

Technical note

Madeira serradella — a winter legume for sandy soils on the Darling Downs

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Introduction

In southern inland Queensland there are about 1.25 million hectares of shallow, sandy, acid, solodised soils which are low in fertility and carry only 1.5 wether sheep/ha (Figure 1). This land unit receives 650 to 750 mm of annual rainfall, 30-35% of which falls in winter. There have been no persistent tropical or temperate legumes available for pasture development. The original yellow serradella (*Ornithopus compressus*) cultivar, Pitman, grew well but did not persist.

The object of our study was to develop a new serradella cultivar. Our evaluation programme was commenced in 1981 with a serradella collection of 102 lines from more than ten countries in the Mediterranean region, provided by Dr J.S. Gladstones of the Western Australia Department of Agriculture.

Selection of a new cultivar

The line MC2 was registered as cv. Madeira (Gladstones *et al.* 1989) because it persists and is productive. It:

- Is capable of producing large quantities of dry matter. For example, in an experiment in which serradella lines are grazed and spelled in alternate months during the growing season, Madeira produced 3100 kg/ha DM after spelling in Spetember 1990.
- Flowers early (90 days after a May planting, compared with 135 days for cv. Pitman), improving the reliability of seed set in an

environment where spring rainfall is low and variable, and the soils hold little water.

- Sets large quantities of seed (2.8 t/ha podded seed has been measured in a seed increase area).

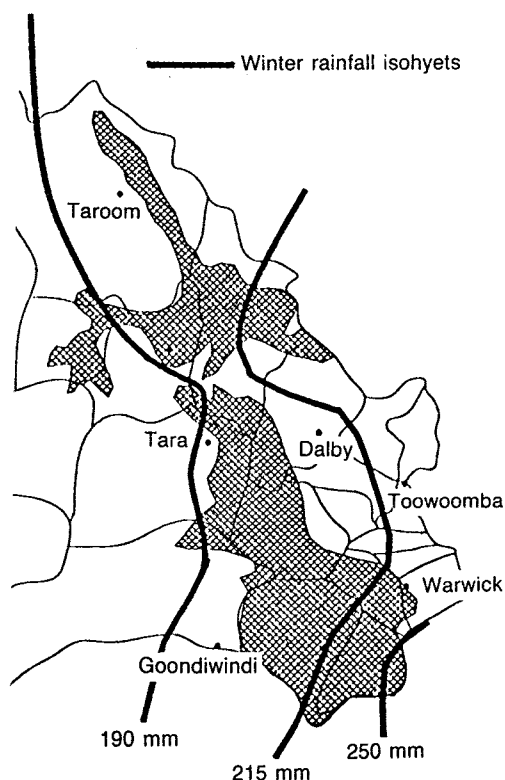


Figure 1. Serradella is adapted to friable soils in this area.

- Sets high proportions of hardseed, essential in a summer rainfall environment (at least 65% of germinable seed in Queensland — and up to 99% in Western Australia).
- Maintains an adequate soil seed reserve and regenerates with high plant populations (> 500/m²) each autumn.

It has been consistently successful in experimental, developmental and commercial sowings made over a 10-year period.

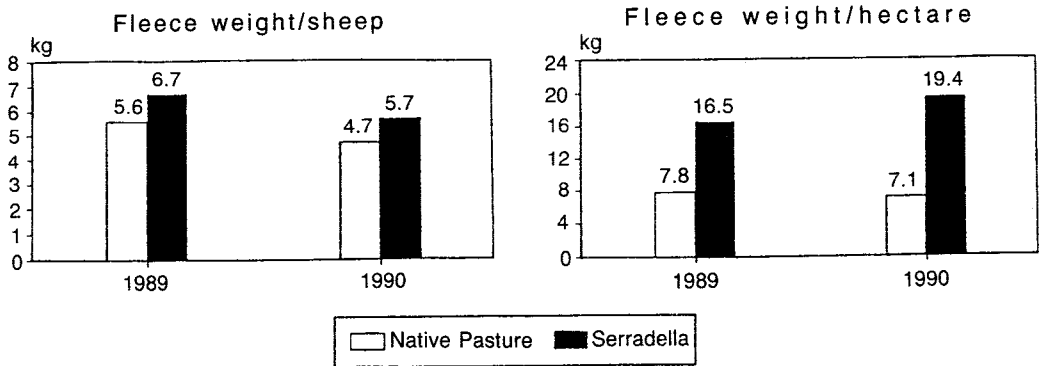


Figure 2. Greasy fleece production per head and per hectare of serradella and native pastures.

Development of the new cultivar

A development area of 35 ha of serradella was sown at Leyburn (28°0'S, 151°30'E) in 1987. Serradella was established with a cover crop of oats and 185 kg/ha superphosphate, and grazed intermittently with cattle. Katambora rhodes grass (*Chloris gayana*) was surface sown in spring 1987. Maintenance applications of superphosphate at 125 kg/ha have been applied every second year.

To measure the value of the new pasture, wool production and liveweight of Merino wethers stocked continuously since July 1988 have been compared with those in the grazer's flock, grazing mainly native pasture. Stocking rates have been:

- Native pasture control 1988-89 and 1989-90 — 1.5 sheep/ha
- Serradella pasture — 2.5 sheep/ha (1988-89); 3.5 sheep/ha (1989-90)

During the two year period the average liveweight of wethers on serradella pasture was 8.4 kg/head greater than those on native pasture. Difference in fleece production/head and fleece production/ha are shown in Figure 2.

Thus, a 2 to 3-fold increase in wool production is being obtained with Madeira serradella pasture, increasing the net return/ha from \$26 to \$45 (Table 1).

Table 1. Economic analysis of improved animal production from serradella pasture compared with native pasture

	Native pasture	Improved serradella pasture
Gross return \$/ha	48	111
Costs — selling	10	24
— on-farm	12	24
— fertilizer	0	18
Total costs \$/ha	22	66
Gross margin \$/ha	26	45

Conclusion

Madeira serradella pasture is persistent and it increases animal production and profits from wool-growing. It should also provide alternative animal production options such as breeding and growing sheep and cattle, which were not previously available.

Reference

- GLADSTONES, J.S., BOLLAND, M.D.A. and LLOYD, D.L. (1989). Register of Australian herbage plant cultivars B. Legumes 11. Serradella (a) *Ornithopus compressus* L. (yellow serradella) cv. Madeira. *Australian Journal of Experimental Agriculture*, 29, 304-305.