

## Foliar manganese for lupins

W.A. Hawthorne and D.C. Lewis

Department of Agriculture, Struan, South Australia

Lupins (*Lupinus angustifolius*) in the southeast of South Australia suffer manganese deficiency despite the drilling of superphosphate with added manganese as recommended in Western Australia (1). Therefore, trials were sown in 1979 to determine if and how the deficiency could be overcome.

### Methods

Replicated trials at 22 sites were sown in factorial design of two rates of manganese sulphate (0 and 32 kg/ha), drilled with the superphosphate (200 kg/ha) at seeding, and two rates of manganese foliar spray (Mangasol<sup>2</sup>) at 0 and 10 l/ha applied at flowering. Harvest yields were obtained, and the number of split seeds recorded in the grain sample.

### Results and Discussion

Manganese significantly ( $P < 0.05$ ) increased grain yields and reduced the proportion of split seeds in the grain sample at 10 of the 22 sites (see table). Manganese significantly ( $P < 0.05$ ) reduced the proportion of split seeds at 8 non-yield responsive sites, and produced no response at 4 sites (see table). Cultivar effects were not apparent.

A Mangasol<sup>2</sup> foliar spray gave significantly ( $P < 0.05$ ) higher yields than the drilled manganese at 2 of the 10 yield responsive sites, and equal yields at the remaining 8. Of the 18 sites showing a reduction in the proportion of split seeds, a Mangasol<sup>2</sup> foliar spray was significantly ( $P < 0.05$ ) more effective than the drilled manganese at 5 sites, equally as effective at 12 sites, and significantly ( $P < 0.05$ ) less effective at 1 site.

**Table Mean grain yield (t/ha) and split seeds (%) after applied manganese**

Manganese Fertilizer	10 sites with yield and split seed responses		8 sites with split seed responses		4 sites with no responses	
	Yield	Split seed	Yield	Split seed	Yield	Split seed
Nil	1.11	24	1.25	8	1.20	3
Drilled Mn	1.55	14	1.38	4	1.17	1
Foliar Mn	1.66	9	1.45	3	1.13	3
Drilled Mn + foliar Mn	1.69	4	1.42	1	1.16	2

It was concluded that a Mangasol<sup>2</sup> foliar spray applied at flowering is a more reliable means of controlling manganese deficiency in lupins than is the drilling of manganese at seeding time. Wide-spread aerial applications of Mangasol<sup>2</sup> have been commercially applied in the two seasons since these trials. The method is cost-effective, and in most cases coincides with insecticide application.

1. Perry, M.W. and Cartrell, J.W. 1976. J. Agric. West. Aust. 17: 20.