

Annual pasture legumes for one year forage crops

B.F.Hackney, B.S. Dear, G.M. Dyce and C.A. Rodham

NSW Department of Primary Industries, Wagga Wagga NSW, 2650.

Annual legumes are widely used as a component of permanent pastures to increase productivity by increasing the supply of nitrogen to non-leguminous pasture species. Additionally, annual legumes provide high quality herbage for grazing livestock and greatly enhance the productivity of wool and meat producing enterprises. In many areas of New South Wales soil conditions, particularly acidity and its associated high levels of exchangeable aluminium, limit the potential of using lucerne as a specialist fodder conservation enterprise. Many annual legumes are more tolerant of acidity than lucerne and are potentially highly valuable one year fodder crops. Using annual legumes in this way can also be of great value in pre-cleaning of paddocks prior to sowing permanent pastures as the higher sowing rates used will result in dense stands which can out compete weeds. Additionally, higher sowing rates can be used with many of these legumes as being aerial seeders, they can be harvested on farm for reseeding. This study reports on the feasibility of using a range of annual legume species as one year forage crops.

Methods

Twenty-one annual legumes cultivars, Aurora lucerne, Aokau sulla and a high density annual legume mix were sown at a site 13 km north of

Binalong in May 2004. Average annual rainfall at the site is 650 mm. In 2004 rainfall was 522 mm with 455mm recorded from May to Dec. Lime had been applied to the site at 2.5t/ha and pH (CaCl) at 0-10cm was 5.2, and 10-20 cm was 4 with 22% exchangeable aluminium. Three replicates of each cultivar were sown in a randomised block design at 10kg/ha, plot dimensions were 2m x 8m. Phosphorus fertiliser was applied at sowing at 20kg/ha. To control grass weeds, 'Treflan' was applied and incorporated prior to sowing at 2L/ha with 'Select' (500mL/ha) was applied 6 weeks after sowing. 'FastacDuo' (100mL/ha) was applied 6 weeks after sowing to control red legged earth mites. Dry matter production was determined by use of calibrated visual assessment in spring.

Results

All cultivars sown (with the exception of Aokau sulla, Avila yellow serradella, Prima gland clover, Paratta purple clover and Urana subterranean clover) produced significantly more dry matter than lucerne (Table 1). Prima, Paratta and Urana were as productive as lucerne while Aokau and Avila produced significantly less. Several cultivars including CIZ12pur-a, Margurita, Clare and Leura as well as the high density legume mix produced twice as much dry matter as lucerne. Deep rooting

species such as biserrula, French serradella, arrowleaf and purple clover were highly productive at this site despite the acidic, high aluminium subsoil conditions. Later maturing cultivars were generally more productive and this was particularly obvious in the subterranean clovers with the latest maturing cultivar, Leura, yielding significantly more than earlier varieties. Similarly the mid-late maturing subterranean clover cultivars, Junee, Coolamon and Goulburn were more productive than the earlier Urana and Seaton Park LF.

Discussion

Most annual legumes sown at this site produced significantly more dry matter than lucerne. The

high levels of production from these annual legumes despite the drier than average year, make them an extremely attractive option for producers wanting a one year forage crop that can be used either for grazing or to make high quality silage or hay. Later maturing cultivars were generally the most productive, although sufficient rain in mid to late spring is required for them to express their full potential. As rainfall decreases, earlier maturing cultivars would be a more reliable choice. The ability of many of the deep rooting annual legumes to produce high quantities of dry matter on a site with moderate to highly acidic sub soil indicates reasonable acid soil tolerance and a viable alternative to lucerne in this area.

Table 1. Annual dry matter production (t/ha) of annual legumes sown at Binalong

Botanical name	Common name	Cultivar	Yield
<i>Trifolium subterraneum</i>	Sub clover	Urana	10.2
		Seaton Park LF	10.9
		Coolamon	14.8
		Junee	13.3
		Goulburn	12.9
		Leura	17.6
<i>T.subterraneum</i> ssp. <i>brachycalycinum</i>	Sub clover	Clare	16.4
<i>T.subterraneum</i> ssp. <i>yanninicum</i>	Sub clover	Riverina	14.6
<i>T.michelianum</i>	Balansa clover	Paradana	10.8
		Bolta	10.8
<i>T.glanduliferum</i>	Gland clover	Prima	9.5
<i>T.hitrum</i>	Rose clover	Hykon	12.3
<i>T.purpureum</i>	Purple clover	Paratta	9.8
		CIZ 12pur-a	16.0
<i>T.vesiculosum</i>	Arrowleaf clover	Zulu II	16.0
<i>Ornithopus compressus</i>	Yellow serradella	Avila	4.9
<i>Ornithopus sativus</i>	French serradella	Cadiz	15.3
		Erica	15.4
		Margurita	16.3
<i>Biserrula pelecimus</i>	Biserrula	Casbah	13.1
		Mauro	13.7
<i>Hedysarum coronarium</i>	Sulla	Aokau	3.4
<i>Medicago sativa</i>	Lucerne	Aurora	8.2
HDL mix*			15.8
LSD 5%			2.42

*HDL mix made up of Zulu arrowleaf, EliteII berseem and Laser Persian clover

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