## C10 Sowing Time, LRZ Yenda, New South Wales

### Introduction

This experiment compared the growth, development and yield of current commercial chickpea varieties and promising advanced breeding lines at two sowing dates on a hard-setting, acidic, red-brown soil at Yenda in southern NSW. The resulting time of sowing (TOS) information will be used to confirm and update current agronomic recommendations for chickpea in this region.

### Site details

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|---|---|
| Soil type | Red sandy loam, pH ($CaCl_2$) (0–10 cm) 5.4 |
| Trial Design | Randomised complete block design with sowing date the main blocks, and varieties the sub-plots; three replications |
| Inoculation | Group N peat inoculant was mixed directly into an on board 100L water tank then pumped though micro-tubes into each sowing furrow |
| Stubble management | Sown into a medium density, standing-wheat stubble |
| Fertiliser | 80 kg/ha grain legume super (N:P:K:S 0:13.8:0:6.1) placed 30–40 mm below the seed |
| Plant population | Target 45 plants/$m^2$, 30 cm row spacing |
| Weed management | Commercial practices used with aim of weed-free trials, eliminating both weed competition and weed seed set<br>Fallow weed control:<br>1.5 L/ha glyphosate (450 g/L) over summer<br>Incorporated by sowing:<br>2 L/ha glyphosate (450 g/L), 2 L/ha Stomp® (440 g/L pendimethalin),<br>1.6 L/ha Avadex® (400 g/L tri-allate) and 900 g/ha Terbyne® (750 g/kg terbuthylazine)<br>Post sowing:<br>500 ml/ha Select® (240 g/L clethodim), 500 ml/100 L Uptake spraying oil<br>150 ml Folicur<br>200 ml Folicur |
| Insect management | Targeting *Helicoverpa* sp.:<br>200 ml/ha Fastac Duo ® (100 g/L alpha-cypermethrin)<br>200 ml/ha Fastac Duo ® (100 g/L alpha-cypermethrin) at late pod fill |

### Treatments

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| Varieties (12) | PBA Hatrick, PBA Slasher, Ambar, Maiden, Monarch, Boundary, Neelam, CICA 1007, CICA 0912, CICA 1016, Striker. |
| Time of sowing (2) | TOS1–29 April, 2015<br>TOS2– 28 May, 2015 |

### Soil analysis

Table 1. Site soil chemical characteristics for 0–10 cm and 10–20 cm depth at Yenda, 2015.

| Depth | pH (1:5 $CaCl_2$) | Al Sat % | Total Nitrogen % | Sulfur mg/kg | P (Colwell) mg/kg | CEC cmol(+)kg |
|---|---|---|---|---|---|---|
| 0–10 cm | 5.5 | <0.1 | 0.08 | 8.6 | 47 | 6.8 |
| 10–20 cm | 5.0 | <0.1 | 0.05 | 6.4 | 9.4 | 6.6 |

### Season

The 2015 growing season at Yenda was almost ideal for pulses except for the hot and dry September and October. Growing season rainfall (April to October) of 264 mm was above the long-term average (231 mm), with 47 mm of this falling in early April ensuring timely sowing. Rainfall in June, July and August was 63% above the long-term average and this contributed to valuable sub-soil moisture.

However, the weather during the flowering and grain filling period of September-October was extreme with eight continuous weeks of no effective rainfall and wide temperature fluctuations (5 September to 31 October). The rapid change from cool temperatures to a number of consecutively hot days in the high 30°C in the first week of October caused crops to abort flower and mature prematurely. This heatwave was to be followed by an exceptionally hot and dry October.

**Results**

*Plant establishment*

Chickpea plant establishment was close to the target of 35 plants/$m^2$.TOS 1 achieved an average of 32.5 plants/$m^2$ while TOS 2 was slightly but significantly higher ($P<0.001$) with 39.4 plants/$m^2$.

*Grain yield*

There was no significant effect of sowing time on yield in this experiment. The extreme weather conditions in the first week of October caused all varieties to abort flowers and mature prematurely. However, there were significant ($P<0.001$) sowing time and variety interactions (Figure 1).

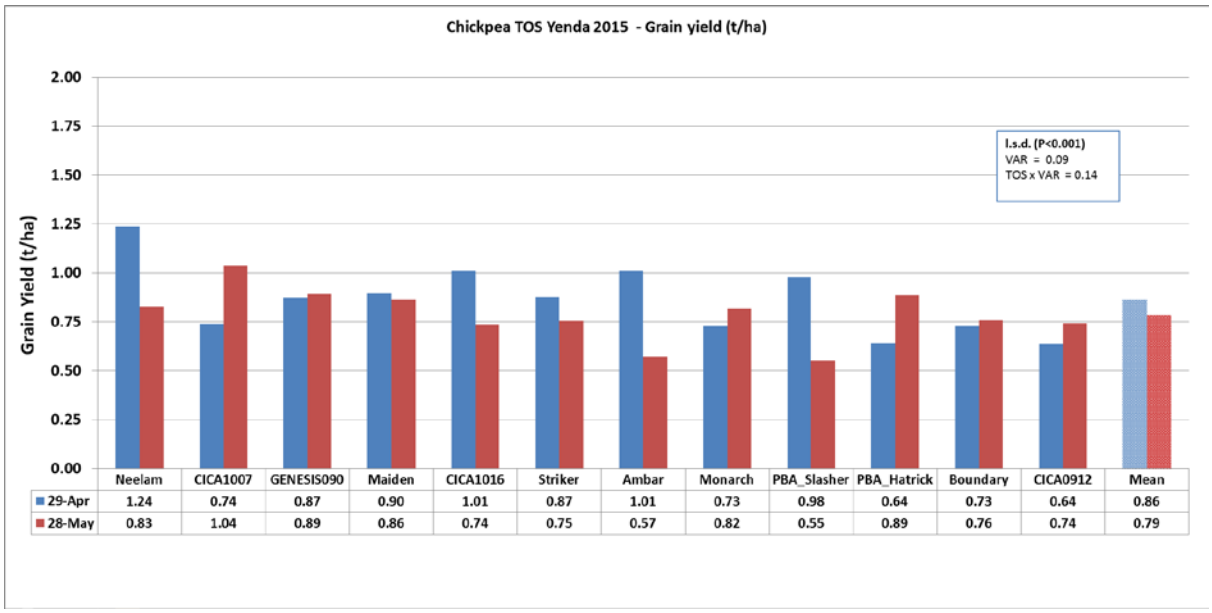
Neelam, Ambar, PBA Slasher, PBA Striker and CICA1016 yielded significantly higher at TOS 1 mostly likely due to their slightly earlier flowering time. This resulted in these varieties being at a more advanced stage of grain-fill development before the unseasonable conditions were experienced in early October.

Conversely, CICA1007, PBA Hatrick, PBA Monarch and CICA0912 were significantly higher yielding at TOS 2.

It is important that these results are viewed within the seasonal context taking into account the severe hot and dry spring conditions experienced.

*Seed size*

There was no significant effect of sowing time on seed size in this experiment. However, there were significant ($P<0.001$) sowing time and variety interactions (Figure 2). The Kabuli varieties PBA Monarch and Genesis 090 were 11.6% and 13.5% larger in seed weight at TOS 2. In contrast the desi varieties PBA Boundary and CICA2016 showed a small but significant reduction in seed size with TOS 2.




| | Neelam | CICA1007 | GENESIS090 | Maiden | CICA1016 | Striker | Ambar | Monarch | PBA_Slasher | PBA_Hatrick | Boundary | CICA0912 | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29-Apr | 1.24 | 0.74 | 0.87 | 0.90 | 1.01 | 0.87 | 1.01 | 0.73 | 0.98 | 0.64 | 0.73 | 0.64 | 0.86 |
| 28-May | 0.83 | 1.04 | 0.89 | 0.86 | 0.74 | 0.75 | 0.57 | 0.82 | 0.55 | 0.89 | 0.76 | 0.74 | 0.79 |

Figure 1. Grain yield of twelve varieties of chickpea sown at three times at Yenda in 2015.

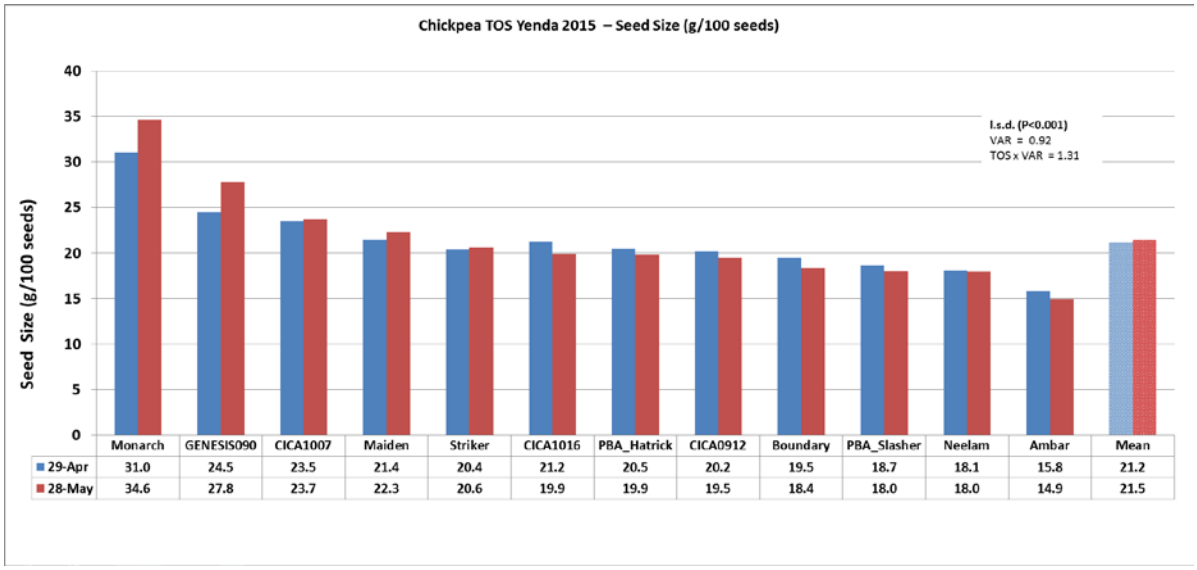



Figure 2. Grain weight of twelve varieties of chickpea sown at three times at Yenda in 2015.

*Acknowledgements*

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