Lentil, Sowing time, LRZ Southern Mallee (Loxton), South Australia
Field Pea, Sowing time, LRZ Southern Mallee (Loxton), South Australia
Chickpea, Sowing time, LRZ Southern Mallee (Loxton), South Australia

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Aim
To assess the impact of seeding time on the production of field pea, lentil and chickpea crops sown in in the low rainfall zone.

Treatments
Time of sowing: using three strategies

- Dry: Sown 22 April and germinated following the season break approximately in mid-May
- Early: Sown same as dry but irrigated immediately to achieve late April germination
- Wet: Sown into moist soil on 22 May

To achieve an early sowing opportunity, approximately 15 mm of irrigation was applied to the early sown treatments via dripper tube that was laid along each seed furrow. The dry sown treatments remained in dry soil until adequate rainfall was received with 11 mm of rain falling on the 10th of May while a further 5.5 mm of rainfall was received on the 20th of May which was just prior to the wet sowing treatment. However only less than 100 mm of total rainfall was received for the growing season and there was a high incidence of frost with 26 days for August – October where minimum temperatures at canopy height were recorded below 0°C.

Varieties: See Table 1

Within each crop type, four varieties were compared. Varieties were selected to represent the range of maturity for each crop type where maturity times increase from Variety 1 to Variety 4; For example, Variety 1 matures the quickest and Variety 4 the slowest.

Table 1. Crop type and varieties included in the trial.

Crop	Variety 1	Variety 2	Variety 3	Variety 4
Field Pea	PBA Twilight	PBA Wharton	PBA Gunyah	PBA Butler
Lentil	PBA Highland XT (CIPAL 1621)	PBA Jumbo2	PBA Hallmark XT	PBA Greenfield
Chickpea	PBA Striker	CICA1521	Genesis 090	Kalkee

Table 2. Other Site Details

	Pinnaroo - Flat
Sowing Dates	Dry and Early: 22 April Wet: 22 May
Plant Density (plants/m²)	Field Pea: 45 Lentil 120 Chickpea 35
Stubble height (cm)	10
Row Spacing (cm)	28
Fertiliser (kg/ha)[1]	50

[1] Granulock Z (N 11, P 21.8, S 4, Zn 1)

Results and Interpretation

- Key messages: When sowing was delayed until rains in May (Wet) overall grain yields in varieties decreased by 20 – 80% in lentil, 40 – 80% in chickpea and 30 – 60% in field pea compared to Early and Dry sowing in April.

- Establishment: Early sowing in April with irrigation increased plant establishment compared to Dry sowing in April or Wet sowing in May in all varieties. Delaying sowing to after rain resulted a 46% reduction in plant number and a 60% reduction in the grain yield of chickpea compared to dry sown plots (Figure 1).

- Biomass: The biomass benefit from dry sowing rather than waiting for rain was 800 kg/ha for field peas, 400 kg/ha for chickpea but only kg/ha 104 for lentils (Table 1). By contrast, the early sowing opportunity simulated through irrigation increased lentil biomass by 1020 kg/ha and chickpea by 780 kg/ha but only 260 kg/ha in field peas (Table 1). Although, early sowing gave higher biomass than dry sowing, it had little benefit on grain yields. Overall, the biomass of field peas (2330 kg/ha) was higher than that of lentils (1810 kg/ha) and of chickpeas (1540 kg/ha).

- Grain yield: Wet sowing in lentils also had 35% less grain yield than the dry sown plots. The early (irrigated) sown lentils established much better than the dry sown plots and produced 80% more grain. The late maturing variety PBA Greenfield had the lowest yield of 149 kg/ha across all sowing dates. Waiting for a wet sowing opportunity resulted in 40% lower field pea yield than sowing dry. The early sowing had 14% greater grain yield than the dry sown field peas. Delaying sowing to after rain resulted a 60% reduction in the grain yield of chickpea compared to dry sown plots (Figure 1). The highest yielding varieties were CICA 1521and PBA Striker. Although yields were lower than their potential yields, in late sown treatments the grain yields of quick maturing varieties, PBA Highland (CIPAL 1621) and PBA Striker were two-fold more than their slowest maturing counterparts.

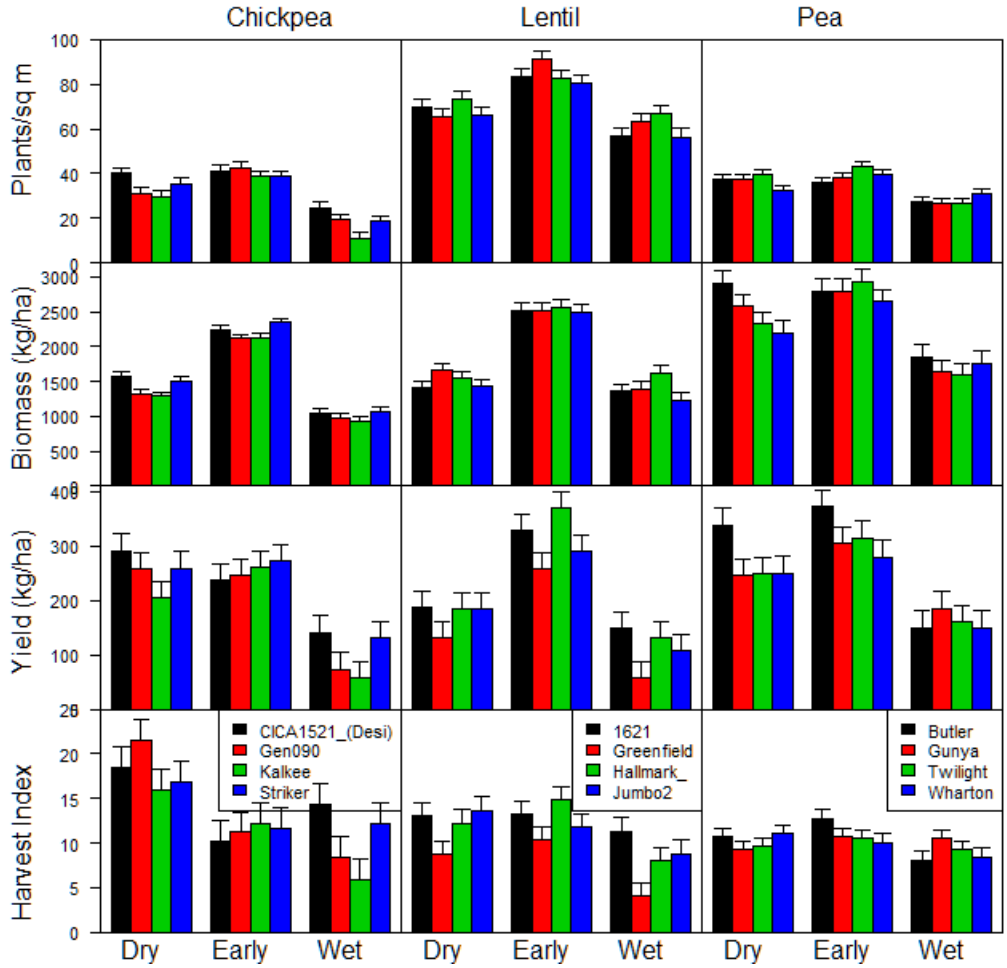

Figure 1. Effect of sowing time on plant emergence, biomass, grain yield and harvest index for lentil, field pea and chickpea. Bars represent standard errors for each sowing time.

Acknowledgements

Frontier Farming Systems technical staff Mick Brady, Todd McDonald, Chris Davies, Charlton Jeisman and Murray Hynam who worked diligently on these trials. Jason Brand for his advice and leadership through the Southern Pulse Agronomy Project. Thank you to Bulla Burra (Loxton) for hosting the trial.