

Desmanthus: a new forage legume to improve wool growth in tropical Australia

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Introduction

In tropical Australia, very short and erratic wet seasons are the critical factors in determining forage growth and animal production (Wheeler and Freer 1986). Grasses are highly susceptible to low rainfall and animal production in such conditions becomes strictly seasonal. Improvements in meat and wool production by the introduction of stylo species (*Stylosanthes* spp.) into natural grasslands have been intensively reported (Gillard and Winter 1984). However, there are currently no suitable introduced legumes for the c.28 M ha of Mitchell grass (*Astrebla* spp.) plains in heavy clay soils of north-west Queensland, grazed predominantly by wool-producing Merino sheep (Phelps 1999). Members of the genus *Desmanthus* appear to offer the possibility for filling this role (Gardiner *et al.* 2004). This work aimed to evaluate the potential of four *Desmanthus* accessions, in comparison with Verano stylo (*Stylosanthes hamata* cv. Verano), as alternative supplements for diets of Mitchell grass hay fed to Merino wethers in north-west Queensland.

Material and methods

Thirty-six Merino wethers (average liveweight 33.96 kg \pm 1.82) were individually housed in metabolism cages and fed with 600 g/hd/d of Mitchell grass (*Astrebla* spp.) hay alone or supplemented with 200 g/d of one of five legume hays (6 wethers per treatment). The hays were made from four *Desman-*

thus accessions and from Verano stylo. The effects on intake and wool growth were measured.

Results

Supplementary diets in general increased significantly nitrogen intake, metabolisable energy intake, clean wool production and wool yield (clean wool/greasy wool \times 100) (Table 1).

Conclusions

These results, associated with evidence of the agronomic adaptation of *Desmanthus* genotypes (Gardiner *et al.* 2004) to the black clay soils of the Mitchell grass plains of northern Queensland, show the high potential of the legumes to improve wool growth in that region.

References

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Table 1. Fibre content, digestibility, intake and wool yield parameters in response to supplementation of a Mitchell grass diet with legume hays.

Supplement	Diets: Mitchell grass hay plus indicated supplement					
	Nil	Verano	<i>D. leptophyllus</i> CPI 38351	<i>D. virgatus</i> CPI 92803	<i>D. virgatus</i> CPI 78382	<i>D. virgatus</i> CPI 79653
Neutral detergent fibre (%)	55.3 a ¹	55.0 a	51.2 ab	48.7 b	52.8 ab	51.6 ab
Acid detergent fibre (%)	52.7 a	50.3 a	45.0 b	43.4 b	48.2 ab	43.8 b
DM digestibility (%)	42.5 bc	46.5 a	43.8 abc	39.8 c	42.2 bc	44.9 ab
OM digestibility (%)	49.0 a	51.4 a	48.4 ab	45.3 b	48.6 ab	48.3 ab
Total nitrogen intake (g/d)	7.6 d	9.4 bc	10.2 b	8.7 c	10.2 b	12.4 a
ME intake (MJ/d)	110 c	139 ab	131 b	117 c	126 bc	144 a
Clean wool (mg/cm ² /d)	0.42 d	0.56 ab	0.55 abc	0.62 a	0.20 bcd	0.45 cd
Wool yield (%)	59.2 c	67.9 b	67.9 b	77.4 a	67.5 b	64.6 bc
Fibre diameter (microns)	18.9 a	20.4 a	19.8 a	19.1 a	19.8 a	20.5 a

¹Means followed by the same letters in rows are not significantly different by the Tukey test ($P < 0.05$).