

## **C6 Crop-Topping, MRZ Yorke Peninsula (Melton), South Australia**

### **Aim**

To understand the required maturity timing in chickpea for successful crop-topping practice of rye grass in South Australia.

### **Treatments**

|             |  |
|-------------|--|
| Varieties:  | Refer to Table 1.  |
| Treatments: | Nil - no desiccant applied<br>Early - applied 8 days pre-ryegrass milky dough stage (15 <sup>th</sup> Oct)<br>Recommended - applied at ryegrass milky dough stage (23 <sup>rd</sup> Oct)<br>Late - applied 14 days post-ryegrass milky dough stage (6 <sup>th</sup> Nov) |

### **Other Details**

|                  |  |
|------------------|--|
| Sowing date:     | 29 <sup>th</sup> May   |
| Fertiliser:      | MAP + Zn (2%) @ 90 kg/ha at sowing   |
| Inoculant:       | Group N  |
| Seed Treatment:  | P-Pickel T (200ml/100 kg seed)   |
| Canopy Closure – | Carbendazim @500 ml/ha, Chlorothalonil @2 L/ha<br>Mid flowering to Early Podding – Carbendazim @500 ml/ha, Chlorothalonil @ 2 L/ha |
| Plant Density:   | Desi = 50 plants/m <sup>2</sup> , Kabuli = 35 plants/m <sup>2</sup>  |
| Soil Type:       | sandy clay loam over light clay  |

### **Results and interpretation**

#### *Grain yield*

- All varieties showed a yield penalty from crop-topping 8 days prior to the recommended timing (ryegrass milky dough stage), averaging a 35% yield loss compared to the nil treatment. Later maturing varieties (except for CICA1156) also showed a yield loss at the recommended crop-top timing (highlighted in Table 1). Mid to late maturing kabuli varieties PBA Monarch, Genesis<sup>TM</sup> 090 and Genesis<sup>TM</sup> Kalkee showed a yield loss from crop-topping 14 days after the recommended timing. Late maturing kabuli breeding lines CICA1352 and CICA1156 showed no significant yield loss at the late crop-top timing. CICA1156 also showed no yield loss at the recommended timing.
- Early maturing varieties have shown a lower incidence of yield loss. This suggests that the early maturing varieties are better suited to the practice of crop topping than later maturing varieties.

#### *Grain weight*

- All varieties showed a reduced grain weight from crop topping 8 days prior to the recommended timing, averaging a 19% loss in grain weight. Out of the 6 latest maturing varieties all but the desi variety PBA Slasher showed a reduction in grain weight from crop-topping at the recommended timing. The 2 latest maturing varieties, the kabuli types CICA1352 and Genesis<sup>TM</sup> Kalkee, showed a reduction in grain weight from crop-topping 14 days post recommended timing.

#### *Lodging*

- There was a significant varietal response for lodging. CICA1007 proved to be very erect for an early maturing desi variety. CICA1352, CICA1107, Genesis<sup>TM</sup> 090 and Genesis<sup>TM</sup> Kalkee proved to be the most erect while PBA Striker and D07073 were the most sensitive to lodging.

**Table 1.** Effect of crop-top timing on grain yield and grain weight of chickpea varieties at Melton, 2014. Varieties are ranked in order according to their visual maturity rating from earliest to latest (E = Early, M = Mid, L = Late).

| Variety     | Maturity Profile |                 | Yield (t/ha) | Yield (% of Nil) |             |            | Grain Wt. (g/100) | Grain Weight (% of Nil) |             |            |
|-------------|------------------|-----------------|--------------|------------------|-------------|------------|-------------------|-------------------------|-------------|------------|
|             | Flower Timing    | Maturity Timing | Nil          | Early 15-Oct     | Rec. 23-Oct | Late 6-Nov | Nil               | Early 15-Oct            | Rec. 23-Oct | Late 6-Nov |
| D07073      | E                | E               | 2.67         | 73               | 88          | 104        | 25.2              | 78                      | 94          | 99         |
| PBA Striker | E                | E               | 2.92         | 71               | 91          | 105        | 22.2              | 83                      | 99          | 103        |
| CICA1442    | E                | E               | 2.79         | 73               | 99          | 93         | 20.0              | 82                      | 94          | 101        |
| CICA1007    | E                | E               | 2.15         | 76               | 96          | 108        | 24.8              | 73                      | 83          | 99         |
| Genesis079  | E                | E-M             | 2.53         | 72               | 99          | 112        | 25.2              | 72                      | 91          | 99         |
| CICA1016    | E                | E-M             | 2.65         | 63               | 77          | 96         | 22.8              | 83                      | 92          | 104        |
| PBA Monarch | E                | E-M             | 2.66         | 56               | 69          | 80         | 37.9              | 76                      | 92          | 107        |
| PBA Slasher | M                | M               | 2.87         | 60               | 76          | 100        | 19.5              | 79                      | 93          | 99         |
| Genesis090  | M                | M               | 2.15         | 59               | 74          | 74         | 31.2              | 86                      | 83          | 94         |
| CICA1156    | M                | M               | 2.32         | 58               | 87          | 106        | 37.7              | 81                      | 76          | 97         |
| CICA1352    | M                | M-L             | 2.09         | 64               | 72          | 99         | 44.4              | 85                      | 78          | 87         |
| Kalkee      | M-L              | L               | 2.17         | 56               | 69          | 59         | 43.2              | 92                      | 81          | 80         |
| <b>Mean</b> |                  |                 | <b>2.50</b>  | <b>65</b>        | <b>83</b>   | <b>95</b>  | <b>29.5</b>       | <b>81</b>               | <b>88</b>   | <b>97</b>  |

LSD ( $P<0.05$ ) timing by variety 0.42 (grain yield), 2.7 (grain weight)

NB: shading indicates a significant difference from the nil treatment.

### Key findings and comments

- Early maturing desi chickpea varieties incurred the least yield loss at the recommended timing for crop-topping. Later varieties and kabuli types showed significant yield loss at the recommended timing and three later kabuli varieties showed yield loss at the late timing.
- Despite PBA Striker and Genesis 079 not incurring a yield loss or grain weight reduction at the recommended timing in 2014 it is still recommended to use extreme caution if using this practice on these varieties. Yield loss has occurred in previous years at this timing in these varieties particularly in seasons where the finish has been longer and more favourable.
- All chickpea varieties showed an average grain weight reduction of 19% from early crop-topping. Some later varieties as well as CICA1007 incurred a grain weight loss at the recommended timing, while CICA1352 and Genesis<sup>TM</sup> Kalkee also incurred a loss at the late crop-top timing. This again suggests that the later maturing varieties are more sensitive to crop-topping and are more likely to incur a grain weight loss as well as a yield loss.
- The performance of the medium sized experimental kabuli line CICA1156 was encouraging in 2014 and requires further evaluation.
- Due to the relative late maturity of chickpeas and regular finding of yield loss in these trials even at the late timing they are generally not considered suitable for the practice of crop-topping at the recommended timing for ryegrass control in SA.