

Productivity of *Lotus pendunculatus* and *Trifolium repens* in a base pasture of kikuyu grass

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Lotium species are often oversown into tropical grass pastures to provide winter feed on dairy farms in the subtropics. Although the high sowing rates (> 30 kg/ha) and N fertilizer used provide substantial early feed, this practice precludes any contribution from clovers.

There is a genuine desire by farmers to reduce the use of N fertilizer, both from a cost and a soil acidification point of view. In this context, the capacity to establish and maintain a winter-growing perennial legume would seem a desirable alternative.

This study sought to determine the effect of defoliation practice on the productivity and persistence of *Lotus pedunculatus* and *Trifolium repens* into a kikuyu (cv. Whittet) grass pasture.

Methods

This plot cut study was conducted in 1992/93 on clay flood plains near Casino, on the north coast of NSW.

Treatments included: (1) Defoliation interval at 14 days or when the lower leaves had begun to senesce

(flexible); (2) Defoliation height at 5 or 12 cm; and, (3) Legumes - *Lotus pendunculatus* cv. Maku or cv. Sharnee (at 2 kg/ha) or *Trifolium repens* cv. Haifa (at 4 kg/ha).

The legumes were inoculated, lime pelleted and broadcast into a dense sward of kikuyu grass, mulched to 5 cm on April 1, 1992, after treatment with glyphosate at 1 L/ha 2 weeks previously. Molybdenum superphosphate at 200 kg/ha and muriate of potash at 100 kg/ha was applied at sowing. From December to March urea was applied at the rate of 100 kg/ha/month. The plots were watered every 4-5 days for 6 weeks and then at weekly intervals to replace evapotranspiration losses. During the first 6 weeks after sowing the sward was mown with a rotary mower at fortnightly intervals to 5 cm stubble height to control the growth of kikuyu.

Results

The relative DM yields of legume and kikuyu grass from sowing to the end of March, 1993, are shown in Figure 1. The total yield of legume over this period was

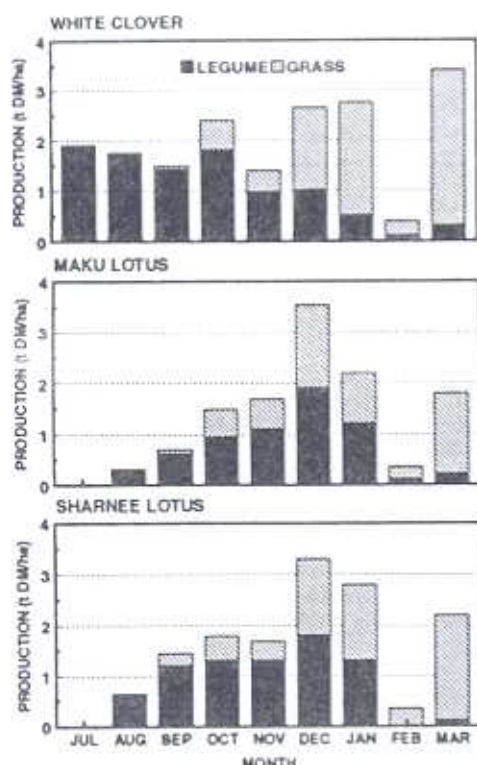


Figure 1: DM yield of white clover, Maku lotus, Sharnee lotus and kikuyu from sowing to March, 1993.

9,552, 6397, 7928 kg DM/ha for Haifa, Maku and Sharnee, respectively, and this was significantly different ($P < 0.01$).

The yield of kikuyu grass for the 'Haifa' plots was 8465 kg DM/ha and 9758 kg DM/ha for the controls (no legumes). The lotus appeared to suppress growth of kikuyu more than white clover.

Table 1: Yield (kg DM/ha) (mean \pm se) of white clover from sowing to March 1993 for the 4 combinations of defoliation height and interval.

Height (cm)	Interval	
	14 days	Flexible
5	10,466 ^A	13,709 ^B
12	11,214 ^A	10,492 ^A

Note: Different postscripts are significantly different at $P < 0.05$.

The 'flexible' x 5 cm height defoliation combination gave a significantly greater ($P < 0.01$) clover (Table 1), and total DM (19250 kg DM/ha) yield than the other three combinations.

Conclusions

With adequate irrigation, and appropriate fertilizer and grazing management, lotus or white clover can provide a real alternative to grass/N fertilizer pasture. Total yields of DM (legume plus kikuyu) over the 12 month period of the study have exceeded 19,250 kg DM/ha.

This pasture has the advantages that it is perennial (lasts at least 3 years), provides all year round feed (although the autumn feed deficit still exists) and is less costly (in terms of N fertilizer and seed).

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