Rhizome development of defoliated Grasslands Maku

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Grasslands Maku plants rely on the rhizome system for plant survival, lateral spread, carbohydrate storage and as an active site of regrowth (Sheath 1975). An understanding of how defoliation acts on the rhizome system will assist in the development of grazing management strategies for persistent and productive lotus swards. The aim of this work was to examine the impact of cutting frequency and intensity on rhizome development of Grasslands Maku at Nowra NSW.

Methods

Three frequencies of defoliation (4, 8 and 12 weeks), at three intensities (2, 6 and 12 cm) were compared in a complete randomised block design (4 replicates). Treatments were imposed on a Grasslands Maku sward sown in April 1992 at 5 kg/ha. The first harvest was November 16 1992, with the final harvest for all treatments on September 30 1993. Plots were cut to the appropriate height using a sickle-bar mower. Rhizome samples (two 20×20×10 cm sods/plot) were taken every four weeks. After the sods were washed, underground plant material was dissected into rhizome buds, new rhizomes, woody rhizomes and rhizome shoots.

Results and Discussion

Total rhizome number/m^2 and total rhizome length m/m2 increased with higher cutting and longer intervals. Where cutting was frequent, cutting height became critical with a severe reduction in rhizome mass and length at the 4 weeks x 2 cm treatment. The impact of severe defoliation was greatest during late autumn and winter when peak rhizome expansion occurred.

Table 1. Total rhizome length (m/m^2) as influenced by cutting height and interval for the period November 1992 to September 1993. LSD=127.5 (P<0.05).

Cutting height (cm)	Cutting interval (weeks)		
	4	8	12
2	100.4	294.5	591.9
6	170.9	428.4	608.6
12	309.7	598.4	880.9

The long rotations required to promote rhizome development, hence shoot initiation and plant expansion would do little to increase the productivity or palatability of the lotus sward. Although the more frequent cutting treatments produced fewer rhizomes, it is feasible that at intermediate cutting (6 cm) there were sufficient rhizome numbers to maintain a productive and persistent lotus sward. A grazing strategy based on seasonal growth of Grasslands Maku, incorporating longer rotations over autumn and winter with shorter rotations in spring and summer will be explored in a Meat Research Corporation funded project, commencing in 1995.

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Reference

Sheath, G. W. (1975). A descriptive note on the growth habit of *Lotus pedunculatus* Cav. *Proceedings of the New Zealand Grasslands Association*, **37**: 215-220.