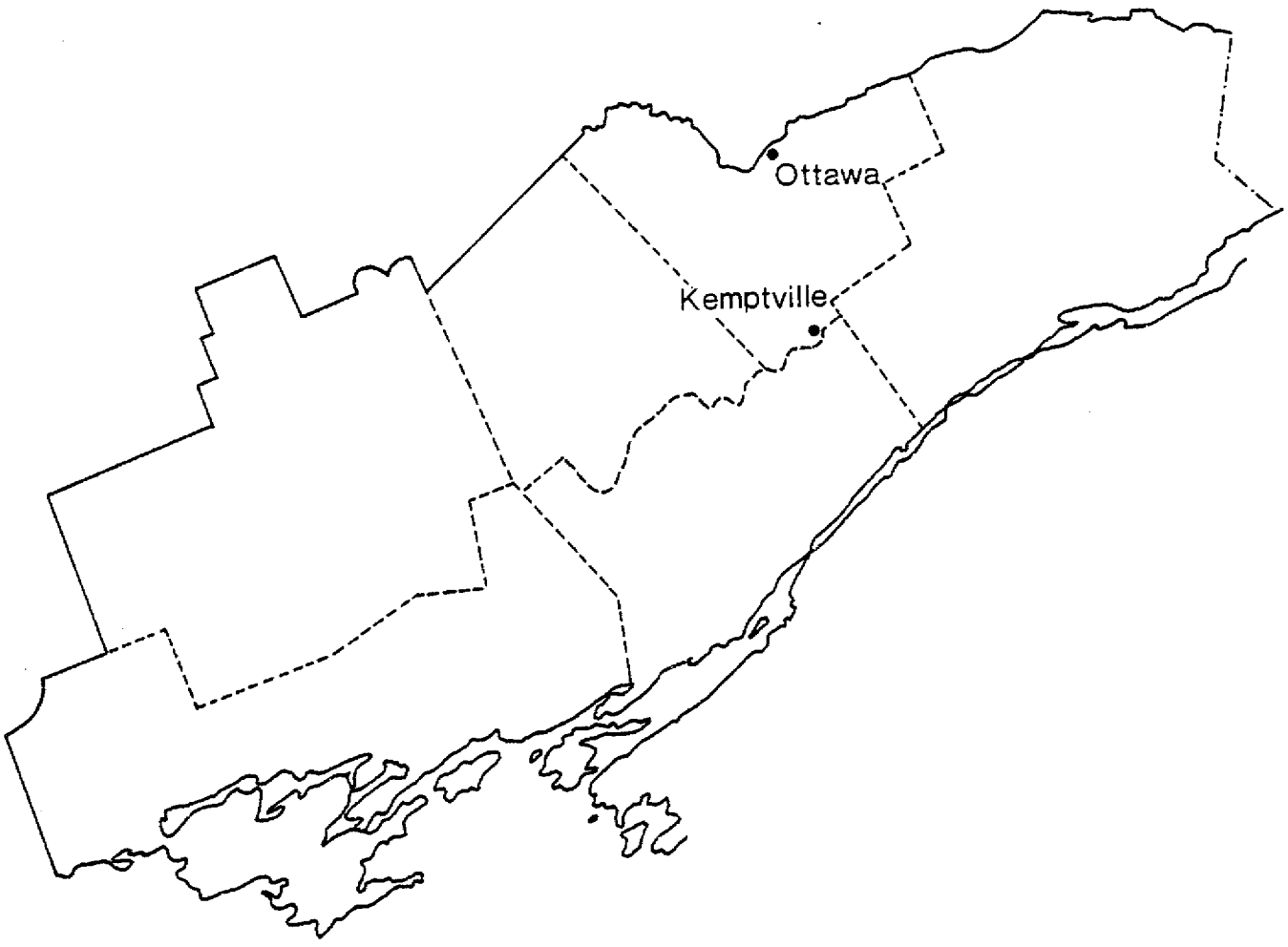
Results of forest insect and disease surveys in the EASTERN REGION of Ontario, 1978



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

SURVEY HIGHLIGHTS

The following information covers the more important insect and disease conditions in the Eastern Region in 1978.

As forecast, populations of the forest tent caterpillar dropped to low levels and only small, widely scattered pockets of moderate-to-heavy infestation remain. Pockets of heavy infestation of spruce budworm recurred and balsam fir mortality increased in the north end of the Tweed District. Infestations of the oak twig pruner, European pine sawfly, jack pine sawfly, larch sawfly, eastern tent caterpillar, pine false webworm and a sawfly on black locust were higher and foliage damage was common. Population declines were noted in oak leaf shredder and birch leafminers.

The pathology program placed special emphasis on Gremmeniella dieback of pine and on oak and maple deterioration. Diplodia tip blight caused moderate damage to red and Scots pine branches at widely scattered locations. Red pine mortality was common in the Lanark County forest and near Finch. Hybrid poplar plantations and the provincial nursery at Kemptville were inspected and with the exception of Cytospora canker on poplar and cabbageheading on hardwoods, little other damage was noted.

A total of 56 samples from the Eastern Region were submitted to the Forest Insect and Disease Survey by personnel of the Ontario Ministry of Natural Resources for identification. Most of these samples were of importance to the forest industry.

C. A. Barnes

Frontispiece. Severe damage of hybrid poplar trees by the canker, *Cytospora chrysosperma* (Pers.) Fr.

(continued)

Page

TREE DISEASES DESCRIBED (concluded)

INSECTS

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

Surveys in 1978 revealed the presence of two new areas of infestation in red pine (*Pinus resinosa* Ait.) plantations near the village of North Augusta, Brockville District and near Dwyer Hill in Ottawa District. These infestations will be monitored closely and spray operations will be carried out if warranted. Elsewhere, populations were lower in the infestations that have persisted for the past three years in Goulbourn and Marlborough townships, where red and jack pine (*Pinus banksiana* Lamb.) trees have been severely defoliated. This reduction in numbers may be due in part to the spray operations carried out in these plantations in 1977. In untreated plantations populations are expected to increase in 1979. The insect was commonly observed at other locations in the eastern part of the Region, but generally at low levels.

Fall Cankerworm, *Alsophila pometaria* (Harr.)

After two successive years of severe defoliation of red oak (*Quercus rubra* L.), white elm (*Ulmus americana* L.), and sugar maple (*Acer saccharum* Marsh.) trees at many locations in the Ottawa and Lanark districts, infestations virtually collapsed in 1978. Scattered pockets of light infestation persist and defoliation was in most instances less than five percent. Occasional larvae were observed east of Arnprior, along Highway 17, and south of Almonte, along Highway 29.

Cedar Leafminers, *Argyresthia freyella* Wlshm., *A. thuiella* Pack., *Pulicalvaria thujaella* (Kft.)

After two years of trace-to-light infestations, a resurgence in population levels occurred in 1978. Light-to-moderate infestations were noted at several points in the Napanee and Brockville districts, where hedgerow white cedar (*Thuja occidentalis* L.) and open growing red cedar (*Juniperus virginiana* L.) showed the characteristic reddening of foliage. In the eastern part of the Region, damage was confined to windbreaks in the Kemptville nursery and at scattered locations in the Cornwall and Ottawa districts. A decline in populations was mentioned in Survey Highlights.

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 Howse et al. (Report O-X-300). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1978 and gives infestation forecasts for the province for 1979.

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

For many years this defoliator of red oak has caused considerable damage to red oak trees at widely separated locations in the Region. In 1977 populations declined and only scattered pockets of infestation were noted in Lanark and Ottawa districts. In 1978 a further decline occurred and infestations dropped to low levels. Small pockets of light defoliation occurred near Ottawa and Tower Hill in Lavant Township, Lanark District. Occasional larvae were observed near White Lake in Tweed District.

Oak Twig Pruner, *Elaphidionoides parallelus* (Newm.)

Increases in population levels of the oak twig pruner occurred in the Brockville, Napanee, Lanark and Ottawa districts in 1978. Heavy infestations in the Mallorytown/St. Lawrence National Park area caused severe twig and branchlet loss. Other noteworthy infestations were observed on hedgerow red oak trees at numerous locations on Wolfe Island, along highways and in fields near Kingston and Gananoque. Moderate-to-heavy infestations were common in Drummond, Lanark and Montague townships and near Perth and Smiths Falls in the Lanark District. Damage was also noted near Ottawa and Cornwall; however, damage was less spectacular than in the other infestations.

The fallen twigs and branches beneath infested trees aroused considerable concern and resulted in several requests for control.

Birch Leafminer, *Fenusa pusilla* (Lep.)

The heavy infestations that have persisted for many years in the Cornwall-Cherry Hill area declined to a low level in 1978. Only light foliage damage was observed. Elsewhere infestations were spotty and defoliation was negligible.

Fall Webworm, *Hyphantria cunea* Dru.

Populations of this webspinning insect declined throughout the Region in 1978. Several nests were observed on ornamentals, particularly in the cities of Ottawa and Kingston, but only occasional nests were observed elsewhere. Favored hosts were black ash (*Fraxinus nigra* Marsh.) and white elm.

Eastern Tent Caterpillar, *Malacosoma americanum* F.

For the fourth consecutive year heavy infestations occurred throughout the Eastern Region. Tents of this insect were common on roadside pin cherry (*Prunus pensylvanica* L.f.), choke cherry (*Prunus virginiana* L.) and

Canada plum (*Prunus nigra* Ait.) at most locations in the six districts. Migrating larvae caused some damage to adjacent trees and shrubs at several locations. The occurrence of larval mortality caused by a viral infection in the Lanark, Tweed and Ottawa districts, coupled with the reduced number of adult moths (compared with 1977) captured in a light trap in 1978 suggests that populations may decline in 1979.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

The heavy infestation that has persisted for the past four years in the Eastern Region, eventually covering an area of approximately 3 000 km^2 (1200 $mi.^2$), declined to small pockets of moderate-to-heavy defoliation at widely scattered locations in 1978 (Fig. 1). The most significant infestation occurred near the village of Hallville in the Cornwall District, where 15 ha (40 acres) of trembling aspen (*Populus tremuloides* Michx.) were severely defoliated. Other scattered pockets of infestation were noted from Hallville westerly to the village of Kaladar in the Tweed District, with moderate-to-heavy defoliation occurring near Sharbot Lake. A further reduction is expected in 1979, as egg-band counts were much lower than anticipated, particularly in the Hallville infestation (Table 1). A further indication of declining populations is reflected in higher cocoon mortality. In many instances successful emergence was 11% or less (Table 2). With the possible exception of the infestation near Hallville in Cornwall District and in a small pocket of poplar near Sharbot Lake in Tweed District, no other infestations are expected in 1979.

A Sawfly, *Nematus* sp.

A heavy infestation of this little known sawfly occurred in a 4-ha (10-acre) black-locust (*Robinia pseudoacacia* L.) plantation located in Camden East Township in Napanee District (see photograph). Total defoliation occurred and the infested trees did not develop new foliage during the growing season. Adjacent to the infested plantation, light defoliation was noted. If infestations recur in 1979, it is anticipated that spray operations will be carried out by personnel of the Ontario Ministry of Natural Resources (OMNR).

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Several red pine plantations were heavily infested by this sawfly in 1978. Severe defoliation occurred in plantations located in Dalhousie Township, Lanark District, where several rows of peripheral trees have died (see photograph). Scattered heavy infestations were common at many points in the Tweed District, particularly in Oso and Olden townships where several years of severe defoliation have caused mortality to smaller trees. A relatively new infestation north of Highway 7 near Sharbot Lake

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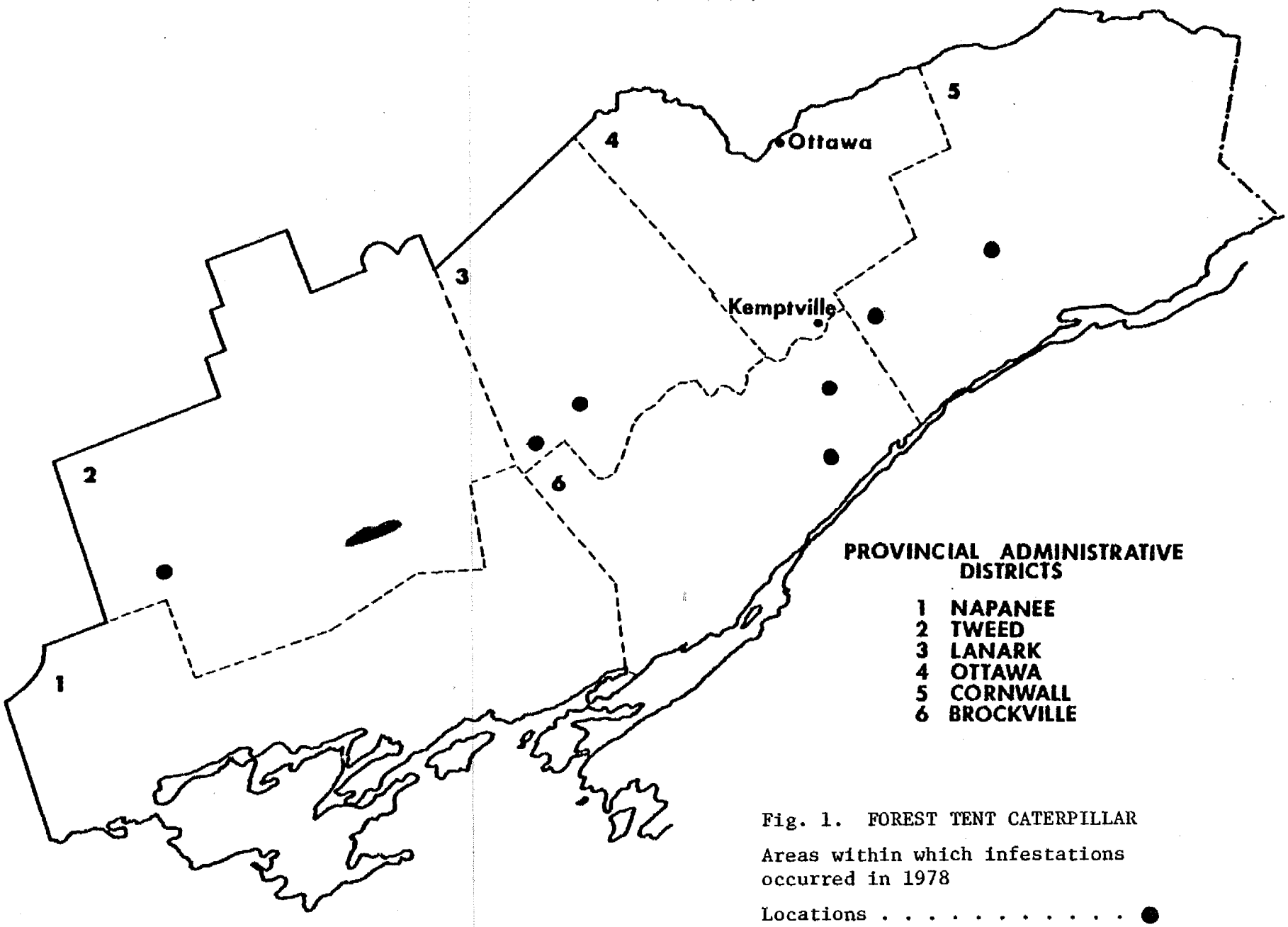


PROVINCIAL ADMINISTRATIVE DISTRICTS

1 NAPANEE
2 TWEED
3 LANARK
4 OTTAWA
5 CORNWALL
6 BROCKVILLE

Fig. 1. FOREST TENT CATERPILLAR

Areas within which infestations occurred in 1978

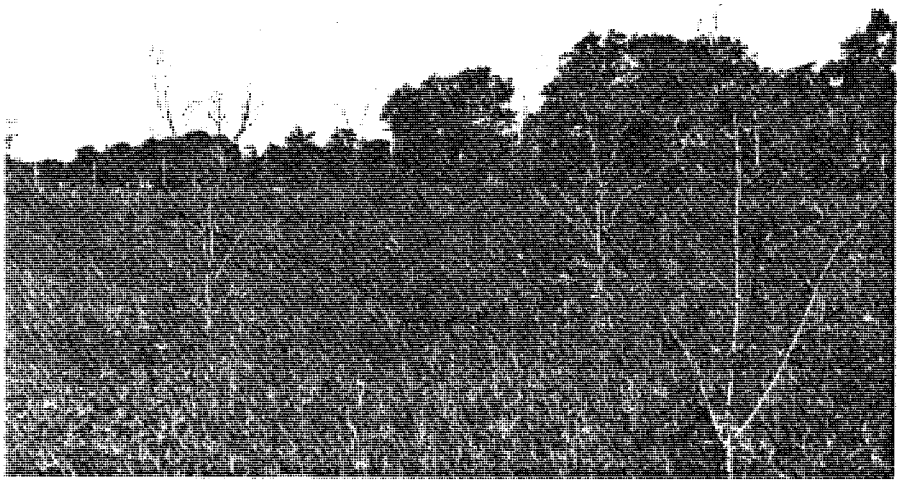
Locations . . . . . ●

has caused some upper crown mortality. Elsewhere, small localized infestations occurred at widely separated locations throughout the Region. In 1977 and 1978 spraying operations were carried out by the Forest Pest Management Institute. Nuclear polyhedrosis virus (5 billion polyhedral inclusion bodies per U.S. gal) was applied at the rate of 1 U.S. gal per acre (.40 ha) to four plantations located in the Tweed and Lanark districts. These plantations ranged in size from 3 to 15 ha (7.5 to 37 acres). Three red pine plantations were treated for protection purposes; the other plantation located in Kaladar Township in Tweed District was for virus production. All applications were successful. Follow-up studies in plantations treated in 1977 were conducted near Richmond. In plot no. 3, no sawfly larvae were found and in check plot no. 1, only occasional larval colonies were observed. Elsewhere, control operations using Malathion in solution were carried out by OMNR personnel and private citizens. Results of these applications are at present inconclusive.

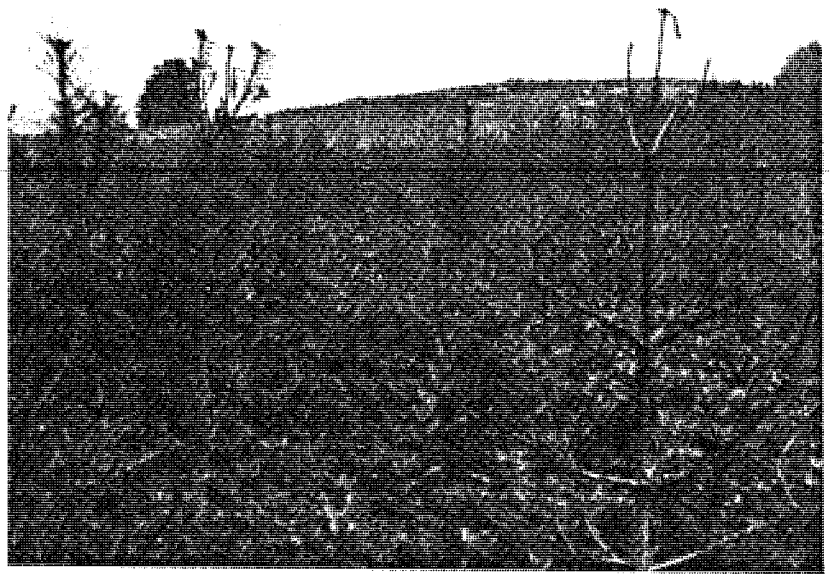
Table 1. Summary of forest tent caterpillar egg-band counts in 1977 and 1978 and infestation forecasts in four districts for 1979 (based on the examination of one to three aspen trees at each location).

Location (Twp)	Avg DBH (cm)[a]	No. of trees examined	Avg no. of egg-bands per tree 1977	Avg no. of egg-bands per tree 1978	1979 infestation forecast
Tweed District					
Kaladar	12.7	3	14.0	0.0	nil
Olden	"	"	-	0.7	light
Kennebec	"	"	-	0.0	nil
Barrie	"	"	-	0.0	"
Lanark District					
Drummond	"	"	2.7	0.0	nil
Brockville District					
Oxford	"	"	1.0	0.0	"
Cornwall District					
Mountain	"	"	-	3.7	moderate

[a] 1 cm = 0.39 in.



Defoliation caused by a *Nematus* sp. sawfly on black-locust, Napanee District.



Mortality of red pine caused by the redheaded pine sawfly, *Neodiprion lecontei* (Fitch), Lanark District.

Table 2. Results of forest tent caterpillar cocoon dissections at three locations in 1977 and 1978 (100 cocoons examined at each location).

Location (Twp)	Parasitized		Diseased		Adult emergence	
	1977	1978	1977	1978	1977	1978
Tweed District						
Kennebec	53	82	29	11	18	7
Olden	67	81	19	8	14	11
Cornwall District						
Mountain	-	78	-	13	-	9

Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross

As in 1977 an increase in larval colonies occurred at many points in the Region in 1978. The most noteworthy infestations with severe loss of 1977 foliage were located on the Burnt Land Tract in Ramsay Township, on fringe and open growing trees in the Ottawa Carleton Forest, in Marlborough Township, on roadside trees near Lavant Station, in Lavant Township and near the village of Elphin in Palmerston Township. Moderate infestations were observed near the Cowles property in Darling Township and in a small plantation near Burritts Rapids in Oxford Township. Jack pine trees located near the Cowles property are in poor condition, because past years' defoliation has caused some branch mortality on trees up to 2 m (6 ft) high. Elsewhere light infestations were common at many points throughout the Region.

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

Larval populations increased at several locations in 1978. Although infestations were generally light through the infested area, a change in boundaries of distribution was noted (Fig. 2). Defoliation of 1977 red and Scots pine (*Pinus sylvestris* L.) plantations did not exceed 15 percent at any location. However, colonies of larvae were common from Ottawa westerly to Marmora. Within this infested area colonies of larvae were noted in plantations near Brockville, Tweed, Lanark, Sharbot Lake and at numerous locations in Prince Edward County.

White Pine Weevil, *Pissodes strobi* Peck

As in past years, this weevil caused appreciable damage to leaders of pine and spruce at many locations. Light damage occurred to leading shoots of Norway spruce (*Picea abies* [L.] Karst.) in a plantation in the

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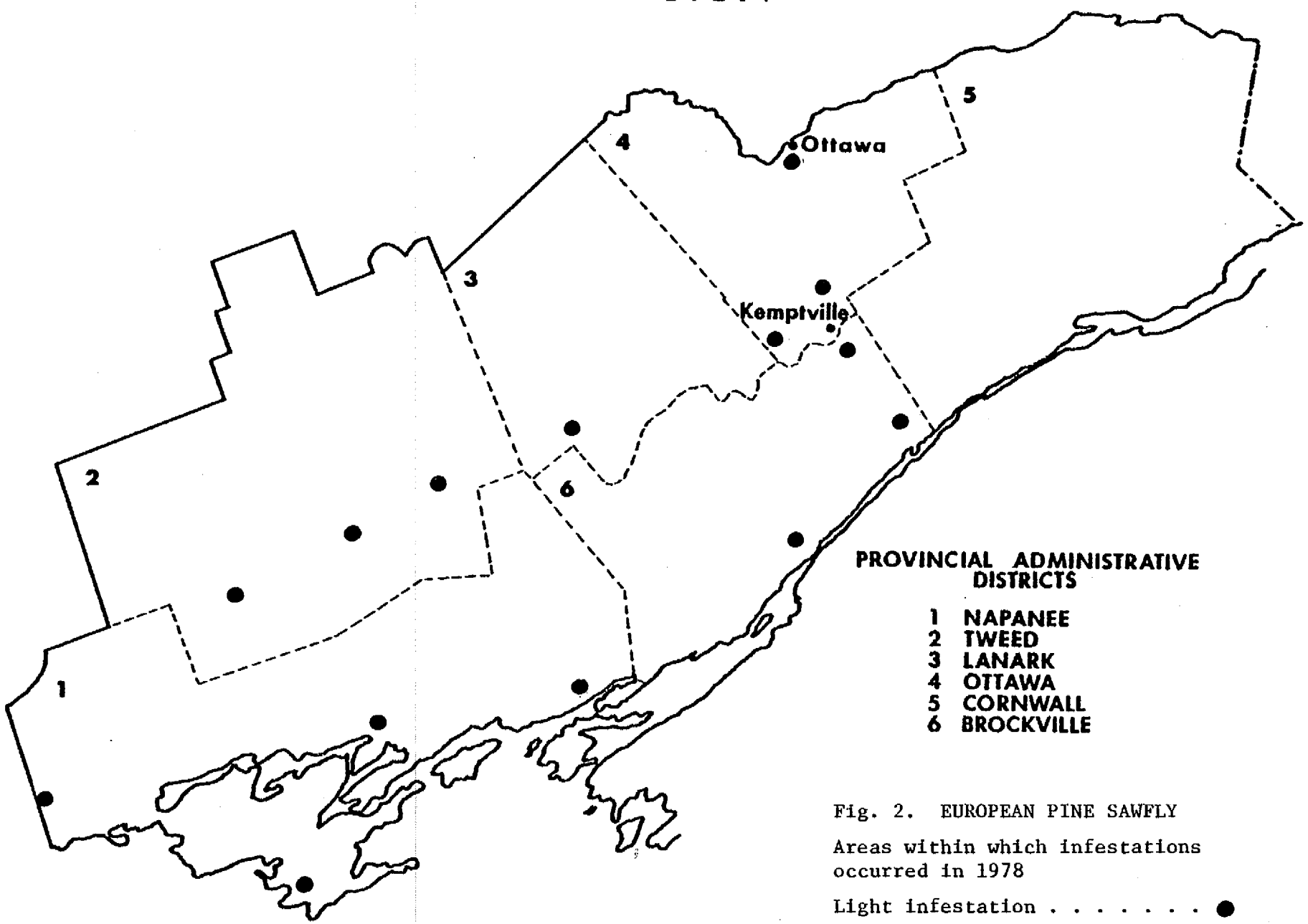

Fig. 2. EUROPEAN PINE SAWFLY

Areas within which infestations occurred in 1978

Light infestation . . . . . ●

Central Research Forest in Gloucester Township near Ottawa. White pine (*Pinus strobus* L.) leader damage was common along Highway 7 west of Perth in Bathurst and North Sherbrooke townships and near Lavant Station in the Lanark District. Light infestations with varying degrees of damage were noted at several points elsewhere in the Region.

Table 3. Summary of damage caused by the white pine weevil at three locations in the Eastern Region in 1978 (counts based on the examination of 100 trees at each sample point).

Location (Twp)	Host	Avg DBH (cm)[a]	No. of leaders weeviled 1978
Ottawa District			
Gloucester	Norway spruce	2.54	4
Lanark District			
Dalhousie	White pine	2.54	15
Brockville District			
Oxford	Scots pine	2.54	3

[a] 1 cm = 0.39 in.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Heavy infestations accompanied by severe defoliation of European larch (*Larix decidua* Mill.) and native larch (*L. laricina* [Du Roi) K. Koch occurred commonly in the Cornwall and Ottawa districts. Most notable infestations occurred in the LaRose Forest, Cornwall District, where severe defoliation for the past several years has caused tree mortality. Heavy infestations persist near Kemptville and North Gower in the Ottawa District. This infestation has been active for the past three years and upper crown mortality of native larch is common. Moderate infestations were observed near Napanee in Camden East Township and at several locations in Lanark District. Elsewhere light infestations were present throughout the remainder of the Region.

Nursery Report

The term "cabbageheading" refers to a condition characterized by curling and clumping of foliage that occurs in some provincial nurseries in Ontario. This condition was observed affecting sugar maple at the

Kemptville Forest Station in 1978. Investigation revealed the presence of the potato leaf hopper (*Empoasca fabae* Harris). In an attempt to prevent damage by this insect, a spray program using Sevin at weekly intervals throughout the growing season was carried out. Although it appears that with the use of the spray program, cabbageheading was not as common in 1978 as in previous years, results are inconclusive. Other insects, occurring in the nursery but causing little damage in 1978, are listed in Table 4.

Table 4. Miscellaneous insects collected in the Kemptville Forest Station in 1978.

Organism	Host(s)	Remarks
Archips argyrospilus (Wlk.) Fruit tree leafroller	cPo	occasional larvae on hedgerow trees
Choristoneura fumiferana (Clem.) Spruce budworm	wS	light infestations in north part of nursery, hedgerows lightly infested
Hyphantria cunea Dru. Fall webworm	mM, wE	occasional nests of this webworm on a variety of hosts in north end of nursery
Malacosoma americanum (F.) Eastern tent caterpillar	cCh, pCh	common on roadside shrubs at many points in nursery
Malacosoma disstria Hbn. Forest tent caterpillar	cP, tA	several colonies observed but defoliation negligible
Neodiprion lecontei (Fitch) Redheaded pine sawfly	rP	scattered colonies of this sawfly on larger trees near Rideau River
Neodiprion sertifer (Geoff.) European pine sawfly	ScP	numerous colonies observed on hedgerow trees near nursery headquarters
Proteoteras aesculana Riley Maple twig borer	siM	twig damage heavy in lower compartment
Zeiraphera canadensis Mut. & Free. Yellow spruce shootworm	wS	New shoot insects caused light damage to windbreak trees.

Hybrid Poplar Report

The most important insect problem affecting hybrid poplar (*Populus* spp.) in the Eastern Region in 1978 was the midge (*Prodiplosis morrisi* Gagne). The midge was present in several plantations in the Cornwall and Brockville districts. Several generations per year may occur and their feeding can cause severe damage to the foliage. Control measures, using a variety of pesticides, were carried out near Kemptville and North Augusta. A shoot borer (*Agrilus* sp.), was common near North Augusta and in the South Nation Conservation Authority Forest near Finch. Other insects (Table 5), either observed or collected in poplar plantations, caused no appreciable damage.

Table 5. Insects collected on hybrid poplar in the Eastern Region in 1978.

Insect	Remarks
Archips argyrospilus (Wlk.) Fruit tree leafroller	small numbers of larvae near Kemptville
Choristoneura rosaceana (Harr.) Obliquebanded leafroller	occasional larvae in plantation near Berwick
Curculionidae Wood borers (weevils)	light weeviling in stems of trees in South Nation plantation near Finch
Ipimorpha pleonectusa Grt. Blackcheeked aspen caterpillar	occasional larvae near Berwick
Malacosoma americanum F. Eastern tent caterpillar	migrating larvae common; however, defoliation was negligible
Malacosoma disstria Hbn. Forest tent caterpillar	feeding colonies scattered throughout plantations near Finch and Kemptville; defoliation light
Messa populifoliella Town. Poplar leafmining sawfly	leafminers common in plantations near Throoptown and North Augusta
Phyllocolpa sp. Poplar leaf-folding sawfly	leaf-folding sawfly common on fringe trees near Throoptown
Pseudexentera oregonana Wlshm. aspen leafroller	has caused severe defoliation of poplar in past years; light infestation at present in South Nation plantation
Schizura unicornis J.E. Smith Unicorn caterpillar	small numbers of larvae near Napanee

Table 6. Other Forest Insects.

Insect	Host(s)	Remarks
Adelges lariciatus (Patch) Aphid	eL	common on this host in the Stormont, Dundas and Glengarry Forest near Finch
Aphrophora cribrata Wlk. Spittlebug	ScP	moderate-to-heavy infestations of spittlebug on roadside trees near Lavant station with some tree mortality; common throughout the Region on several tree species
Archips cerasivoranus (Fitch) Uglynest caterpillar	cCh	common on roadside shrubs at many points in the Lanark and Brockville districts
Cerura sp. Forktailed caterpillar	bPo	occasional larvae on understory trees in County Forest near Lanark
Corythucha sp. Lace bug	wB	common on understory white birch near Lanark; defoliation light
Croesus latitarsus Nort. Dusky birch sawfly	wB	occasional colonies of this sawfly on understory white birch (*Betula papyrifera* Marsh.) near Lanark
Datana integerrima G. & R. Walnut caterpillar	bWa	light-to-moderate infestation persisting on hedgerow trees near Smiths Falls
Erannis tiliaria Harr. Linden looper	Ba	small basswood plantation lightly infested near Marmora
Eucosma gloriola Heinr. Eastern pineshoot borer	ScP	common in plantations near Oxford Station; at present light damage to lateral and leading shoots
Exoteleia pinifoliella (Cham.) Pine needleminer	jP	low populations of needleminers near Almonte
Filatima pseudoacaciella Cham. Leafroller	Hon	leafrollers common on scattered trees in Sandbanks Provincial Park in Prince Edward County

(continued)

Other forest insects (continued).

Insect	Host(s)	Remarks
Gonioctena americana (Schaef.) American aspen beetle	tA	reproduction trembling aspen (*Populus tremuloides* Michx.) moderately defoliated by this beetle near Denbigh
Neodiprion abietis complex Balsam fir sawfly	bF, wS	occasional colonies on plantation trees along Moody Drive, Ottawa and near Lanark; defoliation light
Neodiprion nanulus nanulus Schedl Red pine sawfly	jP, rP	scattered colonies in small red pine and jack pine plantings near Burritts Rapids and Merrickville; occasional colonies observed near Finch and Hopetown
Nephopteryx subcaesiella Clem. Locust leafroller	Hon	leafrollers common on open-growing trees in Sandbanks and Outlet Provincial parks, Prince Edward County; damage negligible
Paranthrene sp. Stem borer	tA	stem borers at low levels in plantations located in Finch and North Augusta townships
Periclista sp. Oak sawfly	rO	scattered colonies near MacDonalds Corners, Sharbot Lake and Almonte; defoliation light
Pineus sp. Aphid	wP	aphids common on needles at many points in Stormont, Dundas and Glengarry forest near Finch
Plagiodera versicolora Laich Imported willow leaf beetle	W	open-growing trees lightly to moderately defoliated near Mallorytown National Park and near Picton
Pleroneura brunneicornis Roh. Balsam shootboring sawfly	bF	This insect caused appreciable damage to new shoots of balsam fir (*Abies balsamea* [L.] Mill.) near Denbigh.

(continued)

Table 6. Other forest insects (concluded).

Insect	Host(s)	Remarks
Psilicorsis reflexella Clem. Leaftier	lA	roadside trees lightly infested along county road 12 near Lanark
Pseudexentera cressoniana Clem. Oak leafroller	rO	leafrollers common on scattered trees in Olden Township
Sparganothis directana Wlk. Leafroller	cCh	common on roadside cherry (*Prunus* sp.) near Bells Corners
Zeiraphera canadensis Mut. & Free Yellow spruce shootworm	wS	minimal damage to new shoots of white spruce (*Picea glauca* [Moench] Voss) near Rideau Provincial Park near Kemptville

TREE DISEASES

Cytospora Canker, *Cytospora chrysosperma* (Pers.) Fr.

This canker caused severe branch and stem damage to several species of hardwood in the Region in 1978 (see Frontispiece). Hybrid poplar was moderately to severely damaged in an OMNR plantation near North Augusta in Brockville District. Approximately 25% of the trees had varying degrees of damage. In the South Nation Conservation Authority forest near Berwick, many stem and branch cankers were noted. Many recently planted cuttings failed to develop on the Domtar property near Finch; only 50% of the cuttings developed foliage. Near Coldbrook in the Napanee District, branch cankering was common on black-locust (*Robinia pseudoacacia* L.)

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

Branch tips of Scots pine (*Pinus sylvestris* L.) and red pine (*P. resinosa* Ait.) were moderately damaged at three locations in the Eastern Region in 1978. The most notable damage occurred in a red pine plantation located in Bathurst Township in Lanark District, where approximately 50% of the red pine trees are dead and others show damage to the terminal shoots. Moderate damage was observed on Scots pine hedgerows near the Uplands airport, where all trees examined had varying degrees of twig and shoot damage. Small localized infections were observed on Scots pine and red pine near Newington, Osnabruck Township, Cornwall District.

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

A European strain of the fungus *Gremmeniella abietina* has caused severe conifer kill in the state of New York in recent years. Since the initial discovery in the Lake Placid area, this disease has caused severe mortality to Scots pine and red pine trees in all age classes at numerous locations in the states of New York and Vermont. This disease has spread rapidly and now occurs within 10 km (6 mi.) of the Ontario-New York border. This year the disease was discovered for the first time in Canada near the village of Powers Court in the province of Quebec. In 1978 the Forest Insect and Disease Survey group from the Laurentian Centre in Quebec detected this disease in an isolated red pine plantation just 2 km (1.2 mi.) north of the New York border. This plantation was immediately put in 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, shipment of material capable of harboring Gremmeniella 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 allow time for research and to develop methods necessary for control.

In the Eastern Region, aerial observations were made and any pine mortality noted was ground checked and suspect material was submitted to the Forest Insect and Disease Survey (FIDS) at the Great Lakes Forest Research Centre for culture. Additionally, over 20 plantations of Scots and red pine in all age classes were thoroughly inspected from the Quebec border westerly to the village of Brighton (Fig. 3),. No evidence of the disease was found.

Maple Deterioration

To the west of the Eastern Region vast areas of sugar maple have died in the Owen Sound-Parry Sound area. For several years prior to 1978, infestations of the forest tent caterpillar had severely defoliated these stands. Although no satisfactory conclusion to this problem has been arrived at, it is felt by researchers that trees severely defoliated by the forest tent caterpillar over a period of years have been under extreme stress. In the Eastern Region, heavy infestations of the forest tent caterpillar, from 1975 to 1977 inclusive, caused severe defoliation of large stands of sugar maple in Dalhousie and North and South Sherbrooke townships in the Lanark District, and in Oso and Olden townships in the Tweed District. However, no mortality has been noted.

Other problems causing crown and branch dieback to sugar maple at many locations in the Tweed and Lanark districts, whether by a biotic or abiotic influence, have not been determined. However, in the past three years severe drought occurring in these areas could be partly responsible for this condition, particularly on shallow sites.

Oak Decline

The two plots that were established in Lavant Township in 1977 were reevaluated in 1978. Although no mortality has occurred, a decline in tree vigor was noted. Two stem rots, a trunk rot of hardwood, *Fomes igniarius* (L. ex Fr.) Kickx and a butt rot, *Fomes connatus* (Weinm. ex Fr.) Gill were noted in a plot near Joe Lake (Table 7). Branch dieback and crown deterioration were common in both plots. The following evaluation system was used: 1 = healthy, 2 = 20% branches dead, 3 = 40% branches dead, 4 = 60% of the tree dead and 5 = tree dead. The 1978 findings indicate an increase in branch mortality over that of 1977.

Red Pine Deterioration

For the past three years ground and aerial surveys have revealed numerous pockets of red pine mortality at widely scattered locations in the Region. The most notable damage occurred in isolated pockets,

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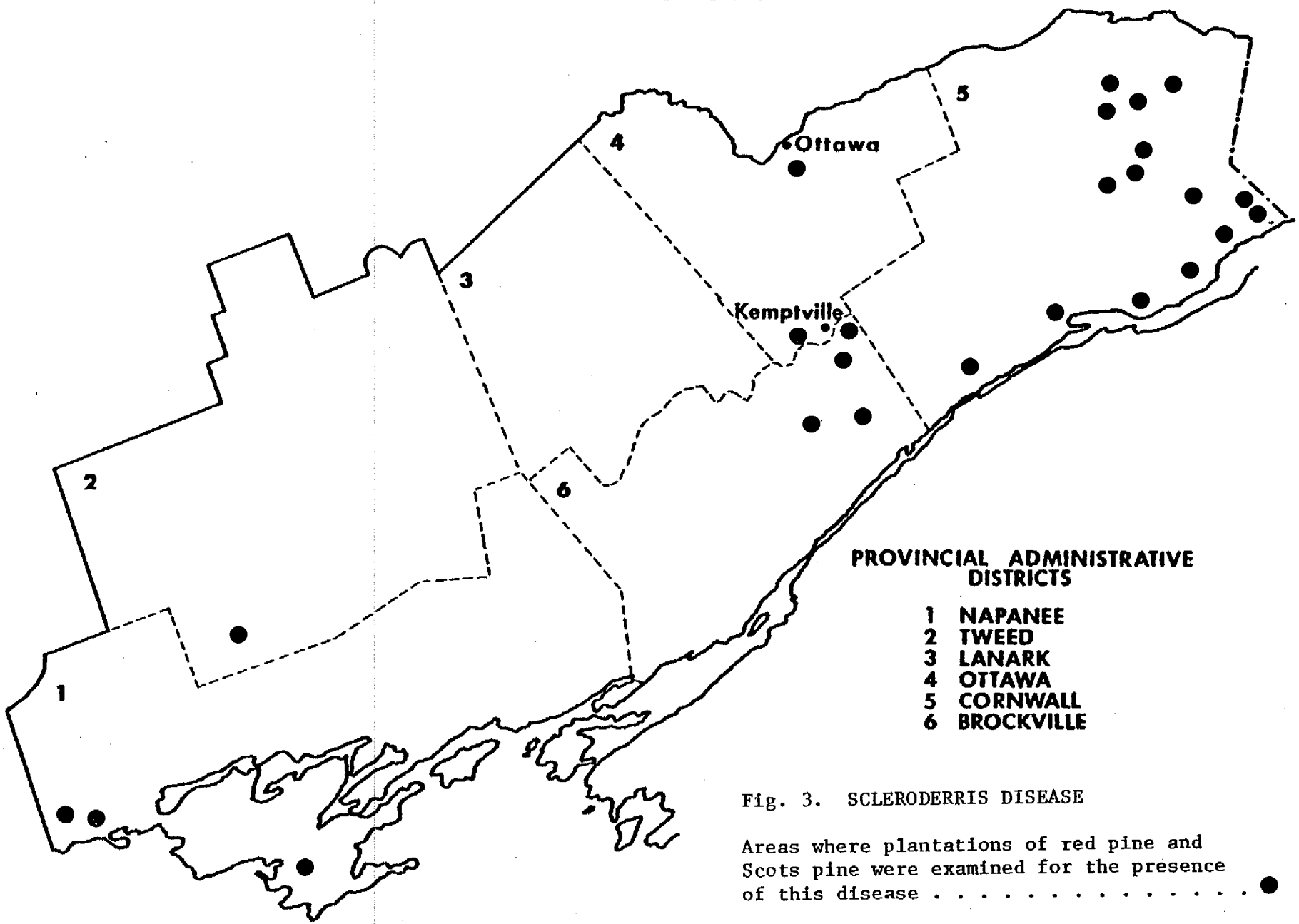

Fig. 3. SCLERODERRIS DISEASE

Areas where plantations of red pine and Scots pine were examined for the presence of this disease . . . . . ●

comprising from 20 to 30 trees in the Lanark County forest in Lanark District, in the Prescott and Russell County forest in Cornwall District and at several points in the Limerick forest in the Brockville District. Over the past three years several samples of roots, branches and stem discs have been submitted to FIDS for culture; no pathogen (biotic cause) has been isolated from these samples. Drought has played an important part in lowering water tables in these areas, thus weakening the trees and making them more susceptible to other agents such as wood boring beetles and several species of bark beetles. In all instances beetle attacks were moderate to high.

Table 7. Oak dieback classes for trees at two locations in the Eastern Region in 1977 and 1978.

Location	Avg height (m)[a]	Avg DBH (cm)[b]	Dieback class 1977					Dieback class 1978				
			1	2	3	4	5	1	2	3	4	5
Lavant Township												
Joe Lake	12	24	46	38	12	4	0	21	59	13	7	0
Flower Station	14	19	28	60	11	1	0	14	72	11	4	0

[a] 1 m = 3.28 ft

[b] 1 cm = 0.39 in.

Wind Damage

In midsummer a severe wind storm caused uprooting of poplar (*Populus* sp.), birch (*Betula* sp.) and pine trees along the banks of the Rideau River from Kemptville through to Manotick. Although approximately 50 trees were blown down, much more severe damage by this storm occurred north of Ottawa in the Gatineau area of Quebec. Scattered damage was observed near Ottawa and Arnprior.

Winter Drying

Reddening of foliage was common in a Scots pine plantation near Oxford Station in the Brockville District. This condition destroys the aesthetic and commercial value of the trees, as well as making them more susceptible to attack by insects or disease.

Salt Damage

In 1978, as in past years, heavy applications of salt have caused severe damage to roadside trees, particularly pines, spruces (*Picea* sp.) and cedars (*Thuja* sp.) at many points in the Eastern Region. Damage caused by this ranged upward to 40%, particularly on hedgerow pine in the Ottawa, Long Sault and Iroquois areas. Varying degrees of damage were noted on well travelled highways such as 401, 43, 7 and 2.

Ice and Snow Breakage

Stems and branches of red pine were damaged or broken off by the weight of snow and ice at scattered locations in the Lanark District in 1978. Scots pine was damaged in a plantation near Oxford Mills; lower branches on peripheral trees were broken and in several instances leader breakage was also noted.

Hybrid Poplar Report

Hybrid poplar plantations were again inspected in the Ottawa, Brockville and Cornwall districts to determine extent of damage and severity of infection by disease organisms. The results of these surveys with comments pertaining to pathogens found are outlined in Table 8.

Table 8. Major and miscellaneous disease organisms collected from hybrid poplar in the Eastern Region in 1978.

Organism	Remarks
Alternaria sp. Leaf blight	severe leaf scorch in compartment C28 at Kemptville Forest Station
Cephalosporium sp.	Root samples contained this organism which appeared in cultures; possibly a contaminant
Cytospora chrysosperma (Pers.) Fr. Canker	common in all plantations; causes branch and stem dieback and some mortality. Root suckers are commonly killed.
Cytospora sp. Canker	moderate damage in all plantations Cankering causes branch and stem dieback.

(continued)

Table 8. Major and miscellaneous disease organisms collected from hybrid poplar in the Eastern Region in 1978 (concluded).

Organism	Remarks
Diplodina sp.	associated with the canker *Cytospora chrysosperma* in a pocket of mortality at Kemptville Forest Station
Fusarium sp.	Recently dead trees on Levack farm near North Augusta had root systems contaminated by this fungi.
Melampsora abietis-canadensis C.A. Ludwig ex Arth. Foliage rust	severe rust infection on clone DN 33; particularly heavy on peripheral trees at provincial nursery
Verticillium sp.	occasional root systems damaged near North Augusta, Brockville District

Nursery Report

In compartments C12, C18, C24, C35, and C37, yellowing of needles of eastern white cedar (*Thuja occidentalis* L.), tamarack, eastern white pine (*Pinus strobus* L.) and red pine was very conspicuous. Numerous samples were submitted for culture to FIDS; however, no pathogens were recovered and no mortality was noted. The present cause of this chlorosis is unknown.

Cytospora canker (*Cytospora chrysosperma* [Pers.] Fr.), *Alternaria* sp., and *Diplodina* sp., problems of hybrid poplar, are dealt with in Table 8.

Table 9. Other forest diseases.

Organism	Host(s)	Remarks
Apiosporina morbosa (Schw.) Arx Black knot	cCh	black knot common on cherry throughout the Region
Cenangium ferruginosum Fr. ex Fr. Twig blight	rP	common on branches and twigs of this host in a forest near Berwick

(continued)

Table 9. Other forest diseases (continued).

Organism	Host(s)	Remarks
Coleosporium asterum (Diet.) Syd. Needle rust of pine	rP, jP	infection lower in 1978 than in 1977; light damage to needles of jack pine near Ompah in Tweed District and to red pine near Bells Corners in Ottawa District
Cronartium quercuum (Berk.) Miybe ex Shirai Eastern gall rust	ScP	common near Sandbanks Park, Prince Edward County near Kemptville, and in Limerick Forest, Brockville District
Cronartium ribicola J.C. Fisch. White pine blister rust	wP	common throughout the Region
Cytospora sp. Canker	rP, wP	common on branches of white spruce (*Picea glauca* [Moench] Voss) near Apple Hill in Cornwall District and in a small red pine plantation near Hopetown in Lanark District
Fusarium sp.	wP	planted white pine damaged by fungi near Finch
Fomes connatus (Weinm.) Gill. Trunk rot	rO	trunk rot on occasional trees near Joe Lake, Lanark District
Gymnosporangium globosum Farl. Cedar rust	rJ	common in the Kingston-Belleville area and through Prince Edward County
Rodent damage	HyPo, rP, ScP, cCh	common near Navan, Finch and North Augusta
Scoleconectria cucurbitula (Tode ex Fr.) Booth Nectria canker	ScP	associated with dead and dying tips common on hedgerow trees near Uplands airport
Steganosporium ovatum (Pers. ex Merat) Hughes	sM	common on dead branches and twigs throughout the Region

(continued)

Table 9. Other forest diseases (concluded).

Organism	Host(s)	Remarks
Therrya fuckelii (Rehm) Kujala Canker	rP	Occasional trees had moderate cankering on branches and twigs near Finch.
Verticicladiella antibiotica Kendrick Root disease	ScP	A root system was infected by this disease in village of Lanark.