

## **Faba Bean, Germplasm x Drought Tolerance, LRZ Southern Mallee (Curyo), Victoria**

### **Authors**

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### **Aim**

To evaluate the performance of faba bean varieties and breeding lines with drought tolerant traits in low rainfall environments.

### **Treatments**

Varieties: AF12025, AF10089, PBA Zahra, PBA Bendoc, PBA Marne, Nura, Farah, PBA Amberley and PBA Samira

### **Other Site Details**

	<b>Curyo</b>
<b>Sowing Date</b>	06 May
<b>Stubble height (cm)</b>	Standing (15)
<b>Row Spacing (cm)</b>	36
<b>Fertiliser (kg/ha)<sup>1</sup></b>	60
<b>Planting density (plants/m<sup>2</sup>)</b>	20

<sup>1</sup> MAP (9.2, 20.2, 0, 2.7) + Zn (2.5)

### **Results and Interpretation**

- Key messages: Similar, to previous seasons and consistent with other sites in 2019, the early flowering and maturing breeding line, AF12025, produced the highest grain yields (17% - 53%) higher than all other varieties. Faba beans had the highest net return (\$1410-2310/ha) of all pulse crops in 2019 at Curyo, ranging from \$1410-2310/ha.
- Establishment and Plant Growth: Adequate soil moisture at sowing due to very high summer rainfall and good rainfall around sowing favoured establishment and growth of faba bean. The breeding line AF12025 was the most vigorous and looked best throughout the season, while the recently released variety, PBA Marne had a relatively slow growth.
- Flowering and maturity: Relative ranking of flowering and maturity times varied considerably between the varieties and breeding lines. AF12025 was the earliest flowering line, at least one week earlier than any other line in the trial, followed by PBA Marne and Farah. PBA Amberley, PBA Samira, PBA Bendoc and PBA Zahra took the longest to flower (Table 2). Although all varieties and breeding lines flowered well behind the earliest line, AF12025, the differences in time to maturity were much less due to dry spring conditions. AF12025 was still the earliest to reach maturity, 3-4 days earlier than other lines, followed by Nura, AF10089, PBA Marne and Farah. PBA Zahra reached the maturity last (Table 2).
- Biomass at Maturity: Varieties and breeding lines varied significantly in biomass at maturity, which ranged between 7.70 t/ha and 10.64 t/ha (Table 2). Farah accumulated the highest biomass at maturity, with no significant difference from AF10089, PBA Zahra and AF12025 (Table 2). The biomass of PBA Samira was 25-38% less than PBA Zahra, AF10089 and Farah. The newly released variety PBA Amberley produced significantly less biomass than Farah and AF10089 but was similar in biomass to other varieties and breeding lines (Table 2).
- Grain Yield and Profitability: The performance of faba bean varieties and breeding lines was excellent in 2019, with grain yields ranging from 3.42 to 5.22 t/ha (Table 2). The earliest flowering and maturing line AF12025 produced the highest grain yield, 53% higher than PBA Samira and 23-25% higher than PBA Bendoc and PBA Marne. The grain yield of PBA Samira was significantly lower than all the varieties and breeding lines except the mid-late maturing variety PBA Amberley (Table 2). PBA Amberley was released in 2019 for its high yielding potential in high rainfall environments with improved resistance to chocolate spot and ascochyta blight.

The net return for faba bean ranged between \$1410 for PBA Samira and \$2310 for AF12025 (Table 2), which was the highest of all pulse crops at Curyo in 2019. Further, it is important to highlight the rotational benefits that faba bean adds to the subsequent crop. These results continue to highlight the potential for faba bean in the Mallee, particularly if new varieties are released with improved adaptation and higher potential grain yields.

Table 2. Flowering and maturity scores (1-early; 9-late), biomass at maturity (t/ha), grain yield (t/ha), harvest index and estimated net return (\$/ha) of faba bean varieties and breeding lines at Curyo in 2019.

Variety	Flowering Time (1: early, 9: late)	Maturity Time (1: early, 9: late)	Maturity Biomass (t/ha)	Grain Yield (t/ha)	Harvest Index	Net return <sup>1</sup> (\$/ha)
AF12025	1	1	9.35	5.22	0.37	2310
AF10089	8	3	10.18	4.46	0.27	1930
PBA Zahra	9	8	9.65	4.30	0.24	1850
PBA Bendoc	9	4	8.09	4.26	0.28	1830
PBA Marne	6	3	8.46	4.18	0.35	1790
Nura	8	2	8.47	4.10	0.30	1750
Farah	7	3	10.64	4.06	0.29	1730
PBA Amberley	9	4	8.05	3.77	0.28	1585
PBA Samira	9	5	7.70	3.42	0.36	1410
<b>LSD (P&lt;0.05)</b>	1	1	1.93	0.43	ns	

<sup>1</sup> Net return based on a grain price of \$500/t and with fixed management costs of \$300/ha.

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