

Damage to Pasture Legumes by Larvae of the Common Blue, *Zizina otis labradus* (Lepidoptera: Lycaenidae)

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It is well known that the common blue butterfly *Zizina otis labradus* (Godt.) is abundant during summer in open, semi-arid areas of New Zealand, and that the larvae feed on legumes (e.g., Gaskin 1966; Miller 1971), but little is known about the pest status of this species.

During the late summer and autumn of 1976 a very dense population of the common blue was observed in a 0.2 ha paddock of paspalum (*Paspalum dilatatum*), ryegrass (*Lolium perenne*), and white clover (*Trifolium repens*) pasture at the Otakanini research area near Helensville. By mid-autumn larval feeding had almost entirely eliminated white clover from the sward throughout the paddock, with the grasses unaffected.

Similar observations were made in late summer and autumn 1977 at a trial on the Aratiatia Lands and Survey block near Taupo where interactions between grass grub *Costelytra zealandica* (White) and pasture species are being studied. This trial consists of a series of 9 × 3 m plots containing combinations of grasses with the legumes 'Grasslands Maku' lotus (*Lotus pedunculatus*) and 'Grasslands Huia' white clover. There are 4 plots of each pasture treatment, and fensulfothion (2 kg/ha) is applied annually to 1/3 of each plot to exclude grass grub. Since the trial commenced in 1973 one treatment, a mixture of 'Grasslands Nui' ryegrass and lotus, which is resistant to grass grub (Farrell and Sweney 1974; Kain *et al.* 1975), has consistently supported low grass grub populations with little difference in growth between insecticide-treated and untreated areas. For example, in autumn 1976 the ryegrass-lotus mixture contained on average 85 grass grubs/m² in the untreated 2/3 of the plots and showed only a slight visible difference in pasture growth between the insecticide-treated and untreated areas. In contrast, grass-white clover mixtures contained on average 670 grass grubs/m² in autumn 1976 and showed a spectacular difference in growth between the treated and untreated areas, the latter being severely damaged by grass grub.

In the 4–6 weeks following the application of fensulfothion in early February 1977, a marked difference was observed in the growth of the ryegrass-lotus mixture between the treated and untreated areas. The lotus was severely defoliated in the untreated areas, but the ryegrass was undamaged (Fig. 1). This damage to lotus had not been apparent in earlier years. In mid-March 1977 large numbers of blue butterflies were observed hovering over the trial site, and close inspection revealed large numbers of larvae feeding on lotus and white clover throughout the site. Table 1 shows the populations of larvae (which were counted in 6 20-cm square quadrats/plot) and pasture production (which was measured by mowing and weighing the herbage and oven-drying a subsample) of the ryegrass-lotus sward. Between November 1976 and January 1977 production of the untreated and treated areas differed by only 3%, which was not statistically significant ($P > 0.10$), but in the period February–April 1977 production in the untreated areas was reduced by 61% compared to the treated areas, a highly significant difference ($P < 0.01$). Since few grass grubs occurred in the ryegrass-lotus sward, and fensulfothion reduced the population of the common blue larvae by 88% (Table 1), the difference in February–April production can be attributed to the



Figure 1. Effect of feeding by a dense population of the common blue larvae on a ryegrass-lotus pasture at Aratiatia. The pegs mark the boundary between the fensulfathion-treated area (left half of figure) and the untreated area (right half of figure). Note the presence of lotus foliage in the treated area.

effects of feeding by the common blue larvae on lotus. High densities of the common blue larvae on lotus have also been observed by G. W. Gibbs (pers. comm.) in the Taupo area and by R. H. Blank (pers. comm.) in the Raglan area.

Table 1. Common blue larval populations and production of ryegrass-lotus pasture at Aratiatia.

| | No. larvae/m ² (March 1977) | Pasture production (kg DM/ha) | |
|-----------------------------|---|-------------------------------|----------------|
| | | Nov 1976- Jan 1977 | Feb-April 1977 |
| fensulfathion-treated areas | 37.5 | 4566 | 612 |
| untreated areas | 312.5 | 4408 | 239 |

It is clear that *Z. o. labradus* is at least a locally significant pest of legumes in dry North Island pastures. The outbreaks recorded at Aratiatia and Otakanini both occurred during autumn droughts on free-draining soils which dry out rapidly. Significant numbers of the common blue have not been observed in a trial similar to that at Aratiatia on a less drought-prone site near Rotorua.

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