

The effect of irrigation frequency on lucerne and white clover production in the Murrumbidgee Valley

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The success of new suckling lamb and sheep milk cheese industries in the M.I.A. is dependent upon a continuous, high quality pasture supply. Highly productive legumes such as white clover cv. Haifa and winter active lucernes have shown promise in overcoming shortfalls in both quality and quantity of traditional pasture varieties. However, little information is available on the irrigation management requirements of these cultivars. A large scale field experiment was undertaken to study the effect of irrigation frequency on dry matter production of these pasture legumes.

Methods

Four perennial legume cultivars, two lucernes (*Medicago sativa* L.) and two white clovers (*Trifolium repens* L.) were established on a Gogeldrie clay (Ug 5.2) at Leeton Field Station. Four irrigation treatments were applied to one year old stands beginning on 24th January 1986, with intervals of 75, 100, 125 and 150mm of potential evapotranspiration (ET_o). Plots were flood irrigated when the accumulated ET_o for each treatment was reached, the number of irrigations during the sampling period ranging from 8 to 4. Pasture dry matter samples were taken at approximately 300mm accumulated ET_o. The two growth periods (see Table 1) were 40 and 63 days respectively.

Results and discussion

Table 1. The effect of irrigation frequency on dry matter yields of lucerne and white clover (tonnes/ha).

Irrigation Interval (mm accumulated ET)		White Clover		Lucerne	
		Haifa	Irrigation	Maxidor II	P581
CUT 1 (Growth period from 24.1.86 to 5.3.86)	75	4.08	3.56	3.83	3.04
	100	4.40	4.24	4.13	3.21
	125	4.21	3.83	3.64	2.91
	150	3.89	3.19	3.54	3.04
CUT 2 (Growth period from 5.3.86 to 7.5.86)	75	3.61	3.38	3.41	3.37
	100	3.47	3.01	3.22	2.99
	125	3.32	2.93	3.19	3.15
	150	3.26	2.43	3.32	3.41

All cultivars performed well at 75mm and 100mm. White clover was more sensitive to moisture stress than lucerne, as indicated by the decline in dry matter production at the longer irrigation intervals. This probably reflects differences in the root systems of the two species. Overall, cv. Haifa was slightly more productive and appeared to withstand moisture stress better than cv. Irrigation, the decrease in dry matter yield being much greater for cv. Irrigation at 125mm and 150mm. Lucerne yields were not significantly affected by irrigation frequency.

The experiment is being continued over the 1986/87 irrigation season, the longest interval being extended to 200mm. In addition to dry matter production, effective rooting depth is being determined by measuring water extraction patterns with a neutron soil moisture probe.