

Managing irrigated lucerne for high protein

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Lucerne hay is an excellent protein supplement for lactating dairy cows. However, a dairy cow in early lactation requires approximately 16% protein so that high protein content hay is essential if low protein grains or silages are included as part of the ration. Frequent cutting is one method of increasing lucerne protein content, so an experiment was begun in 1982 to compare 4 cutting frequencies on four different lucerne varieties. The 4 varieties were Cuf 101 (highly winter active), Pioneer Brand 572 (highly winter active), Pioneer Brand 581 (semi winter dormant) and Pioneer Brand 545 (winter dormant). The 4 cutting frequencies were late vegetative (Veg), early flower bud appearance (Bud), 10% bloom (10%) and full bloom (Bloom). The trial was sown in 1981 and cut at the 10% stage until the different cutting frequencies were imposed in September 1982. Data from the 12 months to September 1983 are presented in Table 1.

Table 1: Total lucerne yields (t/ha/yr), protein contents and in vitro digestibility (DMD). LSD values are 5%.

Variety	Cutting Frequency				l.s.d.
	Veg	Bud	10%	Bloom	
Cuf 101	17.4	18.8	23.2	22.6	
PB 572	16.1	17.9	21.2	23.1	
PB 581	16.8	18.9	21.5	20.6	
PB 545	13.4	16.6	18.4	20.5	
Mean	15.9	18.1	21.2	21.7	1.9
Protein %	24.2	22.3	19.2	17.1	1.4
DMD %	71.6	69.4	66.8	66.1	1.9
Weed Content (%)	20	9	4	2	
No. of Cuts	9.8	8.5	7.8	7.0	

When averaged over cutting frequencies, the winter dormant variety PB 545 yielded significantly less than the other 3 varieties. There were no variety effects on protein content or in vitro digestibility so average values are presented.

Cutting at the vegetative stage resulted in a 25% yield reduction but a 26% increase in protein content when compared to the 10% bloom stage. Therefore, the total protein yield per hectare remained fairly constant. However, the same does not apply to digestible dry matter as more frequent cutting resulted in only very small improvements in digestibility. The extent to which the increased protein content and digestibility from frequent cutting balance the loss in yield will depend on ration requirements. There are however, two additional considerations highlighted in Table 1. Firstly, extra costs and traffic damage are associated with the increased number of cuts made and secondly within 12 months of beginning a frequent cutting schedule, the stand is weakened allowing weeds to invade. The severe weed invasion associated with cutting at the vegetative stage indicates that the productive life of the stand will be considerably shortened. However, it does appear from Table 1 that cutting lucerne at the bud stage rather than 10% bloom can significantly increase protein content and digestibility with only a moderate yield decline. Longer term effects on weed invasion and stand longevity are being monitored.