

Trial 13

Grain Legume Responses to the Application of Phosphorus and Zinc Sponsored by Pivot Agriculture

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Aim: To demonstrate the yield and dry matter responses of field peas, lentils and chickpeas to the application of phosphorus and zinc in the southern Mallee.

Results:

Grain Legume	Fertiliser	Rate kg/ha	Dry Matter t/ha	Grain Yield t/ha	Fertiliser Profit \$/ha
Field peas	Control	0	0.82	0.76	
Field peas	Grain Legume Super	67	1.90	1.50	\$127.70
Field peas	Grain Legume Super	134	2.60	1.70	\$146.50
Field peas	Grain Legume Super Zinc	136	2.51	1.53	\$105.00
Lentils	Control	0	0.24	1.37	
Lentils	Grain Legume Super	67	0.42	1.94	\$208.60
Lentils	Grain Legume Super	134	0.48	2.09	\$247.80
Lentils	Grain Legume Super Zinc	136	0.67	2.12	\$250.10
Chickpeas	Control	0	0.22	1.78	
Chickpeas	Grain Legume Super	67	0.40	2.02	\$33.80
Chickpeas	Grain Legume Super	134	0.60	2.39	\$99.20
Chickpeas	Grain Legume Super Zinc	136	0.58	2.24	\$57.10

Prices used - Field Peas \$200/t, Lentils \$400/t, Chickpeas \$230/t. Fertiliser at list price plus freight

Interpretation:

Field peas: There were excellent yield and dry matter responses from the application of Grain Legume Super to the field peas. At the high rate of application (134 kg/ha), yield increased by 124% and crop mass by 217%. The maximum profit from the application of Grain Legume Super was achieved at this same rate, equivalent to 20 kg phosphorus/ha. In the field pea trial at the long term sodic site last year, this rate of phosphorus (20 kg/ha) was also the most profitable. The addition of zinc did not have an effect on yield or dry matter. This result was not unexpected as the soil test from the site showed the pH to be neutral (6.9) and no free lime in the topsoil. Alkaline soils with free lime in the profile are most responsive to the application of zinc.

Lentils: The application of Grain Legume Super to the lentils produced significant yield and dry matter responses. At the top rate of application in the trial, responses were in the order of 53% and 100% for yield and crop mass respectively. Returns on the investment in fertiliser was highest at the application rate of 134 kg/ha Grain Legume Super. As with the field peas, zinc responses were not recorded in the lentils although dry matter appeared to benefit from its use.

Chickpeas: Yield and dry matter responses were measured in the chickpeas to the application of Grain Legume Super (34% and 173% respectively). While the returns to the use of fertiliser were not as great as with field peas and lentils, the most profitable rate was still 134 kg/ha of Grain Legume Super (20 kg P/ha). The findings for zinc were consistent with the other 2 crop results.

Take Home Message:

Field peas, lentils and chickpeas are responsive to the application of phosphorus. While field peas responded better per kg phosphorus applied, lentils show the greatest returns/kg P due to their higher value. Chickpeas show the least response to phosphorus but application on low phosphorus soils is very profitable. Growers should soil test paddocks going into grain legumes to determine the optimum phosphorus rate to apply and ensure lentils and field peas are priority crops for P fertiliser.