Grain Legume Responses to the Application of Phosphorus and Zinc

Sponsored by Pivot Agriculture
Robert Christie, Regional Agronomist, Pivot Agriculture

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

Methods: Two fertilisers, Grain Legume Super (0:15:07.1) and Grain Legume Super Zinc (0:14.7:0:6.7, 2%Zn) were applied at 10 and 20 kg/ha of phosphorus, and 2.7kg/ha of zinc at sowing to Dundale field peas, Digger lentils and Desavic chick peas. The field peas, lentils and chick peas were sown on 3/6/97 at 100, 50 and 80 kg/ha of seed respectively.

Results

Crop type	Fertiliser	Rate kg/ha	Dry matter t/ha	Yield t/ha
Field peas	Control	0	0.44	0.53
	Grain Legume Super	67 (10kg of P)	0.71	0.57
	Grain Legume Super	134 (20kg of P)	0.91	0.44
	Grain Legume Super Zinc	136 (20kg of P+Zn)	1.02	0.52
Chick peas	Control	0	0.35	0.71
	Grain Legume Super	67 (10kg of P)	0.39	0.66
	Grain Legume Super	134 (20kg of P)	0.42	0.58
	Grain Legume Super Zinc	136 (20kg of P+Zn)	0.36	0.55
Lentils	Control	0	0.42	0.44
	Grain Legume Super	67 (10kg of P)	0.70	0.43
	Grain Legume Super	134 (20kg of P)	0.82	0.42
	Grain Legume Super Zinc	136 (20kg of P+Zn)	0.49	0.44
Significant difference				**NS**

Interpretation: Although there were yield differences between treatments, they were not significant. Visual differences in dry matter production were observed and measured prior to flowering. The most visual dry matter difference was evident in the field peas, but this had no effect on grain yield.

Unfortunately, dry weather during late June and July resulted in poor plant establishment and lack of spring rains after flowering resulted in very poor yields and lack of response to the treatments.

Commercial practice: Grain legumes are normally responsive to the application of phosphorus fertiliser, this was most evident in an identical trial conducted at Birchip in 1996. Field peas and lentils have shown the best returns/kg of phosphorus applied. Chick peas are the least responsive, but on low phosphorus fertility soils the application of phosphorus fertiliser should be profitable.

The regular use of Grain Legume Super Zinc on alkaline, calcareous soils of this region is recommended for legume crops to provide sufficient zinc for other crops in the rotation.