

by R. W. Reid²

Background: Studies on forest insects commenced in the Alberta/Territories region with the transfer of G. R. Hopping from the Vernon laboratory to Calgary in 1948. He was to organize a forest insect laboratory and act as its officer-in-charge. The insect of primary interest at that time was the lodgepole pine needleminer. It was in epidemic proportion over wide areas in the Banff, Jasper, and Yoho National Parks. R. W. Stark was assigned to that problem in the spring of 1948 (A/T 242). In that same spring W. C. McGuffin was transferred from Ottawa to Calgary to organize an insect survey. McGuffin's personal research was concentrated on the taxonomy of the moth family, Geometridae.

A few years prior to 1948 there had been devastating outbreaks of the mountain pine bark beetle on lodgepole pine in Kootenay National Park. Outbreaks of less severity but still damaging occurred in Banff and Yoho National Parks.

During the early 1950's staff expansions permitted increased attention to forest insect pests. The needleminer project was strengthened for several years by addition of two new research officers. Short-term studies were initiated on the two-year cycle budworm in the mountain regions,

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1. Background paper for discussion on "Forest Protection Research" at program co-ordination meeting, Winnipeg, November 6-8/67.
 2. Head, Entomology & Pathology Section, Alberta/Territories Region.

and on bark beetles infesting lodgepole pine logging slash. During this period, work was commenced on the identification and life histories of Adelgid aphids in Alberta (A/T 238). Investigations were completed early in the 1960's and information from these studies has been published.

In 1960 intensive studies were commenced on a pine root weevil (Hylobius). The objectives of that study (A/T 244) have been mainly satisfied and the work will be phased out this year. Studies on the lodgepole pine needleminer were terminated in 1966. Results from both studies are currently being analysed and prepared for publication.

Current problems and program:

a. Bark beetles. Bark beetles are the major forest insect pest to forests in western North America. We are still unable to predict with adequate precision the location and time of outbreaks of these insects. Three general areas of investigation are being pursued.

- i) Behaviour, fecundity, and survival of populations in relation to environmental stress (A.T 245).
- ii) Measurement of populations and relation of these to environmental factors (A/T 246).
- iii) Recognition of factors in the host tree relating to its resistance or lack of resistance (A/T 252).

Project A/T 252 is integrated with studies on blue-stain fungi (A/T 229) and tree physiology (A/T 253) and E.M.R. F-22 (Univ. of Calgary).

b. Hylobius root weevil (A/T 244). This weevil is causing some damage to stands of young lodgepole pine. Damage is evidenced mainly by reduction in radial increment, growth in lateral branches and terminals. Studies on the biology and behaviour have been carried to a satisfactory level of completeness. Pilot control programs of a silvicultural type are planned. An extensive survey to ascertain the distribution and density of the weevil in Alberta was conducted during 1967.

c. Forest tent caterpillar (A/T 257). When this insect occurs in high numbers it may completely defoliate its host tree, aspen. Because aspen thus far has not been greatly utilized commercially, outbreaks of this insect have been only of academic interest and of nuisance value. The Forest Insect and Disease Survey have kept the insect under close surveillance for many years and have much information of an epidemiological nature on hand. Because of increased interest in aspen as an economic tree species, existing data are being summarized and intensive investigations were carried out this year to reduce gaps in our knowledge.

d. Taxonomy of Scolytidae. Considerable work has been done on the taxonomy of bark beetles at this laboratory by G. R. Hopping. A portion of the work is being continued, utilizing cytological and breeding characteristics between species of the genus *Ips*. (Proposed project 1967 - Lanier).

e. Spruce budworm (A/T 255). This insect has been a perennial pest on hitherto inaccessible white spruce in northern Alberta and the Northwest Territories. The Forest Insect and Disease Survey have the major areas of infestation under close observation. Recent surveys show that both mortality and growth loss are occurring in some stands of mature trees. Several of these stands are soon to be accessible by road and have become important in local management planning. Studies on the insect biology, distribution, and impact on the host tree were expanded in 1967 and it is expected the work will be further upgraded in 1968.

f. Biology and control of wood borers. Information related to protection of stored or decked logs is needed. Requests for information on that subject are common. Little is known of the wood borer complex in Alberta, their larval forms, life histories or damage potential. Preliminary studies to satisfy these questions were commenced in 1967. (Proposed project - Raske).

Proposed New Work:

Major changes of work emphasis for 1968 are still very much in discussion and planning stages. Inherent in planning for 1968 and later will be a realignment of work programs, with added emphasis on practical solutions to regional forestry problems. The work program in

1968 and later will undoubtedly demonstrate multi-disciplinary problem analyses and multi-disciplinary work toward solutions to problems. Initial planning for 1968 recognize the following problems for early attention.

a. Damage and loss to seed and seedlings. A program of continuing studies is anticipated to ensure that damage can be kept within practical limits. Current knowledge of the range and extent of damage and loss is fragmentary, hence surveys will form the early part of the program. The strawberry root weevil and spruce bud midge will likely receive early attention.

b. Damage and mortality from the spruce budworm. The significance of losses from this insect remains to be established in consultation with the provincial and territorial forest services and with industrial companies, but it is expected that an expanded program of research and surveys will be needed in 1968. Initial requirements are for studies of the biology of the insect, host response, and impact. Exploratory work is also needed on possibilities for chemical and biological control.

c. Damage from the lodgepole pine root weevil. A pilot control experiment is planned as the culmination of earlier research and surveys. Depending on the date of completion and results of intensive sampling in 1967, the control experiment will be launched in 1968 or 1969.

d. Damage to aspen and poplar. An assessment of losses from insects in aspen and poplar will be part of a major program of research and surveys, the object of which is the demonstration of possibilities for greatly increased use of aspen and poplar. Work on the significance of insects to the growing of aspen and poplar will likely result in a continuing program of studies for one or more forest entomologists. The work, although at a very preliminary stage of planning, will be integrated with work already projected in silviculture, tree biology, pathology, and products working groups in the region.

October, 1967.