



Kanuka (*Leptospermum ericoides*) surviving in a stand of manuka (*L. scoparium*) killed by *Eriococcus* sp.

area such as the Conway River valley. Similarly *Eriococcus* sp. was first noted in an isolated area, the upper Orari Gorge. It is possible that these insects were accidentally introduced on ornamental varieties of manuka, but such explanation would not account for their presence in the remote areas in which they were first recorded.

Effect of *Eriococcus* on Host

A stand of red manuka infested with *Eriococcus* sp. may be distinguished by the blackened appearance of the lower portions of the plants, only the canopy foliage retaining its normal green. Plants carrying high populations of the insect sometimes show accelerated tip growth for a short time before death. The first symptom of approaching death of the plant is the gradual browning of the canopy foliage. This normally occurs at a time of changing ecological conditions, such as the lowering of the soil moisture level or the onset of frosts. Once death ensues defoliation is rapid and only the skeleton of the plant remains until the roots decay. From 3 to 5 years elapse between initial infestation and death and usually 2 to 3 years between death and the collapse of the plant.

When heavily infested plants are sprayed with insecticide and the insect is eliminated the plants recover and continue to grow normally. This indicates that no plant virus is involved. Death of the plant may be due to direct insect feeding, to the production of toxins, to reduction in photosynthetic activity due to the presence of sooty mould, or to any combination of these factors. Experimental work along these lines is now proceeding. This much is certain; the

insect is primarily responsible for death of the plant, since the fungus (associated with *Eriococcus* in manuka blight) is dependent on the continuing production of honey dew by the insect for its existence.

The relative immunity of white manuka is difficult to explain. This plant is readily attacked by *Eriococcus* sp. and though the population density of the insect reaches high levels, very few plants are killed.

This *Eriococcus* sp. has not been recovered from any plants other than red and white manuka, but other plants growing close to infested manuka are sometimes coated with black fungus growing on honey dew dropped from the infested plant.

Spread and Control Sprays

Within the space of 10 years *Eriococcus* sp. has been artificially established throughout both islands. It is now so well distributed that if all further artificial transfer were stopped, it is probable that the insect would continue its natural spread into all sizeable areas of manuka. A discussion on the wisdom of using such an agent against an important member of New Zealand's indigenous flora is outside the scope of this article.

One fact is clear: The effect of this insect on red manuka affords the most spectacular example of biological control of a plant yet seen in this country.

The insect may be controlled with oil emulsions or a spray consisting of either 50 per cent. para para isomer wettable D.D.T. or 10 per cent. gamma B.H.C. nicotine sulphate, and a wetting agent in the proportions 8:1:8 in 800 parts of water. Such sprays, though

useful for specimen plants or small stands, would be neither feasible nor economic on a national scale.

Lack of knowledge of the *Eriococcus* species overseas suggests that in its original habitat it has been kept in check by natural enemies. A search could be made for these parasites or predators, but this may easily be long and expensive.

References

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Radio Broadcasts to Farmers

RADIO broadcasts to farmers will be given during January as follows:—

1XH Hamilton, Mondays at 12.33 p.m. and Tuesdays at 8 p.m. (Frankton stock market report), Wednesdays at 12.33 p.m. (report from Ruakura Animal Research Station), Thursdays at 12.33 p.m., Fridays at 8 p.m. (stock sale review).

1XN Whangarei, Mondays at 8.5 p.m., Wednesdays at 8.1 p.m. (Northland stock market report), Fridays at 8.1 p.m.

1YA Auckland, Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, 7.45 p.m.

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2YA Wellington, Mondays at 7.15 p.m., Thursdays at 12.33 p.m., Fridays at 7 p.m. (Feilding stock market report).

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