Effects of defoliation on the productivity of a persian clover-wimmera ryegrass sward

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Persian clover (Trifolium resupinatum) has been recently introduced to the irrigation areas of northern Victoria. Little information exists on its reaction to defoliation. At Kyabram in 1985, a mixed sward of Persian clover and Wimmera ryegrass (Lolium rigidum) was defoliated to determine the influence of frequency and intensity of defoliation by cutting on herbage productivity.

Methods

Four frequencies of harvest (4, 6, 8 and 12 weeks) were superimposed over two intensities of harvest in a split plot design. An autoscythe was used for the defoliation treatments and intensity of harvest was varied by altering the height of the cutter bar. The heights were ground level or about 5 cm above ground level. Each plot was 2m x 10m and there were six replicates.

Sowing and initial irrigation were in late February. Eight weeks later all plots were harvested to their designated height; the harvest frequency schedule was then followed until the end of December, at which time the experiment was terminated. The plots were irrigated four times in autumn and seven times in spring.

Results and Discussion

For the first 24 weeks, harvesting to ground level was more productive than harvesting above this height because any remaining petioles died after leaf removal. After this period, defoliation to 5 cm provided potential for greater productivity than did defoliation to ground level, particularly at the 4 and 6 week defoliation intervals.

Table 1. Yield of DM (t/ha) and mean digestibility (% of DM) (in parentheses) for the period, May to December.

Intensity of defoliation	Frequency of defoliation (weeks)			
	4	6	8	12
To ground level	7.5(77)	9.2(74)	10.9(73)	11.9(67)
To 5 cm	8.5(75)	9.4(72)	9.8(71)	9.5(65)

Over the whole experiment, when herbage was harvested to ground level, regression analysis indicated that the total DM yield (Table 1) increased in a curvilinear manner as the period between defoliations increased. When the sward was defoliated to 5 cm, total DM yield peaked at the 8 week interval of defoliation (Table 1). A reduction of 10 percentage units in digestibility when defoliation interval was increased from 4-12 weeks, (Table 1), suggests that optimum yields of digestible DM will occur at shorter intervals than will those obtained for yields of DM. The optimum defoliation interval was 6-8 weeks, regardless of defoliation intensity.