

CAN
Fo
46-14
O-X
118

AEON

Lake Simcoe District, 1969
Reports of Forest Research Technicians

Bowser, R.L.

Information Report O-X-118
(Forest Research Laboratory, Ontario Region)

TABLE OF CONTENTS
 REPORTS OF FOREST RESEARCH TECHNICIANS
 Ontario, 1969

	Page
Foreword, L.S. MacLeod	
A. <u>SOUTHEASTERN FOREST REGIONS</u>	
Lindsay District, M.J. Thomson*	A 1 -10
Tweed District, F. Livesey	A 11-18
Kemptonville District, M.J. Applejohn	A 19-32
B. <u>SCOUTING FOREST REGION</u>	
Lake Simcoe District, R.L. Bowser*	B 1 -13
Lake Erie District, G.T. Atkinson	B 14-25
Lake Huron District, V. Jansons	B 26-36
C. <u>SOUTH-CENTRAL FOREST REGION</u>	
North Bay District, L.S. MacLeod*	C 1 -9
Parry Sound District, D. Lawrence	C 10-19
Pembroke District, R.A. Trieselmann	C 20-28
D. <u>CENTRAL FOREST REGION</u>	
Sault Ste. Marie District, K.C. Hall*	D 1 -14
Sudbury District, E.L. Houser	D 15-29
Chapleau District, W. Ingram	D 30-42
E. <u>NORTHERN FOREST REGION</u>	
Cochrane District, H.R. Foster*	E 1 -13
Kapusking District, J. Baker	E 14-22
Swastika District, J. Lombard	E 23-33
F. <u>MIDWESTERN FOREST REGION</u>	
Port Arthur District, H.J. Weir*	F 1 -3
Geraldton District, C.A. Davis	F 9 -17
White River District, H.J. Weir	F 18-24
G. <u>WESTERN FOREST REGION</u>	
Sioux Lookout District, C.A. Barnes*	G 1 -8
Kenora District, J. Mason	G 9 -15
Port Frances District, J. Hook	G 16-22

Supplement Reports on Aerial Spraying Operations

Regional Supervisors *

FOREWORD

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

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

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

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

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

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

L. S. MacLeod
Acting Chief Technician

April, 1970.

LAKE SIMCOE DISTRICT

1969

INTRODUCTION

INSECTS

	Page
Black-headed Budworm	B 1
The Oak Skeletonizer	B 1
Spruce Budworm	B 1
Jack-pine Budworm	B 2
Larch Casebearer	B 2
A Tortricid on Oak	B 3
Rusty Pine-cone Moth	B 3
Zimmerman Pine Moth	B 3
European Spruce Sawfly	B 3
Eastern Pine Shoot Borer	B 4
The Saddled Prominent	B 4
Eastern Tent Caterpillar	B 5
Jack-pine Sawfly	B 5
Red-headed Pine Sawfly	B 6
European Pine Sawfly	B 6
White Pine weevil	B 7
Larch Sawfly	B 7
Other Noteworthy Insects	B 8

TREE DISEASES

Armillaria Root Rot	B 10
Dutch Elm Disease	B 10

(Continued)

LAKE SIMCOE DISTRICT

1969

<u>TREE DISEASES</u> (Continued)	Page
Ink Spot of Aspen <u>Ciborinia whetzellii</u>	B 10
Needle Rust of Pine <u>Coleosporium asterum</u>	B 10
Eutypella Canker of Maple <u>Eutypella parasitica</u>	B 11
Annosus Root Rot. <u>Fomes annosus</u>	B 11
Leaf and Twig Blight of Poplar <u>Pollaccia radiosa</u>	B 11
Cytospora Canker of Spruce <u>Cytospora kunzei</u>	B 11
Deterioration of Roadside Trees	B 11
Winter Drying	B 12
Frost Injury	B 12
Rodent Damage	B 12
Other Noteworthy Diseases	B 13

INTRODUCTION

The following report, based on field surveys, deals with the status of forest insects and tree diseases on a district basis.

Although more confined in some areas high populations of the saddled prominent persisted for the third consecutive year. Notable increases occurred in larval populations of the European pine sawfly, the oak skeletonizer and black-headed budworm. Severe defoliation by the larch sawfly recurred in several areas. In contrast populations of a tortricid on oak, rusty pine cone moth, Zimmerman pine moth and pine shoot moth were noticeably lower.

Evaluations were carried out to determine the status of several tree diseases. Infections of Annosus root rot, white pine blister rust, Dutch elm disease and Cytospora canker remained virtually unchanged. Damage by leaf and twig blight of poplar declined substantially. Late frosts caused considerable damage mainly to deciduous tree species.

The district technician in co-operation with Department of Lands and Forests personnel collected a substantial quantity of virus infected European pine sawfly larvae for future control of the insect. The co-operation and assistance given by Department of Lands and Forests personnel is gratefully acknowledged.

R. L. Bowser

Black-headed Budworm, Acleris variana Fern.

Larval populations increased substantially at scattered locations in 1969. The most notable increases occurred in Essa and E. Garafraxa townships where the total number of larvae per 15-tray sample increased from 15 and 132 to 525 and 405 respectively (Table 1). A medium infestation recurred in Whitchurch Township and low populations were encountered commonly elsewhere in the district.

TABLE 1

Summary of Black-headed Budworm Larval Counts
in the Lake Simcoe District in 1968 and 1969

Location (township)	Tree species	Av. height of trees in feet	Total no. larvae per 15-tray sample	
			1968	1969
Essa	WS	45	15	525
E. Garafraxa	WS	25	132	405
Whitchurch	WS	30	135	135

The Oak Skeletonizer, Bucculatrix ainsliella Murt.

For the second consecutive year severe skeletonizing occurred in red oak stands in Uxbridge Township. A new heavy infestation was noted in the vicinity of Wasaga Beach in Sunnidale Township. Light infestations were common elsewhere in the district. Following pupation of first generation larvae in areas of heavy infestation, understory trees and ground litter were literally white with cocoons; and swarms of adults were observed during the first ten days of August. Although the insect has two generations, defoliation by the first generation larvae appeared to be more severe.

Spruce Budworm, Choristoneura fumiferana Clem.

A new, medium infestation was recorded in a small plantation of large white spruce trees in Chinquacousy Township. A light infestation at the Midhurst Nursery increased to medium intensity with 22 per cent defoliation compared with 14 per cent in 1968. In Essa Township a medium infestation decreased to light intensity in 1969. On the basis of egg counts medium infestations will occur at quantitative sample stations in Essa, Uxbridge and Vespra townships in 1970. Small numbers of the insect were found commonly in beating samples elsewhere in the district.

Jack-pine Budworm, Choristoneura pinus pinus Free.

Light to medium infestations occurred in Scots pine plantings in Oro and Albion townships and in a jack pine plantation in Essa Township (Table 2). Light infestations were recorded in Adjala, Pickering, Essa, Oro, Tecumseth and Vespra townships. Generally, the insect was much more common than in 1968.

TABLE 2

Summary of Jack-pine Budworm Larval Counts in the Lake Simcoe District in 1969

Location (township)	Tree species	Av. height of trees in feet	Total no. larvae per 15-tray sample
Albion	ScP	15	98
Essa	rP	30	30
Oro	rP	30	30

Larch Casebearer, Coleophora laricella Hbn.

A heavy infestation persisted in a European larch plantation east of Aurora in Whitchurch Township where 337 larvae were counted on two 18-inch branch tips. The medium infestation in W. Gwillimbury Township declined to light intensity with only nine larvae counted on two 18-inch branch tips compared with 41 in 1968. Elsewhere in Whitchurch Township and in Albion Township larval populations declined notably (Table 3). Scattered light infestations were common in the district.

TABLE 3

Summary of Larch Casebearer Larval Counts in the Lake Simcoe District from 1967 to 1969

Note: Counts were based on the 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		
			1967	1968	1969
Medonte	EL	6	1.0	5.1	0.1
Albion	EL	5	34.0	76.9	30.6
Whitchurch	EL	6	17.4	42.1	1.0
Vespra	EL	6	0.1	0.5	0.5
Uxbridge	EL	9	2.0	8.5	13.5

A Tortricid on Oak, Croesia semipurpurana Kft.

Medium infestations recurred in red oak stands in Uxbridge and Oro townships. Heavy infestations in Tiny, Mulmur, Vespra and Vaughan townships declined to generally light intensity with scattered small pockets of moderate defoliation.

Adult flights were observed in several areas during the latter part of July.

Rusty Pine-cone Moth, Dioryctria disclusa Heinr.

Cone damage was generally less prevalent than in 1968. At Base Borden, where heavy infestations occurred in red and jack pine plantations for two consecutive years, larval populations declined to medium intensity. Moderate cone damage was recorded in Scots pine plantations in Albion and Pickering townships and in a jack pine plantation in Sunnidale Township. Elsewhere in the district only light damage was observed.

Zimmerman Pine Moth, Dioryctria zimmermani Grt.

High larval populations persisted in fringe and open-grown large red pine trees at Base Borden in Essa Township and at Midhurst in Vespra Township. Elsewhere in Essa Township and in Mulmur and Tosorontio townships infestations declined to light intensity in 1969. Light damage to new shoots was common in numerous pole-size red pine plantations in the central and northern parts of the district.

European Spruce Sawfly, Diprion hercyniae Htg.

Except in Uxbridge Township where a notable decrease occurred larval populations remained virtually the same as in 1968 (Table 4).

TABLE 4

Summary of European Spruce Sawfly Larval Counts in the Lake Simcoe District from 1967 to 1969

Location (township)	Tree species	Av. height of trees in feet	Total no. larvae per 15-tray sample		
			1967	1968	1969
Vespra	nS	45	22	0	-
Medonte	wS	45	62	15	-
Mara	wS	15	18	24	22
Nottawasaga	wS	45	63	10	16
Uxbridge	wS	30	19	74	11
Whitchurch	wS	30	39	0	0
E. Luther	wS	30	-	-	16

Eastern Pine Shoot Borer, Eucosma gloriola Heinr.

Although shoot damage caused by this insect was evident in most pine plantations a decline occurred in the average number of attacks per infested tree and leader damage did not exceed six per cent in areas examined (Table 5).

TABLE 5

Summary of Shoot Damage by the Eastern Pine Shoot Borer
in the Lake Simcoe District in 1969

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	4	43	2	2
Medonte	rP	2	24	1	1
Uxbridge	rP	6	23	1	1
W. Gwillimbury	wP	8	48	2	3
Whitchurch	ScP	8	97	5	6
Vespra	ScP	8	37	2	1
Sunnidale	rP	4	76	2	4

The Saddled Prominent, Heterocampa guttivitta Wlk.

Heavy infestations recurred in the northern part of Oro Township and in the southwest corner of Medonte Township. Several woodlots east of Craighurst suffered 75 to 100 per cent defoliation of sugar maple and basswood trees. Severe defoliation of host trees also recurred on Christian and Beckwith islands, in the north part of Tiny Township and at one point in Uxbridge Township (see map). The small pocket of heavy infestation in Whitchurch Township declined to light intensity.

Pupal counts made in early May in one and two year old infestations varied from 0.9 to 1.4 per square foot of duff compared with 2.2 to 6.8 recovered in samples taken in the fall of 1958. Predation by small mammals was a major factor contributing to the reduction. Approximately 18 per cent parasitism was recorded in 57 pupae reared at the ranger headquarters cabin and from two to eight per cent parasitism occurred in pupal collections reared at the Forest Insect Laboratory.

Plots established in two areas of heavy infestation in 1968 and re-examined in 1969 showed that up to 10 per cent branch mortality occurred on approximately forty per cent of the trees and light tree mortality was recorded in one plot.

Eastern Tent Caterpillar, Malacosoma americanum F.

Populations of this tent caterpillar were noticeably higher in the southern part of the district in 1969. High populations recurred in Scott Township and at numerous points in the Uxbridge area. A notable decrease was recorded at a sample point in Flos Township (Table 6).

TABLE 6

Summary of Eastern Tent Caterpillar Colony Counts
in the Lake Simcoe District from 1967 to 1969

Location (township)	Tree species	No. colonies per mile of roadside		
		1967	1968	1969
Sunnidale	bCh	14	23	37
Tiny	ecCh	26	31	27
Medonte	bCh	11	16	16
Baxter	ecCh	16	11	19
Flos	bCh	31	37	9
Vespra	ecCh	11	8	11

Jack-pine Sawfly, Neodiprion pratti banksianae Roh.

A new medium to heavy infestation was recorded in a small open-grown jack-pine plantation west of Aurora in King Township. A small pocket of heavy infestation in Essa Township declined to light intensity and light infestations were common in jack pine stands elsewhere in the district (Table 7).

TABLE 7

Summary of Jack-pine Sawfly Colony Counts in the Lake Simcoe District
from 1967 to 1969

Location (township)	Tree species	Av. height of trees in feet	Av. no. colonies per infested tree		
			1967	1968	1969
Melancthon	jP	20	5	1.0	1.6
Tosorontio	jP	12	-	1.5	0.6
W. Gwillimbury	jP	15	-	2.0	3.1

Red-headed Pine Sawfly, Neodiprion lecontei Fitch

Small pockets of medium and heavy infestation recurred in a large plantation of five foot red pine trees in Vespra Township. Light tree mortality has occurred for two consecutive years.

European Pine Sawfly, Neodiprion sertifer Geoff.

Population levels increased substantially in several areas in 1969. New heavy infestations were recorded in the northern part of Tiny Township, in Adjala Township and in numerous plantations in the Vivian - Uxbridge area in York and Ontario counties. A heavy infestation recurred in a Scots pine plantation near Ballantrae in Whitchurch Township. In Adjala Township 40-foot jack pine trees suffered 75 to 90 per cent defoliation. A large plantation of 10 to 15-foot Scots pine trees in Albion Township and several small plantings of large jack pine and Scots pine in the Mono Mills - Schomberg area were severely defoliated. Colony counts made at seven locations in the district are shown in Table 8.

In 1969 a virus recovery program was conducted by Department of Lands and Forests personnel and the Forest Research Technician. Small plots were marked off in three areas of heavy infestation and when the larvae reached late third and early fourth instar infested Scots pine trees, ranging from six to ten feet in height, were sprayed with a virus suspension. Approximately five quarts of virus killed larvae (see photograph), were hand picked and forwarded to the Insect Pathology Research Institute for infectivity tests. This concentrate will be used in preparing suspensions for use in future control operations.

TABLE 8

Summary of European Pine Sawfly Colony Counts and Degrees of Infestation in the Lake Simcoe District from 1967 to 1969

Location (township)	Tree species	Av. height of trees in feet	Av. no. colonies per infested tree			Per cent of trees infested in 1969	Degree of infestation in 1969
			1967	1968	1969		
Uxbridge	rP	5	-	-	1.5	57	L
Tosorontio	rP	12	1.0	0.5	1.0	14	L
Tosorontio	ScP	12	2.0	1.0	1.1	21	L
Adjala	ScP	6	-	-	4.5	100	M
Albion	ScP	10	-	3.0	6.1	100	M
Orillia	ScP	12	0.0	1.0	1.0	26	L
Tiny	rP	5	-	1.0	2.1	65	L

White Pine Weevil, Pissodes strobi Peck

A heavy infestation recurred in a white pine plantation in the Orr Lake forest in Flos Township. Seventy-eight per cent of the trees were infested compared with 56 per cent in 1968. Shoot damage increased at quantitative sample points in Whitchurch, Oro, Orillia and King townships (Table 9). In a white pine plantation in E. Gwillimbury Township 30 per cent of the leaders were infested. Minor fluctuations were noted elsewhere.

TABLE 9

Summary of Leader Damage by the White-pine Weevil in the Lake Simcoe District from 1967 to 1969

Location (township)	Tree species	Per cent of trees weevilled		
		1967	1968	1969
Whitchurch	wP	17	19	28
Matchedash	wP	7	16	13
Essa	wP	55	35	27
Orillia	wP	31	35	48
Oro	wP	4	2	8
Whitchurch	nS	6	3	-
Vespra	nS	16	12	11
King	wP	14	20	31
Mara	wP	74	78	63

Larch Sawfly, Pristiphora erichsonii Htg.

Heavy infestations persisted in European larch plantations in Medonte, Flos, Tosorontio, Tecumseth and Whitchurch townships where defoliation generally exceeded 75 per cent. Light and medium infestations in Oro, Adjala, Mulmur, Uxbridge and Pickering townships increased to heavy intensity. Light infestations were prevalent elsewhere in the district.

TABLE 10

Other Noteworthy Insects

Insect	Host(s)	Remarks
<i>Agonopterix robiniella</i> Pack.	Lo	Light infestations in Oro, Albion, and W. Gwillimbury townships
<i>Alsophila pometaria</i> (Harr.)	wE, Ba	Light defoliation in Caledon, Toronto, Uxbridge, and Mono townships
<i>Altica populi</i> Brown	bPo	Heavy localized infestations in southeastern part of district
<i>Altica ulmi</i> Woods	wE	Moderate foliar damage in Mara Township
<i>Aphrophora parallela</i> (Say)	ScP, wP	Heavy infestation in Oro Township caused branch and stem mortality. Medium infestations in Albion and E. Gwillimbury townships
<i>Argyresthia thuiella</i> Pack. and <i>Pulicalvaria thujaella</i> (Kft.)	eC	Although larval populations declined considerably in some areas these two leaf miners caused considerable tip mortality in the central and southeastern parts of the district
<i>Coleophora innotabilis</i> Braun	bPo	Medium infestation of casebearers in Whitchurch Township
<i>Coleophora ulmifoliella</i> McD.	wE	Medium infestation on roadside trees in King Township
<i>Diprion similis</i> (Htg.)	ScP, wP, rP	Notable increases occurred in Pickering and Melancthon townships and larval populations declined in Oro Township
<i>Fenusa ulmi</i> Sund.	wE	Localized heavy infestations

TABLE 10 (Continued)

Insect	Host(s)	Remarks
<i>Hylobius pales</i> (Hbst.)	ScP	Caused moderate to severe shoot mortality in several Christmas tree plantations in Dufferin County
<i>Hyphantria cunea</i> Dru.	As	Medium infestation recurred on green ash trees in Orillia Township. Light elsewhere
<i>Lithocolletis hamadryadella</i> Clem.	bO	Severe mining of fringe trees in Toronto Township
<i>Messa nana</i> Klug	wB	Light infestations in Uxbridge Township
<i>Neodiprion abbotii</i> (Leach)	rP	Few larvae recovered in beating sample in Essa Township
<i>Nepticula</i> n sp. prob. <i>turbidella</i> H.-S.	tA, lA, bPo	Petiole borers common
<i>Paleacrita vernata</i> Peck	wE, Ba	Light defoliation in Caledon, Toronto, Uxbridge and Mono townships
<i>Petrova albicapitana</i> Busck.	jP	Light to medium infestations in King and Adjala townships
<i>Pristiphora geniculata</i> (Htg.)	Mo	Light to severe damage
<i>Profenusa lucifex</i> Ross	bO	Small heavy infestation in Pickering Township
<i>Proteoteras aesculana</i> Riley	mM	Borers common in new shoots in W. Gwillimbury Township
<i>Pulicalvaria piceaella</i> Kft.	wS	Heavy infestation in Chinguacousy Township. Light elsewhere
<i>Tethida cordigera</i> (Beauv.)	wAs	Light defoliation in Oro Township

Armillaria Root Rot, Armillaria mellea (Vahl ex Fr.) Kummer

Further tree mortality occurred in a 4-foot cedar hedge at Midhurst Nursery and in a red pine plantation in Oro Township. New infections were noted in Scots pine regeneration in a clear cut area in Sunnidale Township where ten of 300 trees examined were infected and dying. In a recently thinned hardwood stand in Tosorontio Township the organism was associated with dying red oak trees.

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

Notable increases occurred in the central and northern parts of the district. In the southern part the disease continued at approximately the same rate of infection as in 1968. Counts made in five areas chosen at random are shown in Table 11.

TABLE 11

Summary of Dutch Elm Disease Surveys Carried Out at Five Locations in the Lake Simcoe District in 1969

Location (township)	Total no. trees		
	Healthy	Diseased	Dead
Melancthon	21	37	42
Essa	6	43	1
Pickering	2	41	3
Albion	8	37	15
Markham	16	39	18

Ink Spot of Aspen, Ciborinia whetzellii (Seaver) Seaver

Occasional patches of heavy infection was recorded in small pockets of trembling aspen understory in Whitchurch Township. Trace to light infections were noted at scattered locations elsewhere in the district.

Needle Rust of Pine, Coleosporium asterum (Diet.) Syd.

A small localized area, approximately one half acre in size, in a large red pine plantation in Adjala Township was severely infected. Several one foot trees were killed and heavy infections were common on the lower branches of trees up to four feet high. The area of infection was located on the fringe of the plantation partially shaded by large aspen trees. A light infection recurred in a small jack pine plantation south of Base Borden in Tosorontio Township.

Eutypella Canker of Maple, Eutypella parasitica Davidson & Lorenz

Light infections were common in sugar maple stands in the district. With the exception of Oro Township where a moderate level of infection was recorded, evaluations generally revealed 0 to 5 per cent incidence. Trace tree mortality was apparent in a few stands.

Annosus Root Rot, Fomes annosus (Fr.) Karst.

Light tree mortality occurred in infection centres in red pine stands in Flos and Medonte townships and in a mixed pine plantation in Uxbridge Township. No mortality was recorded in infection centres in Whitchurch and Brock townships in 1969.

Leaf and Twig Blight of Poplar, Pollaccia radiosa (Lib.)
Bald. & Cif.

Infection levels were generally much lower than in 1968. In Orillia Township a heavy infection occurred in approximately 1.5 acres of open growing trembling aspen regeneration and localized small patches of moderate infection were noted in the Vivian forest area in Whitchurch Township. Trace and light infections were observed at scattered locations elsewhere in the district.

Cytospora Canker, Cytospora kunzei Sacc.

Evaluations taken in white spruce plantations in Vespra and Essa townships revealed moderate and light levels of infection respectively. Tree mortality at Midhurst in Vespra Township increased from 0 to 7.5 per cent in 1969. Pruning scars were probably the most important factor influencing the disease in the two areas. Trace to light levels of infection were observed on occasional trees in spruce windbreaks at several widely separated locations.

Deterioration of Roadside Trees

This condition persisted especially along the major highway systems in the district. Although a number of tree species were affected a decline was evident in sugar maple trees. Notable deterioration also occurred in roadside plantings of pines, spruces and cedars in several areas. Incidence ranged from light to heavy in localized groups of trees particularly in the central and southern parts of the district.

Winter Drying

This condition caused severe needle drop in the upper half of young white spruce trees in a 10-acre plantation in Tiny Township. Eighty to 90 per cent of the trees were affected. The lower portions of the trees below the cover of snow were protected and the foliage remained green and healthy. Moderate damage occurred in several pine and spruce plantings along Highway 400 between Toronto and Coldwater.

The generally accepted explanation for this condition is that the needles or leaf buds lose moisture during periods of high temperature accompanied by drying winds. The roots are unable to replace this water loss either because of low soil temperatures or because the stem is frozen and water is unable to pass through it resulting in a form of desiccation.

Frost Injury

Red oak trees suffered severe leaf and bud damage at points in Tiny, Sunnidale and E. Gwillimbury townships and moderate damage was recorded in Uxbridge Township. In Tiny and Sunnidale townships a distinct frost line was evident at approximately the 25-foot level. Ash trees in the Wasaga Beach area were also severely damaged. Light to heavy shoot damage occurred in small pockets of white spruce and Norway spruce plantings in low lying areas in the vicinities of Vivian and Uxbridge. Sumac suffered varying degrees of damage in most areas examined.

Rodent Damage

Although damage to deciduous trees was much less notable in 1969 damage in scattered Scots pine plantations was moderate to severe. Thirty to 50 per cent mortality of small Scots pine trees was recorded at points in Mulmur, Uxbridge, Oro and Adjala townships and at scattered points in the Ballantrae area in York County.

TABLE 12

Other Noteworthy Diseases

Organism	Host (s)	Remarks
<i>Alternaria</i> sp.	eC	Associated with moderate damage to 2-0 stock - Midhurst Nursery
<i>Cytospora</i> sp.	E1	Branch and stem mortality in Oro Township
<i>Gymnosporangium</i> sp.	Haw	Light and heavy infections in Sunnidale and Matchedash townships respectively
<i>Lophodermium pinastri</i> (Schrad. ex Hook.) Chev.	rP	Caused moderate needle cast on fringe and open grown trees in Orillia Township
<i>Scolecnectria cucurbitula</i> (Tode ex Fr.) Booth	rM	Associated with cankers on stem and branches of living tree