

New medic pasture systems to increase production in pasture/cereal rotations in the Victorian mallee

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Cropping in the Victorian Mallee largely follows a fallow-cereal-pasture rotation. Wheat, the major cereal grown, is subject to very considerable losses from both cereal cyst nematode (*Heterodera avenae*) and the take-all fungus (*Gaeumannomyces graminis*). In 1978/79, for example, it was estimated that yield reductions caused by the two diseases represented about \$40 million (1, 2).

As well as infecting cereal crops, both diseases are hosted by grasses and are carried over during the pasture phase, in which *Hordeum leporinum*, *Lolium rigidum* and *Bromus* species are dominant. By the use of higher seeding rates and appropriate herbicide applications it should, therefore, be possible to produce medic-dominant pastures that will reduce the levels of disease and weed infestation in all phases of the rotation.

Methods

Medic pastures (*Medicago truncatula* cv. Jemalong) were sown on 18th June, 1981, at rates of from 1 to 256 kg seed/ha with 13 kg P/ha on a sandy loam soil at Walpeup, on a site with no history of medic. Trifluralin was applied at 1 i/ha and incorporated the day before sowing and Diclofop-methyl (1 k/ha) and Methabenzthiazuron (550 g/ha) were applied on 30th July for control of *L. rigidum* and broadleaf weeds, respectively.

Results and Discussion

There were no increases in dry matter (DM), seed yield or pod numbers at harvest by sowing at rates greater than 16 kg/ha (Table 1).

Table 1: Effects of medic seeding rates (kg/ha) on medic and weed densities (plants/m²) and on medic DM and seed yields (kg/ha)

Seeding rate (kg/ha)	Medic density		Medic DM yield		Seed yield	Pod Nos. (m ²)	Winter weeds 3/9		Summer weeds 9/12	
	3/9	9/12	3/9	9/12			9/12	9/12	Grass	B'leaf
1	3	10	1	284	9	89	9	8	2	1
4	35	19	29	512	29	183	3	55	0	7
8	78	40	42	1263	101	688	2	2	0	0
16	118	70	61	1594	168	781	1	0	1	0
32	288	63	175	1590	144	913	0	2	0	0
256	1017	70	474	1439	162	868	0	1	0	0

Furthermore, where pastures were sown at rates of 8 kg/ha or higher, winter weed infestation (*Brassica tournefortii* and *Sisymbrium orientale*) was greatly reduced compared to that in lower density pastures. The mat of senescent medic pasture also reduced the density of summer weeds (*Chondrilla juncea* and *Lactuca serriola*, Table 1). These results indicate that the sowing of dense medic swards coupled with strategic herbicide applications may enable highly productive, weed-free pastures to be established. Wheat will be direct-drilled into the medic plots in 1982 to assess whether the different sward densities influence cereal yields.

1. Brown, R. H. 1981. Proc. Cereal Cyst Nematode Seminar, Department of Agriculture Victoria, Horsham, pp.1-6.

2. Griffiths, J. B., and Walsgott, D. N. 1982. Proc. Australian Agronomy Conference (in press).