

Competition between Mt Barker and Karridale sub clover. sown in binary mixtures

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Karridale is the recommended alternative cultivar of *Trifolium subterraneum* for Mt Barker in NSW. Mt Barker is known to be a highly aggressive cultivar which is difficult to replace (1). Trials in N.S.W. (2) have shown that once established, the plant density of Karridale can be up to 100% higher than that of Mt Barker. Seed reserves are also consistently greater, while the hard seed level is increased by 68% with Karridale. Studies in Victoria (1) demonstrated that Karridale, sown into an old Mt Barker pasture, was able to prevent Mt Barker from dominating the sward while most other new cultivars succumbed to competition from the Mt Barker plants. The present field experiment was designed to explain which characteristics of Karridale assisted that cultivar to be competitive with Mt Barker.

Methods

Swards of Karridale, Mt Barker and a 50:50 mixture of Karridale and Mt Barker were sown in three replicates at Marulan on the NSW southern tablelands. The seed was broadcast onto a prepared seed bed at 8kg/ha in March 1985. Establishment counts on these plots were made in 1985 and 1988. Seed harvests were undertaken in mid-September 1987 and after seed set in 1987/88. Total burr and seed number and the number of seeds per burr were recorded. The seed from the mixed swards was then grown out in a glasshouse to determine the ratio of Karridale to Mt Barker seed in the seed pool. All measurements were taken in three 0.25 m² samples from each plot. The plots were not grazed.

Results and discussion

There was no significant difference between the residual burr numbers of the two cultivars at the mid-1987 harvest. However, while Mt Barker had only an average of 53 seeds left per 50 burrs in mid-1987, Karridale had nearly double that number, 86 seeds per 50 burrs. At seed set at the end of 1987/88, Karridale set 28% more seed than Mt Barker. Again there was a significant difference in the number of seeds set per burr ($p < 0.05$).

Table 1. Burr and seed yields in 1987 (in 0.25 m²)

	<u>Mt Barker</u>	<u>Karridale</u>	<u>Binary</u>	
<u>Burr number</u>				
mid 1987	163	153	226	1sd 5% = 52
end 1987/88	86	239	134	
<u>Seeds/50 burrs</u>				
mid 1987	52.8	85.6	61.7	1sd 5% = 17.4
end 1987/88	73.9	103.4	91.6	

Although Karridale was sown as 50% of the binary seed pool in 1985, it contributed 69% of the seed after seed set in 1987, an increase of 19% in three years. Associated with this was a change in the botanical composition of the sward. At establishment in 1985 almost 40% of the plants in the mixed sward were Mt Barker plants, while by establishment in 1988 only 18% of the sward was Mt Barker. This is a direct result of the fact that 69% of the seed in the seed pool at the end of 1987 was Karridale seed. This experiment demonstrates that Karridale has the capacity to dominate swards in which it has been sown at equivalent seed numbers with Mt Barker. It is the ability of the plants of Karridale to produce a much greater amount of seed which contributed to its success.

1. Hutton and Curnow (1987), Proceedings 4th Aust. Agronomy Conference.
2. Dear, B.S. (1987). Paper presented to the NSCIP workshop at Wagga.

