

Field Pea, Canopy management, LRZ Mid North (Willowie), South Australia

Field Pea, Canopy management, MRZ Mid North (Hart), South Australia

Field Pea, Canopy management, LRZ Eyre Peninsula (Wudinna), South Australia

Authors

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Aim

To reduce lodging and increase harvestability and biomass.

To assess fungicide efficacy on blackspot infection under different canopy structures (Hart ONLY).

Treatments

Varieties: 12 cultivar combinations were tested at each site

Hart	Willowie and Wudinna
PBA Oura + canola x2	PBA Oura + canola x2
100% PBA Oura (SL)	100% PBA Oura (SL)
75% PBA Oura + 25% PBA Percy	75% PBA Oura + 25% PBA Percy
50% PBA Oura + 50% PBA Percy	50% PBA Oura + 50% PBA Percy
25% PBA Oura + 75% PBA Percy	25% PBA Oura + 75% PBA Percy
100% PBA Percy (C)	100% PBA Percy (C)
PBA Percy + canola x2	PBA Percy + canola x2
100% PBA Wharton (SL)	100% PBA Wharton (SL)
75% PBA Wharton + 25% 13HO474-P-14HO-6	75% PBA Wharton + 25% Parafield
50% PBA Wharton + 50% 13HO474-P-14HO-6	50% PBA Wharton + 50% Parafield
25% PBA Wharton + 75% 13HO474-P-14HO-6	25% PBA Wharton + 75% Parafield
100% 13HO474-P-14HO-6 (breeding line)	100% Parafield (C)

SL=semi leafless, C=conventional.

Table 2. Trial site details

	Hart	Willowie	Wudinna
Sowing date	16 May	16 May	21 May
Row spacing (cm)	23	23	27
Fertilizer (kg/ha)¹	80	75	75
Seeding rate (plants/m²)		Conventional type: 45 Semi-leafless type: 55	

¹MAP (9.2, 20.2, 0, 2.7) + Zn (2.5)

Results and Interpretation

- Key Messages: Field pea cultivar mixtures show potential in terms of decreasing lodging and increasing harvestability. Cultivar combinations did not increase biomass and grain yield compared to sole varieties in 2019.
- Disease (Hart): Early infection and progression of blackspot was low due to minimal rainfall over the growing season and drier than average seasonal conditions. When rainfall was conducive to disease progression the rainfall event coincided with strong winds, which dried out the canopy and did not allow disease progression. As a result of these conditions, cultivar combinations showed no differences in percentage of blackspot infection on leaves or stems.
- Normalised difference vegetation index (NDVI): NDVI was measured multiple times during the growing season to identify differences in ground cover and/or early vigour. There were NDVI differences observed between treatments at Hart and Willowie, 2019 (data not shown). On June 24th, 100% PBA Percy had improved vigour compared to 100% PBA Oura at Hart. However, by August 20th vigour was similar between these two treatments as indicated by the NDVI readings. On August 20th, 100% PBA Wharton had improved canopy structure and ground cover than 100% 13HO474-P-14HO-6 (breeding line). The Willowie site had similar results, in which 100% PBA Percy had higher NDVI values, suggesting improved vigour and ground cover, than all mixtures except for 50% PBA Oura + 50% PBA Percy on June 26th (data not shown).

- Plant height: The differences in plant height between cultivar mixtures when measured at flowering and at crop maturity, at Wudinna in 2019 (Figure 1). Incorporating cultivar mixtures of PBA Oura and PBA Percy did not influence plant height compared to 100% PBA Percy at flowering. Additionally, incorporating a mix of 75% PBA Percy + 25% PBA Oura increased plant height by 6 cm compared to 100% PBA Oura. However, there was no difference in plant height between 100% PBA Oura and 100% PBA Percy at flowering.

At crop maturity plant height of 100% PBA Percy was 16 cm taller than 100% PBA Oura. Canola emergence was poor in 2019 and as a result incorporating canola with PBA Oura did not increase plant height. Incorporating cultivar mixtures of 25% PBA Oura + 75% PBA Percy increased average plant height compared to 100% PBA Oura while average plant height in 50% PBA Oura + 50% PBA Percy was equal to 100% PBA Percy. Plant height of 100% PBA Parafield at crop maturity was 22 cm taller than 100% PBA Wharton. Incorporating cultivar mixtures of PBA Wharton and PBA Parafield (all combinations) increased plant height compared to 100% PBA Wharton, but were equal to 100% PBA Parafield.

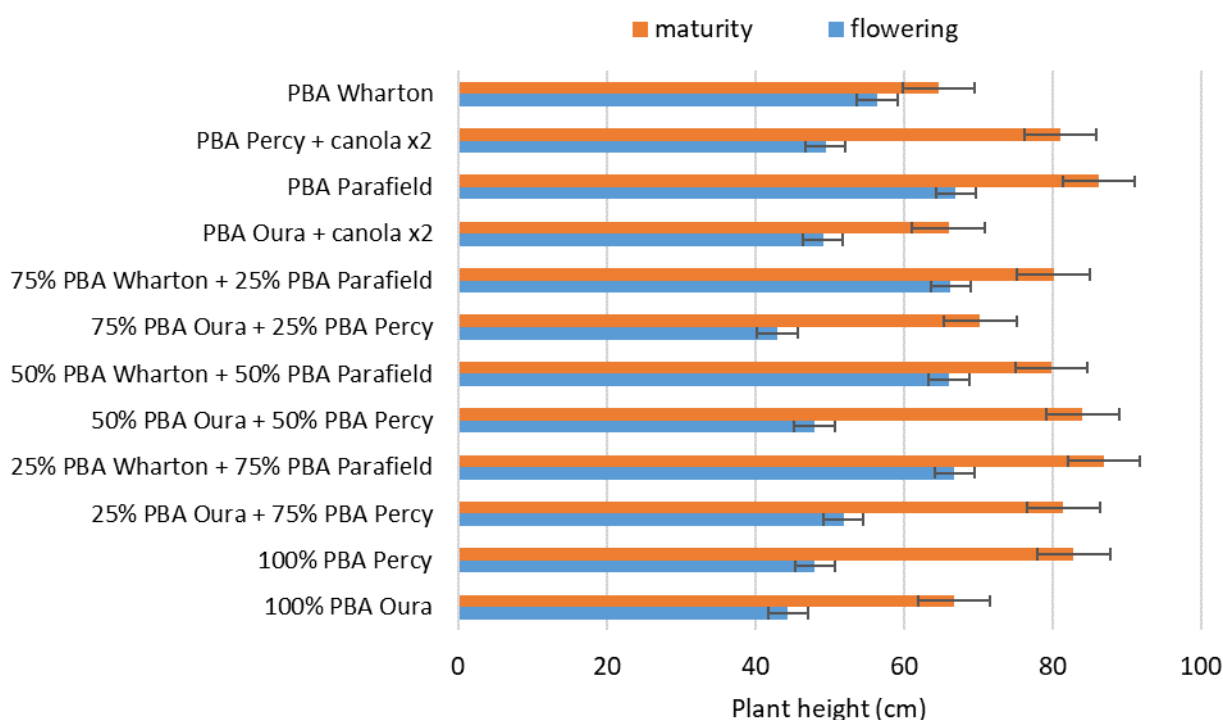


Figure 1. Average plant height at flowering and crop maturity of cultivar mixtures at Wudinna, 2019. Error bars represent least significant difference ($P < 0.05$).

- Grain yield: At Hart, 100% 13HO474-P-14HO-6 (breeding line) was the highest yielding treatment (1.48 t/ha) and was 16% higher yielding than 100% PBA Wharton (Figure 2). In 2019, cultivar mixtures did not increase or reduce grain yield. Long-term yield data would be beneficial to determine if mixing conventional field pea and semi-leafless field pea influence grain yield in the southern region. At Willowie, average grain yield was 0.25 t/ha under drought conditions and no difference in grain yield was observed between cultivar mixtures. At Wudinna, grain yield of 100% PBA Wharton (0.52 t/ha) was lower than all other cultivar combinations (Figure 3). There were no differences between other cultivar combinations.