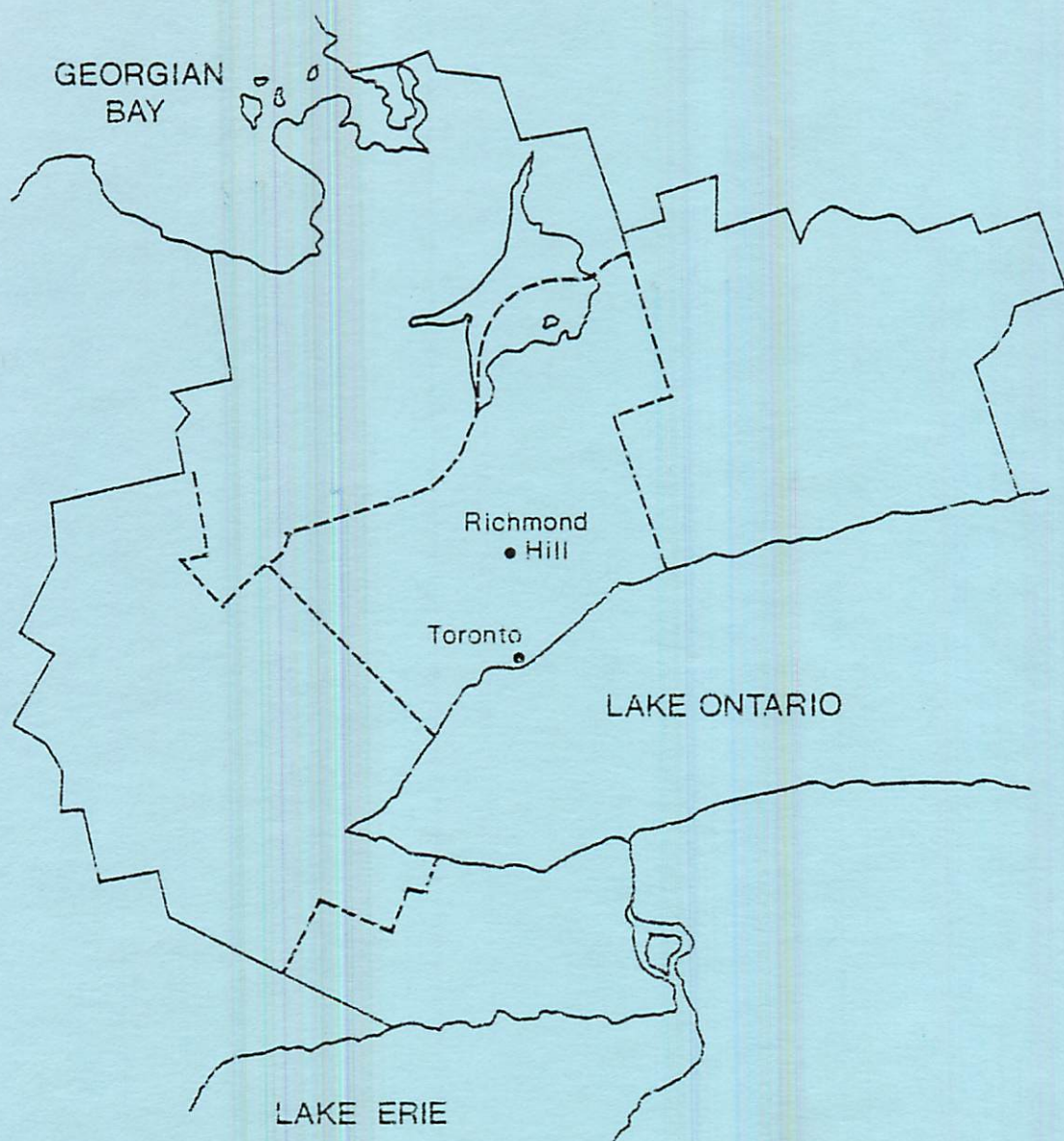


Results of forest insect and disease surveys in the CENTRAL REGION of Ontario, 1978



CARRIED OUT BY THE GREAT LAKES FOREST
RESEARCH CENTRE IN CO-OPERATION WITH
THE ONTARIO MINISTRY OF NATURAL RESOURCES

SURVEY HIGHLIGHTS

The status of the more important forest insect and disease conditions found in the Central Region of Ontario in 1978 are described herein. Forest tent caterpillar infestations collapsed, and at some locations significant declines were observed in populations of the oak leaf shredder and larch casebearer. Populations of the pine false webworm, larch sawfly, and spruce budworm persisted at relatively high levels while unusually heavy infestations of the northern pine weevil caused severe damage to red pine plantings at several locations. Successful control operations were carried out against the oak leaf shredder and larch sawfly.

Forest disease surveys concentrated on a search for the European strain of Scleroderris disease of pines and although numerous stands were examined the disease was not found. Surveys to monitor the status of maple decline and oak mortality were continued. Ash dieback, Diplodia tip blight, horse chestnut leaf blight and winter drying all prompted numerous inquiries from private individuals and forest managers.

M. J. Applejohn

H. J. Weir

Frontispiece



Typical defoliation caused by
the oak leaf shredder,
Croesia semipurpurana (Kft.).

Mature red pine trees with broken tops
caused by severe ice and snow storm.



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INSECTS

Pine False Webworm, *Acantholyda erythrocephala* (Linn.)

This introduced defoliator was formerly confused with a web-spinning sawfly (*Cephalcia* sp.), a native insect, the larvae of which are very similar to that of the pine false webworm. However, adults collected in Flos Township, Huronia District, in the spring of 1978 were identified as the European species. The insect was first recorded in Ontario in 1961 in Scarborough Township, Maple District. Since that time its range has increased to encompass most of Ontario south of a line between Parry Sound and Ottawa. It has also been collected near Lake of the Woods, Kenora District.

In the Huronia District in 1978, heavy infestations persisted in several Scots pine (*Pinus sylvestris* L.) plantations in Oro Township, while medium infestations were observed on Scots pine and red pine (*P. resinosa* Ait.) in Mono and Flos townships. In the Lindsay District, a heavy infestation persisted in a 40-ha (100-acre) red pine plantation along with moderate-to-high populations on red pine in Douro Township and on white pine (*Pinus strobus* L.) in Balsam Lake Provincial Park. Light infestations were observed on jack pine (*Pinus banksiana* Lamb.) in Adjala Township, Huronia District, and on Scots pine in Uxbridge Township, Maple District.

Pine Spittlebug, *Aphrophora cribrata* (Wlk.)

High populations persisted in the southern part of the Lindsay District where heavy feeding caused branch and tip mortality in a 6-ha (15-acre) white pine seed orchard in the Orono Forest Station and in semimature Scots pine plantations in Darlington and Cartwright townships. High populations were also observed in Scots pine Christmas tree plantations in Oro Township, Huronia District, and in Whitchurch Township, Maple District. Small numbers of feeding adults were observed commonly throughout the Region.

Cedar Leafminers, *Argyresthia aureoargentella* Brower, *A. canadensis* Free., *A. thuiella* Pack., and *Pulicalvaria thujaella* (Kft.)

In the Huronia District, ornamental trees and small white cedar (*Thuja occidentalis* L.) stands were moderately to severely defoliated in the Angus-Creemore-Dunedin area of Nottawasaga and Essa townships. Pockets of heavy infestation also recurred in the Hockley Valley east and north of Orangeville. In the Lindsay District, light-to-medium infestations occurred on windbreaks in the Orono Forest Station in Newcastle Township, while populations declined to low levels in Harvey and Verulam townships. Small numbers were more common than usual in the remainder of the Region.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The results of damage surveys, population sampling and egg-mass counts have been included with those of other survey regions in a special report by G.M. Howse et al. (Report O-X-300). This report provides a complete description and analysis of developments on the status of the spruce budworm situation in Ontario in 1978 and gives infestation forecasts for the province for 1979.

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Light infestations persisted in Scots pine Christmas tree plantations in Oro and Tosorontio townships and on planted jack pine in Adjala Township, Huronia District. Low populations were also observed in red pine plantations at the Orono Forest Station, Lindsay District, on Scots pine in Blenheim Township, Cambridge District, and in Uxbridge Township, Maple District. Occasional larvae were found on beating samples at a number of other widely separated locations.

Larch Casebearer, *Coleophora laricella* Hbn.

A general decline in numbers of this insect was evident in 1978. Heavy infestations which had persisted on European larch (*Larix decidua* Mill.) in the Hodson and Cookstown tracts in West Gwillimbury Township, Huronia District, for the previous four years were reduced to light intensity. Similar reductions in population levels were observed in Pickering Township, Maple District, and Oro Township, Huronia District, where populations declined from high to medium levels. Severe defoliation was again observed from the air on native tamarack (*Larix laricina* [Du Roi] K. Koch) in the Minesing Swamp area of Vespra and Sunnidale townships, Huronia District, although the area involved was reduced from 520 ha (2 mi.²) to 260 ha (1 mi.²). A small, medium infestation was recorded on tamarack in the Orono Forest Station, Lindsay District.

Oak Leaf Shredder, *Croesia semipurpurana* (Kft.)

Populations of this defoliator declined from medium and high levels in the Methodist Point and Awenda Park areas, on Giants Tomb Island and on Beausoleil Island in the Huronia District (see Frontispiece). Population declines also occurred in the Uxbridge-Ballantrae area of the Maple District and in the Ganoraska and Durham forests of the Lindsay District where most stands were only lightly defoliated. Pockets of heavy infestation persisted in the Barrie-Midhurst-Minesing area, near Farlain Lake in Tiny Township, and in Tosorontio and Mulmur townships, Huronia District. A new area of medium-to-heavy infestation was discovered along the Severn River in Orillia Township, Huronia District, which extended northeast into

the Bracebridge District. In an effort to avert further serious damage to red oak (*Quercus rubra* L.) stands at Midhurst Forest Station, Wildman Tract and Dufferin Forest, aerial spraying operations were carried out using the insecticide, Orthene, at several different concentrations. Post-spray larval surveys, aerial defoliation surveys and fall egg surveys all indicate that good control was achieved at all three locations.

Walnut Caterpillar, *Datana integerrima* G. & R.

Heavy infestations occurred on individual trees and small black walnut (*Juglans nigra* L.) plantings in the Hamilton-Cambridge area, the Brantford-Paris area and at a few locations near Guelph in the Cambridge District. Severe defoliation of single and small clumps of trees was noted throughout the towns of Fonthill, Welland, Port Colbourne and Fort Erie in the Niagara District where trees suffering 100% defoliation were common. Light-to-medium infestations were observed at a number of locations in Markham and Pickering townships, Maple District.

Palmerworm, *Dichomeris ligulella* Hbn.

This pest, usually of minor importance, caused severe damage to the foliage of red oak, black oak (*Quercus velutina* Lam.) and pin oak (*Q. palustris* Muenchh.) at a number of locations in the Niagara District. Heavy infestations occurred along regional road 112 in the town of Fort Erie, along the Chandler Road in the town of Pelham and along Highway 3 between Dunnville and Fort Erie. The same trees also suffered light damage by the oak leaf shredder (*Croesia semipurpurana* [Kft.]) which causes similar damage.

Eastern Pineshoot Borer, *Eucosma gloriola* Heinr.

Unusually heavy infestations were observed on semimature and mature red pine in the Angus-C.F.B. Borden-Creemore area of the Huronia District. Heavy infestations were also observed on white pine in Medonte Township, Huronia District, and on white and Scots pine in Beverly, Puslinch and Flamborough townships, Cambridge District. Medium populations were observed at several locations in Tiny Township, Huronia District while small numbers of infested shoots were observed at many other locations.

Birch Leafminer, *Fenusa pusilla* (Lep.)

A substantial increase in numbers of this insect was evident in most of the Central Region except in the Lindsay District where slight population declines were recorded. In the Huronia District,

natural white birch (*Betula papyrifera* Marsh.) was heavily infested in the Barrie-Midland area, south of Collingwood in Nottawasaga Township, and at several locations in Orillia and Rama townships. Severe browning of white birch foliage was observed in the Orono Forest Station, Lindsay District, and along Highway 81 between Grimsby and St. Catharines in the Niagara District. Heavy infestations were also noted in the Pinehurst conservation area in Brantford Township, Cambridge District. Small numbers were common throughout the remainder of the Region.

Fall Webworm, *Hyphantria cunea* Dru.

Heavy infestations which had persisted near Alliston in Huronia District for the past three years declined to light intensity in 1978. New, heavy infestations occurred in Dummer, Harvey and Asphodel townships, Lindsay District. Medium infestations were recorded on a variety of hosts in the Oakville-Stoney Creek and Paris areas of Cambridge District along with medium-to-heavy infestations in the Welland and Fonthill areas of Niagara District. Small numbers of feeding nests were common throughout the Region.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Infestations of this insect, which were widespread in Huronia and Lindsay districts in 1977, collapsed in 1978 (Fig. 1). In the Huronia District small pockets of medium-to-heavy defoliation persisted at the north end of Christian Island in Georgian Bay, and in the vicinity of Mud Lake in Rama Township. Small, light infestations also persisted on trembling aspen (*Populus tremuloides* Michx.) near Pepperlaw and Beaverton in the Maple District and in Manvers Township in the Lindsay District. A small pocket of light infestation occurred along Regional Road 24 in the Niagara District. Infestations in sugar maple (*Acer saccharum* Marsh.) woodlots near St. Agatha in the Cambridge District declined to very low levels in 1978.

Balsam Fir Sawfly, *Neodiprion abietis* complex

Increased populations of this defoliator were evident in 1978. Heavy infestations were recorded on small clumps of balsam fir (*Abies balsamea* [L.] Mill.) in Medonte, Oro, Matchedash, Orillia and Rama townships, Huronia District. Less severe damage was observed on balsam fir in swampy areas and pastured woodlots in Flos and Tiny townships, Huronia District. Light infestations occurred west and south of Erin in Erin Township, Cambridge District.

CENTRAL REGION

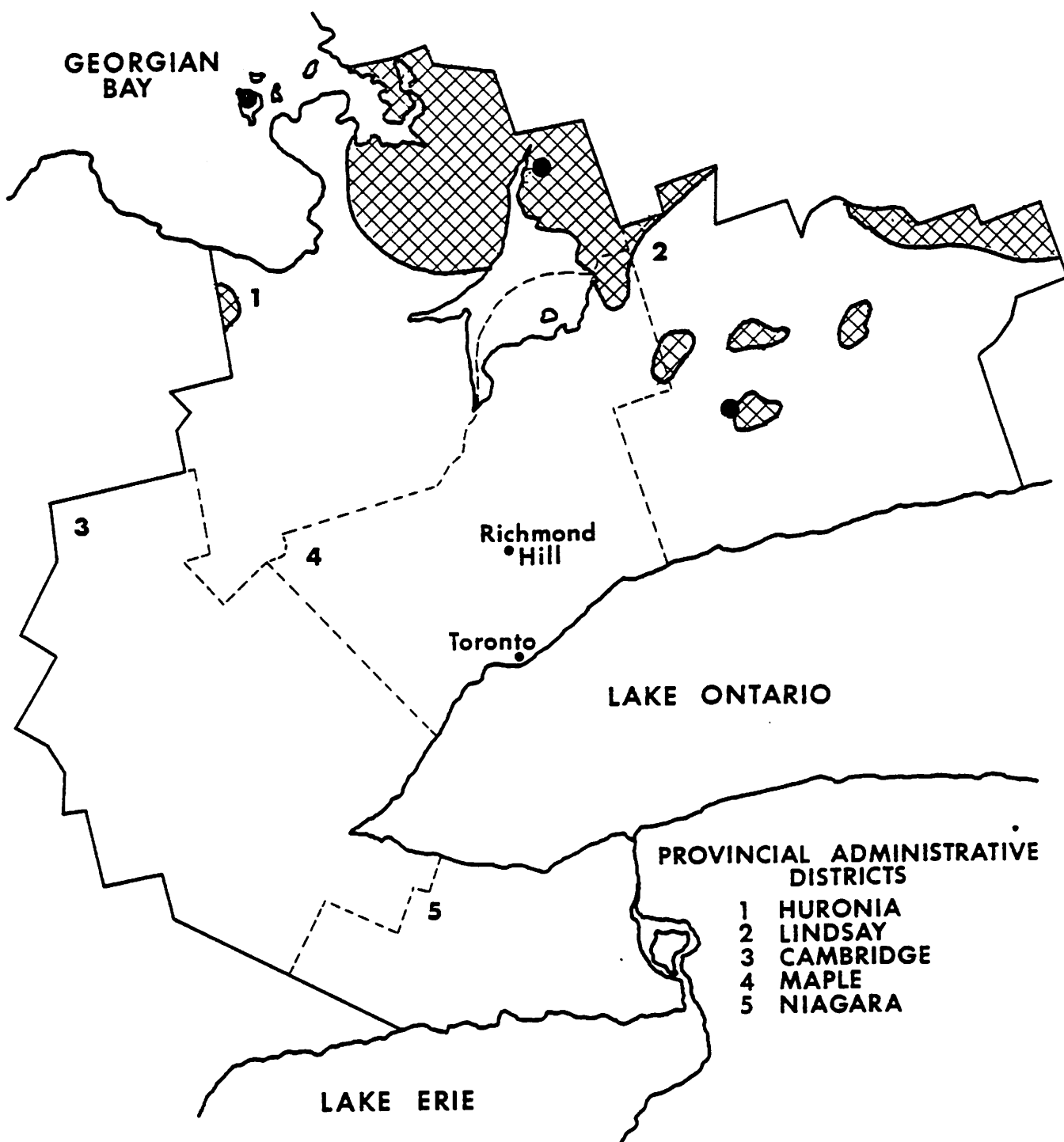




Fig. 1. FOREST TENT CATERPILLAR

Areas within which moderate-to-severe defoliation occurred.

1977 

1978 

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Increased populations of this insect were observed in red pine plantations in the Lindsay and eastern Huronia districts (Table 1). Small localized pockets of light infestation occurred in red pine plantations in Rama, Matchedash and Medonte townships, Huronia District, and in Otonabee Township, Lindsay District. Small numbers of colonies were encountered in the Maple and southern Huronia districts.

Table 1. Summary of redheaded pine sawfly colony counts in two districts in 1978 (100 trees examined at each location).

Location (Twp)	Host	Avg ht of trees (m) ^a	Total no. of colonies
Lindsay District			
Otonabee	rP	2	43
Emily	rP	1.5	13
Belmont	rP	2	29
Huronia District			
Rama	rP	3	17
Medonte	rP	1	5

^a 1 m = 3.28 ft.

White Pine Weevil, *Pissodes strobi* (Peck)

Populations remained generally low in 1978 with two exceptions. In Medonte Township, Huronia District, leader damage was 50% and in Balsam Lake Provincial Park, Lindsay District, leader damage was 54%. Medium infestations were observed in Beverly Township, Cambridge District, and in Whitchurch Township, Maple District. Small numbers of infested leaders were observed commonly throughout the Region.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Although heavy infestations were observed at many locations in the Region, some population declines were evident in 1978.

In the Huronia District, severe defoliation recurred on mature tamarack (*Larix laricina* [Du Roi] K. Koch) in Rama Township and on European larch in Mulmur, Mono, Vespra and Oro townships. Particularly

heavy defoliation occurred in a European larch plantation in C.F.B. Borden. Medium infestations persisted on European larch in Medonte Township and on tamarack in Matchedash Township. In the Cambridge District, populations declined to medium levels in the Luther Marsh in East and West Luther townships and on European larch in Beverly Township. High numbers persisted in Woolwich Township and medium infestations were again observed in East Garafraxa and Maryborough townships.

General declines were observed in the Uxbridge area of the Maple District although isolated pockets of heavy infestation remain. Private plantations in Uxbridge Township, supporting medium infestations, were again treated with the insecticide Malathion, applied by aircraft using boom and nozzle equipment at 4.7 L/ha (1/2 gal/acre) emulsifiable concentrate. Excellent control was obtained.

Medium-to-heavy infestations occurred in a 10-ha (25-acre) European larch plantation in Clarke Township, Lindsay District, while light infestations were common throughout the Region.

Oak Leafmining Sawfly, *Profenusa lucifex* Ross

A slight decline in populations was evident in a 5 000 ha (12,300 acre) infestation south of Rice Lake in Hamilton and Haldimand townships, Lindsay District (Table 2). Small pockets of severe defoliation persisted in Asphodel and Harvey townships, Lindsay District, while light infestations were observed in South Dumfries Township, Cambridge District, Tosorontio Township, Huronia District, and near Niagara-on-the-Lake, Niagara District.

Table 2. Summary of leaves mined by the oak leafmining sawfly at four locations in the Lindsay District in 1977 and 1978 (counts based on examination of 100 leaves, randomly selected from five trees at each location).

Location (Twp)	Host	<u>Percentage of leaves mined</u>	
		1977	1978
Asphodel	wO	93	71
Hamilton	wO	98	87
Haldimand	wO	-	67
Harvey	wO	78	63

Table 3. Other forest insects.

Insect	Host(s)	Remarks
<i>Acrobasis juglandis</i> LeBar. Pecan leaf casebearer	Wa	medium infestations at Balls Falls conservation area, Niagara District, and at several locations in South Dumfries Township, Cambridge District
<i>Andricus petiolicola</i> O.S. Oak petiole gall	wO	medium numbers on scattered trees along the Niagara Parkway in Niagara District
<i>Arge pectoralis</i> (Leach) Birch sawfly	wB	light defoliation of ornamentals at one location in Ops Township, Lindsay District
<i>Bucculatrix ainsliella</i> Murt. Oak skeletonizer	Oak	medium infestation in South Dumfries Township, Cambridge District
<i>Callirhytis punctata</i> (O. & S.) Gouty oak gall wasp	pin O	high populations of oak gall makers along the Chantler Road in the town of Pelham, Niagara District
<i>Cecidomyia foliora</i> R. & H.	rO	heavy infestation leaf folders on plantation trees near Alton, Maple District
<i>Dendroctonus simplex</i> Lec. Eastern larch beetle	tL	very high numbers in recently dead trees in Rama Twp, Huronia District
<i>Dioryctria reniculelloides</i> Mut. & Mun. Spruce coneworm	wS	found commonly in conjunction with the spruce budworm in Lindsay and Huronia districts
<i>Dioryctria zimmermani</i> Grt. Zimmerman pine moth	rP	heavy at C.F.B. Borden, Huronia District
<i>Diprion similis</i> (Htg.) Introduced pine sawfly	wP	medium population in a white pine seed orchard in the Orono Forest Station
<i>Epinotia aceriella</i> Clem. Maple trumpet skeletonizer	sM	high populations at several locations in Essa and Oro twp, Huronia District

(continued)

Table 3. Other forest insects (continued).

Insect	Host(s)	Remarks
<i>Eriophyes tiliae</i> Pgst.	Be	common on trees in the city of Welland, Niagara District
<i>Eucordylea blastovora</i> McLeod Spruce micro moth	wS	commonly found with spruce budworm at a number of sample points in the Lindsay District
<i>Fenusa ulmi</i> Sund. Elm leafminer	slE, wE	high populations in the town of Lincoln, Niagara District, and at one location in Orillia Twp, Huronia District
<i>Heliomata cycladata</i> Grt. Locust looper	blL	heavy at two locations in Oro Twp, Huronia District
<i>Ips pini</i> Say Pine engraver	rP, jP	associated with decadent trees in Erin Twp, Cambridge District and Mulmur Twp, Huronia District
<i>Janus abbreviatus</i> (Say) Willow shoot sawfly	hybrid Po, tA	medium population in hybrid poplar plantation in Innisfil Twp, Huronia District, and on trembling aspen reproduction near the tree seed plant at Angus, Huronia District
<i>Lithocolletis lucetiella</i> Clem. Basswood leafblotch miner	Ba	light infestation east of Victoria Harbour, Huronia District
<i>Malacosoma americanum</i> F. Eastern tent caterpillar	most deciduous species	Populations continued high at many locations in the Region.
<i>Neodiprion nanulus nanulus</i> Schedl Red pine sawfly	rP	light infestation on planted red pine in Belmont Twp, Lindsay District
<i>Neodiprion pratti banksianae</i> Roh. Jack pine sawfly	jP	light infestation at one location in Albion Twp, Maple District

(continued)

Table 3. Other forest insects (continued).

Insect	Host(s)	Remarks
<i>Neodiprion sertifer</i> (Geoff.) European pine sawfly	scP	generally low populations throughout the Central Region
<i>Oligonychus ununguis</i> Jac. Spruce spider mite	blue spruce	heavy on ornamental trees along the Niagara Parkway near Niagara Falls, Niagara District
<i>Phylloxera caryaecaulis</i> Fitch Hickory gall aphid	shHi	high population near Dunnville, Niagara District
<i>Pikonema alaskensis</i> (Roh.) Yellowheaded spruce sawfly	wS	high population in Baxter Twp, Huronia District; light infestations in Mara Twp, Huronia District, and light-to-medium infestations on small numbers of trees at a number of locations in Lindsay District
<i>Pineus strobi</i> (Htg.) Pine bark aphid	wP	medium infestation on semi-mature white pine trees in the Ganoraska-Durham Forest in Clarke Twp, Lindsay District
<i>Pissodes approximatus</i> Hopk. Northern pine weevil	rP	Heavy infestations caused high mortality in a plantation in Essa Twp; somewhat lower damage occurred in Flos and Vespra twp, Huronia District.
<i>Pristiphora geniculata</i> (Htg.) Mountain ash sawfly	Mo	caused varying degrees of defoliation to ornamental mountain ash (<i>Sorbus</i> spp.) throughout the Region
<i>Proteoteras aesculana</i> Riley Maple twig borer	siM	caused severe damage to leaders of trees in transplant compartments in the Orono Forest Station, Lindsay District
<i>Pseudexentera oregonana</i> Wlshm. Aspen leafroller	tA, bPo	medium infestation near Mount Forest, Cambridge District, and in C.F.B. Borden, Huronia District

(continued)

Table 3. Other forest insects (concluded).

Insect	Host(s)	Remarks
<i>Psilocorsis reflexella</i> Clem. An oak leaftier	rO	medium infestation near Farlain Lake in Tiny Twp, Huron District
<i>Pulicalvaria piceaella</i> (Kft.) Combed spruce needleminer	wS	heavy at one location in C.F.B. Borden, Huron District
<i>Pyrrhalta luteola</i> (Mull.) Elm leaf beetle	wE	heavy in Victoria Park in the town of Niagara Falls, Niagara District
<i>Sparganothis sulfureana</i> Clem. Needle tier	rP	light infestation tube makers in Orillia Twp, Huron Dis- trict

TREE DISEASES

Diplodia Blight, *Diplodia pinea* (Desm.) Kickx

Through surveys conducted this disease was detected in 1978 in numerous Scots pine plantations throughout the Region. The most severe damage was in a plantation 10 m (33 ft) in ht in Medonte Township, Huronia District. Current tree mortality at this location was 8.6 percent (Table 4). Heavy infection levels were also present in Uxbridge Township, Maple District, and in Mono Township, Huronia District. Light-to-medium defoliation was observed at a number of other locations in the Region.

The disease is also a damaging pest of Austrian pine (*Pinus nigra* Arnold) and severe damage occurred on ornamentals in the Midhurst Forest Station, in the cities of Paris and Cambridge, and the town of Elora in the Cambridge District and in the city of Niagara Falls.

Table 4. Summary of damage caused to Scots pine by Diplodia blight at four locations in 1978 (150 trees examined at each location).

Location (Twp)	Avg ht of trees (m) ^a	Trees affected (%)	Foliage damage (%)	Current tree mortality (%)
Huronia District				
Medonte	10	100	61.5	8.6
Mono	9	62	10.2	0
Maple District				
Whitchurch	23	50	10.0	0
Uxbridge	9	100	10.0	2

^a 1 m = 3.28 ft

Scleroderris Disease, *Gremmeniella abietina* (Lagerb.) Morelet

The North American race of this disease has been present in Ontario for a number of years and has caused varying degrees of damage to young hard pines in the northern part of the province. Recently the European race, which causes a dieback of pine and affects all ages of trees, has caused extensive mortality to Scots pine and red pine plantations in New York and Vermont states. This race was detected in 1978 in the province of Quebec in an isolated red pine plantation just 2 km (1.25 mi.) north of the New York border. This plantation was immediately put into quarantine and sanitized by destroying all infected material.

Both Canadian and American authorities have imposed quarantines to impede the spread of the disease. In the United States, shipments of material capable of harboring Sclerotinia from affected areas is prohibited. The Canadian quarantine screens the importation of susceptible host materials from all parts of the world where the European race exists. This quarantine reduces the risk of accidental introduction, and, it is hoped, will provide the time needed for research and development of methods for control.

In 1978 extensive surveys were carried out in southern Ontario to determine the status of this race. Approximately 30 plantations were surveyed in the Central Region with a minimum of 500 trees being examined at each location (Fig. 2). Results were negative in all instances.

Leaf Anthracnose of Maple, *Kabatzeila apocynpta* (Ell. & Ev.) Arx

This disease caused discolored, ragged foliage on open grown and hedgerow trees at numerous locations in the Region. Defoliation was heavy in Pickering and Markham townships, Maple District, and in Puslinch, Trafalgar and West Lamborough townships, Cambridge District (Table 5). Medium defoliation was common in the eastern Niagara District while foliar damage declined in Mono Township, Huronia District, where it has been high for several years. A general decline was also evident in most of the Lindsay District.

Horse Chestnut Leaf Blotch, *Phyllosticta parva* Desm.

This foliar disease has been a perennial problem in recent years. Defoliation was much more severe in 1978. Particularly heavy defoliation occurred on ornamentals and open grown trees in the Oakville-Milton-Hamilton area, Cambridge District and at numerous locations in Cayuga and Canbrough townships, Niagara District. Severe foliar damage also occurred on ornamentals in the cities of Guelph, Kitchener and Waterloo in Cambridge District. Generally, foliar damage was medium; however, occasional severely affected trees were noted in the north Toronto area of Maple District and in the Fonthill and Welland areas of Niagara District. Light defoliation was common in the remainder of the Region.

Ash Dieback

This condition was present at higher than normal levels in 1978. Severe top-killing and light tree mortality were observed in several woodlots in Arthur Township, Cambridge District. The fungus *Sphaeropsis* (*Phoma*) Sacc. is one of a group of fungi known to be associated with this condition, and it was isolated from tissue samples from this location. Top-killing and branch mortality were also evident on hedgerow trees and ornamentals in Flos and Medonite townships, Huronia District, and similar conditions prevailed at numerous locations in the Niagara District and in Pickering and Markham townships, Maple District.

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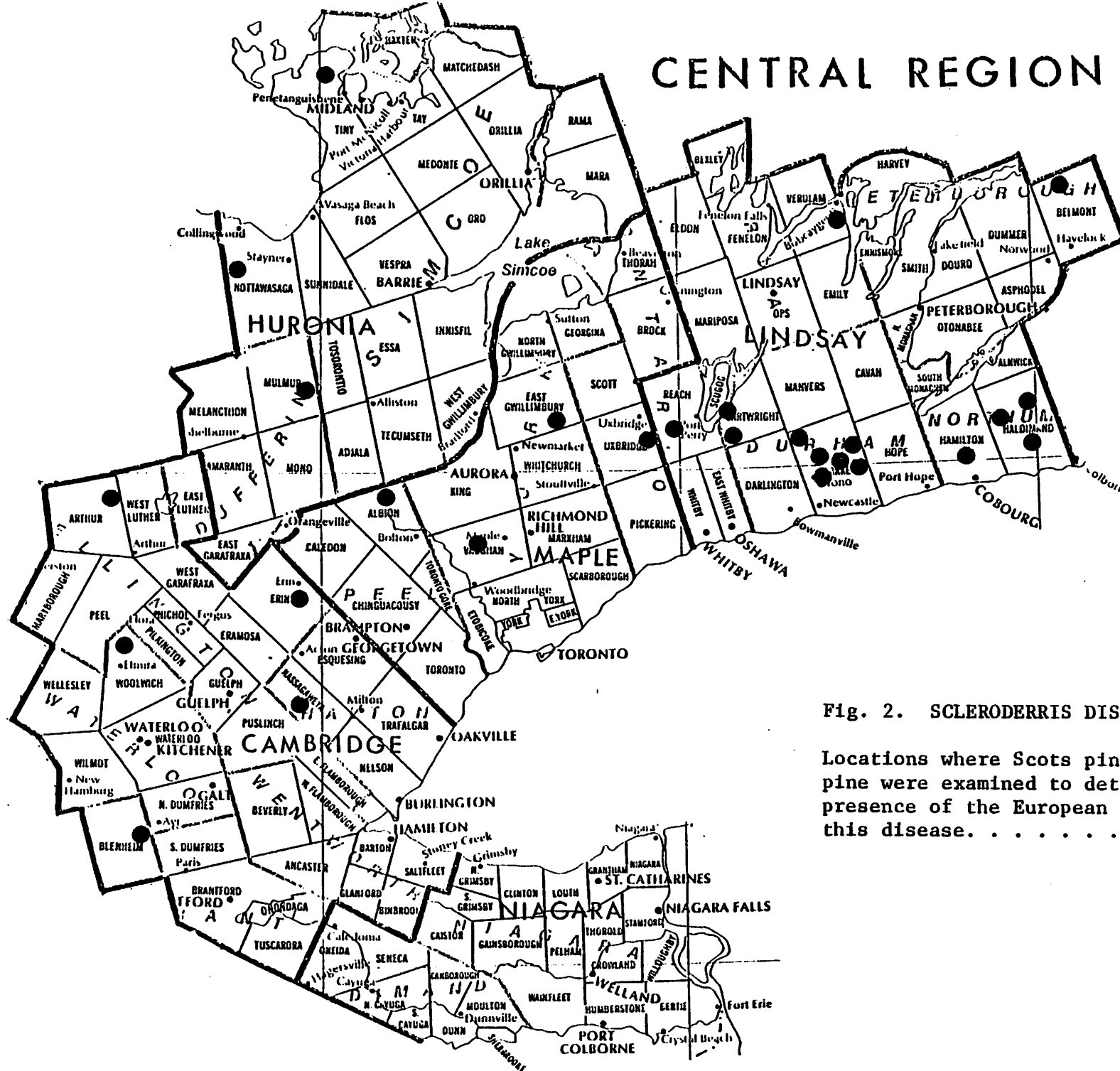


Fig. 2. SCLERODERRIS DISEASE

Locations where Scots pine and red pine were examined to determine the presence of the European race of this disease. ●

Table 5. Summary of damage caused by leaf anthracnose of maple at nine locations in 1978 (150 trees examined at each location).

Location	Avg ht of trees (m) ^a	Trees affected (%)	Foliage damage (%)
Lindsay District			
Dummer Twp	22	82	34
Cavan Twp	18	2	3
Huron District			
Mono Twp	14	40	10
Cambridge District			
West Flamborough Twp	12	85	75
Puslinch Twp	17	30	25
Trafalgar Twp	15	75	90
Maple District			
Pickering Twp	15	80	70
Niagara District			
Lincoln	11	30	33
Town of Pelham	12	13	23

^a 1 m = 3.28 ft

Maple Mortality

Ground and aerial surveys revealed numerous pockets of maple mortality in Orillia, Matchedash, Oro, Tiny and Flos townships, Huronia District. The most severe damage occurred south of Highway 400 in Concessions 5 and 6 of Medonte Township. There, a stand in excess of 400 ha (100 acres) of semimature and mature sugar maple has died. The pattern of damage was similar to that which has occurred in Owen Sound and Parry Sound districts where maple mortality has followed several years of heavy infestation by the forest tent caterpillar, *Malacosoma disstria* Hbn.

Oak Mortality

Aerial surveys detected pockets of red oak mortality in the Huronia District at several locations in northern Tiny Township near Awenda Park, on Giants Tomb Island in Georgian Bay, on Beausoleil Island in Georgian Bay Islands National Park, in the Midhurst Nursery area, in the Minising-Barrie area, and at several locations in Oro Township. Pockets of oak mortality were also observed in the Uxbridge Township area of Maple District. Permanent sample plots to study oak mortality were established in 1977 at Awenda Park, Huronia District, Dufferin Forest, Huronia District, Uxbridge Forest, Maple District, and Clarke Township, Lindsay District, and showed mortality rates ranging from 1 to 8 percent in 1978.

A different type of oak mortality occurs in the Brantford-Paris area of Cambridge District. Symptoms include yellowing and thinning of the foliage, followed by dieback from the top. The process takes one to two years with mortality occurring on single and small clumps of trees rather than in patches.

Snow and Ice Damage

A late winter storm caused pockets of severe damage in a 101-ha (250-acre) mature red pine plantation in the Northumberland County Forest, Lindsay District (see Frontispiece). Less serious ice damage was also observed in two plantations in Woolwich Township, Cambridge District, and at several widely separated locations in Huronia District.

Winter Drying

Winter drying was unusually severe in 1978. In the Huronia District, Scots pine Christmas trees suffered severe damage at several locations in Oro and Tiny townships and red pine plantations in Flos Township. Light mortality occurred at one location south of Elmvale. Severe foliar damage also occurred on Scots pine in Manvers Township and on white pine at Balsam Lake Provincial Park in the Lindsay District. There, 100% of the trees were affected with 92 and 100% of the foliage damaged, respectively. Severe winter drying was also observed on planted white pine south of Paris in the Cambridge District. Light and moderate damage were common throughout the Region.

Table 6. Other forest diseases.

Organism	Host(s)	Remarks
<i>Agrobacterium tumefaciens</i> (E.F. Sm. & Town.) Conn. Crown gall	silver poplar	caused large galls on roots of several ornamentals in the city of Cambridge
<i>Armillaria mellea</i> (Vahl ex Fr.) Kummer Armillaria root rot	rO	associated with oak mortality in permanent sample plots in Huron and Maple districts
<i>Botryosphaeria quercum</i> (Schw.) Sacc. Botryosphaeria canker	rO	associated with branch cankers and chlorotic foliage on ornamentals in the city of Barrie, Huron District
<i>Cenangium acuum</i> Cke. & Pk. Twig blight	aP	caused needle drop at one location in Mulmur Twp, Huron District
<i>Ceratocystis ulmi</i> (Buism.) C. Moreau Dutch elm disease	wE, nE	continues to kill residual elms and small reproduction throughout the Region
<i>Coleosporium asterum</i> (Diet.) Syd. A needle rust on pine	rP	light infections in Harvey, Belmont and Dummer twp, Lindsay District and in Albion Twp, Maple District
<i>Cronartium ribicola</i> J.C. Fisch. White pine blister rust	wP	little change in overall status in the Region, single heavy infection in young plantations near Ariss in the Cambridge District
<i>Cytospora chrysosperma</i> (Pers.) Fr. Cytospora canker	lPo hybrid poplar	very heavy infections in Serpant Mounds Provincial Park, Lindsay District and on orna- mentals in North Dumfries Twp, Cambridge District
<i>Diplodia elaeagni</i> Passer	Russian olive	caused dieback of ornamentals at one location in the town of Angus

(continued)

Table 6. Other forest diseases (continued).

Organism	Host(s)	Remarks
<i>Diplodia mori</i> Westd.	mulberry	caused branch dieback and cankers on ornamentals at the Pinehurst conservation area near Paris, Cambridge District
<i>Dothistroma pini</i> Hulbary Red band disease needle blight	aP	Heavy defoliation caused light mortality in one plantation in Uxbridge Twp, Lindsay District, and in Mulmur Twp, Huronia District.
<i>Fomes annosus</i> (Fr.) Karst. Annosus root rot	jP, mP, scP	little change in distribution in the region; several new pockets of infection located in 1978
<i>Fusarium</i> sp.	wS, rP	medium infection on 2-0 stock in the Orono Forest Station, Lindsay District
<i>Ganoderma applanatum</i> (Pers. ex Wallr.) Pat. Heart rot	Norway M	associated with root and butt rot of ornamentals at one location in Kitchener-Waterloo area, Cambridge District
<i>Glomerella cingulata</i> (Ston.) Spauld. & Schrenk Leaf spot anthracnose	Buckeye	heavy infections on ornamentals along the Niagara Parkway, Niagara District
<i>Libertella faginea</i> Desm. Libertella dieback	Be	fruiting on recently dead trees in the city of Welland, Niagara District
<i>Lophodermium juniperi</i> (Grev.) Darker Needle cast	rJ	fruiting on ornamentals in Victoria Park, Niagara Falls, Niagara District
<i>Melampsora medusae</i> Thuem. Larch needle rust	tL, tA	light defoliation in Flos Twp, Huronia District
<i>Melanconium bicolor</i> Nees Twig blight	wB	caused heavy cankering and branch dieback at the Pinehurst conservation area near Paris, Cambridge District

(continued)

Table 6. Other forest diseases (concluded).

Organism	Host(s)	Remarks
<i>Valsa abietis</i> Fr. Cytospora canker	Eur. L	associated with wilting and branch dieback at one location in Mono Twp, Huronia District
Drought injury	wP, rP wS	caused considerable mortality to plantations on dry sites in Mulmur and Mono twp, Huronia District