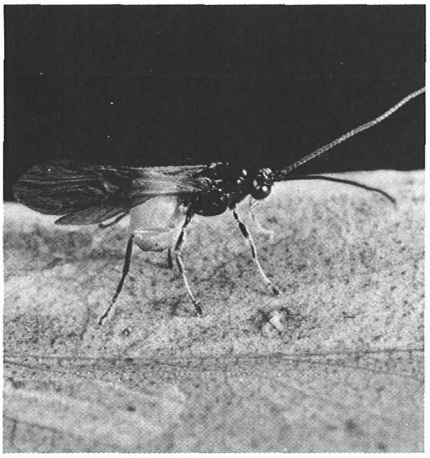
TECHNICAL NOTES

The present status of *Eucalyptus* leaf-mining sawfly *(Phylacteopha froggatti)* and its control

W. Faulds

The *Eucalyptus* leaf-mining sawfly *Phylacteophaga froggatti* Riek was first discovered in New Zealand in 1985 and is now established in most of the North Island north of a line from New Plymouth to Hastings. South of this there are isolated populations in Palmerston North, Wanganui, Hawera and some other localities. In the South Island the sawfly was found in Picton in 1991 and Christchurch in 1992. Establishment of this insect in the South Island and the isolated North Island localities would have been either by the transport of infested trees into these areas in breach of the Forest Disease Control Regulations or by adult insects carried on or in motor vehicles.



***Bracon phylacteophagus* oviposting into sawfly mine.**

Bracon phylacteophagus Austin, a parasitic wasp imported from Australia as a biocontrol agent of the sawfly, was first released in New Zealand in 1988. The female parasite probes into the sawfly mine with its ovipositor, stings the sawfly larva to paralyse it, and then lays an egg within the mine close to the paralysed larva. When the egg hatches, the first instar larva moves onto and feeds on the host larva. From oviposition to emergence of the new parasite adult can take as little as 15 days in warm temperatures.

The parasite has now spread throughout the main sawfly-infested area and has been found in Hawera. It has also been released and is established in Palmerston North, Picton and Christchurch. This parasite is proving to be a very effective control. Parasitism rates of more than 95% are normal. Wherever *B. phylacteophagus* has been established for more than one season sawfly populations are extremely low and further southward spread of the pest from the main infestation is now restrained. When the biocontrol agent has been released soon after the establishment of sawfly in an area (e.g. Picton and Christchurch), sawfly numbers have remained low, never reaching pest status.

However, even where the parasite has been established more than two years, newly planted areas are still sometimes severely damaged by sawfly in the first summer after planting. This could be because the parasite has reduced sawfly numbers, and consequently its own numbers, to such a low level that when sawfly moves onto trees in these areas there is a delay before the parasite catches up. At least two species of hyperparasites have adapted to use *B. phylacteophagus* as a host, but because of the very low incidence of hyperparasitism it is of no consequence.

Sawfly infestations in new areas well south of the main infestation can be expected in future due to accidental transport of the pest into these areas. If newly infested areas are too geographically isolated for the parasite to spread into naturally, parasites will have to be released there.

Barron Road Syndrome

M.K. Kay

Barron Road Syndrome is so called because it was first studied at Barron Rd, Kinleith Forest. Its main symptoms are the premature abscission of new foliage of *Eucalyptus regnans*. It is most noticeable when the upper crown of infected trees becomes devoid of foliage while the lower canopy retains older foliage from the previous season. On close inspection emerging leaves exhibit small necrotic spots, and stems and petioles may be roughened by galling. Older, retained leaves may also be distorted and roughened by galling and often show extensive leaf-spotting. Other eucalypt species may exhibit some of these symptoms but generally retain their foliage.

During the warm wet 1989/90 season BRS was reported from Northland to Hokitika. As a number of causal agents could have been responsible, plots were established to test a range of broad-spectrum biocides in Kinleith and Tasman Forests.

Three biocides – a miticide, an insecticide and a fungicide – were separately applied to young, healthy *E. regnans* which were planted amongst badly affected trees. An insecticide/fungicide mix formed a fourth treatment. Plots were established at four sites and biocide applications (four treatments plus an unsprayed control, four replicates/treatment/site) were made at three weekly intervals from December 1990 until May 1991. Tree heights were measured, and subjective health observations made monthly.

By March 1991 it was apparent that the fungicide and fungicide/insecticide treatments were having a positive effect on tree health and growth. Trees in plots given these treatments showed very little shoot galling or defoliation. Low levels of a number of common leaf spot fungi were recorded on the fungicide sprayed trees. Trees in the miticide, insecticide and control plots developed the typical BRS "stalky" tops and showed extensive leaf-spotting. By the end of May, when spray applications ceased, the difference between the fungicide treatment and the other treatments was even more marked. Trees in the fungicide treated plots were almost free of spots, lesions and galls, in addition to showing superior height growth.

The results from these trials indicate that BRS is caused by a fungal agent/s and can be controlled by repeated applications of a broad spectrum fungicide throughout the growing season. Unfortunately this is unlikely to be a practical option for plantation forestry and efforts are being made to identify the causal agent or agents and to determine if there are any *E. regnans* families which are resistant to the disorder.