

B8. Faba Bean Crop-topping/Desiccation, Yorke Peninsula (Melton), Eyre Peninsula (Yeelanna) and South East (Bool Lagoon), South Australia

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Aim

To determine the correct maturity timing required in faba bean for successful crop topping practice.

Treatments

- Sites: Bool Lagoon - AR = 550mm, Soil type: clay
Melton – AR = 425mm, Soil type: sandy clay loam over light clay
Yeelanna – AR = 400mm, Soil type: loamy clay over sandy clay
- Varieties: Table 1
- Treatments: see tables for dates
Nil - no desiccant applied
Early Crop-top - applied 7-14 days pre ryegrass milky dough stage
Mid Crop-top - applied at ryegrass milky dough stage (“Recommended”)
Late Crop-top - applied 7-14 days post ryegrass milky dough stage

Table 1: Flowering and maturity patterns of faba bean crop-top varieties.

| Variety | Flowering | Maturity |
|-------------|-----------|----------|
| Fiesta | E-M | E-M |
| Nura | M-L | E-M |
| PBA Rana | M-L | M-L |
| Farah * | E-M | E-M |
| AFO5095-1 * | M-L | L |
| AFO8014 * | E | E |

E = Early, M = Mid, L = Late

* = variety included in trial at Melton site only

Results and Interpretation

- All three trials showed only a crop-top timing response (ie no interaction with variety). This means that all varieties showed the same grain yield response at each timing of application, and that no variety was better suited to crop-topping in these trials.
- Early crop-topping caused significant yield losses at all three sites (Table 2). Bool Lagoon was the only site to show a yield loss from crop-topping at the Mid treatment timing, while there was no yield loss from crop-topping at the Late application timing at any site.
- The Bool Lagoon trial showed the highest yield loss from Early crop-topping of the three sites (72% yield loss compared to the Nil treatment), and also showed a 9% yield loss from crop-topping at the Mid Treatment timing. The Melton and Yeelanna trials showed yield losses of 24% and 38%, respectively, from crop-topping at the Early treatment timing compared to the Nil.

Table 2: Effect of crop-top timing on grain yield (% of Nil) of faba bean varieties, Bool Lagoon, Melton and Yeelanna 2012.

| Site | Timing | Yield (% of Nil) | LSD (P<0.05) (% of Nil) |
|-------------|-------------|------------------|-------------------------|
| Bool Lagoon | Early 8/10 | 28 | 7 |
| | Mid 26/10 | 91 | |
| | Late 6/11 | 104 | |
| | Nil | 4.7 t/ha | |
| Melton | Early 12/10 | 76 | 17 |
| | Mid 25/10 | 88 | |
| | Late 6/11 | 103 | |
| | Nil | 1.7 t/ha | |
| Yeelanna | Early 24/10 | 62 | 15 |
| | Mid 14/11 | 94 | |
| | Late 30/11 | 105 | |
| | Nil | 1.3 t/ha | |

Shaded figures denote significant difference to the corresponding Nil treatment

Key Findings and Comments

- Crop-topping 7-14 days prior to milky dough stage of ryegrass caused significant yield loss at all three sites, and ranged from 24% at Melton to 72% at Bool Lagoon.
- Crop-topping at the milky dough stage (MDS) of ryegrass caused significant yield loss at only one of the three sites (Bool Lagoon).
- Variation in response to crop-topping between the three sites is likely due to a combination of differences in sowing dates, site yields, seasonal conditions (particularly end season) and the maturity profiles of the local ryegrass biotype.
- Previous research has shown that sensitivity to crop-topping in pulse crop species is generally related to variety maturity, where later maturing varieties generally show higher yield losses when applied too early. These trials showed no relationship between varietal maturity and yield loss from crop-topping in 2012. Work will be ongoing to identify varieties or plant types better suited crop-topping for weed control.
- Previous research has shown that untimely crop-topping of beans can result in reduced grain weight. Across all varieties this has averaged 9% grain weight reduction from crop-topping at ryegrass MDS, and 17% reduction from crop-topping 7-14 days prior to ryegrass MDS. Grain size and grain weight is particularly important in broad bean production, where emphasis is paid to seed size and consistency.