

Comparison of lentil and field pea varieties

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Key findings

- Sowing outside of the preferred lentil and field pea sowing window, followed by below average spring rainfall, resulted in water stress during reproductive stages, impacting yield across both crop types.
- Lentil yields ranged from 0.63-1.60 t/ha with PBA Highland XT achieving the highest yield.
- All field pea varieties yielded similarly at Hart in 2025, averaging 1.08 t/ha.
- National Variety Trial (NVT) yield averages at Riverton for lentils were 3.06 t/ha and field peas were 2.67 t/ha, significantly greater than what was achieved at Hart.

Aim

To compare the performance of pre-commercial and newly released lentil (*Lens culinaris*) and field pea (*Pisum sativum*) varieties alongside current commercial variety options in the medium rainfall zone of South Australia.

Methodology

Two trials were established at Hart, SA in 2025 to investigate lentil and field pea varietal performance (Table 1). The trials were randomised complete block with three replicates. Twelve lentil varieties including two pre-commercial lines ALB2422 and ALB2424 and 14 field pea varieties including pre-commercial lines APB2401, APB2403 and APB2501 were evaluated.

The trial was managed through the application of pesticides to ensure an insect, weed and disease-free canopy. Lentil yields were variable across the 2025 trial site due to the combined effect of soil constraints, pre-emergent herbicide damage and dry conditions (Decile 3, 223 mm). The residual standard deviation (residual SD), representing unexplained variation between plots, was 0.34 t/ha. This should be considered when interpreting grain yield results provided.

Trial data was analysed utilising REML spatial model (Regular Grid) in GenStat 24th Edition. Bonferroni critical difference values (Bonferroni CD) were calculated using average standard error of difference (SED) from the GenStat output and the relevant t critical value calculated in Excel. This number can be used to determine the difference required for a significant effect between treatments.

Table 1. Trial details for 2025 lentil and field pea variety comparison at Hart, SA.

Plot size	1.75 x 10 m	Soil N	120.4 kg N/ha
Location	Hart, SA	Fertiliser	Seeding: MAP (10:22) Zn 1% @ 80 kg/ha
Seeding date	June 20, 2025		
Harvest date	November 5, 2025		
Previous crop	Bale awnless wheat (hay)		
Growing season rainfall	Decile 3 (223 mm)		

Results and discussion

Lentil grain yield

At Hart in 2025 lentil yields ranged from 0.63-1.60 t/ha with the average yield being 1.02 t/ha. Late emergence, followed by below average spring rainfall resulted in water stress during reproductive stages, impacting yield across all varieties. PBA Highland XT yielded higher than all varieties, other than PBA Hallmark XT and GIA Thunder which were statistically equivalent (Table 2).

Long-term yield data shows that GIA Thunder and PBA Jumbo 2 continue to perform well, yielding above the trial average across multiple seasons at Hart (Table 6). In 2025, GIA Thunder was ranked in the top three yielding varieties within the National Variety Trial at Owen and Riverton (National Variety Trials, 2025). PBA Hallmark XT and PBA Highland XT also continue to perform well, exceeding the average site yield the last two years by at least 30% (Table 3).

Growing conditions in 2025 across the Mid North were variable, with some areas receiving timely rain which increased yield potential. This was evident in the varying results in the National Variety Trials (NVT), where average lentil yield at Riverton was 3.06 t/ha, Crystal Brook was 2.21 t/ha and Owen was 1.35 t/ha, all greater than the average yield at Hart (1.02 t/ha) (GRDC, 2025).

Table 2. Grain yield (t/ha) and maturity characteristics (= unknown maturity) of lentil varieties at Hart in 2025. Lentil maturity characteristics sourced from 2026 South Australian Crop Sowing Guide. Shaded values in each column indicate best performing treatments. Any difference between two means greater than the Bonferroni critical difference value is significant at $\alpha = 0.05$ after Bonferroni correction.*

Lentil variety	Maturity	Grain yield (t/ha)
GIA Metro ^{db}	Mid-late	0.63 ^a
GIA Sire ^{db}	Mid	0.64 ^a
ALB Dane ^{db} (ALB2321)	Mid-late	0.80 ^{ab}
ALB2424	*	0.91 ^{abc}
ALB2422	*	0.94 ^{abc}
ALB Terrier ^{db}	Mid	1.00 ^{abc}
GIA Colombo ^{db} (GIA2301L)	Mid	1.04 ^{abc}
PBA Jumbo2 ^{db}	Mid	1.04 ^{abc}
GIA Lightning ^{db}	Mid	1.05 ^{abc}
GIA Thunder ^{db}	Mid	1.29 ^{bcd}
PBA Hallmark XT ^{db}	Mid	1.31 ^{cd}
PBA Highland XT ^{db}	Early-mid	1.59 ^d
Average grain yield (t/ha)		1.02
P-value (≤ 0.05)		<0.001
Bonferroni CD		0.52

Table 3. Long-term yield data for lentil varieties at Hart 2021-2025.

% of trial average						Grain yield (t/ha)
Variety	2021	2022	2023	2024	2025	2025
ALB2422					92	0.94
ALB2424					89	0.91
ALB Dane ^{db} (ALB2321)					79	0.80
ALB Terrier ^{db}		111	111	52	98	1.00
GIA Colombo ^{db} (GIA2301L)				89	102	1.04
GIA2302L				111		
GIA2303L				89		
GIA Leader ^{db}	103	105	99	52		
GIA Lightning ^{db}		105	105	111	103	1.05
GIA Metro ^{db}		80	81	74	62	0.63
GIA Sire ^{db}		80	92	66	62	0.64
GIA Thunder ^{db}	113	123	110	118	126	1.29
PBA Blitz		90	100			
PBA Bolt ^{db}		90	104			
PBA Hallmark XT ^{db}	97	99	97	148	129	1.31
PBA Highland XT ^{db}	99	104	100	148	156	1.59
PBA Hurricane XT ^{db}	95	105	93	118		
PBA Jumbo2 ^{db}	110	108	105	108	102	1.04
PBA Kelpie ^{db} XT	82	94	103	118		
Average grain yield (t/ha)	1.62	1.30	5.42	0.14	1.02	
Sowing date	May 18	May 18	June 9	June 5	June 20	
April - Oct (mm)	355	232	355	176	223	
Annual rainfall (mm)	503	401	519	240	263	

Field pea yield

There were no significant differences in yield observed between any varieties at Hart in 2025. Yields ranged from 0.97-1.28 t/ha with an average of 1.08 t/ha (Table 5). Long-term yield data shows that Kaspas and PBA Butler continue to perform well, often yielding above the trial average across multiple seasons at Hart (Table 6).

Varying results in the field pea National Variety Trials were also observed, with the average yield at Riverton being 2.67 t/ha and 1.83 t/ha at Willamulka, both exceeding Hart's average yield. Similarly to Hart, APB Bondi was in the top three performing varieties within the NVT at Riverton. PBA Taylor performed well, achieving the highest yield at Riverton, 3.13 t/ha, and within the top two varieties at Willamulka, achieving the same yield as the top variety Kaspas, 2.04 t/ha (GRDC, 2025).

Table 5. Field pea grain yield (t/ha) results from Hart in 2025.

Variety name	Grain yield (t/ha)
PBA Gunyah ^b	0.97
PBA Oura ^b	0.97
GIA Kastar ^b	0.99
APB2501	1.03
GIA Ourstar ^b	1.03
GIA2203P	1.05
PBA Butler ^b	1.05
PBA Taylor ^b	1.06
PBA Wharton ^b	1.06
APB2401	1.07
Kaspa	1.11
APB Bondi ^b	1.16
PBA Pearl	1.24
APB2403	1.28
Average grain yield (t/ha)	1.08
P-value	NS



Photo. Field pea plots at Hart in 2025.

Table 6. Long-term yield data for field pea varieties at Hart 2021-2025.

% of trial average						Grain yield (t/ha)
Variety	2021	2022	2023	2024	2025	2025
APB2401				105	99	1.07
APB2402				95		
APB2403					119	1.28
APB2501					96	1.03
APB Bondi ^{db}				113	108	1.16
Kaspa	113	106	102	98	103	1.11
GIA2202P		110	95			
GIA2203P			101	113	98	1.05
GIA Kastar ^{db}	88	86	99	93	92	0.99
GIA Ourstar ^{db}	93	84	85	101	96	1.03
PBA Butler ^{db}	108	112	101	92	98	1.05
PBA Gunyah ^{db}		93	99	97	90	0.97
PBA Oura ^{db}		101	99	102	90	0.97
PBA Pearl		106	103		115	1.24
PBA Percy		99	98			
PBA Taylor ^{db}		105	110	85	98	1.06
PBA Wharton ^{db}	98	99	109	107	98	1.06
Average grain yield (t/ha)	1.38	1.61	3.63	0.77	1.08	
Sowing date	May 18	May 18	June 9	June 5	June 20	
April - Oct (mm)	355	232	355	176	223	
Annual rainfall (mm)	503	401	519	240	263	

Summary

Decile 3 (223 mm) GSR at Hart in 2025 affected yield and quality across the trial site. In general, lentil and field pea yields were low, with an average of 1.02 and 1.08 t/ha, respectively. The highest yielding lentil was PBA Highland XT (1.59 t/ha) and field pea was pre-commercial line APB2403 (1.28 t/ha), although all field pea varieties yielded similarly.

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References

Grains Research & Development Corporation (GRDC). 2025. National Variety Trials. Available at <https://nvt.grdc.com.au/>