i> Complex	jP	A heavy infestation on six trees in Mara Township declined to light intensity. Scattered colonies seen elsewhere (see map and photo- graphs)
<i>Nymphalis antiopa</i> Linn.	decid- uous	Colonies seen at widely scattered points
<i>Oligonychus ununguis</i> (Jac.)	nS	Heavy concentrations suspected of causing rapid tree decline through the south half of the district
<i>Pamphilius ochreipes</i> (Cr.)	Viburnum	Heavy infestations recurred at Midhurst. Life history being studied.
<i>Petrova albicapitana</i> (Busck)	jP	Pitch masses common at points in Whitchurch and East Gwillimbury townships
<i>Phratora purpurea purpurea</i> Brown	tA	Heavy infestations occurred in Uxbridge Township

TABLE 13 (continued)

Insect	Host(s)	Remarks
<i>Pikonema alaskensis</i> (Htg.)	WS	Small heavy infestation recurred in Mara Township. Light populations elsewhere
<i>Pineus strobi</i> (Htg.)	wP, rP	Light infestations persisted in Vivian and Uxbridge forests Medium infestations recurred on the current shoots of young red pine in Adjala Township
<i>Pityogenes hopkinsi</i> Sw.	wP	Heavy infestations in young dying trees
<i>Pleroneura borealis</i> Felt	bF	Although an infestation year populations were low
<i>Phyllocoptes aceris-crumena</i> (Rly.)	sM	Heavy infestations common
<i>Pristiphora geniculata</i> (Htg.)	Mo	Heavy infestations near Orillia, medium in Tiny and Mono townships, light near Caledon
<i>Profenusa lucifex</i> (Ross)	bO	First Ontario record
<i>Recurvaria florum</i> Free.	rP	Heavy infestations in the flowers of red pine trees recurred. Life history studies progressing
<i>Rhyacionia adana</i> Heinr.	rP	Heavy infestations declined to light in Nottawasaga Township
<i>Rhyacionia buoliana</i> (Schiff.)	scP	Light infestation near Orillia
<i>Rhyacionia busckana</i> Heinr.	JP	Light mining of current shoots
<i>Rhynacaenus pallidior</i> (Leng)	Al	Light infestations of this leaf-mining weevil (first Regional record, 1965) recurred in E. Gwillimbury and occurred at several other locations in 1966
<i>Saperda moesta</i> Lec.	tA	Life history studies in progress Heavy infestations in stems of young trees recurred
<i>Schizura concinna</i> J.E. Smith	nM, bCh, tA, Ap	A few widely scattered colonies seen
<i>Sternochetus lapathi</i> (L.)	bPo, tA	Heavy populations in the stems of young trees in Uxbridge, Essa and Tosorontio townships
<i>Taniva albolineana</i> Kft.	blue spruce	Heavy infestations on ornamental trees along Highway 400 declined to medium intensity
<i>Trisetacus grosmanni</i> Keifer	bF	Infested buds numerous at points in Medonte, Essa and Vespra Townships
<i>Xyela minor</i> Nort.	rP	New light infestations in the flowers at widely separated points in the district
<i>Zeiraphera ratzeburgiana</i> Ratz.	WS	Defoliation approximated 40 per cent at points in Tiny, Essa and Uxbridge townships. Light and medium pockets of infestation elsewhere
	iP	Light infestations generally