

11.3 THE EFFECT OF RHIZOBIA INOCULUM RATES ON FABA BEAN YIELD - SYMMONS PLAINS

Location: Symmons Plains (Perth)
Clarendon Lodge (Nile) Tasmania

GSR (April-Nov): 478 mm

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Methodology:

Group F inoculum in a peat base was applied to the seed as a slurry prior to sowing. The standard rate of rhizobia inoculum (200g/100kg seed) was compared with inoculum rates five times the standard rate (high), and uninoculated nil treatments. Trials were conducted at two sites, Clarendon Lodge and Symmons Plains. Fiesta faba bean were sown on the 9 May 2003 at Clarendon Lodge and on the 29 May 2003 at Symmons Plains at a sowing rate of 280 kg/ha. Fertiliser, 250 kg/ha of 4:13:7:9 + Mo, was banded at sowing at both sites. Plots were 8m x 1.7m with four replicates at each site. Ten plants from each plot were collected at mid flowering between late September (Clarendon Lodge) and early October (Symmons Plains). The number of effective nodules, those with pink colouring, was counted on each plant.

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Background:

There is limited information to quantify the benefit of inoculating faba beans with rhizobia. Higher rates of rhizobia inoculum may provide more effective nodulation and improve crop yield or stress tolerance.

Aim:

To investigate the nodulation and yield response of Faba beans to higher rates of rhizobia inoculation.

Results and Discussion:

	Inoculation	Yield (t/ha)	Number of nodules	Shoot weight (g)	Root weight (g)
Average across both sites	High	2.9	7.7	9.2	1.4
	Standard	2.8	7.0	8.2	1.2
	Nil	2.2	1.8	5.2	0.9
	Significance	**	***	***	***
	LSD	0.37	0.77	1.27	0.20
Symmons Plains		2.5	5.3	6.4	0.7
Nile		3.0	5.7	8.7	1.6
	Significance	*	NS	***	***
	LSD	0.45	-	1.03	0.16

Rhizobia inoculation increased yields above the uninoculated (Nil) plants. There was a trend for the high rate of inoculum to increase yield above the standard rate at the Nile site, but this was not significant. Inoculation increased the weight of plant shoots, roots and the number of nodules compared to the nil plants. There was a significant increase in the number of nodules between the low and high rate treatments at

The winter and early spring of 2003 were particularly wet and both sites were waterlogged for much of this time. Water logging was more severe at Symmons Plains, where root weights in particular were substantially reduced and the uninoculated plants were showing signs of nitrogen stress (yellowing). However a dry finish during October and November may have limited the yield difference between control and inoculated plants.

Conclusions:

Rhizobium inoculation improved faba bean yields by 9-30% above uninoculated plants. Higher rates of rhizobium inoculum show a trend to further increase yield though this was not significant. Rhizobium inoculation should be considered as cheap insurance against conditions not favourable to nitrogen supply, particularly during winter. The trials will be continued in 2004/05