



STATUS OF THE SPRUCE BUDMOTH
on the
PRICE BROTHERS SOUTH KENOGAMI LIMITS
(1955)

by

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PRICE BROTHERS' SOUTH KENOGAMI LIMITS

The Price Brothers' South Kenogami Limits are part of a large tract of forest which has been severely hit by the spruce budworm. These limits located in the saguenay region comprise: the forested area extending south from Lake Kenogami to the height of lands in the Laurentians. The vegetation is typical of the boreal forest, i.e. spruce fir stands often mixed with birch or poplar. Large portions of these limits have apparently been dirturbed by cutting operations in recent years, while other areas support very fine spruce fir stands still available to the forest industry.

SPRUCE BUDWORM HISTORY

Our knowledge is quite restricted as to the infestations caused by the spruce budworm, in the area concerned, prior to the Forest Insect Survey. A few references to this region were made by Swaine and Craighead, in their report on the last outbreak which swept the Province from 1909 to 1923. (Bull. 34, New-series-technical, Can. Dept. Agr., 1924) These authors mention in their report that the "earliest record concerning an outbreak in the Saguenay watershed based on ring counts, indicates that the infestation occurred in Lake Manouan on the headwaters of the Shipshaw River in 1909. By the following year it had spread south across the entire country as far as the St. Lawrence River." Intensive studies were conducted in the following years to try and find out whether bud-

worm injuries vary with types of stands. A portion of this work was done in the Kenogami area. It was found that in mature stands the percentage of dead balsam varied from 75 to 90 per cent. By comparison, it was found that in second growth forest, i.e. 50 to 75 years of age, only 15 per cent of the trees had been killed though apparently defoliated to the same degree. It was concluded then that younger trees have more resistance to the damaging effects of spruce budworm attack.

PRESSENT BUDWORM OUTBREAK

The information at hand, regarding the present budworm outbreak is probably more complete than the earlier records referred to above. General records have been accumulated on this insect in this region by the Forest Insect Survey since 1939. In addition to this, an egg-mass and defoliation survey was carried out by Price Brothers' personnel in late summer 1955. There are in addition data collected during an aerial reconnaissance conducted over the same territory in early fall, by the Laboratory of Forest Zoology in cooperation with the Provincial Bureau of Entomology.

During the first year of operation of the Forest Insect Survey only a few budworm larvae were received from the South Kenogami area. The same was recorded up to the year 1946, when population of this insect started to increase. The infestation reached its peak in 1950. As a result, dead balsam tops were quite common in severely infested stands, in the fall of the same year, and a few trees died. In 1951 the insect population remained at a high level and tree mortality increased.

For some unexplained reason the situation changed abruptly in 1952 and the spruce budworm became extremely scarce even in stands where it had been abundant the preceding year. In 1953 the insect population increased very slightly and by the end of 1954 it had approximately reached the 1948 level. The accompanying map shows the conditions as they appeared from the air at the end of October 1955.

To facilitate the discussion of this map, it was deemed advisable to divide the territory into a northern and southern section, with the 48th parallel as the dividing line. The northern portion contains those areas of heaviest attack of which two are of special significance. The first of these centers about the Belle River, and the second occurs on the western slope of the Cyrias River. Adjacent to the latter on its western side, is a patch of moderate infestation, which covers the headwaters of Pika and Morin rivers. This patch also extends to the southern section of the limits and includes the upper Des Canots River. The region included between these two main infested areas that is, the Lower Des Escores and Lower Pikauba watersheds, was the only one to be classified as lightly infested. The variation in intensity of budworm infestation in the northern section, could perhaps be explained by differences in stand composition, or past cutting operations.

In the southern section of the limits, most of the stands have been classified as lightly infested. Aside from the area of moderate infestation referred to above, only two relatively small patches of severe infestation, have been located. The first one centers on the western slope of Des Escores River, the second on Cyrias watershed. Throughout

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this region however, there is scattered an abundance of dead balsam trees, killed by the spruce budworm at the peak of the infestation, around 1950.

Defoliation records collected during the egg-mass and defoliation survey conducted by the company's personnel are in complete agreement with the observations made from the air. They indicate that, in the northern section, balsam trees show the equivalent of 2.5 years of severe defoliation with an average of 75 per cent defoliation on the current year's growth. In the southern section, only one year of severe defoliation, has been recorded, with an average of 13 per cent defoliation of the current year's foliage.

The egg-mass counts were used to determine the probable magnitude of the budworm population likely to occur in 1956. The material and the records collected by Price Brothers', in relation with this survey, were sent to the Forest Zoology Laboratory for revision. The only change made, consisted in a reclassification of the sampling stations on a new basis, i.e. the average number of egg-masses per foliage unit (100 sq.ft.) for each tree sampled at every station. The reclassification was made according to the following:

<u>Classes</u>	Number of egg-masses per 100 sq. feet of foliage
Light	0 - 99
Moderate	100 - 199
Severe	200 & plus

A total of 36 locations were sampled, 17 in the northern section and 19 in the southern section of the limits; all of these are represented

by a circle on the infestation map. Out of the 17 stations of the northern section, 15 were classified as severe, one as moderate, and one as light. The average number of egg-masses per 100 sq. feet of foliage was figured at 631, with a maximum of 2,520. It is also worthy of mention that 85 per cent of the trees sampled, yielded enough egg-masses to cause a severe defoliation of the 1956 growth. Of the 19 locations sampled in the southern section, 14 fell into the light category and 5 into the severe group. The number of egg-masses per foliage unit, averaged 168 and the maximum number found was 1208. In addition the proportion of the trees sampled which bore enough population to cause a severe defoliation on the 1956 growth, was figured at only 17.2 per cent.

SUMMARY AND CONCLUSION

Balsam fir stands of the Price Brothers' South Kenogami Limits suffered important defoliation by the spruce budworm, both during the 1909 to 1923 and 1939 outbreak. Records concerning the earlier epidemic are rather scanty, but relatively abundant data have been secured on budworm activities during the present outbreak. Defoliation was particularly severe on this territory from 1947 to 1951. At that time budworm attacks were especially serious in the southern half of the limits where a certain proportion of the balsam fir trees died.

During the two following years, however, there occurred an important reduction in the budworm population. The insect has made important gains since that time however so that it now constitutes a menace to balsam fir stands located in the northern section of the limits.

Balsam trees have already suffered over two years of severe defoliation and on the basis of egg counts, it is expected that the 1956 growth will also be destroyed.

In the southern section the situation is less alarming, for the present, at least, even if a proportion of the trees died at the peak of the infestation. Surviving balsam firs have not been seriously defoliated in recent years and according to the sampling records defoliation should be light again in 1956. Nevertheless it should be kept in mind that the insect is still present in this section and that it may eventually develop into destructive numbers.

Quebec, January 31, 1956.