

Caragabal site attributes

2024

Background

The Caragabal trial site was a sodic clay loam soil. Above average rain fell right through summer 2023/24 providing excellent seedbed moisture for the first sowing date. The soil was wet (sticky) for the second sowing date and with more rain post-sowing, establishment from the second sowing date was reduced. Late winter and spring rain was below average, but grain yield potential was high due to stored water from earlier rain. A frost event of -2.8°C was recorded on 16 September which impacted grain yield.

Weather data

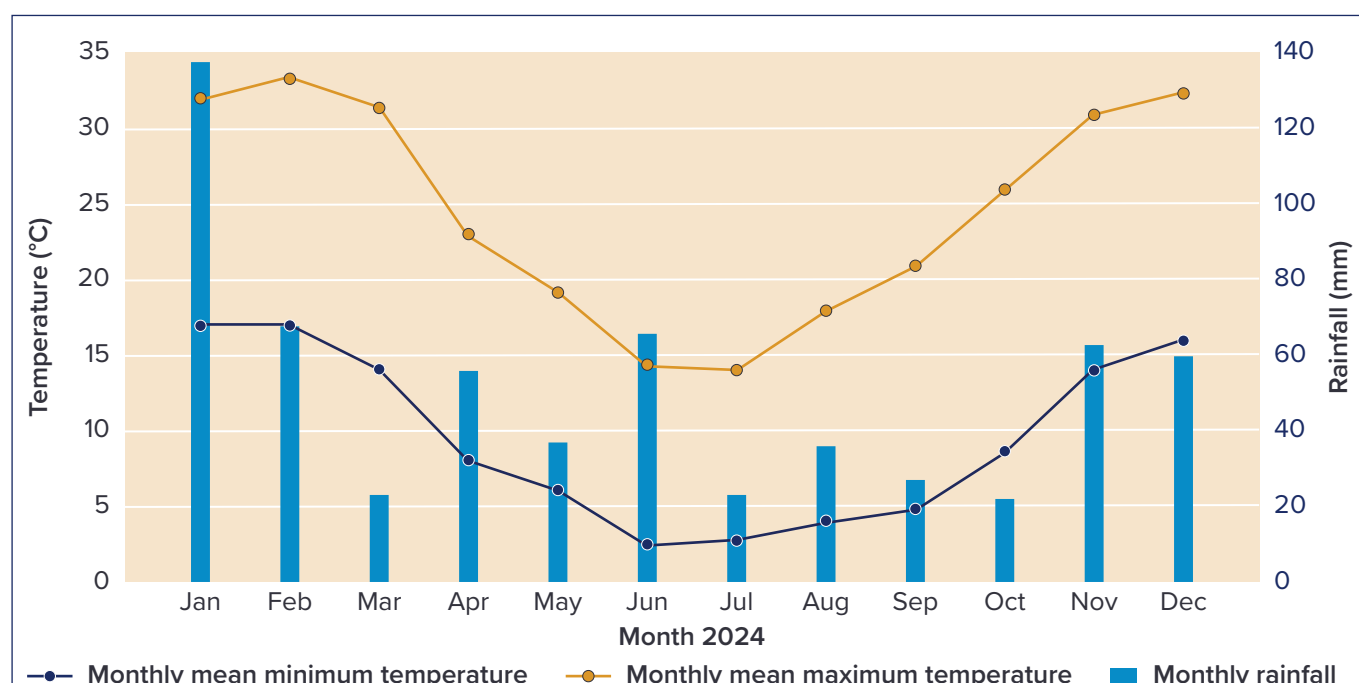


Figure 1: Monthly rainfall and mean minimum and maximum temperature at Caragabal in 2024.

Crop sequence and key management dates

Crop sequence			Key management dates 2024		
Year	Crop	Cultivar	Activity	Date	Comments
2023	Wheat	Scepter ^{db}	Sowing	23 April	Sowing date 1: chickpea, faba bean, field pea, lentil, lupin and vetch TOS trials
2022	Canola	Pioneer 44Y94 CL			Faba bean phosphorus management trial
2021	Wheat	Scepter ^{db}	Sowing	21 May	Sowing date 2: chickpea, faba bean, field pea, lentil, lupin and vetch TOS trials
			Harvest	15 November	All faba beans, field peas, lentils and vetch
				5 December	All chickpeas and lupins

Soil characteristics

The soil was a clay loam with some acidity and sodicity in the soil surface. Both sodicity and pH increased with soil depth. The electrochemical stability index (ESI) was less than 0.05 in the top 10 cm, indicating that the soil is likely dispersive. The site had good background soil phosphorus fertility. There were 36 rhizobia/g soil from Group G/S (lupins and serradella), 78.7 rhizobia/g soil from Groups E/F (faba bean, field pea, lentil, vetch), with no chickpea rhizobia detected.

Table 1: Soil characteristics at Caragabal pulse site, sampled 30 April 2024.

Characteristic	Unit	Soil depth (cm)			
		0–5	5–10	10–15	15–20
pH [1:5 CaCl ₂]		4.78	5.02	5.44	5.88
Organic carbon	%	1.75	1.55	–	–
Phosphorus [Colwell]	mg/kg	56	54	–	–
Cation exchange capacity (CEC)	meq/100 g	12.6	15.0		
Exchangeable calcium (Ca)	%	55.6	50.5		
Exchangeable magnesium (Mg)	%	31.8	37.8		
Exchangeable potassium (K)	%	6.9	4.6		
Exchangeable sodium (Na)	%	4.9	6.8		
Exchangeable aluminium (Al)	%	0.4	0.1		
Exchangeable hydrogen (H)	%	0.5	0.3		
Salinity EC (1:)	dS/m	0.14	0.18		
Texture					
Sand	%	54.5	9.7		
Silt	%	21.8	22.8		
Clay	%	23.8	27.5		

Table 2: Soil nitrogen status at Caragabal pulse site, sampled 30 April 2024.

Characteristic	Unit	Soil depth (cm)				
		0–10	10–20	20–50	50–80	80–120
Nitrate (NO ₃) N (ppm)	mg/kg	12.8	7.2	2.1	3.9	1.2
Ammonium (NH ₄) N (ppm)	mg/kg	2	1.9	1.2	1.5	1.3



Waterlogging impacted crop establishment and subsequent growth of the second sowing date (21 May) trials, even in faba beans at Caragabal – 14 August 2024

Faba bean phosphorus rate and placement

Caragabal 2024

Key findings

- NDVI assessments were taken on 24 July as it relates with crop biomass (to a point). NDVI increased with higher phosphorus (P) rates and was higher where P was placed in-furrow compared with where it was broadcast and incorporated by sowing (IBS).
- Grain yield followed a similar trend as NDVI. Yield increased from 4.1 to 4.5 t/ha as P rate increased from nil to 25 kg P/ha. Placing P in-furrow with seed gave a 0.2 t/ha yield improvement over where P was broadcast and incorporated by sowing (IBS).

Trial details

A faba bean phosphorus (P) placement trial was conducted at Caragabal in 2024. Four P rates were used, 0, 5, 15 & 25 kg P/ha (0, 22, 66 & 110 kg/ha MAP). P was applied in-furrow (with DBS tines, separated from seed by ~1.5–2 cm) or broadcast and incorporated by sowing (IBS), at each of the four P rates.

Table 1: Trial management of the faba bean P placement trial at Caragabal in 2024.

Management	2024
Sowing date	23 April
Starter fertiliser	As per treatments outlined above
Pre-emergent herbicide	Pre-sowing: Simazine 900 @ 500 g/ha + Reflex® @ 0.9 L/ha
Variety	PBA Samira [Ⓛ]
Target plant population	25 plants/m ²

Results

Table 2: Effect of P rate and placement (IBS v in-furrow) on NDVI of PBA Samira[Ⓛ] faba beans, measured 24 July at Caragabal, 2024.

P rate (kg P/ha)	NDVI		
	P placement	IBS	In-furrow
0		0.56	0.56
5		0.56	0.62
15		0.61	0.65
25		0.60	0.68
P placement average		0.58	0.63
I.s.d. (P = 0.05) P rate		0.037	
I.s.d. (P = 0.05) P placement		0.032	
I.s.d. (P = 0.05) P rate × P placement		n.s.	

n.s. = not significantly different

Table 3: Grain yield of PBA Samira[®] faba beans with P applied at 4 rates and all P rates applied either IBS or in-furrow at Caragabal, 2024.

P rate (kg P/ha)	Grain yield (t/ha)		
	P placement	IBS	In-furrow
0		4.12	4.11
5		4.09	4.36
15		4.27	4.54
25		4.29	4.63
P placement average		4.19	4.41
I.s.d. ($P = 0.05$) P rate		0.14	
I.s.d. ($P = 0.05$) P placement		0.14	
I.s.d. ($P = 0.05$) P rate $\times$ P placement		0.19	

n.s. = not significantly different

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'.

Also thank you to the Cooper family from Caragabal for hosting the trial and providing assistance with the management of the trial.

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