FOREST INSECT AND DISEASE SURVEYS IN THE EASTERN REGION OF ONTARIO, 1977

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Frontispiece. Severe defoliation of tamarack trees caused by the larch sawfly, *Pristiphora erichsonii* (Htg.).

SURVEY HIGHLIGHTS

This report describes the more important insect and disease conditions in the Eastern Region in 1977.

Forest tent caterpillar infestations continued at high levels and covered approximately 3 600 km^2 (1,400 $mi.^2$) of forested land. Pockets of heavy infestation of the spruce budworm recurred in several townships in the Tweed and Lanark districts. Mortality of balsam fir increased in Denbigh, Ashby and Effingham townships. Populations of the webspinning sawfly, redheaded pine sawfly, larch sawfly, eastern tent caterpillar, pine spittlebug, fall cankerworm and blackheaded jack pine sawfly all showed marked increases and defoliation was severe at many locations. Population declines were noted in oak leaf shredder, fall webworm, oak leafminer, and cedar leafminers. European pine sawfly populations remained at low levels; however, changes occurred in distribution in 1977.

The pathology program placed special emphasis on hybrid poplar, oak and maple problems. Surveys carried out at many points revealed the presence of verticillium wilt on maple in the Ottawa and Kemptville areas. Two oak sample plots were established in the Lanark area and will be checked for the next five years to monitor oak decline. Nursery surveys revealed many problems, particularly the presence of Cylindrocladium root rot in white spruce seedlings in compartment 7 and spider mite damage to red pine seedlings in compartment 8 in the Kemptville nursery. Frost, drought and rodent damage were heavier in 1977 than in 1976. Mortality of white elm, caused by Dutch elm disease, was heavy in 1977.

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INSECTS

Fall Cankerworm, *Alsophila pometaria* (Harr.)

For the second consecutive year this insect caused severe defoliation of red oak (*Quercus rubra* L.), white elm (*Ulmus americana* L.) and sugar maple (*Acer saccharum* L.) trees at many locations in the Lanark and Ottawa districts. Heavy infestations persisted in the Ottawa-Carp-Arnprior areas, at many points from Almonte westerly to Lanark, and near Perth and Smiths Falls. Defoliation was severe in all areas infested. The heavy infestations reported in Napanee District near Belleville and in Prince Edward County declined in 1977 to a low level; only scattered pockets of light infestation were observed. The linden looper, *Erannis tiliaria* Hbn., and spring cankerworm, *Paleacrita vernata* (Peck), were collected in small numbers in association with the fall cankerworm, but did not cause defoliation of any consequence.

Pine Spittlebug, *Aphrophora parallela* Say

This chronic pest of coniferous trees caused considerable damage to Scots pine regeneration (*Pinus sylvestris* L.) in the LaRose Forest in the Cornwall District. In the Prescott and Russell County Forest both European larch (*Larix decidua* Mill.) and tamarack (*Larix laricina* [Du Roi] K. Koch) were moderately infested; however, no twig damage was observed. Elsewhere the insect was found in varying degrees of infestation. White pine (*Pinus strobus* L.), eastern hemlock (*Tsuga canadensis* [L.] Carr.) and tamarack were lightly damaged in Napanee District near Kingston and along Highway 401 near Trenton and Belleville. In the remainder of the Region the spittlebug was commonly observed on a variety of hosts.

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

The current outbreak of cedar leafminers, which began in 1969 and virtually collapsed in 1976, continued at low levels in 1977. The only noteworthy infestations observed were located near Belleville, Picton and Marmora on white cedar (*Thuja occidentalis* L.) and on red juniper (*Juniperus virginiana* L.). Damage in the eastern part of the Region was confined to windbreaks and hedgerows at several points in the Ottawa, Cornwall, Lanark and Brockville districts.

Pine Webspinning Sawfly, *Cephalcia* sp. prob. *frontalis* Westw.

This insect caused considerable damage to red pine (*Pinus resinosa* Ait.) and jack pine (*Pinus banksiana* Lamb.) at several locations in the Ottawa District in 1977. Heavy infestations occurred in

red and jack pine plantations in Marlborough and Goulbourn townships and defoliation of 1976 and 1977 foliage was heavy. OMNR personnel carried out spray operations on red pine trees in Marlborough Township; however, results of this control will not be known until 1978. Smaller but significant infestations were observed in private red pine plantations near the village of Richmond in Goulbourn Township, where damage was heavy. Small numbers of larvae were observed at several other locations in the Ottawa District.

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-280). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1977 and gives infestation forecasts for the province for 1978.

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

For the first time in several years populations of this red oak defoliator declined in the Region. Infestations were reduced to two small pockets near Ottawa in the Ottawa District and near Tower Hill in the Lanark District. Defoliation, though heavy in some instances, was confined to occasional trees in both pockets of infestation. The small scattered pockets of light infestation reported in 1976 in the Denbigh area declined to very low levels; only a few larvae were observed in this area. Small numbers of larvae were observed at scattered locations in Tweed and Lanark districts.

Birch Leafminer, *Fenusa pusilla* (Lep.)

As in the past six years, white birch (*Betula papyrifera* Marsh.) and wire birch (*Betula populifolia* Marsh.), were again infested heavily by this leafmining sawfly. In the Cornwall District, heavy infestations persisted at many points along highways 401 and 2 east of Cornwall in Charlottenburgh and Lancaster townships. Damage to the leaf surface was in excess of 90%. Scattered pockets of heavy infestation were common along the St. Lawrence River from Cornwall west to Matilda Township. Many ornamentals in towns and villages were infested, and this gave the trees an unsightly appearance. Small localized infestations were noted at several locations in the Brockville and Ottawa districts.

Fall Webworm, *Hyphantria cunea* Dru.

Although there was a general decline in population levels, many small localized infestations were observed in all districts of the Region. In several instances the favored hosts, black ash (*Fraxinus nigra* Marsh.)

and white elm were covered by the unsightly webbing and defoliation was high. Ornamentals in many towns and villages were infested, and this necessitated control.

Eastern Tent Caterpillar, *Malacosoma americanum* F.

Increases in population levels occurred in all districts in 1977. Nests of this insect were common along roadsides and in fields, where host material such as pin cherry (*Prunus pensylvanica* L.) and chokecherry (*Prunus virginiana* L.), apple (*Malus* sp.) and Canada plum (*Prunus nigra* Ait.) were readily available. Defoliation was severe in Lanark, Brockville, Napanee, Tweed, Ottawa and Cornwall districts. In many instances migrating larvae, in search of food, caused varying degrees of damage to nearby trees and shrubs.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

The two major infestations reported in the Lanark and Tweed districts in 1976 expanded and coalesced in 1977, forming one large infestation covering an area of approximately 3 000 km^2 (1,200 $mi.^2$) from the Lindsay-Tweed border near Marmora, easterly to Perth in Lanark District (see Appendix, Fig. A1). Smaller but significant infestations occurred adjacent to the main body, covering an additional area of 700 km^2 (275 $mi.^2$). These infestations were located in Marmora and Lake townships in Tweed District, in many small pockets in the western part of Lanark District, in Goulbourn Township, Ottawa District and near Kemptville, Brockville District. Defoliation of trembling aspen (*Populus tremuloides* Michx.), red oak and sugar maple was severe. Although most defoliated trees produced new foliage, damage was still noticeable in late summer.

For several years moth flights have been monitored by counting the number of captures in a light trap located near the heart of the present infestation. This information, coupled with egg-band counts, has been a relatively good barometer for forecasting future infestation patterns. In 1977, moth flights were heavy, but egg counts were considerably lower than anticipated (Table 1). A further indication of declining populations is reflected in higher cocoon mortality. In many instances successful emergence was 15% or less (Table 2). Depending on larval emergence and other factors, populations are expected to be lower in 1978 in many infested areas. This appears to be the case in the Marmora-Madoc area as well as near Tweed and Kaladar. Smaller areas of scattered moderate-to-heavy infestation are expected to recur in Lanark and Tweed districts.

Table 1. Summary of forest tent caterpillar egg-band counts in 1976 and 1977 and infestation forecasts in four districts for 1978 (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		1978 infestation forecast[b]
			1976	1977	
Tweed District					
Madoc	12	3	56	3.7	M
Hungerford	12	1	128	14.0	S
Kaladar	15	1	124	14.0	S
Marmora	12	3	37	3.0	M
Elzevir	12	1	-	11.0	S
Lanark District					
Drummond	10	3	61	2.7	M
N. Sherbrooke	12	1	42	11.0	S
Lanark	12	3	5	0.0	nil
Ottawa District					
Marlborough	15	3	-	0.0	nil
Brockville District					
Oxford	10	3	-	1.0	L

[a] 1 cm = 0.39 in.

[b] L = light, M = moderate, S = severe

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

Heavy infestations recurred at many scattered locations in 1977. Although several plantations in the Tweed and Lanark districts were heavily infested, the most notable damage occurred in a 100 ha (250 acre) red pine plantation in Olden Township in the Tweed District. This area was sprayed by aircraft using Malathion in solution; however, the insecticide was applied when the insect was almost fully grown and the success or failure of the control will not be known until 1978. Mortality of red pine trees 1 m (3.28 ft) high or less was common at many locations in the Lanark District. Nuclear polyhedrosis virus trials are to be carried out in 1978 in the Lanark and Tweed districts.

Table 2. Results of forest tent caterpillar cocoon dissection at nine locations in 1976 and 1977 (100 cocoons examined at each location).

Location (Twp)	Parasitized		Diseased		Adult emergence	
	1976	1977	1976	1977	1976	1977
Tweed District						
Marmora	72	54	2	36	26	10
Kennebec	51	53	5	29	44	18
Kaladar	76	61	9	24	15	15
Hungerford	64	56	5	22	31	22
Olden	60	67	7	19	33	14
Madoc	-	73	-	12	-	15
Lanark District						
Drummond	64	71	3	16	33	13
North Sherbrooke	59	59	5	12	36	29
Dalhousie	65	57	18	14	17	29

Jack Pine Sawfly, *Neodiprion pratti paradoxicus* Ross

Although population levels increased at many points in the Region in 1977, only light-to-moderate defoliation occurred. The most noteworthy infestation was observed on scattered jack pine trees along the Ashby Lake road in Denbigh Township in Tweed District. Defoliation of 1976 foliage ranged upward to 20%. Light infestations on hedgerow and plantation jack pine were common near Merrickville, Athens, Prescott and Burritts Rapids in the Brockville District, on many hedgerows in the Cornwall District and at scattered locations in the Green Belt near Ottawa International Airport. Colonies of larvae were common at many points near the village of Tweed, along Highway 41 north of Kaladar and near the village of Denbigh in the Tweed District. Defoliation did not exceed 10% at any location.

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

New distribution records were established when occasional colonies of larvae were recorded on red, white and Scots pine at several locations in the Brockville District. Occasional colonies were observed in the National Capital Commission Green Belt Forest near Ottawa and on hedgerows near Tweed and at Outlet Provincial Park in Prince Edward County. Elsewhere this insect occurred in small numbers and defoliation did not exceed 5%.

White Pine Weevil, *Pissodes strobi* Peck

Light-to-moderate infestations recurred at many points in the Region in 1977. A moderate infestation occurred in white pine regeneration near the Snow Road in Palmerston Township in Lanark District. Past infestations in this area have caused crooked stems and have reduced the aesthetic and commercial value of the trees. Some localized infestations were noted at points in the LaRose Forest, Cornwall District, in Hungerford Township, Tweed District, near Prescott, Brockville District and near Lanark, Lanark District. In an effort to control this pest, OMNR personnel continue to clip and destroy infested shoots.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

As in 1976, heavy infestations accompanied by severe defoliation of European and native larch occurred commonly in the Brockville, Cornwall, Ottawa and Lanark districts (see Frontispiece). The most severe infestations were observed at scattered locations in the LaRose Forest, and in Finch, South Plantagenet and Clarence townships in the Cornwall District. In the Lanark District, heavy infestations persisted and many small pockets of severe defoliation were observed west of Lanark and along county roads 8 and 16 from Heron Mills east to Almonte. Smaller pockets or occasional trees were infested near Ottawa, North Gower and Kemptville in the Ottawa District and north of Prescott, along Highway 16 in the Brockville District. Single-tree mortality of European larch is common in the LaRose Forest.

Nursery Report

In compartments 8 and 54 of the Kemptville Forest Station the pine tip moth, *Rhyacionia adana* Heinr., caused moderate damage to red pine seedlings. Approximately 10% of the terminal shoots were damaged. Spider mites damaged foliage of red pine to such a degree that Kelthane (in solution) was used to attempt to control the problem. Hybrid poplar plantings were moderately damaged by the willow shoot sawfly, *Janus abbreviatus* (Say). Most damage was confined to trees in the upper compartment. Midge damage was extensive, and gave hybrid poplar trees a blackened appearance in many compartments.

Hybrid Poplar Report

The Ontario Ministry of Natural Resources has started a program in the Eastern Region to develop a hybrid poplar that will be relatively insect and disease resistant and able to withstand the rigors and temperature extremes of the Canadian climate. Plantations of approximately 400 ha (1,000 acres) are located principally in the Cornwall and

Brockville districts. Smaller plantations either under the Woodlands Improvement Act Agreement or on Crown land are located in the Tweed, Ottawa and Napanee districts. Table 3 is based primarily on observations made in the Brockville and Cornwall plantations. Insects causing appreciable damage were a midge, *Prodiplosis morrisi* Gagne, willow shoot sawfly, *Janus abbreviatus* (Say), poplar shoot borer, *Saperda calcarata* Say, and a Chrysomelid leaf beetle whereas the remaining insects caused little damage.

Table 3. Insects collected on hybrid poplar in the Eastern Region in 1977.

Insect	Remarks
Altica sp. Leaf beetle	poplar leaf beetle common on occasional trees in nursery
Archips argyrospilus (Wlk.) Fruit tree leafroller	collected in small numbers at Kemptville Nursery
Chrysomela sp. Leaf beetle	light-to-moderate infestation of leaf beetle near Throoptown, 5-10 percent defoliation
Gypsonoma haimbachiana (Kft.) Poplar shoot borer	feeding by this insect has caused severe damage to young poplar, at present collected only in small numbers in the nursery
Janus abbreviatus (Say) Willow shoot sawfly	occurs commonly in the Kemptville nursery and in plantations near North Augusta. The willow shoot sawfly is capable of causing severe damage to leading shoots of young trees
Malacosoma americanum (F.) Eastern tent caterpillar	migrating larvae common through Johnson plantation; defoliation negligible
Malacosoma disstria Hbn. Forest tent caterpillar	common on adjacent trees; however, migrating larvae caused little damage on Johnson farm, near Throoptown, near Bracebridge or near Kemptville

(continued)

Table 3. Insects collected on hybrid poplar in the Eastern Region in 1977 (concluded).

Insect	Remarks
Orthosia hibisci (Guen.) Owlet moth	occasional larvae on small trees near Brockville
Prodiplosis morrisi Gagne Midge	midge damage moderate to severe in Kemptville nursery and near North Augusta
Saperda sp. prob. *calcarata* Say Borer	common at low levels in South Nation Conservation Authority Plantation in Finch Twp

Table 4. Other forest insects

Insect	Host(s)	Remarks
Adelges lariciatus Patch Aphid	eL	heavy infestations on this host at many points in LaRose Forest
Archippus strianus Fern. Lined spruce needle moth	S	new shoots of hedgerow trees lightly infested at Kemptville Nursery
Archips fervidanus Clem. Oak webworm	rO	common on scrub red oak at several points near MacDonalds Corners, Lanark District
Chionodes thoraceochrella Chambers Micro moth	rO	small numbers on understory trees near Bells Corners, Ottawa District
Choristoneura rosaceana Harr. Obliquebanded leafroller	cCh, rO	roadside shrubs lightly infested near Bells Corners, Nepean Township and in National Capital Commission Green Belt

(continued)

Table 4. Other forest insects (continued)

Insect	Host(s)	Remarks
Coleophora laricella Hbn. Larch casebearer	tL	light-to-moderate infestation on smaller trees near Kemptville, North Gower and in Limerick forest
Datana integerrima G. & R. Walnut caterpillar	bWa	scattered colonies on hedgerow near Perth; 10% defoliation
Eucosma gloriola Heinr. Eastern pineshoot borer	jP	moderate infestation on leading shoots in small OMNR plantation north of Burritts Rapids, Marlborough Township, Ottawa District
Lithocolletis aceriella Clem. Maple leafblotch miner	sM	leafminers caused little damage to large trees near Ottawa
Messa nana Klug. Birch leafmining sawfly	wB	common on understory trees near Jordan Lake, Tweed District and near Sharbot Lake
Monoctenus sp. Cedar sawfly	ewC	cedar sawfly common but at low levels through the Region
Nematus sp. Leaf folding sawfly	tA	common on trembling aspen and hybrid poplar at many points in the Region
Nymphalis antiopa L. Mourningcloak butterfly	hybrid poplar Siberian elm	exotic trees lightly infested near Kemptville and North Augusta
Nymphalis milberti Godt. Spiny caterpillar	nettles	common on this host at Kemptville nursery
Ocnerostoma sp. Needleminer	rP	light-to-moderate mining of needles at Rideau Provincial Park

(continued)

Table 4. Other forest insects (concluded)

Insect	Host(s)	Remarks
Petrova albicapitana (Busck.) Northern pitch twig moth	jP	small numbers of pitch masses on jack pine at three widely scattered locations in Brockville, Napanee and Ottawa districts
Phenacaspis pinifoliae (Fitch) Pine needle scale	scP	pine needle scale caused varying degrees of damage on roadside trees in Goulbourn Township
Phigalia titea Cram. Looper	cCh, wO	small numbers on chokecherry in National Capital Commission Green Belt and near Almonte
Phratora purpurea purpurea Brown Aspen leaf beetle	tA	understory trees lightly infested near North Augusta
Phytoptus abnormis Garman Linden gall mite	Ba	gall mites common on this host at many points in Fitzroy Township, Ottawa District
Plagiodera versicolora (Laich) Imported willow leaf beetle	W	light defoliation by the willow leaf beetle in National Park near Mallorytown
Pseudexentera oregonana Wlshm. Aspen leafroller	tA	small trees lightly infested at one point in Fitzroy Township, Ottawa District
Sparganothis directana Wlk. Leafroller	cCh	found commonly in Brockville and Ottawa districts

TREE DISEASES

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

As in the past several years damage and mortality of white elm trees was widespread.

In midsummer, surveys and observations detected severe symptoms at many points in the Region. Reddening of foliage was extremely heavy on many of the remaining elms, particularly in the Smiths Falls-Perth area, and this indicates that mortality in 1978 will likely be high.

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

Levels of foliar damage were higher in 1977 than in 1976 at many points in the Region. This needle rust on jack and red pine caused appreciable damage in plantations in the Lanark, Ottawa and Tweed districts (Table 5). Moderate damage occurred in several red pine plantings in the Lanark District, light damage near Bells Corners in the Ottawa District and light-to-moderate damage was noted in a jack pine plantation in Palmerston Township in the Tweed District.

Table 5. Needle rust damage at four points in 1977 (counts based on examination of 150 trees at each location).

Location (Twp)	Tree species	Height (m)[a]	Damage level 1977
Lanark District			
Lanark	rP	3	moderate
Dalhousie	rP	2	moderate
Ottawa District			
Nepean	rP	5	light
Tweed District			
Palmerston	jP	5	light-moderate

[a] 1 m = 3.28 ft

Maple Decline:

In southwestern Ontario a serious problem has developed in pure stands of sugar maple. Mortality of trees in all age and size classes is extensive.

In 1977 surveys were carried out in southeastern Ontario under a variety of conditions and in a variety of situations. Ten areas were selected: three bush lots, four rural roadsides, and three urban roadsides. In each instance 100 trees were examined and the crown deterioration class was recorded for each tree (Table 6).

In the Ottawa-Kemptville-Merrickville areas verticillium wilt, *Verticillium dahliae* Kleb., was found and occasional tree mortality was noted. Many trees had light-to-moderate branch dieback, apparently caused by a variety of diseases, namely: a canker *Cytospora chrysosperma* (Pers.) Fr., tip dieback with leaf chlorosis, *Coniothyrium* sp. and a saprophyte, *Steganosporium ovatum* (Pers. ex Mérat) Hughes. These pathogens are generally considered of secondary importance.

Oak Decline

In recent years forest managers and the general public have expressed concern about the apparent decline of red oak in many areas of southern Ontario. Two plots of 100 tagged trees each were established, with prime consideration being given to site and stand history (insect and disease damage, weather, etc.). All trees were tagged and DBH and height were recorded. A dieback classification system rating trees from 1 to 5 depending on the severity of dieback was also used with each tree (Table 7). Decline in tree vigor in these plots will be monitored for five consecutive years.

Drought Damage

Severe drought occurred in an area (including Prince Edward County) from Brockville westerly to the village of Brighton. Early leaf fall was common throughout the affected area. Any permanent damage to affected trees will not be known until 1978 or later.

Ice and Snow Damage

A severe winter storm moving out of the southwest accompanied by gale force winds caused uprooting and breakage of many trees of several species in the southwest part of Prince Edward County, near Sandbanks and Outlet Provincial parks (Fig. 1). The heavy accumulation of snow associated with this storm did not melt in many protected areas until early June.

Figure 1

Snow and ice damage,
Prince Edward County.

Figure 2

Frost damage to hybrid
poplar, Johnson farm,
Brockville District.

Table 6. Summary of maple decline at 10 locations in the Eastern Region in 1977 (based on the examination of 100 sugar maple trees at each location).

Location	Avg DBH (cm)[a]	Crown classification (%)				
		1	2	3	4	5
Tweed District						
Olden Twp	23	76	14	8	2	0
Oso Twp	40	84	16	0	0	0
Palmerston Twp	40	68	16	13	3	0
Brockville District						
Bastard Twp	38	67	20	7	6	0
Bastard Twp	30	69	18	11	2	0
Oxford Twp	20	79	21	0	0	0
Wolford Twp	30	73	22	4	1	0
Lanard District						
Darling Twp	40	77	18	3	2	0
Ottawa District						
Ottawa (city)	25	61	24	11	4	0
Ottawa (city)	50	75	18	6	1	0

[a] 1 cm = 0.39 in.

Note: Maple decline is principally branch mortality. Class 1 is healthy; classes 2, 3 and 4 have more than 20, 40 and 60% of the branches dead, respectively; class 5 is dead.

Frost Damage

In the eastern part of the Region late spring frosts caused considerable damage to new foliage of hybrid poplar and the expanding shoots of conifers at several points in the Brockville and Cornwall districts. Mortality of occasional hybrid poplar was noted at the Johnson farm near North Augusta (Fig. 2).

Table 7. Oak dieback classes for trees at two locations in the Eastern Region in 1977 (100 red oak trees examined at each location).

Location (Twp)	Avg height (m)[a]	Avg DBH (cm)[b]	Dieback class			
			1	2	3	4
Lanark District						
Lavant (Joe Lake)	12	24	46	38	12	4
Lavant (Flower Stn)	14	19	28	60	11	1

[a] 1 m = 3.28 ft

[b] 1 cm = 0.39 in.

Note: Oak decline is principally branch mortality. Class 1 is healthy; classes 2, 3 and 4 have more than 20, 40 and 60% of the branches dead, respectively; class 5 is dead, and trees in this class were not included in the sample.

Salt Damage

Tree damage by salt application on well travelled highways was high, particularly in areas where salt is heavily applied.

Nursery Report

Cylindrocladium root rot, *Cylindrocladium floridanum* Sob. & Seymour, a nursery disease of major importance in the United States and more recently in Ontario, caused appreciable damage to white spruce (*Picea glauca* [Moench] Voss) seedlings at the Kemptville Forest Station. In 1975 culturing from soil samples revealed the presence of this root rot. However, at that time it did not pose a serious problem and a close watch was kept for any undesirable development. In 1977 small patches of 3-0 white spruce seedlings died in compartment 7. It was determined through culturing from suspect material that Cylindrocladium root rot was the principal agent involved. Although control is not advised at present, continued vigilance is planned.

Needle cast fungi, *Lophodermium nitens* Dark., and *L. inastri* (Schrad ex Hook.) Chev., were responsible for the loss of over 700,000 red pine seedlings. Almost the entire supply of 2-0 red pine was lost. White and Scots pine were also lightly infected.

Other diseases causing appreciable damage are listed in tabular form with appropriate comments (Table 8).

Table 8. Miscellaneous disease organisms collected in the Kemptville Forest Station.

Organism	Host(s)	Remarks
Cylindrocarpon radicicola Wr. Root rotting fungus	rP	This root rotting fungus caused moderate needle discoloration on 3-0 seedlings in compartment 8, bud development was poor.
Cylindrosporium sp. Leaf spot	hybrid poplar	leaf chlorosis common on this host in compartment 59.
Cytospora sp. A canker	rO, sM Hon	secondary cankering on branches and stems of several hardwood seedlings in compartment 11
Fusarium sp. Damping off	rP	damping off common in several compartments
Gloeosporium sp. Anthracnose	hybrid poplar	anthracnose common in compartment 54
Leaf scorch	rP	dehydration caused by host in several compartments
Marssonina populi (Lib.) Magn. Leaf spot of poplar	hybrid poplar	Leaf blight caused moderate damage in compartment 56.
Melampsora medusae Thuem. Leaf rust	hybrid poplar	two rows (clone DTAC 1) severely infected; other rows in the same compartment lightly damaged
Multi leaders (cabbage heading)	tL, wS, rP	60% of the tL seedlings malformed by this condition; common on white spruce and red pine

Hybrid Poplar Report

Several disease organisms were identified and the more important appear to be leaf anthracnose (*Marssonina populi* Lib. & Magn.) and leaf rust (*Melampsora medusae* Thuem.). Branch and stem cankers, namely *Dothichiza populea* Sacc. & Briard., *Cytospora chrysosperma* (Pers.) Fr. and *Cytospora* sp., were common at many locations (Table 9). Frost caused light tree mortality on the Johnson farm near North Augusta.

Table 9. Major and miscellaneous disease organisms collected from hybrid poplar in the Eastern Region in 1977.

Organism	Remarks
Chaetophoma sp. Stain	associated with heart stain in lower branches of occasional trees on Johnson farm
Colletotrichum gloeosporioides Penz. Anthracnose	leaf discoloration and twig die-back common in one compartment at nursery
Cylindrosporium sp. Leaf spot	leaf spot disease common in compartment 54 at nursery
Cytospora chrysosperma (Pers.) F. Canker	cankers common on branches and stems of several trees in Augusta and South Plantagenet Township
Cytospora sp. Canker	common on branches in South Nation Conservation Authority Forest in Finch Township
Dothichiza populea Sacc. & Briard. Canker	in some instances moderate amounts of cankering on lower branches; common on Johnson farm and in South Nation Plantation
Gloeosporium sp. Anthracnose	leaf anthracnose common in compartment 59 at nursery
Marssonina populi (Lib.) Magn. Leaf blight	leaf and tip blight common at many points; damage noted on Johnson farm in nursery, and on Bohringer property near Navan

(continued)

Table 9. Major and miscellaneous disease organisms collected from hybrid poplar in the Eastern Region in 1977 (concluded).

Organism	Remarks
Melampsora medusae Thuem. Leaf rust	several rows of DTAC clone heavily infected in nursery; lighter infection on adjacent trees
Melanconium sp. Canker	secondary cankering associated with dead or dying branches
Phlyctaena sp. Leaf spot	leaf spot disease at low levels on Johnson farm

Table 10. Other forest diseases

Organism	Host(s)	Remarks
Ciborinia whetzelii (Seaver) Seaver Ink spot	tA	ink spot common on understory trees near North Augusta
Endocronartium harknessii (J.P. Moore) Y. Hiratsuka Globose gall rust	scP	gall rust common at many points in Brockville and Ottawa districts
Gymnosporangium globosum Farl. Cedar apple rust	rJ	cedar apple rust common in Kingston area and at many points in Prince Edward County
Melampsorella caryophyllacearum Schroet. Witches' broom	bF	occasional witches' broom on scattered trees near Sharbot Lake
Melanconium oblongum = *Melanconis juglandis* (E. & E.) Groves Dieback	Bu	severe branch dieback at many points in Lanark District

(continued)

Table 10. Other forest diseases (concluded)

Organism	Host(s)	Remarks
Phoma infessa Ell. & Ev. Leaf and tip blight	bAs	leaf and tip blight common on roadside trees along Highway 401 near Kingston
Phragmidium rubi-idaei (DC.) Karst. A leaf rust	raspberry	heavy rust infection near North Augusta, Ottawa and Picton
Puccinia caricina (Schum.) Schroet. Leaf rust	goose-berry	rust damage heavy on leaves and fruit along roadsides and in open fields near North Augusta
Sclerophoma pithya (Thuen.) Hochn. Dieback	rJ	associated with severe terminal damage near Picton and Black River, Prince Edward County
Sphaeropsis sp. Canker	eMo	branch and stem cankers causing tree mortality on Kemptville College of Agriculture Technology campus
Therrya fuckelii (Rehm) Kujala Canker	rP	associated with branch dieback; common in pockets of red pine mortality in Limerick Forest
Venturia macularis (Fr.) = Müller & Arx = *Pollaccia radiosa* (Lib.) Bald. & Cif. Shoot blight	tA	shoot blight common on understory trees throughout the Region

EASTERN REGION

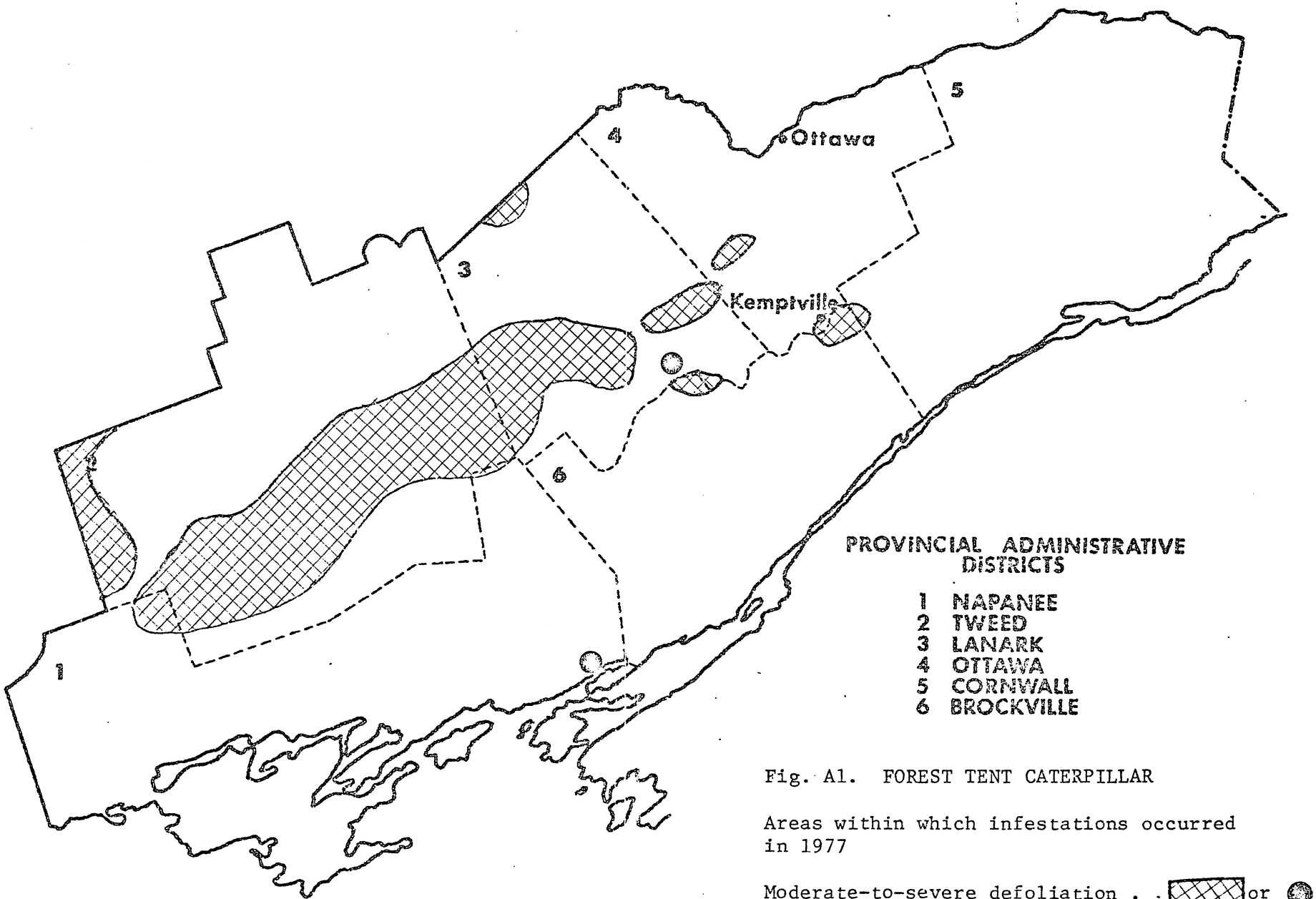

Fig. A1. FOREST TENT CATERPILLAR

Areas within which infestations occurred in 1977

Moderate-to-severe defoliation . . or