

# TRIAL SUMMARIES

## Lentils

### L1 Sowing Time, LRZ Southern Mallee (Curyo), Victoria

#### Aim

To investigate the adaptability of a range of lentil varieties and variety mixes to varying sowing dates.

#### Treatments

Varieties: Red types - Nipper, Nugget, PBA Blitz, PBA Flash, PBA Jumbo, PBA Bolt, PBA Ace (seed source: Curyo 2013), PBA Ace (Horsham: seed source: Horsham 2013), CIPAL0901, CIPAL1301, CIPAL1405, PBA HurricaneXT, PBA Jumbo2, Green Types – Boomer, PBA Greenfield, PBA Giant. All seed for trial other than indicated was sourced from Trials at Curyo in 2013.

Sowing dates: 2 May (Early), 12 June (Mid)

#### Other Details

Row Spacings: 36cm  
Stubble: Standing (approximately 15 cm), sown inter-row  
Fertiliser: MAP + Zn @ 60 kg/ha at sowing  
Plant Density: 120 plants/m<sup>2</sup>  
Soil type: Soil Type: Alkaline Sandy Loam over a heavy clay at about 40-60cm (Table 1)

Table 1. Soil characterisation at Curyo 2014

Depth (cm)	P (mg/kg)	K (mg/kg)	OC (%)	EC (dS/m)	pH (CaCl <sub>2</sub> )	pH (H <sub>2</sub> O)	B (mg/kg)	CaCO <sub>3</sub> (%)
0-10	30	632	1.02	0.12	7.3	8.1	2.0	2.6
10-20	8	459	0.66	0.17	7.5	8.5	4.2	3.2
20-40	5	463		0.28	7.9	9.2	10.9	11.5
40-60	3	570		0.39	8.0	9.7	20.2	22.7
60-100	3	615		0.61	8.1	9.9	26.2	24.4

#### Results and Interpretation

- Key Message: Earlier sowing was significantly higher yielding for all varieties in 2014, increasing economic returns by an average of \$500/ha. PBA Ace was again highest yielding sown early. The yields of PBA HurricaneXT were lower than expected and reflective of the pod drop that was observed and may also be related to its relatively early maturity.
- Plant establishment – Due to the early rainfall, emergence for both sowing dates occurred within 2 weeks of the respective sowing date. Establishment ranged between 90 and 130 plants/m<sup>2</sup> (data not shown). PBA Jumbo2 and PBA Bolt generally had the lowest establishment, while PBA HurricaneXT was highest.
- Plant growth, Flowering and Maturity – Growth until August was adequate and as expected given the seasonal conditions. The dry and cold conditions throughout August and September meant that growth was slowed and resulted in relatively small plants in the 12 June sown treatments. The ongoing dry conditions ensured plants experienced significant drought stress that rapidly progressed maturity and reduced grain yields. The relative flowering time and maturity of the varieties was slightly different to previously observed and somewhat compressed (Table 2). In particular it was noted that PBA HurricaneXT was relatively earlier than observed in previous agronomic trials. No major differences in maturity for the 12 June sown treatments was noted, due to the terminal drought, hence no data is shown.
- Pod Drop – At Curyo there was a significant interaction between sowing date and cultivar for pod drop score in 2014. At the May 2 sowing date PBA HurricaneXT had significantly greater pod drop than all other varieties (Fig. 1). The earliest maturing group of CIPAL0901, PBA Blitz and PBA HurricaneXT all displayed significantly greater pod drop early sown than late sown. Conversely, several of the later lines, CIPAL1405, PBA Giant and PBA Jumbo all showed higher pod drop scores in the later sown plots.

Table 2. Days to flowering and relative maturity scores (1 - Early, 4 – Late; recorded 8 Oct) of lentil varieties sown May 2 and June 12 (flowering only) at Curyo in 2014.

Variety	Days to Flowering		Maturity Score
	2 May	12 June	2 May
CIPAL0901	102	91	1
PBA Blitz	103	91	1
Boomer	105	94	3
PBA Bolt	105	96	2
PBA Giant	105	96	3
PBA HurricaneXT	105	94	1
PBA Jumbo2	105	94	2
Nugget	107	98	3
PBA Ace (Curyo)	107	94	2
PBA Ace (Horsham)	107	94	2
CIPAL1301	108	96	2
PBA Flash	108	94	2
PBA Greenfield	108	98	3
CIPAL1405	112	100	4
Nipper	112	99	3
PBA Jumbo	112	96	3

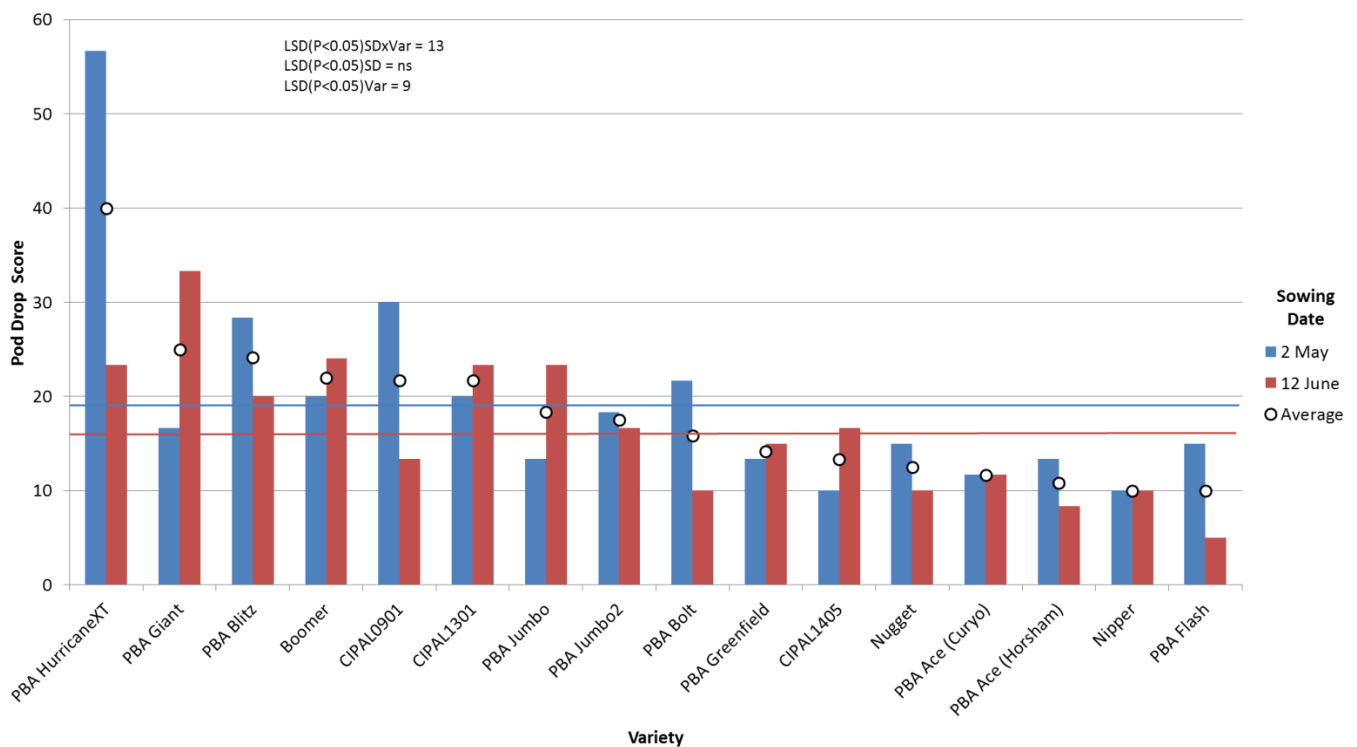


Figure 1. Prod Drop Scores (0 = No loss; 100 = All pods dropped) recorded at harvest (30 Oct and 6 Nov) of lentil varieties sown May 2 and June 6 at Curyo in 2014.

- Grain Yield, Profitability and Grain Weight – Despite the extremely dry spring, grain yields were good, ranging between 0.4 and 1.2 t/ha (Fig. 2). Treatments sown May 2 (1.03 t/ha) were generally more than double those sown June 12 (0.46 t/ha). Yield loss from delaying sowing ranged from a 63% reduction for PBA Ace to a 40% reduction for PBA HurricaneXT, even though for PBA HurricaneXT pod loss at the early sowing date was more than double that at the later sowing date. When sown early PBA Ace (from the Curyo seed source), similar to previous seasons, was highest yielding, although statistically there was no significant difference between the top 10 varieties. Across both sites the PBA Ace seed sourced from Curyo was generally higher yielding than sourced from Horsham. PBA HurricaneXT and PBA Blitz were the lowest yielding varieties sown early. Both varieties were in the earliest maturity group. At the later sowing date PBA Flash was highest yielding at 0.53 t/ha and Boomer lowest 0.38 t/ha. While these may appear relatively small differences, the economic value was high, as a 0.1 t/ha improvement in

yield was worth approximately \$85/ha (Table 2). Based on 2014 harvest prices a yield of 0.3 t/ha could have broken even economically. Sowing the lentils early resulted in average returns \$500/ha more than later sowing (ranging between \$650/ha and \$350/ha dependant on variety).

Grain weights were generally normal for most varieties and quality excellent (Table 3). There was a generally slight increase at the later sowing date, but that was inconsistent across varieties.

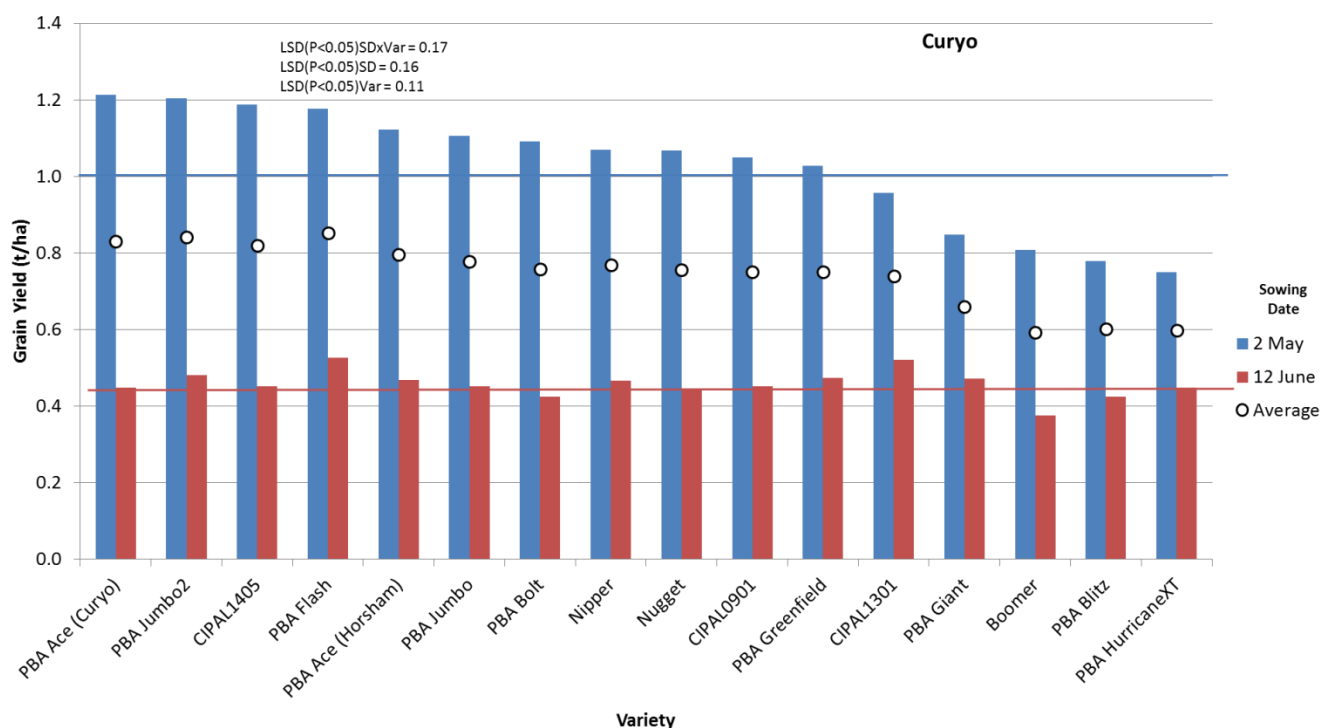


Figure 2. Grain yield (t/ha) of lentil varieties sown May 2 and June 12 at Curyo in 2014.

Table 2. Estimated Net Income (\$/ha) of lentils grown at Curyo in 2014. Net Income based on grain prices at \$850/t with fixed management costs of \$230/ha.

Sowing Time	2 May	12 June	Average
PBA Ace (Curyo)	\$801	\$151	\$476
PBA Jumbo2	\$793	\$178	\$486
CIPAL1405	\$779	\$154	\$467
PBA Flash	\$771	\$218	\$494
PBA Ace (Horsham)	\$724	\$168	\$446
PBA Jumbo	\$710	\$154	\$432
PBA Bolt	\$697	\$132	\$414
Nipper	\$680	\$166	\$423
Nugget	\$678	\$149	\$413
CIPAL0901	\$663	\$154	\$408
PBA Greenfield	\$643	\$173	\$408
CIPAL1301	\$584	\$213	\$398
PBA Giant	\$491	\$171	\$331
Boomer	\$457	\$90	\$273
PBA Blitz	\$432	\$132	\$282
PBA HurricaneXT	\$407	\$151	\$279
Average	\$644	\$160	

Table 2. Grain weight (g/100seed) of lentils grown at Curyo in 2014.

Sowing Time	2 May	12 June	Average
PBA HurricaneXT	3.50	3.72	3.61
Nipper	3.45	3.92	3.69
PBA Ace (Curyo)	4.18	4.30	4.24
PBA Ace (Horsham)	4.19	4.38	4.29
Nugget	4.27	4.39	4.33
PBA Bolt	4.16	4.52	4.34
CIPAL1301	4.18	4.76	4.47
CIPAL0901	4.60	4.66	4.63
CIPAL1405	4.88	5.17	5.02
PBA Flash	4.92	5.25	5.09
PBA Jumbo	5.14	5.17	5.16
PBA Jumbo2	5.40	5.51	5.46
PBA Greenfield	5.42	5.62	5.52
PBA Blitz	5.32	5.72	5.52
Boomer	6.44	6.39	6.42
PBA Giant	7.18	7.09	7.14
	4.83	5.04	

lsd( $P < 0.05$ )<sub>sow date x variety</sub> = 0.18; <sub>sow date</sub> = 0.19; <sub>variety</sub> = 0.13.

### Key Findings and Comments

- Earlier sowing was significantly higher yielding for all varieties in 2014, increasing economic returns by an average of \$500/ha. PBA Ace was again highest yielding sown early. The yields of PBA HurricaneXT were lower than expected and reflective of the pod drop that was observed and may also be related to its relatively early maturity. In previous season's where terminal drought stress was not as much of an issue, PBA HurricaneXT tended to be slightly later maturing than PBA Blitz and CIPAL0901. In addition the pod drop observed in PBA HurricaneXT in 2014 has not been seen previously in agronomic trials.
- The new large seeded red variety PBA Jumbo2 performed extremely well confirming its adaptation to the southern Mallee. The medium sized green PBA Greenfield also showed adequate yields given seasonal conditions indicating potential for greens to be grown in this region as market opportunities allow. The large Green PBA Giant was still profitable with excellent seed size and quality, highlighting its potential as an alternative type for markets into the future.
- Similar to 2013 seed size and quality was significantly larger and better in the Mallee than in the Wimmera.