L8 Sowing Date, MRZ Mid North (Pinery), South Australia

Aim

To understand the agronomic performance of new lentil varieties under varying environments of early and delayed sowing times in South Australia.

Treatments

Varieties:	Boomer, Nipper, Nugget, PBA Ace, PBA Blitz, PBA Bolt, PBA Flash, PBA Herald XT, PBA Hurricane XT, PBA Jumbo, CIPAL1104 (PBA Greenfield), CIPAL1203 (PBA Jumbo 2), CIPAL1207 (PBA Giant), CIPAL1301, CIPAL1421
Sowing dates:	7th May and 5thJune, 2014

Other Details

Row Spacing:	22.5cm (9 inches)
Plot Size:	10m
Inoculums:	Nil
Soil Type:	Sandy loam / Limestone clay
Fertiliser:	MAP + Zn (2%) @ 90 kg/ha at sowing
Seed treatment:	P-Pickle T (200 ml/100 kg seed)
Foliar Fungicides:	Canopy Closure – Carbendazim @500 ml/ha, Chlorothalonil @2L/ha Mid flowering to Early Podding – Carbendazim @500 ml/ha, Chlorothalonil @ 2L/ha
Plant Density:	120 plants/m^2

Results and interpretation

Flowering

- Table 1 presents flowering date observations of lentil varieties at different sowing dates at Pinery. The time to flowering varied between varieties and sowing dates. PBA Blitz and the advanced breeding line CIPAL0901 were the earliest flowering varieties at the two sowing dates.
- Varieties flowered within similar intervals across sowing dates (Table 1).

Table 1: Date of first flower recorded for 15 lentil varieties sown at two different dates at Pinery 2014

	Sowing date	
Variety	**7-May**	**5-Jun**
PBA Jumbo	30-Aug	12-Sep
CIPAL1104	24-Aug	6-Sep
PBA Flash	22-Aug	4-Sep
Boomer	22-Aug	4-Sep
CIPAL0901	16-Aug	29-Aug
CIPAL1203	24-Aug	5-Sep
PBA Herald XT	4-Sep	17-Sep
PBA Hurricane XT	30-Aug	12-Sep
CIPAL1301	27-Aug	9-Sep
PBA Ace	27-Aug	9-Sep
Nipper	6-Sep	20-Sep
CIPAL1207	24-Aug	6-Sep
Nugget	2-Sep	15-Sep
PBA Blitz	18-Aug	29-Aug
PBA Bolt	21-Aug	3-Sep

Maturity

- Lentil maturity was significantly affected by sowing date (P =0.002) and variety (P <0.001) indicating a consistent pattern in maturity time for all varieties across the two sowing dates.
- Generally, a delay in sowing caused a delay in maturity time across all the 15 varieties.
- Averaged across sowing dates, the pattern of maturity time was characteristic of the varieties. However the magnitude of the differences in maturity time was not always distinct between varieties as would be expected (Figure 3). This was particularly true between the early and mid-maturing varieties where the trend in maturity time was compressed leaving no real differences. For example, the early maturing line PBA Blitz was the earliest maturing line in the trial, and was also equal to a number of varieties including PBA Jumbo 2, PBA Jumbo, and Nipper which are characteristically rated as mid-maturing varieties. This compressed trend in maturing time may have resulted from haying off due to an early dry spring.

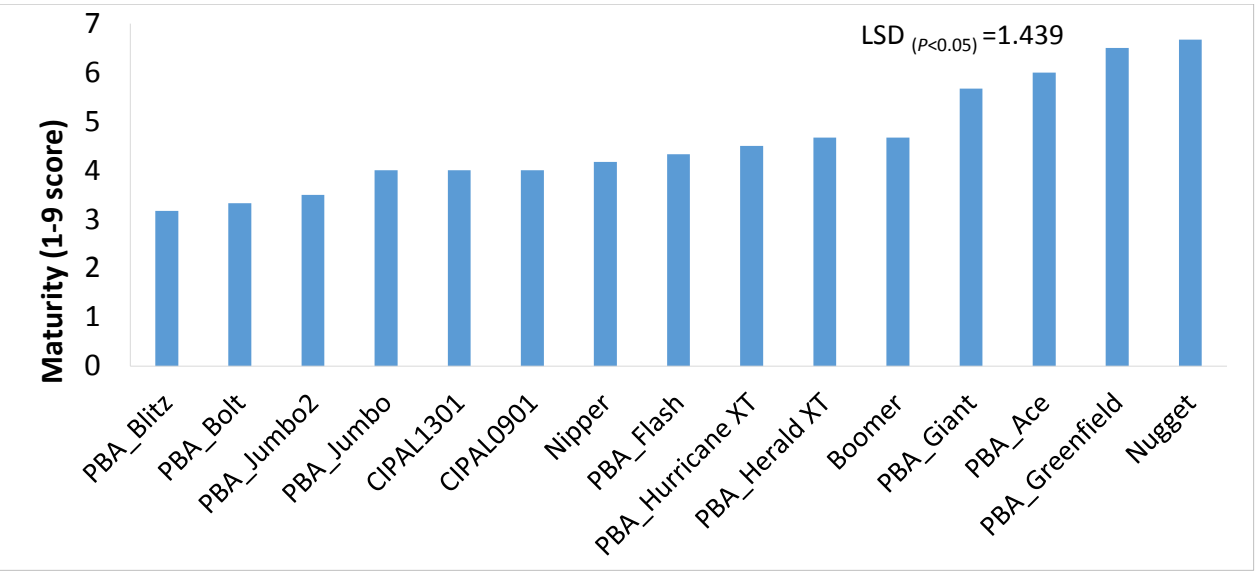

Figure 3: Maturity of 15 lentil varieties at Pinery, South Australia 2014. Varieties are ranked in order of maturity from earliest to latest. Maturity score: 1 = early, 9 = late.

Lodging

- There was a significant (P<0.001) sowing date by variety interaction for lodging resistance (9= erect, 1 = flat). This suggests that varieties differed in their levels of lodging resistance however the differences were dependent on sowing date (Figure 4).
- The early sowing date increased plant lodging greatly over the delayed sowing treatment in all varieties, with no variety showing acceptable standing ability (score of 6 or greater at this timing). All varieties exhibited an acceptable standing ability at the later sowing date.
- Across both sowing dates, PBA Blitz showed the most lodging, but generally variety discrimination in this trial was low.

Grain Yield

- A sowing date by variety response (P <0.001) was identified for grain yield indicating that there was a significant difference in grain yields between varieties however the magnitude of these differences differed with the time of sowing (Figure 5).
- The mid maturing PBA Jumbo 2 and early/mid maturing PBA Flash were the highest yielding varieties with 2.81 t/ha and 2.7t/ha at the early time of sowing respectively. The mean yields of these two varieties were however statistically similar to PBA Bolt (2.75), CIPAL1301 (2.66), PBA Hurricane XT, CIPAL0901 (2.57) and PBA Greenfield (2.53) at this sowing.
- A delay in sowing saw no yield advantage for these high yielding varieties and varieties like PBA Flash incurred the highest yield penalty with the delay in sowing (24%).
- The mid/late maturing Boomer yielded significantly lower than all varieties at the early time of sowing.
- The mid/late maturing Boomer and mid maturing PBA Jumbo were shown to have a slight yield advantage when sown late, a result which was dissimilar from all other varieties.

- On the other hand, mid/late maturing PBA Herald XT had the lowest yields compared to all the varieties at the later time of sowing.

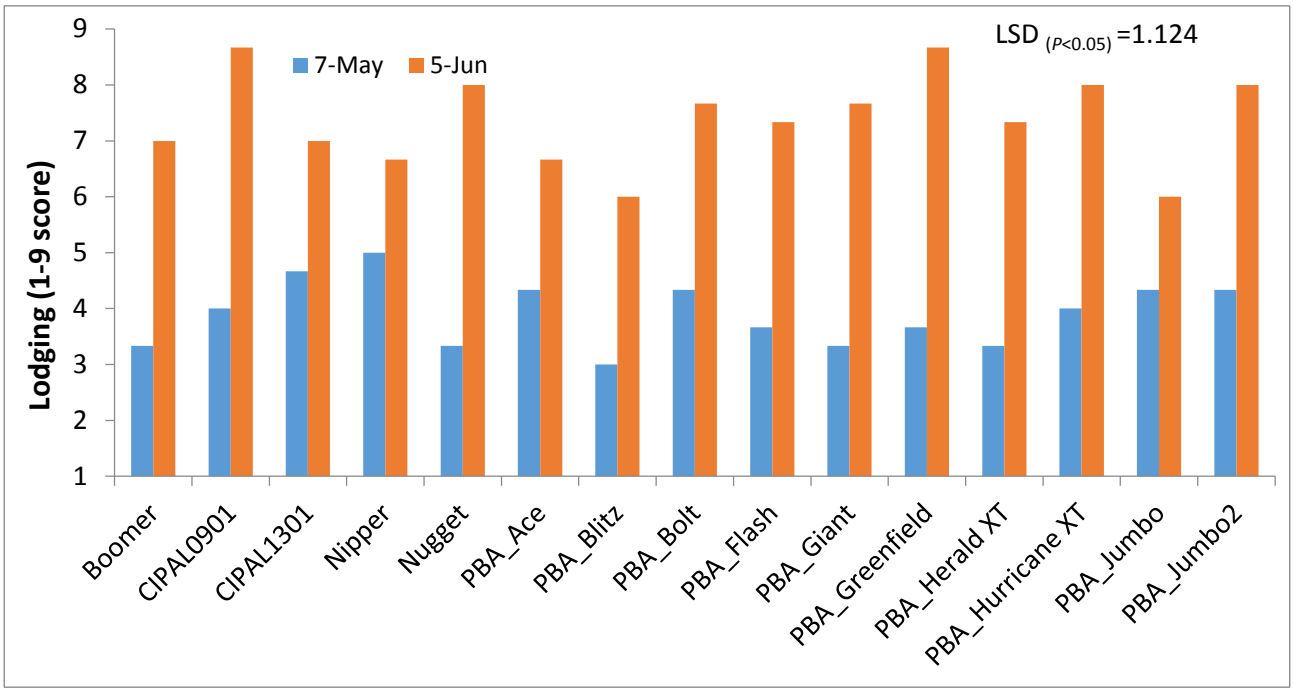

Figure 4: Lodging scores of 15 lentil varieties at two different times of sowing; Early (7th May) and Late (5th June) at Pinery, South Australia 2014. Lodging score:1=flat, 9= erect.

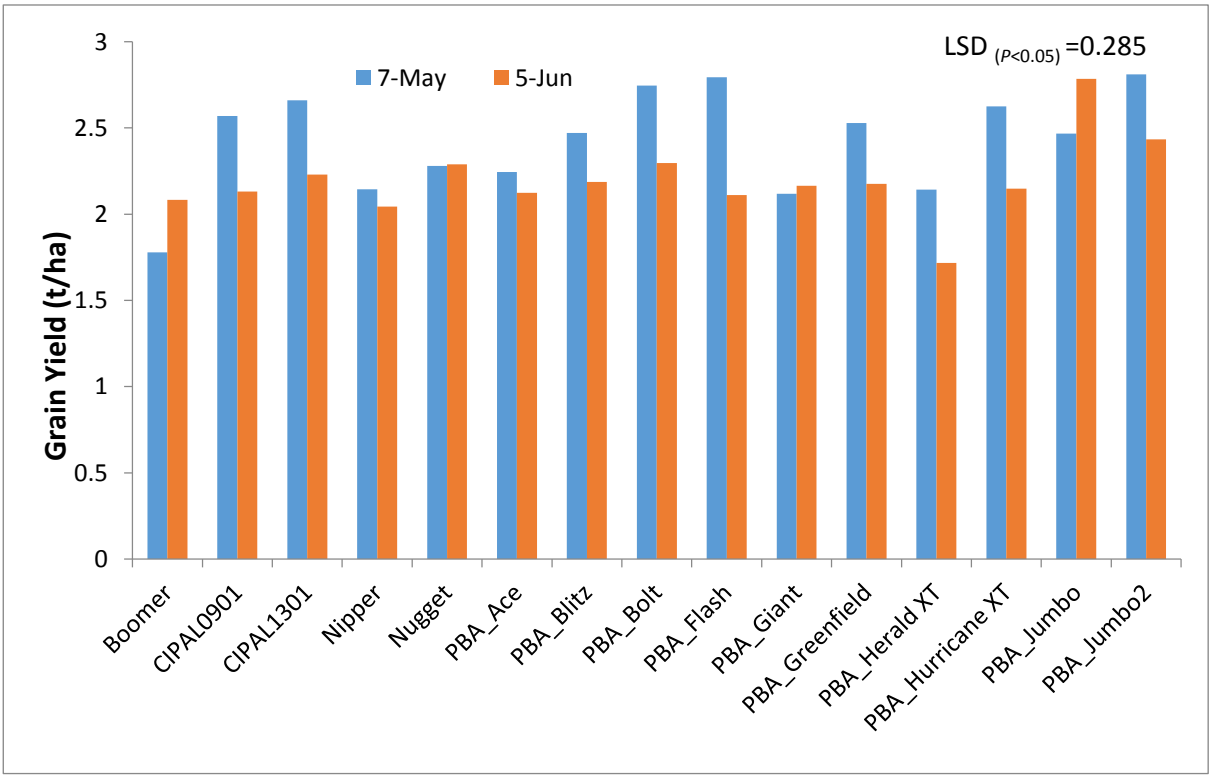

Figure 5: Grain yield (t/ha) of 15 lentil varieties sown at two different sowing times Early (7th May) and Late (5th June) at Pinery, South Australia 2014.

Key findings and comments

- Under quick dry spring finishing conditions, varieties may not always finish characteristic to their maturity rating. Differences between varieties in terms of early, mid and late maturity rating may not always be clearly defined. Instead, there is a trend of varieties to 'hay off' with selected mid-maturing varieties including PBA Jumbo 2 maturing similar to the early maturing varieties.
- The sowing date by variety response for grain yield showed that in the environment tested, varieties yielded differently depending on time of sowing whereby some: a) yielded higher when sown early with no real yield advantage when sown late (PBA Jumbo 2, PBA Hurricane XT, PBA Greenfield, PBA Flash, CIPAL0901 and CIPAL1301); b) had a yield advantage at a later sowing as opposed to early sowing (Boomer and PBA Jumbo) and c) showed no yield response to varying sowing date (Nipper, Nugget, PBA Ace and PBA Giant). This result is consistent with previous findings and suggest some varieties are poorly suited to early sowing.
- Plant lodging at maturity was increased past unacceptable levels in all varieties when sown at the early date. This is likely to reduce harvestability, increase harvest times and potentially affect yield and disease levels and must be considered when sowing lentils early.