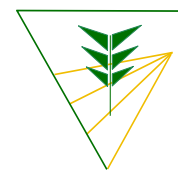


Effects of Nutrients on Lupin Yield and Protein

Aim: To evaluate a range of nutrients on lupin yield and protein.

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Location: West Buntine

Background: This is the second year of the project. In 2002, no results were obtained from the Liebe Group site. At two of three other sites, there were small reductions in grain protein from the addition of potassium and increases from application of Flexi – N at podding.

Trial Details:

Plot size and replication	Plots 20m x 1.42m. 2 Replicates
Soil type	Yellow sand
Soil Test (2003)	P 25 mg/kg, K 55 mg/kg, S 9.6 mg/kg, Organic Carbon 0.63%, Reactive Iron 437 mg/kg, pH 5.8, DTPA Mn 4.29 mg/kg, Boron 0.4 mg/kg
Sowing date	May 8 th 2003
Conditions at sowing	Soil dry, 15mm received May 9 th
Machinery	Knife point + press wheels
Seeding rate	Tanjil lupins at 100 kg/ha
Fertiliser	No basal application
Herbicides and Insecticides	May 6 th : Simazine 2l + Bulldock 70 mL/ha May 30 th : Brodal Options 120 mL/ha July 7 th : Fusion 250 g/ha
Paddock History	2002 = Wheat, 2001 = Lupins, 2000 = Wheat

Nutrition Treatments: Rates of application are listed for each nutrient.

Phosphorus (P): 15 kg/ha, drilled with the seed or deep banded 5-7cm below seed.

Manganese (Mn): 6 kg/ha, drilled with the seed or deep banded 5-7cm below seed.

Molybdenum (Mo): 70 g/ha + Cobalt (Co): 25g/ha, wet mixed with TSP to coat each fertiliser granule.

Boron (B): 1.2 kg/ha, dry mixed with TSP.

Potassium (K): 50 kg/ha topdressed 19/6/03.

Sulphur (S): 25 kg/ha topdressed 19/6/03.

Results: The site suffered severely from Simazine damage. Early rains were sporadic which delayed the recovery of the crop. Control of the ryegrass infestation was also delayed to allow the plants to recover from the Simazine damage. This resulted in late and less effective control.

Grain yields reflected the impact of the chemical damage and ryegrass competition. There was a significant response (0.2 t/ha) to the application of P (15 kg/ha) at seeding. Deep banding the P 5-7cm below the seed depth gave a further significant response (0.21 t/ha). The addition of Mo (70 g/ha) + Co (25 g/ha) to the TSP applied at seeding had a significant negative effect on crop yield (-0.17 t/ha). The addition of B (1.2 kg/ha) into the fertiliser mix applied at seeding had a significant negative effect on crop yield (-0.12 t/ha). There were no yield benefits from the application of Mn, K or S.

GRAIN YIELDS (t/ha)

TREATMENT AT SEEDING	POST EMERGENT TREATMENT			
	Nil	K	S	K + S
Nil	0.58	0.59	0.54	0.60
P	0.80	0.72	0.81	0.81
P (Deep Banded)	1.03	0.93	0.99	1.02
P + Mn	0.79	0.69	0.80	0.77
P + Mn (Deep Banded)	0.99	1.03	0.82	0.92
P + Mn + Mo + Co	0.74	0.72	0.65	0.77
P + Mn + Mo + Co + B	0.59	0.50	0.59	0.71
F Test (0.05): P = 0.000 lsd = 0.1294				

Lupin protein levels ranged from 33.5 – 35.4%. There was a significant increase in protein from the application of P (15kg/ha). When P was deep banded there was a further increase in lupin protein. There was no effect on protein from the application of Mn, Mo + Co, K or S.

There was a reduction in protein following the addition of B to the fertiliser mix.

INFRATECH PROTEIN (%)				
TREATMENT AT SEEDING	POST EMERGENT TREATMENT			
	Nil	K	S	K + S
Nil	33.8	33.7	34.2	33.8
P	34.2	34.5	34.9	34.0
P (Deep Banded)	34.9	34.2	35.0	35.4
P + Mn	34.9	34.1	33.4	34.4
P + Mn (Deep Banded)	34.5	33.8	34.1	34.8
P + Mn + Mo + Co	34.3	34.6	34.4	34.5
P + Mn + Mo + Co + B	33.7	33.8	33.5	34.3
F Test (0.05): P = 0.009 lsd = 0.797				

TREATMENT	GRAIN YIELDS (t/ha)	INFRATECH PROTEIN (%)
Nil	0.58 a	33.9 a
P	0.78 b	34.4 b
P (Deep Banded)	0.99 c	34.9 c
F Test (0.05):	P = 0.009 lsd = 0.129	P = 0.002 lsd = 0.417

TREATMENT	GRAIN YIELDS (t/ha)	INFRATECH PROTEIN (%)
Nil	0.72 b	34.4 b
B	0.60 a	33.8 a
F Test (0.05):	P = 0.011 lsd = 0.077	P = 0.009 lsd = 0.359

Summary:

- Simazine damage early, affected growth.
- Lupin yields averaged 0.77 t/ha.
- Protein levels averaged 34.3%.
- There was a significant response in both yield and protein to the application of 15 kg/ha P, with a further increase when the P was deep banded.
- There was a significant decrease in both yield and protein following the application of 1.2 kg/ha B.
- There was a significant decrease in yield following the application of Mo + Co, but there was no effect on protein.
- There were no effects on yield or protein following application of Mn, K or S.

Technically reviewed by: Bob French

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