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1977

FORESTRY BULLETIN

August - October, 1976

Forest Insect and Disease Conditions in Ontario



Layer of redheaded pine sawfly larvae on the ground at the base of a red pine, killed by Leconte's nuclear polyhedrosis virus.

GREAT LAKES FOREST RESEARCH CENTRE
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This is the third and final bulletin on forest insect and disease conditions in Ontario for the 1976 field season. Collectively these bulletins describe the more important forest pest problems surveyed in the province during the periods (1) May, (2) June-July, and (3) August-October. More detailed regional reports of forest pest surveys are now in preparation for distribution this spring and descriptions of these conditions will eventually appear in published form in the grey-covered annual report of the Forest Insect and Disease Survey in Canada designed more for historical purposes.

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FOREST INSECTS

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

This account assumes knowledge of the extent and location of spruce budworm caused defoliation of balsam and spruce which was described and outlined on a map in the June-July Forestry Bulletin.

Late in the summer and in the fall consultations were held with officials of the Ontario Ministry of Natural Resources to discuss the spruce budworm situation in northwestern Ontario, particularly the strategy of suppression spraying which has been followed in this part of Ontario since 1968. Of special concern was the surging budworm population over a sizeable area outside of the 35,000-ha (87,000-acre) 1976 spray block. Information made available included results of extensive egg surveys, maps showing areas with moderate or severe budworm feeding based on intensive aerial surveys, evaluations of spraying results and analyses of population trends. When all aspects of the situation had been considered, the Ministry decided that no major spraying operation would be carried out in northwestern Ontario in 1977.

In September, Survey personnel and others at the Centre were requested to investigate the amount of sap rot in dead balsam that was being considered for cutting on the Shining Tree Management Unit, Gogama District. Dead balsam trees were found to be surprisingly free of sap rot compared to those associated with an earlier spruce budworm outbreak (1940s) in the Lake Nipigon area of northern Ontario. Differences were thought to be the result of extremely low numbers of balsam fir bark beetles, *Pityokteines sparsus*, in the Shining Tree Management Unit, in comparison with those present during the earlier Nipigon outbreak, when virtually every dead balsam showed evidence of attack. The bark beetle was also found to be rare in other parts of northeastern Ontario where balsam trees are dying. There would seem, therefore, to be an opportunity to cut dead balsam for the next few years at least, and operations are proceeding at Shining Tree. More recently a map showing the areas of spruce budworm associated tree mortality in northeastern Ontario has been prepared. Different colors are used to indicate, by year, the areas in which mortality was first detected since 1972.

Preliminary infestation forecasts for 1977 for southern and northeastern Ontario, based on an extensive egg-mass survey, are as follows.

Egg-mass counts show that, for southern Ontario, densities have declined over all by about 36%. This is the third consecutive decline in egg-mass counts since populations reached a peak in 1973. The average egg-mass count is now 128 egg masses per 9.29 m² (100 sq. ft) of foliage. Significant increases were recorded for Bracebridge and Parry Sound districts. In view of the decreases that have occurred, it seems likely that defoliation will be confined to numerous small pockets totalling a few hundred thousand hectares in 1977.

Egg-mass densities have declined by about 16% over all for northeastern Ontario in 1976. The average egg-mass count is 370 per 9.29 m² (100 sq. ft) of foliage. Increases were recorded in the districts of Kirkland Lake, Cochrane, Timmins and Temagami whereas decreases occurred in all other districts. It is expected that some expansion will occur along the northern and northwestern boundaries of the outbreak.

More detailed forecasts will appear later in a report on the status of spruce budworm in Ontario in 1976.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

In addition to the information concerning this pest in the June-July issue of the Forestry Bulletin, forecasts for 1977 infestation intensities based on counts of overwintering egg masses are now available. Generalized forecasts by region are as follows:

Northwestern: Heavy infestation is expected to cover the same parts of the Red Lake, Kenora and Dryden districts as were infested in 1976 as well as adjacent areas east of the 1976 infestation boundaries (i.e., around Ear Falls and between the towns of Dryden and Sioux Lookout).

North Central: Defoliation of aspen can be expected around the town of Atikokan (as in 1976), in a few areas west of Thunder Bay, and in the Pagwachuan River area of the Geraldton District.

Northern: Aspen is expected to be stripped of foliage over a large part of the Hearst and Kapuskasing districts. Infestations are expected to continue in the Moosonee District and to expand for 104 km (65 miles) or more east of the 1976 infestation boundaries. Numbers have declined in the Kirkland Lake District.

Northeastern: Moderate-to-severe infestations can be expected again in parts of the Espanola and Sudbury districts but populations declined in the North Bay District. Scattered pockets of light or moderate feeding damage are expected in the Sault Ste. Marie and Blind River districts, and defoliation will again be severe on St. Joseph Island.

Algonquin: Widespread infestations are evident on maple and aspen in the Parry Sound, Bracebridge and Minden districts with patches of light and moderate defoliation in the Bancroft District.

Eastern: Parts of the Tweed and Lanark districts that were infested in 1976 are expected again to show moderate-to-severe feeding damage, with infestation spilling over into surrounding areas.

Central: Infestations are expected to continue on sugar maple in the northern part of the Huronia District and on aspen in the northern part of the Lindsay District.

Southwestern: The potential exists for defoliation similar in intensity to that of 1976 in many maple woodlots in the Owen Sound and Wingham districts.

Redheaded Pine Sawfly, *Neodiprion lecontei* (Fitch)

This chronic pest of red pine again proved troublesome in parts of the Northeastern, Algonquin, Central and Eastern regions. In general, control using chemical insecticide was successful when sprays were properly timed, and in some instances Survey field technicians assisted in timing spray applications.

The Insect Pathology Research Institute in Sault Ste. Marie has developed the use of a naturally occurring virus against this sawfly and reports excellent knock-down of larvae (see cover). It is hoped that one or more experimental trials can be carried out in cooperation with the Ontario Ministry of Natural Resources in 1977 to ascertain the practical value of sprays containing Leconte's virus in managing the redheaded pine sawfly. Some obvious advantages are inherent in the use of biological insecticide materials.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.)

The amount of spruce defoliation caused by this sawfly in the Northern Region over the past 3 years, and the number of young white and black spruce trees killed, confirm that it demands greater attention as a plantation pest than it has heretofore received. Again in 1976, defoliation was especially heavy on snow hedges, ornamental spruces, natural regeneration and spruce plantations in parts of the Hearst, Kapuskasing, Cochrane, Timmins and Kirkland Lake districts. More planted spruce were killed along highways 11 and 101 as well as near Englehart, Charlton and New Liskeard. Infestations were reported on ornamentals in the town of Biscotasing in the Chapleau District, and in several areas in the North Bay and Sudbury districts. Damage was much more prevalent than usual in the Algonquin Region but rarely was defoliation of more than moderate intensity.

Fall Webworm, *Hyphantria cunea* Dru.

Unsightly webbing and defoliation of black and white ash, white elm, Manitoba and red maple, black walnut, basswood and other deciduous hosts were reported in late summer from the Pembroke, Parry Sound and Bracebridge districts in the Algonquin Region; from Aylmer, Chatham, Huronia and Lindsay districts in the Southwestern and Central regions; and from the Lanark, Brockville, Ottawa and Cornwall districts in the Eastern Region. The insect again caused unsightly damage at Beauceage Point west of North Bay.

Greenstriped Mapleworm, *Dryocampa rubicunda rubicunda* Fr.

This pest which for several years has been defoliating some stands of red and sugar maple in central Ontario reversed the trend in 1976 and declined markedly in numbers. The only infestations of note were in Carnarvon Township on Manitoulin Island and in Jocelyn Township in the Sault Ste. Marie District.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Damage to the leading shoots of jack pine was more frequent than usual in the Northwestern Region, especially in the districts of Red Lake, Ignace, and Dryden. Damage was also evident in the Chapleau and Gogama districts of the Northern Region where in one plantation the proportion of jack pine trees with damaged leaders was as high as 21%. Increased incidences of attack were also recorded on white, jack and Scots pine in various plantations of the Central Region. In the Southwestern Region, damage levels on white pine remained much the same as in the past.

Oak Leafmining Sawfly, *Profenusa lucifex* Ross

Severe browning of red and white oak foliage occurred late in the summer near Kingston, around Gananoque and along the Thousand Island Parkway in the Eastern Region, and in parts of the Central Region. Heavy infestation occurred through an area of approximately 6,000 ha (15,000 acres) south of Rice Lake in the Lindsay District and in pockets in parts of the Maple, Huronia and Niagara districts.

Saratoga Spittlebug, *Aphrophora saratogensis* (Fitch)

Serious damage to plantations of red pine in the form of branch and top mortality in parts of the Pembroke District in 1974 and 1975 was confirmed to be the result of feeding by Saratoga spittlebugs. It is the adult spittlebug that causes damage to red pine by puncturing and feeding beneath the bark of year-old shoots. Based on the number of eggs present on the pines and numbers of young spittlebug nymphs feeding on silvery cinquefoil, *Potentilla argentea* L., following the hatching of eggs in May, 1976, damage was expected to be heavy again. Of 13 plantations showing evidence of previous damage south and southwest

of Pembroke six were scheduled for treatment by the Ontario Ministry of Natural Resources. Spraying was done in July after the nymphs had completed feeding on sweetfern and after all the adults had emerged.

Malathion was applied to these plantations on July 22 using a Piper Super Cub equipped with boom and nozzles at a rate of 0.96 kg A.I. per ha ($\frac{1}{2}$ lb per acre) based on the reported success of this concentration in operation spraying in the United States. Untreated private plantations were used as checks, and the spraying was considered highly successful.

The Unit is continuing to work closely with forest managers on this unusual problem but it is evident that cooperative efforts over the past year have brought a solution within easy reach.

Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex

Infestations of this sawfly were reported on jack pine at scattered locations in the Atikokan, Thunder Bay, Geraldton and White River districts of the North Central Region and in the Chapleau, Hearst, Timmins and Kirkland Lake districts of the Northern Region. Usually the defoliation caused by the sawfly is insufficiently severe or persistent to cause tree mortality but defoliated stands appear ragged and unhealthy.

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

Scattered defoliation of walnut trees was observed in the Cambridge-Brantford area in the Central Region and in Stanley and Stephens townships in the Wingham District of the Southwestern Region.

Aspen Blotch Miner, *Lithocolletis ontario* Free.

Severe browning of trembling aspen foliage was reported from the Sioux Lookout and Ignace districts in the Northwestern Region and in Blind River District in the Northeastern Region. In most instances it was regeneration aspen that came under attack.

Mountain Ash Sawfly, *Pristiphora geniculata* (Htg.)

Severe defoliation of mountain ash trees was common through central and northern Ontario from Thunder Bay east to the Quebec border and north into the Kapuskasing District. Mountain ash ornamentals and highway plantings were heavily defoliated at several locations in the Southwestern Region.

TREE DISEASES

Leaf Spot of Balsam Poplar, *Septoria populicola* Pk.

This disease of balsam poplar was evident in the Eastern Region where affected foliage had dropped by late August or early September. Diseased trees looked "unusual" with the few leaves remaining confined to the tips of the branches. North and west of the Eastern Region defoliation levels tapered off but individual trees were noticeably affected in the Bancroft and Minden districts of the Algonquin Region.

Leaf Anthracnose of Hardwoods

Leaf anthracnose, as the term is used here, is a general condition characterized by browning of the foliage, usually along the margins of the leaves.

Leaf anthracnose was much more prevalent in southern Ontario than usual, possibly as the result of abnormally high infection brought on by the unusually wet summer weather. The disease on sugar maple, caused by *Kabatella apocrypta* (Ell. & Everh.) Arx, was most prevalent in the Niagara, Cambridge and South Huronia districts. It was also common in the Central Region and in the South-western Region where it caused noticeable damage in parts of the Owen Sound, Wingham and Aylmer districts. The condition created much public concern in urban areas. Damage by *Marssonina juglandis* (Lib.) Magn. was also obvious on the foliage of butternut and walnut in the Eastern Region.

Single-tree Mortality of Balsam Fir

A condition characterized by the appearance of scattered, individual, dead balsam trees in midsummer was observed again in the North Central and Northeastern regions. At one study area on the Caramat Road in the Geraldton District, approximately 4% of the mature or overmature balsam fir died in 1976. The cumulative mortality in this stand since 1970 has reached 17%. In the Blind River District of the Northeastern Region, a high incidence of mortality was reported along the Mississagi River from Lafoe Creek to Aubrey Falls but the condition was observed elsewhere as well.

Nursery Root Rot Disease, *Cylindrocladium floridanum*

A summer survey of northern Ontario nurseries which was carried out using a bioassay method to determine presence of the causal organism in soil samples systematically selected from northern Ontario nurseries resulted in no positive cultures. Samples submitted by the Forest Station at Thunder Bay did contain *C. floridanum*. The disease has now been recorded at St. Williams, Orono, Kemptville, Midhurst, Kirkwood and Thunder Bay.

Snow Mold

The cause of a serious snow mold problem on nursery stock at the Dryden Forest Station was tentatively identified as *Lophophacidium hyperboreum* Lagerberg.

Drought

Various types of drought symptoms were evident through northern Ontario in 1976. In the Northwestern Region, mortality of pines, which had already started in stands on shallow soils in 1974 and 1975, became more extensive and severe in 1976. Damage also took the form of top-killing and discolored foliage of jack pine, red pine and to a lesser degree white pine. Areas affected included high rocky sites in part of the Fort Frances District and on a group of islands in Lake of the Woods in the Kenora District.

Other symptoms of drought such as the premature yellowing and shedding of birch and aspen foliage became prevalent late in the growing season elsewhere in northern Ontario. In parts of the Chapleau District, some planted jack pine also showed the effects of drought.

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January 31, 1977