





Phosphorus management in pulses Barellan 2022

Key findings

- The soil was a brown sandy loam with pH_{Ca} 5.2, Colwell phosphorus 44 ppm and total nitrogen (0–60 cm) 52.9 kg N/ha. The pulse crop grown was lupins in 2016.
- There was no effect of P fertiliser rate or placement on establishment of lentils, but lupin establishment was reduced when P was placed with seed compared to P being spread and incorporated by sowing (IBS).
- Early vigour of lentils (measured by NDVI on 2 August) increased with P rate and was higher when P was placed with seed compared to IBS. There was no effect of P rate on NDVI at the second assessment (31 August) but there was still a positive effect of P applied with seed compared to IBS. NDVI in lupins followed a similar trend as observed with plant establishment with negative effects of P when applied with seed.
- Grain yield response was similar to the response observed with establishment. Lentil yield was not affected by P rate or placement; lupin yield was reduced where P was placed with seed.
- Lentil yield averaged 2.8 t/ha. Lupin yield ranged from 4.75 t/ha where P was applied with seed to 5.6 t/ha where P was applied IBS.

Trial Details

Table 1:	Trial management	and treatments	applied a	t Barellan	in 2022.
	J				

Management			
Pre-sow herbicides	3 May: glyphosate 450 @ 1.5 L/ha + Reflex® (240 g/L fomesafen) @ 1 L/ha		
Sowing date	6 Мау		
Sowing rate	Calculated for each species and variety based on seed size. Lentil target 100 plants/m², albus lupin target 30 plants/m²		
Fungicide	Due to multiple trial species on one site, fungicide application was off-label. Contact trial manager for more information		
Insecticide	11 October: Transform (500 g/kg sulfoxaflor)@ 50g/ha + Trojan® (150 g/L gamma- cyhalothrin) @ 30 mL/ha + wetter 1000 @ 0.2%		
Harvest date	20 December		
Treatments			
Species, variety	Lentil, PBA Hallmark XT ⁽⁾		
	Albus lupin, Luxor ^(b)		
Phosphorus rate	Nil	Note: nitrogen applied as MAP was	
	11 kg P/ha (50 kg/ha MAP)	balanced using urea so each treatment	
	22 kg P/ha (100 kg/ha MAP)	received the same rate	
Phosphorus placement	IBS (spread and incorporated by sowing)		
	With seed		

Results

Lentils

Table 2: Effect of phosphorus rate and placement on plant establishment (22 June), NDVI and grain yield of lentils at Barellan in 2022.

	Establishent			
Treatment	(plants/m²)	NDVI – 2 August	NDVI – 31 August	Grain yield (t/ha)
Phosphorus rate				
0	87	0.32	0.50	2.86
11	91	0.36	0.53	2.95
22	83	0.38	0.56	2.68
Mean	87	0.35	0.53	2.83
l.s.d. (<i>P</i> =0.05)	ns	0.037	ns	ns
Phosphorus placement				
IBS	88	0.33	0.51	2.90
With seed	86	0.38	0.56	2.76
Mean	87	0.35	0.53	2.83
l.s.d. (<i>P</i> =0.05)	ns	0.013	0.035	ns



Albus lupins

Table 3: Effect of phosphorus rate and placement on plant establishment (22 June), NDVI and grain yield of albus lupins at Barellan in 2022.

Treatment	Establishent (plants/m²)	NDVI – 2 August	NDVI – 31 August	Grain yield (t/ha)
Phosphorus rate				
0	20	0.41	0.62	5.45
11	17	0.37	0.59	5.08
22	19	0.37	0.61	5.02
Mean	18	0.38	0.61	5.18
l.s.d. (<i>P</i> =0.05)	ns	0.039	ns	0.362
Phosphorus placemen	t			
IBS	24	0.45	0.67	5.61
With seed	12	0.32	0.54	4.75
Mean	18	0.38	0.61	5.18
l.s.d. (<i>P</i> =0.05)	8.0	0.065	0.054	ns



Acknowledgements

We gratefully acknowledge the investment support of the GRDC for BRA2105-001RTX, '*Development and extension to close the economic yield gap and maximise farming systems benefits from grain legume production in New South Wales*'. Thanks to farmer co-operator Jeff Savage "Avenel" Barellan for hosting the trial and assisting with management.

Contributors

Barry Haskins and Rachael Whitworth – Ag Grow Agronomy and Research rachael@aggrowagronomy.com.au

© Brill Ag 2023

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of publication (March 2023). Readers should make their own enquiries and rely on their own advice when making decisions related to material contained in this publication.











