

## SHEEP SHOW DIFFERENCES IN ACCEPTABILITY OF PASTURE LEGUMES AND CROP WEEDS AT THREE STAGES OF PLANT MATURITY

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Sheep offer an alternative to chemical herbicides for weed control in the pasture phase of cropping systems. To improve the effectiveness of grazing sheep for weed control we need to identify legume species with low acceptability because we expect they will have the potential to compete more effectively with weeds. Based on this hypothesis, we tested the acceptability to sheep of six legumes relative to annual ryegrass and wild radish at three stages of maturity.

The acceptability of each legume was defined as the percentage of the legume in the total forage consumed by the sheep (Kenney and Black, 1984). At each stage of plant maturity (vegetative, reproductive and senesced), six treatments comprising a pot of wild radish, a pot of annual ryegrass along with one of six legumes were offered together to six individually penned Merino weaner wethers. Different sheep from the same flock were used at each stage of plant maturity. The vegetative and reproductive plant material was offered intact in the pots in which they were grown. The senesced plant material was offered in pots after all components of each plant were cut into 10 cm lengths.

The six treatments were offered to the six sheep for two minutes on each of six days according to a 6x6 Latin square design balanced for residual effects. The 3 pots in each treatment were assigned to a different position when offered to each sheep. The sheep had *ad libitum* access to a diet of 80% cereal chaff, 18% lupin seed and 2% mineral mix except for the one hour prior to and when the treatments were offered each day. The sheep had water available *ad libitum* at all times.

**Table 1. The percentage of legume in the forage consumed by Merino weaner wethers offered each of six legumes together with wild radish and annual ryegrass for two minutes (values are means  $\pm$  s.e.)**

Legume	Stage of maturity (days from sowing)		
	Vegetative (day 69)	Reproductive (day 118)	Senesced (day 226)
biserrula ( <i>Biserrula pelecinus</i> cv. Casbah)	30.7 <sup>b</sup> $\pm$ 4.37	50.6 <sup>bc</sup> $\pm$ 8.64	62.0 <sup>ab</sup> $\pm$ 10.43
chickpea ( <i>Cicer arietinum</i> cv. Tyson)	9.0 <sup>a</sup> $\pm$ 2.08	44.0 <sup>b</sup> $\pm$ 9.16	82.5 <sup>bc</sup> $\pm$ 6.93
crimson clover ( <i>Trifolium incarnatum</i> cv. Caprera)	36.8 <sup>b</sup> $\pm$ 4.23	69.7 <sup>c</sup> $\pm$ 6.06	88.0 <sup>c</sup> $\pm$ 2.95
serradella ( <i>Ornithopus sativus</i> cv. Cadiz)	28.2 <sup>b</sup> $\pm$ 5.04	48.3 <sup>b</sup> $\pm$ 7.53	78.3 <sup>bc</sup> $\pm$ 7.10
snail medic ( <i>Medicago scutellata</i> cv. Sava)	10.8 <sup>a</sup> $\pm$ 4.21	17.4 <sup>a</sup> $\pm$ 4.66	35.2 <sup>a</sup> $\pm$ 12.51
sub. clover ( <i>Trifolium subterraneum</i> cv. Dalkeith)	8.5 <sup>a</sup> $\pm$ 2.51	41.4 <sup>b</sup> $\pm$ 6.22	74.6 <sup>bc</sup> $\pm$ 10.39

Values within columns with different superscripts are different (P<0.05).

There were clear differences in the relative acceptability of the 6 legumes to sheep when they were offered with the 2 weed species and their ranking differed according to the stage of plant maturity (Table 1). The results support our original reasoning that choosing a suitable competitive legume and timing the grazing by sheep should optimise the control of weed species. For example, crimson clover was highly acceptable at all stages of maturity and would presumably be of little value to encourage sheep to eat weeds as an alternative in a field situation. By contrast, snail medic, subterranean clover and chickpea were the most unacceptable legumes at the vegetative stage but, of these, only snail medic had a low acceptability at all stages of maturity. Annual ryegrass had a higher acceptability than wild radish (52.5 vs 26.8%, P<0.001) and all 6 legumes at the vegetative stage but decreased with maturity and was lowest when senesced (13.0%). Based on this, grazing at the vegetative stage in conjunction with a legume of low acceptability should help reduce the ryegrass component of the pasture whereas grazing at other times or with an acceptable legume is likely to have little effect.

KENNEY, P.A. and BLACK, J.L. (1984). *Aust. J. Agric. Res.* **35**, 272-82.

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