3. Field Peas

F1. Sowing Time x Row Space, LRZ Southern Mallee (Curyo), Victoria

Aim

To investigate the adaptability of a range of field pea varieties and breeding lines to wider row spacing's sown inter-row in to standing stubble compared with conventional cropping systems (narrow row spacing with slashed stubble). The interaction sowing times is also compared.

Note: Trial is a comparison of systems, not just row space. In the wider row spacing's plots were sown with narrow lucerne points, press wheels and chemicals applied pre-sowing. In the narrow row spacing's plots were sown with narrow lucerne points, harrows and chemicals applied post-sowing, pre-emergent.

Treatments

Varieties:	Kaspa, Morgan, OZP0703, OZP0804, OZP0805, PBA Gunyah, PBA Twilight, Sturt.
Sowing dates:	6 May (Early), 7 June (Late)
Row Spacings/Stubble:	30 cm row spacing, inter-row, standing stubble (ST30), 60 cm row spacing, inter-row, standing stubble (ST60), 17.2 cm row spacing, slashed stubble (sl17).

Other Details

Fertiliser:	MAP + Zn @ 40 kg/ha at sowing
Plant Density:	35 plants/m^2

Results and Interpretation

- Key Message: Early sowing was beneficial at this site even in a year of above average rainfall. Extreme rainfall events throughout harvest resulted in grain yield losses between 0% and 55%, the most severe response was in the variety, Sturt, with greatest susceptibility to pod shattering. Several of the new genotypes continue to show potential indicating yield stability across a range of seasonal conditions.

- Plant establishment – Establishment range between 13 and 33 plants/m^2 for field peas at Curyo in 2010 (Table F1.1). Sturt had the lowest establishment and Morgan highest. There was little difference between sowing dates for all genotypes except Sturt (Table F1.1). Plant establishment was higher in the narrow row spacing treatments (Table F1.2)

Table F1.1. The effect of the interaction between sowing date and field pea genotype on establishment (plants/m^2) at Curyo in 2010.

Sowing Date	Kaspa	Morgan	OZP0703	OZP0804	OZP0805	PBA Gunyah	PBA Twilight	Sturt
6 May	30	34	23	27	27	26	28	20
7 June	33	34	26	30	28	30	31	13

lsd(P<0.05)SDxGen = 3.7, except when comparing genotypes within a sowing date = 3.6

Table F1.2. The effect of row space on field pea establishment at Curyo in 2010.

Row Space	Plants/m2
sl17	31
ST30	28
ST60	23

lsd(P<0.05)Row Space = 1.5

- Maturity Biomass – Selected varieties were sampled for biomass and yield component analysis. Generally Biomass was higher in the early sown (May 6) treatments compared with later sown (June 7) treatments (Table F1.4). There was a significant interaction between row spacing and genotype (Table F1.3). Overall all genotypes across the two sowing dates, the sl17 treatment produced more biomass than ST30, which was greater than ST60. However there was variation

in this response, with PBA Twilight and Morgan producing more biomass in the ST30 compared with sl17 treatments.

- Grain Yield – Due to extreme rainfall events throughout harvest some grain yields were significantly reduced. Potential grain yields were in excess of 3.5t/ha for varieties such as Morgan and Sturt. It was predicted that in the May 6 sown treatments grain yield losses where between 20% and 30% and in the June 7 sown treatments losses were between 0% and 55% (Table F1.5). Sturt had the greatest or equal greatest yield loss at both sowing dates. Based on the actual grain yields all genotypes had a significant yield loss through delayed sowing, similar to biomass estimates, however some varieties were more responsive than others. Sturt showed a yield loss of 57% through delayed sowing, while OZP0805 had only a 12% loss (Table F1.5). Responses to row spacing's were similar to that observed for biomass. Generally, grain yields were highest in the sl17 treatment and lowest in the ST60 treatment (Table F1.6). However, several varieties, including Morgan, OZP0703 and PBA Gunyah showed little or no response to increasing row spacing from sl17 to ST30.

Table F1.3. The effect of row space and stubble on maturity biomass (t/ha) of selected field pea genotypes at Curyo in 2010.

Row Space	Kaspa	Morgan	PBA Twilight	Sturt	*Average*
sl17	7.89	7.46	6.57	7.52	7.36
ST30	5.11	8.45	7.03	6.44	6.76
ST60	5.15	6.20	5.38	6.33	5.76
Average	6.05	7.37	6.32	6.76	

lsd(P<0.05)Row SpacexGen = 1.81, except when comparing genotypes within a row space = 1.57

Table F1.4. The effect of sowing date on field pea maturity biomass (t/ha) at Curyo in 2010.

Sowing Date	t/ha
6 May	7.79
7 June	5.46

lsd(P<0.05)SD = 0.44

Table F1.5. The effect of the interaction between sowing date and field pea genotype on grain yield (t/ha) at Curyo in 2010 (Number in brackets indicates predicted yield loss due to rain fall events based on biomass and harvest index calculations taken from the yield component sampling completed before rainfall events).

Sowing Date	Kaspa	Morgan	OZP0703	OZP0804	OZP0805	PBA Gunyah	PBA Twilight	Sturt	*Average*
6 May	2.62 (18%)	2.51 (31%)	2.63	2.89	2.34	2.85	2.53 (23%)	2.69 (30%)	*2.63*
7 June	1.88 (6%)	2.12 (0%)	1.68	2.05	2.04	2.01	2.04 (21%)	1.15 (54%)	*1.87*

lsd(P<0.05)SDxGen = 0.47, except when comparing genotype within a sowing date = 0.30. lsd(P<0.05)SD = 0.50

Table F1.6. The effect of the interaction between row space and field pea genotype on grain yield (t/ha) at Curyo in 2010.

Row Space	Kaspa	Morgan	OZP0703	OZP0804	OZP0805	PBA Gunyah	PBA Twilight	Sturt	*Average*
sl17	2.63	2.51	2.29	2.86	2.58	2.62	2.55	2.18	*2.53*
ST30	2.23	2.48	2.54	2.39	2.13	2.58	2.31	1.70	*2.29*
ST60	1.88	1.95	1.63	2.17	1.86	2.09	2.01	1.88	*1.93*
Average	*2.25*	*2.31*	*2.15*	*2.47*	*2.19*	*2.43*	*2.29*	*1.92*	

lsd(P<0.05)Row SpacexGen = 0.41, except when comparing genotypes within a row space = 0.36. lsd(P<0.05)Gen = 0.21, lsd(P<0.05)RS = 0.25.

Key Findings and Comments

Similar to lentils it is important to interpret the grain yield results with caution as it was demonstrated that yield loss due to extreme rainfall events was between 0% and 55%. The importance of pod shatter resistance has been highlighted through these results as, both Kaspa and PBA Twilight have the pod shatter resistance trait and generally show the least yield loss due to the rainfall events. Despite these limitations, grain yields for peas, particularly sown early were excellent and several of the new genotypes continue to show potential in a season considerably different from that which we have had for the last decade, which is promising from a yield stability perspective into the future.