

NOTES

CICADA DAMAGE IN AN INDIGENOUS FOREST

During an inspection of Atuanui State Forest some 16 miles north-east of Kaukapakapa, North Auckland, fairly severe cicada damage was noted about the margin and along the edge of clearings within the forest. This damage is caused by oviposition in both leading and lateral shoots, and is characterised by an elongated wound extending 1 to 2 inches along the axis of the shoot. Within the raised bark borderings the wound is a very distinctive series of closely spaced V-shaped incisions in the wood, giving a "herring-bone" pattern easily recognised in the field.

The result of these attacks may be merely a raised gall-like welt where the wound has been occluded ; where the process is incomplete there are often projecting tufts of wood of the typical pattern raised by insertion of the ovipositor. But frequently the branch or leader is so weakened that it falls of its own weight.

The first specimen noticed showing cicada attack was a shrubby manuka (*Leptospermum scoparium*) some six feet high. Half a dozen of the outer branches were hanging dead for 12 or 15 inches from the tip ; in diameter they ranged from $\frac{1}{4}$ to $\frac{3}{8}$ inch. Closer examination revealed numerous branches which had been attacked previously, often without causing breakage. It is noteworthy that an adjacent kanuka (*L. ericoides*) of similar size and growing under the same conditions had suffered no attack.

Along both the eastern and western margins of the forest manuka was similarly affected, the dead tips being quite conspicuous from a distance. What is more important, however, was the fact that rimu, miro, kahikatea and totara regeneration from one to six feet high had also been damaged. In one locality on the eastern boundary, where young rimu were fairly abundant beneath a rather open stand of manuka 15 feet high, nearly every seedling was damaged. Here some of the rimu leaders had fallen over at points 8 to 12 inches from the tip, and some were turning upwards again.

Closer study of the wounds showed that insertion of the ovipositor raised the bark and wood beneath. The small tunnel so made was approximately $\frac{1}{4}$ inch deep and penetrated the branch obliquely. In each tunnel 2 to 4 cigar-shaped white eggs were found. In some instances only one egg had developed and was larger than normal, while the others were shrunken and blackish. Microscopic examination showed this dark colour to be due to a fungus.

Associated with the egg channels in one manuka specimen were small bluish-black springtails (Collembola) about $\frac{1}{16}$ inch long. In another manuka specimen examined, and also in a pendant rimu leader, young larvae of an unidentified longhorn beetle were found.

In Rotorua forests the longhorn, *Navomorpha lineatum* is known to enter Douglas fir in this manner.

Thirteen species of cicada have been recorded by Myers (1) in New Zealand and, with the exception of *Melampsalta cruentata* Fabr., all are endemic. *M. cingulata* Fabr. appears to be the most widespread and common, though it is not known whether it is responsible for the damage here recorded. Little is known of the habits and life cycle of the New Zealand cicadas.

The widespread occurrence of oviposition in situations where there is ample light tends to confirm the opinion that cicadas are light demanders in this respect at least.

The plentiful oviposition marks, both fresh and old, indicate a high normal infestation in the Atuanui Forest, also the high proportion of fresh damage suggests that there was an increased population in the summer of 1948-49.

It seems probable that in some localities at least continual oviposition in regenerating podocarps may present a serious silvicultural problem. Opening of the canopy by logging and later release cuttings may well provide optimum conditions for this insect.

Cicada damage to exotic shade-bearers used to interplant logged indigenous forest in the Taumarunui district has previously been recorded in his journal (2), and is stated to have reached such proportions as to make the advisability of further planting questionable.

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References

1. Myers, J. G. (1921). A Revision of New Zealand Cicadidae (Homoptera) with Descriptions of New Species. *Trans. N.Z. Inst.* Vol. LIII.
2. Ranger, F. J. (1945). Cicada Damage to Exotic Shade Bearers. *N.Z. J. For.* Vol. V, No. 2.

COMPRESSION FAILURE IN *PINUS RADIATA* STEMS EXPOSED TO STRONG WIND

In Vol. V, No. 4 (1947) of this Journal an account was given of wind damage to stands of *P. radiata* on coastal country in the Manawatu district. On sand dunes in this locality the species is strongly rooted and damage from the gale of February, 1947, was characterised by stem breakage rather than uprooting.

In damaged stands some trees were left with a lean. Generally this was not due to partial uprooting, but rather to a permanent bend, most pronounced in the first 10 feet, but occasionally present higher in the stem. This bending was caused by compression failure on the side away from the wind. Characteristically the bark had come