

Legume evaluation in the Monaro region of New South Wales

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A large rain shadow extends over 50% of the Monaro region of New South Wales. Average rainfall is 425 mm in the centre of the rainshadow, rising to 550 mm on its perimeter. Moreover, it can be extremely variable from year to year and the persistence of annual and perennial legumes is affected. Subclover and lucerne are currently the most successful introduced legumes in sown pastures in this region.

Methods

To identify more persistent and vigorous strains for this area, various species, cultivars and strains were sown in small plots near Berridale in March 1979. These included *Trifolium repens* cvs. Haifa and Siral, *T. subterraneum* cv. Seaton Park, Woogenellup and Mt Barker, *T. ambiguum* strains Alpine and Monaro, and *Medicago polymorpha* cv. Circle Valley. The site was well-drained granite-derived soil, elevation 915 m a.s.l. All lines were inoculated and lime-pelleted before sowing into small plots 0.75 m x 10 m with three replications. After sowing the plots were topdressed with 400 kg ha molybdenum superphosphate.

Results and Discussion

Rainfall during 1979, 1980 and 1981 was 477 mm, 510 mm and 470 mm. Seasonal conditions in each year were drier than average. Despite the dry conditions, all cultivars and strains established satisfactorily by mid-June with more than 50 plants per 1 m row. Growth was not enough to allow cuts to be taken and instead the plots were rated for vigour and density

in spring each year and the results are reported below. Before rating began, the best plot was selected and given the maximum score. The remaining plots were then rated relative to this plot; those with no plants remaining were given a zero.

Species	Cultivar or strain	Density (0-5)		Vigour (0-10)		
		1980	1981	1979	1980	1981
<i>T. repens</i>	Haifa	3.7	2.7	2.7	3.0	5.3
	Siral	0.3	0.0	1.7	0.3	0.0
<i>T. ambiguum</i>	Alpine	1.0	0.0	2.3	1.0	0.0
	Monaro	0.3	4.3	2.0	0.7	5.7
<i>T. subterraneum</i>	Seaton Park	0.3	3.0	5.7	0.3	4.3
	Woogenellup	1.0	2.3	6.3	0.7	5.3
	Mt Barker	0.7	1.7	6.0	0.7	4.3
<i>M. polymorpha</i>	Circle Valley	0.0	0.0	5.3	0.0	0.0
L.S.D. (5%)		1.0	2.6	0.9	1.1	2.8

The results indicate that Circle Valley could not persist despite its early flowering and good vigour in the first year.

Of the two *T. ambiguum* lines, the hexaploid Monaro proved to be more persistent than the diploid Alpine under low rainfall conditions, which suggests that the hexaploids may be more tolerant to dry conditions than the diploids. This is the lowest rainfall at which a *T. ambiguum* line has been observed to establish and persist in Australia. Haifa white clover was superior to Siral in persistence and vigour. While all subclover cultivars were vigorous in the first year, the earlier flowering Seaton Park had a slightly higher plant density by the third year. The results suggest there were possibilities for Haifa and Monaro to complement the demonstrated role of subclover as a basis for pasture improvement in this difficult environment.

