

Results of forest insect and disease surveys in the SOUTHWESTERN REGION of Ontario, 1979



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

SURVEY HIGHLIGHTS

Heavy infestations of the spruce budworm persisted throughout several townships on the Bruce Peninsula, Owen Sound District. Aerial surveys revealed extensive mortality of balsam fir on the northern tip and western side of the peninsula from the area of Driftwood Cove, on the north, to Red Bay on the south. Population levels of cedar leaf-miners increased sharply throughout several areas of the Owen Sound and Wingham districts and at other widely scattered locations in the Region. Special surveys were conducted for cutworm damage and red pine plantations were examined for the presence and impact of specific insect and disease problems. Infestations of the white pine weevil, eastern pineshoot borer, larch sawfly, walnut caterpillar and fall webworm increased slightly.

Forest disease surveys throughout the Region concentrated once again on the detection of Scleroderris disease of pine and the decline of oak and maple. Varying degrees of damage caused by Diplodia tip blight were found at widely scattered locations in the Region. As in the past, leaf anthracnose, ash dieback, winter drying and abiotic conditions were of concern to conservation authorities, private individuals and forest managers.

High-value forests or special interest areas in the South-western Region can be grouped into four categories. Pest and disease problems noted in these particular situations are listed as follows:

St. Williams Forest Station - cutworm damage (p. 5), willow shoot sawfly (p. 11), larch sawfly (p. 9), yellow spruce shootworm (p. 12) and Fomes annosus root rot (p. 19).

Point Pelee National Park - walnut lace bug (p. 10), walnut caterpillar (p. 5), fall webworm (p. 7), and hackberry nipple-gall maker (p. 11).

Provincial Parks - orangestriped oakworm (p. 1), palmerworm (p. 6), maple trumpet skeletonizer (p. 11), and Diplodia tip blight (p. 13).

Conservation Authorities - Fomes annosus root rot (p. 19), and northern pine weevil (p. 12).

After four years as a representative of the Forest Insect and Disease Survey Unit in the Southwestern Region of Ontario, D.C. Constable has been transferred to the Northern Region of Ontario.

The valuable cooperation and assistance received from personnel of the Ministry of Natural Resources are gratefully acknowledged.

D. C. Constable

M. J. Applejohn

Frontispiece



Defoliation of red pine caused
by the pine needle midge,
Contarinia baeri (Prell.).
Typical damage also occurs on
Scots pine.

Severe damage to
red pine caused by
limestone chlorosis.



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INSECTS

Orangestriped Oakworm, *Anisota senatoria* J.E. Smith

Once again varying degrees of defoliation occurred on scattered white oak (*Quercus alba* L.) trees at several locations in Aylmer, Simcoe and Chatham districts. In the Aylmer District, light feeding was observed along Highway 14 south of Newbury in Mosa Township and along Highway 9 in Ekfrid Township. Moderate defoliation was also observed on scattered white oak along Highway 59 from the town of Norwich in Norwich Township and north to the village of Curries in East Oxford Township, Simcoe District. Light levels of defoliation again persisted on single, open-growing trees at Rondeau Provincial Park and in Tilbury Township, Chatham District. Farther north in the Wingham and Owen Sound districts this insect was not observed.

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

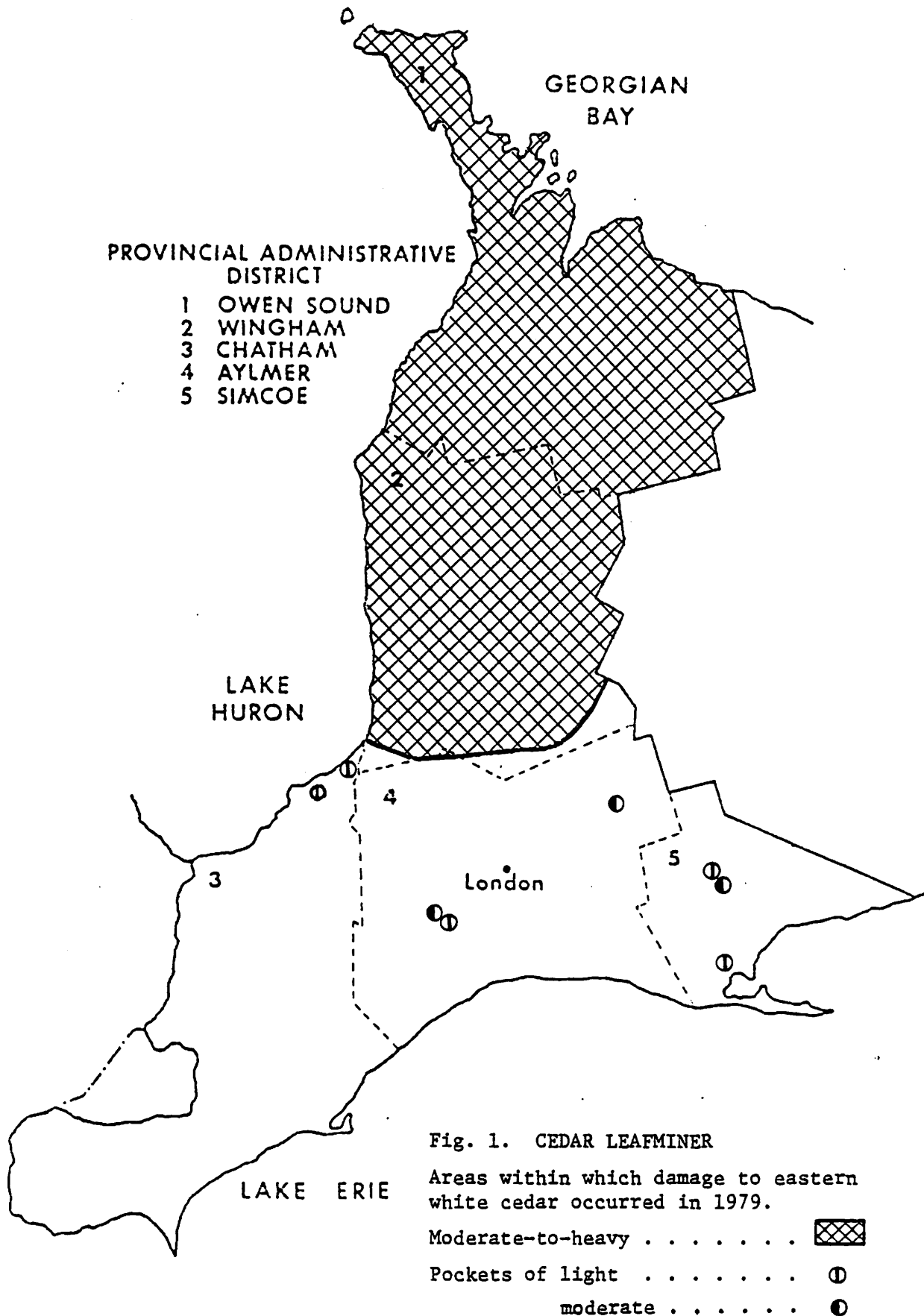
After a decline of approximately four years, population levels of the cedar leafminers have greatly increased at several locations in the Region (Fig. 1). Severe browning of eastern white cedar (*Thuja occidentalis* L.) foliage was prevalent throughout most stands in the Owen Sound District. The most conspicuous damage was observed along the Bruce Peninsula and as a result of repeated attacks mortality has occurred on shoreline trees in the Johnston Harbour area, and at one location in Osprey Township.

In the Wingham District, severe leafmining was observed throughout most of the northern townships. The most noticeable damage was throughout the townships of Ashfield, Wawanosh East, Wawanosh West and especially areas around Goderich, Saltford and Falls Reserve in Colborne Township. Small scattered pockets of heavy infestations were recorded in the Clifford-Harriston areas of Minto Township. South of Goderich, along Highway 21 to the town of Grand Bend, infestation levels varied from light to very heavy wherever the host was present.

In the Aylmer District, heavy damage was observed at several locations in West Oxford Township, and moderate damage to foliage on scattered clumps of trees near the John E. Pearce Provincial Park in Dunwich Township. Pockets of heavy defoliation were observed on eastern white cedar at various points along the Thames River in Lobo Township. Light-to-moderate damage also occurred throughout Caradoc Township. In the Simcoe and Chatham districts, this leafminer was present but damage was generally light.

Although no tree mortality was observed in the above area, some twig and branch mortality has occurred as a result of previous infestations, especially to trees growing in poorer sites. Severe browning

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was evident, and there were many rust-colored cones which will remain on the trees for a period of two or more years.

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-310). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1979, and gives infestation forecasts for the province for 1980.

Larch Casebearer, *Coleophora laricella* Hbn.

Varying degrees of defoliation were observed at scattered locations in the Region. In the Simcoe District, severe defoliation occurred for the third year in a small stand of native larch (*Larix laricina* [Du Roi] K. Koch) at the Waterford conservation area in Townsend Township. Light damage was also observed in scattered stands of native larch and European larch (*Larix decidua* Mill.) throughout South Walsingham and Charlotteville townships.

In the Wingham District, light defoliation was observed near Holyrood in Kinloss Township, at the Sheppardton Tract in Colborne Township and at the Doc Murray Plantation in Downie Township. At the Ellice Swamp in Ellice Township, light-to-moderate damage was recorded.

Farther south in the Aylmer District, mature European larch trees at several locations in Caradoc Township were completely defoliated while light damage occurred at the Public Utility Forests near Sweabury in West Oxford Township.

Although this insect often causes 100% defoliation of larch early in the growing season, the trees produce a new crop of foliage and apparently suffer little, if any, permanent damage.

The Pine Needle Midge, *Contarinia baeri* (Prell.)

The pine needle midge has been recorded in eastern Ontario in Ottawa, Lanark and Brockville districts (Fig. 2) and in adjoining areas of Quebec.

In 1979, this insect was found in a private Christmas tree plantation in Concession 1 Lot 21, Middleton Township, Simcoe District. Approximately 2 ha (5 ac) of Scots pine (*Pinus sylvestris* L.) were severely damaged (see Frontispiece). Most of the defoliation was confined to the upper crown, where many of the leaders and lateral branches were completely defoliated. This rendered the trees unmerchantable, at least in the year of attack by the insect.

PROVINCIAL ADMINISTRATIVE REGIONS AND DISTRICTS

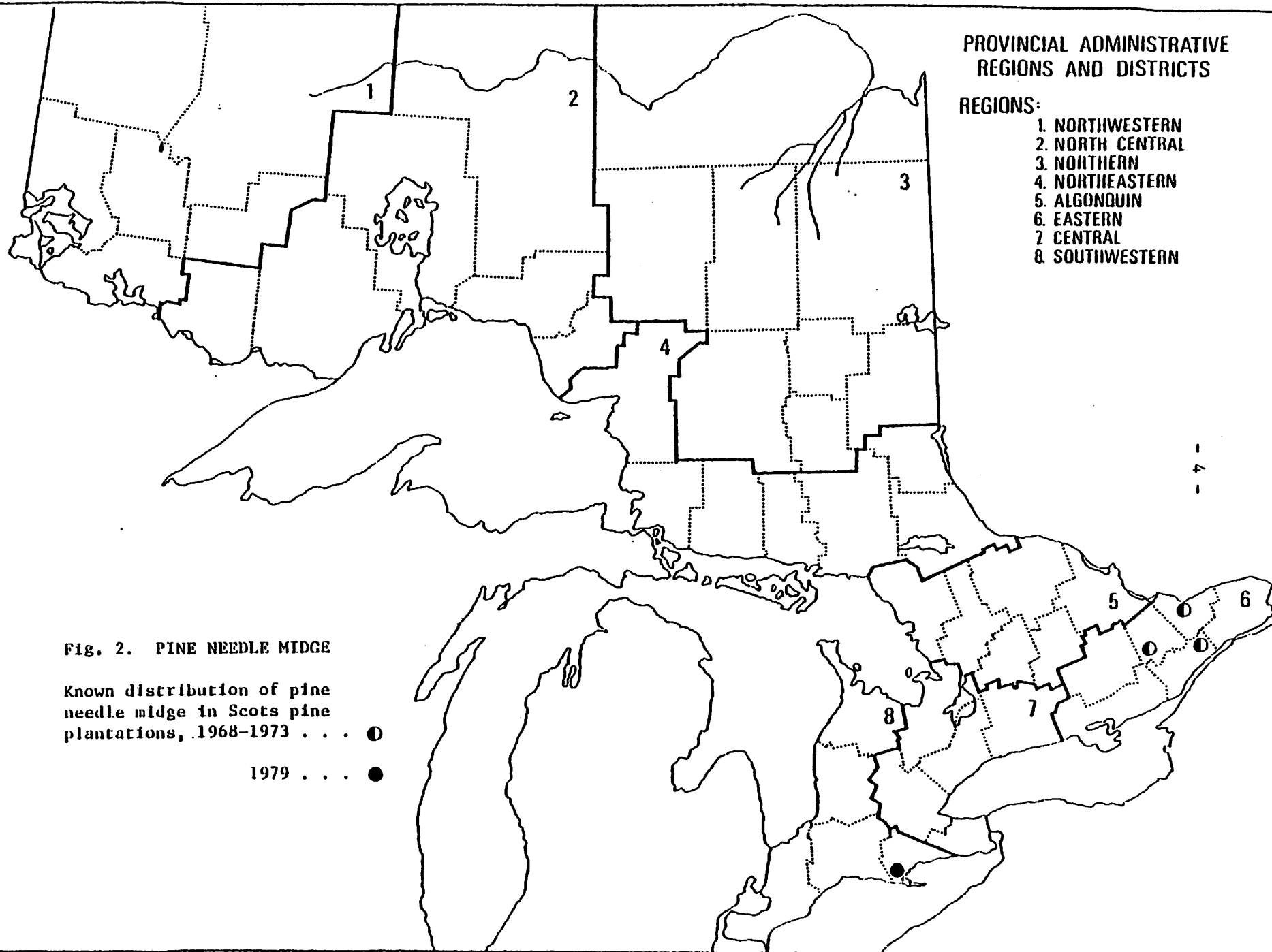
REGIONS:

1. NORTHWESTERN
2. NORTH CENTRAL
3. NORTHERN
4. NORTHEASTERN
5. ALGONQUIN
6. EASTERN
7. CENTRAL
8. SOUTHWESTERN

Fig. 2. PINE NEEDLE MIDGE

Known distribution of pine
needle midge in Scots pine
plantations, 1968-1973 . . . ○

1979 . . . ●



The insect feeds between the needle pairs in early June and completes feeding by early to mid-August. Since most of the foliage on which the larvae feed drops to the ground, the larvae spin cocoons in the duff and pupate during June of the following year.

Surveys will be conducted in 1980 to determine whether the infestation will persist and whether the trees will recover from this condition.

Cutworms on Regeneration

Since cutworm larvae pose a threat to regeneration, special surveys were conducted to determine population levels, number of species and other pertinent data. Three plots, each containing 300 jack pine (*Pinus banksiana* Lamb.) seedlings from the St. Williams Forest Station, were placed out in extensive bare soil and buried level with the soil surface next to natural forest surroundings. These sites were chosen because it is believed that female moths may be attracted to potential oviposition sites by the radiation from open, as opposed to foliated, ground. Observations (including one or two in the evening) were made each week, from late May to the end of June. No cutworms were collected nor was damage noted in the sample areas.

However, cutworm damage was observed in two compartments elsewhere in the nursery. Light damage to silver maple (*Acer saccharinum* L.) seedlings was observed while moderate damage occurred on black locust (*Robinia pseudoacacia* L.) seedlings. Larvae were collected by digging down 3-4 cm into the soil around downed seedlings. Only one species of cutworm was obtained from the compartments sampled. This was the dark-sided cutworm (*Euxoa messoria* Harr.), one of the more destructive members of the cutworm family. Surveys will continue in 1980.

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

Population levels increased throughout most of the Region. Moderate-to-severe defoliation was observed at Point Pelee National Park, Leamington and in the Windsor-Sarnia areas of the Chatham District. In many cases, single and open-growing clumps of black walnut (*Juglans nigra* L.), butternut (*Juglans cinerea* L.) and hickory (*Carya* sp.) were completely stripped of foliage. Light-to-heavy defoliation was observed at many locations throughout the Aylmer District, especially in the Aylmer, St. Thomas and London areas, and once again along Highway 3 to the Chatham border. Varying degrees of defoliation continued throughout most of the Simcoe District and several townships in the southern parts of the Wingham District. This insect was not observed north of Wingham or in the Owen Sound District.

The Palmerworm, *Dichomeris ligulella* Hbn.

This insect was found in two districts of the Region. In the Simcoe District light-to-moderate damage of red oak (*Quercus rubra* L.) and white oak foliage was observed at the Bachus Tract in South Walsingham Township and throughout the Turkey Point area of Charlotteville Township. Small scattered pockets of moderate defoliation were observed north of Simcoe throughout Burford Township. Light defoliation, mainly on red oak, was observed in Pinery and Rondeau provincial parks in the Chatham District.

Eggs are laid on the undersides of leaves in early spring. The larvae feed on and skeletonize the leaves, either in exposed positions or within folded or rolled leaves.

Pupation occurs either in the rolled leaves or in the ground litter. Adults appear during July or August and live until the following spring. Although most important as a pest in apple orchards, this species is capable of severely defoliating oak during outbreaks.

Eastern Pineshoot Borer, *Eucosma gloriola* Heinr.

During the past two years, population levels of this shoot borer have remained low throughout the Region. However, in 1979 it was recorded at several locations (Table 1). Damage was confined mainly to white pine (*Pinus strobus* L.) but on occasion damaged shoots were also observed on Scots pine (*Pinus sylvestris* L.), red pine (*Pinus resinosa* Ait.) and jack pine at trace levels. General surveys indicated that planted white pine is more susceptible to attack than planted red or jack pine.

Birch Leafminer, *Fenusa pusilla* (Lep.)

Population levels remained high at scattered locations in the Region. Defoliation was observed on natural white birch (*Betula papyrifera* Marsh.) and on a wide variety of ornamental birch throughout the work area. Heavy infestations persisted on natural white birch in Osprey Township, Owen Sound District. In the Simcoe District, severe leafmining was observed at the St. Williams Forest Station and on plantings throughout the towns of Simcoe, Port Rowan, Port Dover and in the Waterford area. Varying degrees of defoliation were observed in the London-St. Thomas areas of the Aylmer District and west along Highway 401 to the city of Windsor. In many cases along Highway 401, leafmining caused 100% browning of foliage and resulted in premature leaf drop. Moderate defoliation on young white birch plantings was observed at Point Farms Provincial Park and on many roadside and ornamental plantings throughout the Seaforth, Mitchell and Stratford areas of the Wingham District. Although no tree mortality has been observed some light tip and branch damage has resulted. Since there are usually two or more generations of this leafminer each year, white birch trees are under stress during most of the growing season.

Table 1. Summary of shoot damage by the eastern pineshoot borer in three districts (counts based on examination of 50 to 150 randomly selected trees at each location).

Location (Twp)	Host	Avg ht of trees (m) ^a	No. of trees examined	Trees attacked (%)	Leaders attacked (%)	Total no. of laterals attacked
Aylmer District						
Delaware	wP	2.1	50	11	2	13
McGillivray	wP	2.1	100	13	1	18
West Williams	wP	3.0	100	21	4	29
Yarmouth	rP	3.0	150	1	0	1
West Oxford	rP	1.3	150	0	0	0
Simcoe District						
Woodhouse	wP	4.0	100	39	18	57
Charlotteville	wP	1.5	100	28	13	33
South Norwich	rP	1.0	150	0	0	0
Houghton	rP	2.4	150	0	0	0
Wingham District						
Downie	wP	4.5	100	8	2	13
Turnberry	wP	4.5	100	0	0	0
Colborne	wP	6.0	100	6	2	7

^a 1 m = 3.28 ft

Fall Webworm, *Hyphantria cunea* Dru.

Population levels of this deciduous defoliator increased sharply throughout the Region. It was most abundant in the Chatham District in the Leamington-Wheatley areas, south to Point Pelee and along Highway 18, west to the city of Windsor. In the Aylmer District, this tent-making insect could be found in large numbers throughout the towns of Aylmer and St. Thomas and the city of London. In the Simcoe, Wingham and Owen Sound districts, it was observed along secondary roads more commonly than in the previous year. Defoliation was observed on a wide variety of hosts and as usual prompted numerous inquiries from the general public. Although it is of no great importance as a forest pest since it attacks understory and weed species, it greatly detracts from the aesthetic value of trees.

European Pine Sawfly, *Neodiprion sertifer* (Geoff.)

During the past few years there has been no major change in population levels of this defoliator in the Region. It was found readily but in low numbers (Table 2). Feeding was observed on planted red pine, Scots pine and jack pine at various locations throughout cities and towns.

Table 2. Summary of European pine sawfly colony counts in three districts in 1979 (counts based on examination of 100-150 trees at each location).

Location (Twp)	No. of trees examined	Avg ht of trees (m) ^a	Host	Total no. of colonies	Avg no. of colonies per tree
Wingham District					
Turnberry	100	1.8	rP	26	.26
Simcoe District					
Woodhouse	100	4.6	jP	13	.13
Delhi	100	0.9	scP	303	3.0
South Norwich	150	2.1	rP	0	0.0
Houghton	150	4.6	rP	13	0.09
Woodhouse	150	4.6	rP	0	0.0
Charlotteville	150	13.7	rP	0	0.0
Aylmer District					
West Oxford	150	2.1	rP	3	0.02
Yarmouth	150	0.9	rP	95	0.63

^a 1 m = 3.28 ft

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Populations of this defoliator have significantly declined in the Owen Sound and Wingham districts. A small pocket of moderate-to-heavy defoliation was observed on sugar maple (*Acer saccharum* Marsh.) and trembling aspen (*Populus tremuloides* Michx.) at the Cape Croker Indian Reserve. Light defoliation was observed on the north side of Hope Bay in the vicinity of Jackson Cove along the Bruce Peninsula.

In the Wingham District, single larval colonies were found at one location in Carrick Township, with only trace levels of defoliation. This insect was not found elsewhere in the Region.

White Pine Weevil, *Pissodes strobi* (Peck)

This insect, which has been found in very low numbers in previous years, increased slightly at scattered locations in the Region. The most noticeable damage occurred at two locations in Charlotteville Township (Table 3). Although white pine is most commonly attacked, all pines and spruces may be damaged. As a result of girdling and killing of terminal shoots the weevil seriously affects the form as well as the commercial and aesthetic value of trees.

Table 3. Summary of leader damage by white pine weevil in three districts in 1979 (counts based on the examination of 100 white pine and/or white spruce at each location).

Location (Twp)	Avg ht of trees (m) ^a	Host	Leaders attacked (%)
Simcoe District			
Charlotteville	2.1	wS	16
Charlotteville	.9	wP	2
Charlotteville	9.0	wP	14
Chatham District			
Bosanquet	9.0	wP	3
Wingham District			
Turnberry	4.5	wP	2
Downie	4.5	wP	6
Downie	6.0	wS	9
Colborne	6.0	wP	5

^a 1 m = 3.28 ft

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

High populations were present throughout several areas of the Simcoe District. Small scattered pockets of larch were completely stripped of foliage in South Walsingham, Charlotteville, and Woodhouse townships. In the Aylmer District, small stands of native larch at the Delaware Sportsmen Association site and also at one location in Caradoc Township were 100% defoliated. Farther south in the Chatham District, population levels declined from heavy to light in a small stand of larch 5 km (3 mi) south of Ridgetown, in Howard Township

In the Wingham District, population levels declined from heavy to light at the Robertson Tract in Colborne Township, and at one location in Kinloss Township. Light-to-moderate damage also occurred throughout the Ellice Swamp, in Ellice Township, wherever the host was present. Light-to-moderate defoliation occurred in scattered pockets of larch south of Williamsford to the town of Durham along Highway 6 and in Osprey Township, Owen Sound District.

Larch sawfly larvae eat the needles on older twigs and when infestation levels are heavy the entire tree may be completely stripped of foliage. Larch seldom die as a result of defoliation because they are able to refoliate in the same growing season.

Table 4. Other forest insects.

Insect	Host(s)	Remarks
<i>Adelges lariciatus</i> (Patch) Spruce gall aphid	wS	moderate levels of twig-galls, Artemesia Twp, Owen Sound District
<i>Agrilus anxius</i> Gory Bronze birch borer	wB	causing light mortality to understory trees, Charlotteville Twp, Simcoe District
<i>Antispila nyssaefoliella</i> Clem. Tupelo leafminer	black gum	severe leafmining to a small clump of trees, Turkey Point, Simcoe District
<i>Archips cerasivoranus</i> Fitch Cherry-uglynest caterpillar	chC	light-to-moderate population levels throughout the Region
<i>Cenopsis pettitana</i> Rob. Basswood leafroller	Ba	low populations of leaf-rollers, Sydenham Twp, Owen Sound District
<i>Coleophora innotabilis</i> Braun. Aspen casebearer	bPo	heavy infestation of case-bearers causing 100% defoliation, Artemesia Twp, Owen Sound District
<i>Corythucha juglandis</i> Fitch Walnut lace bug	Ba	moderate-to-severe browning of foliage throughout Charlotteville and South Walsingham twp, and Point Pelee National Park, Chatham District

(continued)

Table 4. Other forest insects (continued).

Insect	Host(s)	Remarks
<i>Diprion hercyniae</i> (Htg.) European pine sawfly	nS	trace populations obtained in beating tray samples, London Twp, Aylmer District
<i>Epinotia aceriella</i> Clem. Maple trumpet skeletonizer	sM	moderate damage persists in John E. Pearce Provincial Park, Dunwich Twp, Aylmer District
<i>Erannis tiliaria</i> Harris Linden looper	deciduous	trace levels throughout the Region
<i>Fenusa dohrnii</i> Tischb. European alder leafminer	A	scattered pockets of moderate-to-heavy leaf-mining, Middleton, Charlotteville and South Walsingham twp, Simcoe District
<i>Homadaula anisocentra</i> Meyrick (= <i>albizziae</i> Clark) The Mimosa webworm	Hon L	severe defoliation of ornamentals in the town of Harrow, Chatham District
<i>Janus abbreviatus</i> (Say) Willow shoot sawfly	cPo	causing severe damage to new shoots, St. Williams Forest Station, South Walsingham Twp, Simcoe District
<i>Neodiprion abietis</i> complex Balsam fir sawfly	bF	light defoliation at scattered locations, Holland Twp, Owen Sound District
<i>Nymphalis antiopa</i> L. Mourningcloak butterfly	deciduous	commonly found throughout Region on a wide variety of hosts
<i>Pachypsylla celtidismamma</i> Fletcher Hackberry nipple-gall maker	Ha	moderate-to-severe damage to foliage throughout Point Pelee National Park, Chatham District

(continued)

Table 4. Other forest insects (concluded).

Insect	Host(s)	Remarks
<i>Pissodes approximatus</i> Hopk. Northern pine weevil	rP	killing young trees, Haldimand-Norfolk Conserva- tion Forest, Woodhouse Twp, Simcoe District
<i>Pristiphora geniculata</i> (Htg.) Mountain ash sawfly	Mo	varying degrees of defolia- tion at several locations in the Region
<i>Pulicalvaria piceaella</i> Kft. Combed spruce needleminer	WS	moderate damage on scattered trees, Ausable-Bayfield conservation area, Hay Twp, Wingham District
<i>Rhyacionia adana</i> Heinr. Pine tip moth	scP	light-to-moderate damage in a private plantation, Middleton Twp, Simcoe District
<i>Tetralopha asperatella</i> Clem. Maple webworm	sM	light damage to foliage in West Zorro and Dunwich twp, Aylmer District; moderate damage in Townsend Twp, Simcoe District and Culross Twp, Wingham District
<i>Vasates quadripes</i> Shim. Maple bladdergall mite	siM	heavy on scattered trees at the Bachus Tract, South Walsingham Twp, Simcoe District
<i>Zeiraphera canadensis</i> Mut. & Free. Yellow spruce shootworm	WS	moderate-to-heavy defoliation of new shoots on shelterbelt trees, St. Williams Forest Station, Simcoe District

TREE DISEASES

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

The fungus *Diplodia pinea* (Desm.) Kickx was found in three districts of the Region (Fig. 3). Small clumps and single trees have been affected at several widely scattered locations, and there has been much flagging and branch mortality. For the second consecutive year, branch mortality was observed on scattered plantings of Austrian pine (*Pinus nigra* Arnold) and Scots pine at the Holiday Provincial Park, Chatham District. As a result of repeated infections, single-tree mortality has occurred. Moderate-to-heavy damage still persists at the old Turkey Point arboretum with Austrian, red and Ponderosa pine (*P. ponderosa* Laws.) being affected. This disease organism has not been observed in the Wingham or Owen Sound districts.

The most common symptom of this disease is stunting and subsequent browning of current-year shoots in May and June. Fully developed shoots can also be killed. Pockets of infected trees are typical in windbreaks. In more severe cases, pitchy cankers may form under the bark of twigs or the main stem, causing individual branches or the entire tree to turn brown and die. Small black fungus fruiting bodies may be found on branches, stems, needles and cones.

Sycamore Anthracnose, *Discula platani* (Pk.) Sacc.

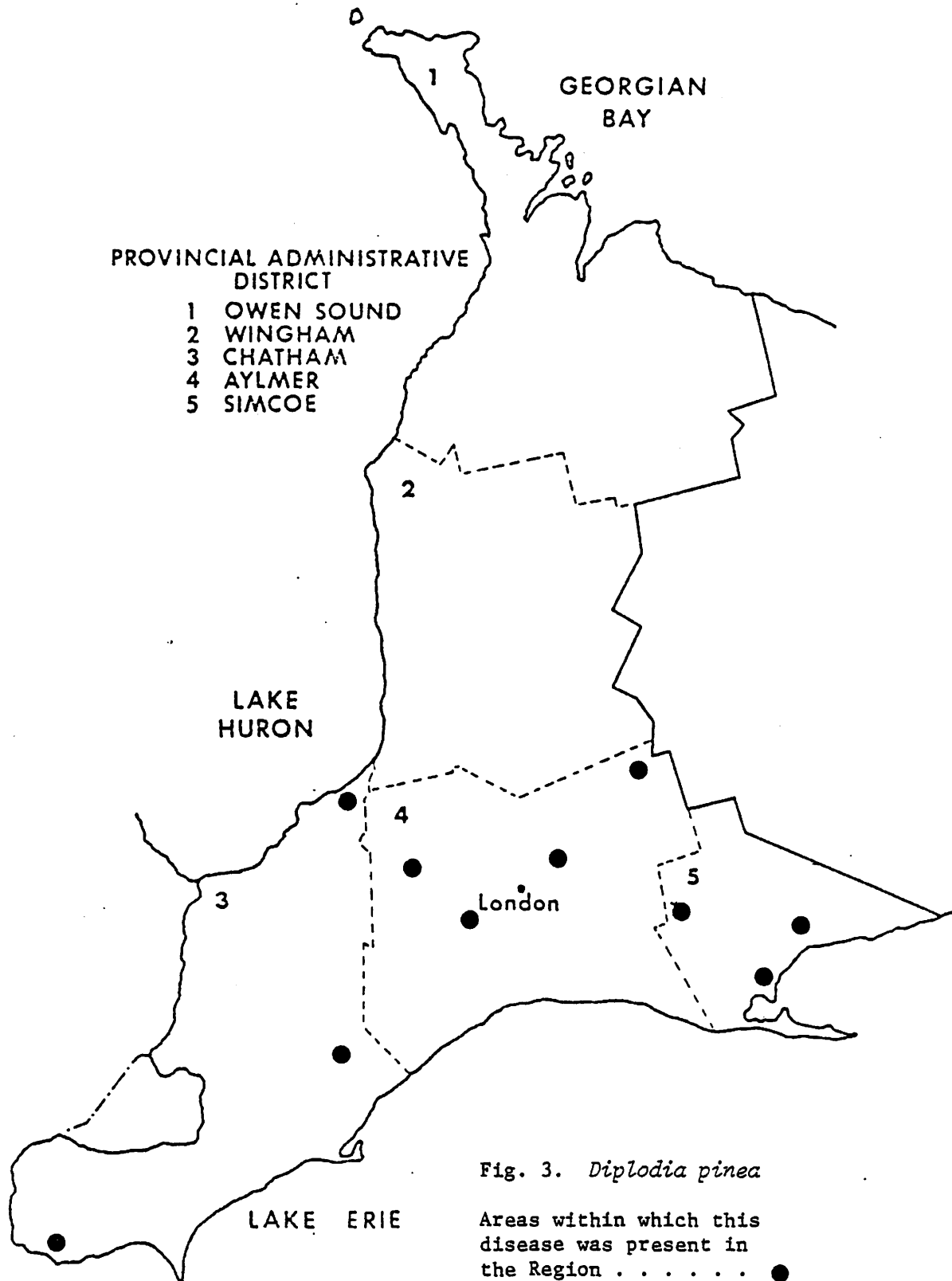
This disease was present at high levels on scattered, open-growing, ornamental sycamores (*Platanus occidentalis* L.) at widely scattered locations. Throughout the towns of Simcoe, Tillsonburg and Delhi, Simcoe District, damage to foliage was severe and in several cases affected trees had all their foliage killed. In the Aylmer District, small scattered pockets of trees growing along the Thames River, near the town of Kilworth, were severely defoliated. Foliar damage was high on many trees in the Chatham and Windsor areas and along Highway 3 in the area from Kingsville to Harrow, Chatham District.

Although no tree mortality has resulted, some light branch mortality has occurred as a result of cankers caused by the disease. Refoliation occurred later on in the summer but leaves were generally fewer in number and smaller in size.

Dothistroma Needle Blight of Pine, *Dothistroma pini* Hulb.

Dothistroma needle blight caused by the fungus *Dothistroma pini* Hulb. is capable of causing serious damage to all species of pine. Losses in Christmas tree plantings can be especially severe, since the trees can be rendered unmerchantable by this disease in a single season.

SOUTHWESTERN REGION



Infection occurs in the fall. The needles turn yellow and the ends become chlorotic and drop prematurely. Second-year needles are cast the same year that infection occurs, while current needles are cast during the following spring or early summer.

Needle blight was found at one location in the Region. In Glenelg Township, Owen Sound District, 96% of the trees were affected and approximately 35% of the foliage died in a plantation of Austrian pine approximately 6 ha (15 ac) in size with heights and diameters averaging 7.0 m (22 ft) and 13.0 cm (5 in.), respectively.

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

The European race of this disease is reported to have caused severe mortality in more than 20 000 ha (50,000 ac) of red and Scots pine plantations in 12 New York counties. It has also occurred in the states of Vermont and New Hampshire as well as the provinces of Quebec, New Brunswick and Newfoundland.

In 1978, an extensive survey was carried out in the Southwestern Region. Seventeen pine plantations (red and Scots) were examined and a total of 500 trees at each site were inspected. In 1979 surveys continued for detection of this disease. Thirteen of the seventeen plantations were examined at widely scattered points in the Region. No disease symptoms have been found to date as part of this survey or during general detection work in the Region.

Leaf Anthracnose of Maple, *Kabatella apocrypta* (Ell. & Ev.) Arx

This disease, characterized by discolored and ragged foliage, was again prevalent throughout the Region in varying degrees (Table 5). Disease symptoms usually appear in mid-May. Infection can occur throughout the growing season. Anthracnose usually causes the leaves to curl, dry out, and fall prematurely. As in the past, trees growing along highways and throughout cities and towns were more seriously damaged than those growing in open fields or in woodlots. Although little damage has resulted, this foliar disease has prompted numerous inquiries from the general public as to preventive control measures.

Horse Chestnut Leaf Blotch, *Phyllosticta paviae* Desm.

This foliar disease has been a problem in recent years. Defoliation, however, was light throughout the Region in 1979. Foliar damage was very light in the Chatham and Aylmer districts compared to the previous year when heavy damage occurred in patches of trees. Farther north in the Wingham and Owen Sound districts foliar damage occurred at only trace-to-light levels.

Table 5. Summary of damage caused by leaf anthracnose of sugar maple at eight locations in 1979 (150 trees examined at each location).

Location (Twp)	Avg ht of trees (m) ^a	Foliage damaged (%)
Aylmer District		
Yarmouth	18	23.0
East Oxford	16	25.3
Dereham	16	15.0
Simcoe District		
Woodhouse	16	6.7
Woodhouse	15	11.0
Wingham District		
Downie	16	10.6
Turnberry	17	65.0
Chatham District		
Sarnia	9	35.0

^a 1 m = 3.28 ft

Abiotic Conditions

In early spring, a problem which had occurred in 1977 on beech (*Fagus grandifolia* Ehrh.) was evident again at scattered locations in the Region. Foliage was sparse and appeared smaller than usual. The condition was possibly a result of near-drought conditions that occurred in 1978. The problem was observed in Aylmer, Simcoe and Chatham districts.

Numerous inquiries were received from the general public concerning the deterioration of maple and ash. Most of the trees affected were ornamentals, roadside and open-growing trees in fields and pastures. In many cases, no insect or disease organisms were found. However, general observations indicated that conditions such as soil compaction, mechanical injury, spraying of herbicides along rights-of-way, fumes and salt may have been major factors involved in the deterioration. Similarly affected trees were not observed in undisturbed woodlots.

Ash Dieback

This condition, characterized by dead crowns, lateral branch mortality, and light tree mortality was present at higher than normal levels on most species of ash throughout the Region in 1979. The problem was most noticeable in the Wingham and Owen Sound districts, where many roadside and ornamental plantings were affected. Although the actual cause of this condition is undetermined, near-drought conditions in the summer of 1978 could have been a contributing factor to the deterioration of ash. General observations also indicate that some damage was due to fumes and salt, especially along major highways and throughout cities and towns.

Samples of damaged tissue, cultured in the laboratory, contained no primary pathogens. Secondary organisms isolated included *Cytospora* sp., *Discula aridum* (Ellis & Holw.) Arx and *Discula quercina* (West.) Arx.

Limestone Chlorosis

Approximately 4 ha (11 ac) of mature red pine trees died, probably as a response to calcareous soil. Affected areas were the Robertson Tract in Colborne Township, and a small pocket of trees in the King Tract in Culross Township, Wingham District (see Frontispiece). At the Robertson Tract, established in 1936, the trees are between 15 and 20 cm in diameter (5.9-7.8 in.). Trees are dying in groups and decline is spreading throughout the stand. Branch and foliage samples submitted to the laboratory for analysis revealed that no disease organisms were present from dying tissue. However, the fungus *Armillaria mellea* (Vahl ex Fr.) Kummer, commonly known as Armillaria root rot, was present at the root collar on several dead trees. Armillaria root rot is generally considered a secondary disease organism. The pH readings for soil samples taken at the King and Robertson tracts were 7.5 and 7.6, respectively--typical of calcareous soils that are poor red pine sites.

Since damage was more noticeable at the Robertson Tract, a disease assessment was performed. Twenty-eight percent of the trees were dead, 31% had severe crown mortality (> 25% dead), 17% had some branch mortality and 24% had only foliar symptoms of decline.

Oak Deterioration

In 1977, three oak plots were established in the Region so that the problem of oak decline could be studied. Stand history with respect to insect and disease damage, weather, heights and diameters was recorded. The trees were rated and placed in dieback classes. Data (Table 6) indicate that considerable decline has occurred in the two plots of Lake Simcoe District, but a fairly stable status is indicated for the plot in the Chatham District.

Table 6. Summary of oak deterioration at three locations in the Region.

Location (Twp)	Avg ht (m) ^a	Avg DBH (cm) ^b	Dieback class															
			1977					1978					1979					
			1	2	3	4	5	1	2	3	4	5	0	1	2	3	4	5
Simcoe District																		
Charlotteville	17	32	70	8	12	10	0	69	9	12	10	0	14	44	14	19	18	1
South Walsingham	17	22	42	35	18	5	0	40	33	19	4	4	0	36	38	16	3	6
Chatham District																		
Bosanquet	11	29	69	7	17	7	0	69	7	17	7	0	0	68	11	16	5	0

^a 1 m = 3.28 ft

^b 1 cm = 0.39 in.

Note: Oak decline is principally branch mortality. For most purposes trees in dieback class 0 are considered healthy. Class 1 = 6-20%, class 2 = 21-40%, class 3 = 41-60%, class 4 = 61+ and class 5 = dead.

Salt Damage

This problem was present throughout the Region, but the over-all damage was generally light. As in the past, damage was observed on both coniferous and deciduous hosts along major highways and throughout cities and towns where salt was more frequently applied.

Table 7. Other forest diseases.

Organism	Host(s)	
<i>Armillaria mellea</i> (Vahl ex Fr.) Kummer Armillaria root rot	deciduous coniferous	light tree mortality observed at widely scattered locations throughout Region
<i>Coleosporium asterum</i> (Diet.) Syd. A needle rust on pine	rP	trace-to-light infections throughout Region
<i>Discula quercina</i> (West.) Arx Anthracnose of oak	rO	heavy infections on natural regeneration West 1/4 Line Road, South Walsingham Twp, Simcoe District
<i>Dothiorella</i> sp. Stem disease	rO	causing top killing of main stem on several sapling- sized trees, Turkey Point, Simcoe District
<i>Endocronartium harknessii</i> (J.P. Moore) Y. Hiratsuka Globose gall rust	scP	moderate-to-heavy damage throughout plantings at Turkey Point, Charlotteville Twp, Simcoe District
<i>Fomes annosus</i> (Fr.) Karst. Fomes annosus root rot	rP, wP, wS, rJ	heavy infection centres throughout South Walsingham and Charlotteville twp, Simcoe District
<i>Gloeosporium aridum</i> Ell. & Holw. Anthracnose of ash	A	moderate infections causing premature defoliation, Hwy. #4, London Twp, Aylmer District

(continued)

Table 7. Other forest diseases (concluded).

Organism	Host(s)	Remarks
<i>Gloeosporium catalpae</i> E. & E. Leaf anthracnose fungus	catalpa	varying degrees of defoliation at scattered points in the Region
<i>Gymnosporangium globosum</i> Farl. Leaf and twig gall rust	Haw	light levels of infection throughout Point Farms Provincial Park, Colborne Twp, Wingham District and at trace levels elsewhere in the Region
<i>Lophodermium pinastri</i> (Schrader ex Hook) Chev. Needle cast of pines	rP	moderate infections on lower branches of mature trees, Turkey Point, Charlotteville Twp, Simcoe District
<i>Marssonina brunnea</i> (Ell. & Ev.) Magn. A leaf spot	tA	moderate damage observed on scattered trees, Colborne Twp, Wingham District, and in Concession II, Caradoc Twp, Aylmer District, causing premature defoliation at both locations
<i>Melampsora abietis-canadensis</i> Ludw. ex Arth. A cone rust	eH	light infection on new cone crop, Concession VII, North Norwich Twp, Simcoe District
<i>Melasmia acerina</i> Lev. Tar spots of maple	sM	moderate damage to foliage on young growth, Lambeth Nursery, Delaware Twp, Aylmer District
<i>Verticillium albo-atrum</i> Reinke & Berth. Verticillium wilt	catalpa	severe infection on scattered ornamentals, Hwy. #2, Caradoc Twp, Aylmer District