

## PROVINCE OF QUEBEC

### FOREST INSECT SURVEY

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#### INTRODUCTION

Again in 1956 the Provincial Bureau of Entomology conducted the forest insect survey work in the Province in general, while the Forest Biology Laboratory carried out intensive surveys of the spruce budworm in eastern Quebec and of the jack-pine sawflies in the various regions where this tree species is prevalent. This report summarizes the observations made on these two insects as well as on the European spruce sawfly and the European pine shoot moth, two species of particular interest to the research program of this laboratory.

#### IMPORTANT INSECTS

**Spruce Budworm, *Choristoneura fumiferana* (Clem.).**—The severe outbreak continued in Quebec during the summer of 1956. The spruce budworm remained an acute problem in the lower St. Lawrence and Gaspé regions, the only areas where intensive budworm survey work was conducted during the summer. Aerial survey records, supplemented by ground observations at approximately 400 locations along accessible roads, form the basis for this report. The area sprayed in 1956 was approximately one half of that sprayed in 1955 and totalled 450,000 acres distributed between Rimouski-Mitis, Matapédia, Matane, and Chaleurs Bay districts where balsam fir mortality was imminent.

Spring emergence was delayed by approximately two weeks, due to adverse weather conditions which continued to be detrimental to the insect through the rest of its development. As a result, egg deposition took place unusually late. On the other hand, the extremely abundant production of flowers on balsam fir trees provided the young larvae with an ample food supply and enabled them to survive the critical period before the opening of the buds. This may explain why the insect population was generally higher in 1956 than in 1955. The infestations are illustrated on the accompanying map which concerns only the eastern Quebec regions.

Aside from the sprayed areas, only one stretch of forest land in Gaspé North County, north of the Shickshocks, now remains lightly infested. In the sprayed areas, there were variations in the degree of infestation, depending upon the year of spraying. With the exception of a small patch of "severe" in the Patapédia watershed, infestation conditions varied between light and moderate in areas sprayed in 1954, whereas they were generally light in the areas treated in 1955. The 1956 spraying operations saved some 50 per cent of the current year's foliage.

In the remaining balsam fir stands of eastern Quebec, the infestation varied from moderate to severe with highest concentrations in Bonaventure and Gaspé South counties. In some sectors severe back feeding occurred.

The center of infestation reported for the Lake St. John Region in 1955, remained active and increased in area. Information received from the North Shore Region indicated that the centers reported in 1954 and 1955 extended so



that large areas of the Laval, Bersimis and Papinachois watersheds were involved. Reports of an upsurge of the spruce budworm around previous infestation centers in the Batisan and Eagle watersheds were also received.

Sampling revealed that egg deposition was extremely high this year, although occurring relatively late in the season. At higher elevations many egg masses were still unhatched in mid-September. It is not expected that these eggs will survive the winter.

The egg-mass survey indicates that the strip in Gaspé North County mentioned above, will be lightly infested again in 1957. This is also true for the sprayed areas around Matane. On the contrary, areas sprayed in 1954 in the Rimouski-Mitis and Matapédia regions will probably be heavily infested in 1957. The areas treated in 1955 in the same regions and the Chaleurs Bay Region will have infestations varying from moderate to severe. In all areas reported as moderately and severely infested in 1956, high population levels are expected in 1957.

**Jack-pine Sawfly, *Neodiprion swainei* (Midd.).**—In 1956, special attention was given to the jack-pine sawfly in central Quebec. In addition to the territory covered in 1955, sampling was extended to the Lake St. John and Saguenay areas. Sample plots were established in 22 representative stands, in order to follow the progress of the outbreak. In each plot, 25 jack pine trees were tagged, described, and the defoliation estimated. Cocoon and egg counts were also made in each area. Similar records were taken in 175 additional temporary stations in co-operation with limit holders.

According to observations made in the field, the general decline in sawfly population levels noted last year was even more apparent in 1956. Centers of active infestation are now restricted to relatively small areas as indicated on the accompanying map. The most important points of infestation west of the St. Maurice River were located north of Manouane Lake and in Gosselin, Dupuis, and Livernois townships. In the Lake St. John area, small patches of infestation were located only in Deschene and Tremblay townships.

Adverse climatic conditions in the spring and early summer greatly retarded larval developments of the insect, so that large numbers of feeding larvae were killed by early fall frosts. This will undoubtedly result in a further reduction in population levels in 1957.

Among the parasites recovered from rearings, two species were *Perilampus hyalinus* Say and *Dahlbominus fuscipennis* (Zett.). The latter species, which is an imported cocoon parasite of the European spruce sawfly, had been obtained in 1954 and 1955.

**European Spruce Sawfly, *Diprion hercyniae* (Htg.).**—According to sampling performed in 1956, the population level of this insect was more uniform than in previous years. Larvae were easily collected although in relatively small numbers from nearly all spruce stands sampled within a 100-mile radius of Quebec City.

The infested plantation near Lake Mégantic, mentioned in the 1955 Report, was sampled again in 1956. There was evidence of a slight decrease in the population level and of less variation in numbers from one tree to another. A plantation near Trois-Rivières was infested in 1956. Natural stands containing considerable numbers of spruce sawfly larvae were located at St. Nicholas, Ste. Agathe, and St. Sylvestre in Lévis and Lotbinière counties.



Larval mortality from disease was observed in the field again in 1956. In laboratory rearings, disease mortality was lower than in 1955 but parasitism increased. The parasites recovered were all dipterous.

**European Pine Shoot Moth, *Rhyacionia buoliana* (Schiff.).**—General scouting for this pest, which was reported in Quebec City for the first time in 1954, was conducted in the main cities of the Province. Infested Mugho pines were found only in Granby and Quebec.

Observations at Quebec City showed that more than 70 per cent of the overwintering larvae were killed and that during the summer about 25 per cent of the remainder were destroyed by parasites. Much reduced population levels are expected in 1957.







