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## Effect of seed phosphorus, seed size and seedling density on the growth of lupins.

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Experiment 89SC22. Effect of seed phosphorus, seed size and seedling density on the growth of lupins.

M. Riley, M.D.A. Bolland and K. Adcock.

Location

South Carrabin Research Station, Hayden paddock.

Treatments

A. Factorial combination of:

1. Soil P - 0, 300 kg superphosphate/ha drilled with seed.
2. Seed size - approximately 125, 170 g/1000 seed.
3. Seeding rate - 60, 80, 110 kg/ha.
4. Replicates - 4.

Note: For these treatments seed contained 0.29% P

B. Factorial combination of:

1. Soil P - 0, 300 kg superphosphate/ha drilled with seed.
2. Seed P - 0.29, 0.38% (from 88E54).
3. Seed size - approximately 125, 170 g/1000 seed.
4. Replicates - 4.

Note: For these treatments seed sown at 80 kg/ha.

Sowing details

Lupin cv. Danja lime pelleted and inoculated. Basal copper fertilizer applied at 1 kg/ha.

Sown on 17/5/89.

Harvested on 28/11/89.

Table 8. Effect of seed phosphorus (P) concentration, fertilizer P level, seed size and seeding rate on plant counts at six weeks, shoot dry matter (DM) at 12 and 21 weeks after sowing and seed yield at maturity of lupins cv. Gungurru grown at South Carrabin Research Station in 1989

Fertilizer P (kg super/ha)	Seed P (%)	Seed size	Seed rate	Plant counts/m <sup>2</sup>	Shoot DM (kg/ha)		Seed DM (kg/ha)		
					12 weeks	21 weeks			
A.									
0	0.28	Small	Low	37	78	402	90		
			Medium	42	93	476	80		
			High	62	122	604	40		
		Large	Low	31	92	644	90		
			Medium	43	108	672	80		
			High	60	158	692	60		
300	0.28	Small	Low	31	127	1554	290		
			Medium	42	186	1608	350		
			High	58	198	1614	310		
		Large	Low	26	165	1836	350		
			Medium	34	212	1874	400		
			High	56	285	2132	370		
Soil P				**	**	**	**		
Seed size				*	**	**	NS		
Seed rate				**	**	NS	NS		
Soil P x seed size				NS	NS	NS	NS		
Soil P x seed rate				NS	NS	NS	NS		
Seed size x seed rate				NS	NS	NS	NS		
Soil P x seed size x seed rate				NS	NS	NS	NS		
B.									
0	0.28	Small	Medium	42	93	476	80		
			Large	Medium	43	108	672	80	
		0.39	Small	Medium	54	95	621	70	
				Large	Medium	45	120	821	90
		300	0.28	Small	Medium	42	186	1608	350
				Large	Medium	34	212	1874	400
0.39	Small		Medium	44	113	1498	210		
	Large		Medium	42	150	1659	310		
Soil P				**	**	**	**		
Seed P				**	**	NS	**		
Seed size				*	*	NS	*		
Soil P x seed P				NS	**	NS	**		
Soil P x seed size				NS	NS	NS	NS		
Seed P x seed size				NS	NS	NS	NS		
Soil P x seed P x seed size				*	NS	NS	NS		

## Comments

1. Omitting superphosphate depressed seed dry matter at maturity and shoot DM during the season despite increasing plant counts at six weeks after sowing.
2. Plants grown from small seed had lower shoot DM at 12 and 21 weeks after sowing but at maturity seed size generally resulted in no difference in seed DM. Similarly decreasing seeding rate decreased plant density at six weeks, and shoot DM at 12 weeks but had not effect on seed DM at maturity.
3. Decreasing seed P concentration decreased plant density at six weeks, shoot DM at 12 weeks and increased seed DM at maturity in the plots treated with superphosphate.