

Barellan site attributes

2024

Focus

- **Pulse species and variety comparison** – evaluate pulse species including chickpeas, faba beans, field peas, lentils, lupins and vetch to determine suitability within the site environment.
- **Phosphorus (P) response** – determine the P efficiency of lentils and field peas. Which species is more responsive to P and which can better adapt to varying P rates?
- **Field pea fungicide** – determine the most cost-effective management strategy for controlling blackspot in field peas in a variable rainfall environment.

Climate

The 2024 season began strongly, with soaking rains in early April. Although a dry spell followed, beneficial rainfall in mid-May led to very wet conditions, allowing crops to establish well. This promising start, categorised as decile 8 to 10, set the season up for optimum grain yield (Table 1).

However, below-average rainfall persisted across much of the area throughout winter, with warm, dry conditions into August. By September, conditions were tightening, culminating in a widespread severe frost in mid-September. On September 16, the temperature at Griffith Airport dropped as low as -2.1°C , with even lower temperatures recorded in other areas, remaining below 0°C for much of the night. Rainfall in the last week of September allowed some crops to recover.

In mid to late October, storms with strong winds and hail caused further crop damage in some regions.

Table 1: Monthly rainfall for 2023, 2024 and long-term average (LTA, 1878–2024) at Barellan Post Office (BOM Number 74005) and total annual and growing season (GSR, April–October) rainfall.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	GSR
2023	43.6	0	79.1	44.6	17.0	50.3	22.8	19.3	4.3	10.0	97.7	40.4	429.1	168.3
2024	112.6	48.7	5.4	45.4	59.2	18.9	32.2	31.0	22.4	27.2	69.4	34.6	507.0	236.3
LTA	38.9	34.0	38.2	34.8	37.6	40.3	36.5	37.9	34.9	42.6	35.4	31.6	442.7	264.6

Crop sequence and key management dates

Crop sequence			Site management 2024		
Year	Crop	Cultivar	Activity	Date	Comments
2023	Wheat	Scepter [Ⓛ]	Sowing	1 May	Pulse species and variety comparison P response in lentils and field peas Field pea fungicide
2022	Wheat	Scepter [Ⓛ]	Establishment	13 June	Establishment scores on all trials
			NDVI early	24 July	Biomass assessed on all trials
			NDVI flowering	27 August	Biomass assessed on all trials
			Harvest	22 November	All trials

Soil characteristics

Table 2: Soil chemical characteristics at Barellan in April 2024.

Characteristic	Unit	Soil depth (cm)	
		0–10	10–60
Nitrate (NO ₃) N	ppm	37	5
Ammonium (NH ₄) N	ppm	<1.0	<1.0
Phosphorus [Colwell]	ppm	29	
Potassium [Am. Acet.]	meq/100 g	0.86	
Magnesium [Am. Acet.]	meq/100 g	0.69	
Calcium [Am. Acet.]	meq/100 g	4.75	
Sulphur [MCP]	ppm	7.0	
Manganese [DTPA]	ppm	24.7	
Boron [CaCl ₂]	ppm	0.4	
Copper [DTPA]	ppm	0.4	
Iron [DTPA]	ppm	17.0	
Zinc [DTPA]	ppm	0.2	
Organic matter	%	1.5	
CEC	meq/100 g	6.35	
Ca:Mg ratio		6.9	
K base saturation	%	13.6	
Mg base saturation	%	10.9	
Ca base saturation	%	74.9	
Na base saturation	%	<1.0	
pH [1:5 CaCl ₂]		5.4	
EC [1:5 H ₂ O]	dS/m	0.09	
Aluminium [KCl]	meq/100 g	0.03	
Chloride	ppm	17.0	
Sodium [Am. Acet.]	meq/100 g	<0.1	
Soil N	kg N/ha	44	33
Total N (0–60 cm)	kg N/ha	77	



Barellan farm walk, 25 September 2024

Table 3: Segmented soil pH and salinity at the 2024 Barellan pulse trial site sampled February 2025.

Depth (cm)	pH (CaCl ₂)	Salinity (dS/m)
0–5	5.00	0.170
5–10	4.33	0.076
10–15	4.54	0.063
15–20	5.16	0.054

Phosphorus response in field pea and lentil

Barellan 2024

Key findings

- A widespread severe frost on 16 September impacted the trials in 2024, with temperatures as low as -2.1°C , staying below 0°C for much of the night.
- There was no effect of P rate on establishment, NDVI and grain yield of both lentils and field peas in 2024.
- There was no effect of P placement on establishment, NDVI and grain yield of both lentils and field peas in 2024 (site Colwell P 29 mg/kg).

Trial details

Two trials were conducted to determine the effect of phosphorus (P) rate and placement on lentils and field peas establishment and grain yield

Table 1: Trial management details of the lentil and field pea phosphorus rate and placement trials at Barellan in 2024.

Management	2024
Pre-sow herbicides	Terbyne® Xtreme® 875 @ 1 kg/ha + Terrad'or® @ 20 g/ha + TriflurX® @ 1.2 L/ha + Gramoxone® 250 @ 2 L/ha
Sowing date	1 May
Starter fertiliser	See treatments, Table 2
Sowing rate	Calculated from seed size for target plant population: field pea – 40 plants/m ² ; lentil – 100 plants/m ²
Post-emergent herbicides	24 June: Factor® @ 80g/ha + Platinum® Xtra 360 @ 0.33 L/ha + Hasten @ 1%
Fungicide	21 August: Miravis® Star @ 250 mL/ha
Insecticide	2 October: Trojan @ 30 mL/ha + BS1000 @ 0.2%
Desiccation	11 November
Harvest	22 November

Table 2: Phosphorus treatments for APB Bondi[®] field pea and PBA Hallmark XT[®] lentil trials at Barellan in 2024.

Treatment	Phosphorus placement
Phosphorus placement	IBS (spread then incorporated by sowing)
Phosphorus rate (kg P/ha)	0, 5, 10, 20

Phosphorus applied as MAP

Nitrogen supplied in MAP was balanced so each treatment received the same amount

Results

Lentil

Table 3: Effect of phosphorus rate and placement on plant establishment (13 June), NDVI (24 July, 27 August) and grain yield of PBA Hallmark XT[®] lentils at Barellan in 2024.

Treatment	Establishment (plants/m ²)	NDVI 1	NDVI 2	Grain yield (t/ha)
Phosphorus rate				
0	109	0.35	0.69	1.70
5	102	0.36	0.69	1.62
10	107	0.34	0.70	1.67
20	113	0.35	0.70	1.60
Mean	108	0.35	0.70	1.65
I.s.d. ($P = 0.05$)	ns	ns	ns	ns
Phosphorus placement				
IBS	106	0.36	0.71	1.67
With Seed	109	0.34	0.69	1.63
Mean	108	0.35	0.70	1.65
I.s.d. ($P = 0.05$)	ns	ns	ns	ns

n.s. = not significantly different



Lentil phosphorus response trial at first NDVI assessment at Barellan, 24 July 2024

Field pea

Table 4: Effect of phosphorus rate and placement on plant establishment (13 June), NDVI (24 July, 27 August) and grain yield of APB Bondi[®] field peas at Barellan in 2024.

Treatment	Establishment (plants/m ²)	NDVI 1	NDVI 2	Grain yield (t/ha)
Phosphorus rate				
0	50	0.50	0.68	2.15
5	55	0.48	0.69	2.14
10	53	0.49	0.68	2.23
20	51	0.46	0.66	2.22
Mean	52	0.48	0.67	2.18
I.s.d. ($P = 0.05$)	ns	ns	ns	ns
Phosphorus placement				
IBS	55	0.49	0.68	2.23
With Seed	49	0.47	0.67	2.14
Mean	52	0.48	0.68	2.18
I.s.d. ($P = 0.05$)	ns	ns	ns	ns

n.s. = not significantly different

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