

## **F3 Crop-topping/Desiccation, MRZ Mid North (Balaklava), South Australia**

Co-authored by Jenny Davidson, South Australian Research & Development Institute – Waite

### **Aim**

To determine the correct maturity timing required in field pea for successful crop topping practice.

### **Treatments**

Varieties: see Table F3.1  
Sowing date: 15 June  
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  
Chemical: Paraquat at 800ml/ha  
Fertiliser: Map + Zn @ 90kg/ha

**Table F3.1.** Field Pea flowering and maturity ratings, Balaklava crop-top trial 2011.

<b>Variety</b>	<b>Flower</b>	<b>Maturity</b>
Alma	L	L
Bundi	E	E
Dundale	E	M
Glenroy	L	L
Kaspa	L	M
OZP0903	M	E-M
Parafield	M-L	M-L
PBA Gunyah	E	E
PBA Oura	M	E
PBA Twilight	E	E
Sturt	M	M-L
SWCeline	E	VE
Yarrum	L	M

E = Early, M = Mid, L = Late

### **Results and Interpretation**

- Significant two way interactions (Timing x Variety) were observed for grain yield and grain weight (Table F3.2).
- Grain Yield – No varieties showed yield loss from Late crop-topping in 2011, and only two varieties showed reduced yield at the Recommended timing; the later maturing conventional type peas Alma and Parafield.

Many genotypes showed reduced grain yield at the Early crop-top timing (2 weeks prior to Recommended). Those varieties which showed no yield loss at this timing included the six earliest maturing lines PBA Twilight, PBA Oura, OZP0903, PBA Gunyah, SW Celine and Sturt. Yarrum also showed no yield loss from crop-topping in 2011 at this timing, and has previously shown a variable response to crop-topping across seasons. Despite being rated as having late flowering and mid maturity timing, Yarrum is noted for its rapid maturity and has shown relatively low yield loss from this practice in some previous seasons.

Long term summary of crop-top timing on grain yield (Table F3.3) shows the earliest maturing varieties to be consistently better suited to crop-topping than the later maturing lines, with fewer yield loss incidences and lower average yield losses. Yield loss results show common commercial cultivars Kaspa and Parafield are less suited, with Parafield showing yield loss in three of six trials at the Recommended timing. Again, Yarrum shows variable response across seasons, with fewer incidence of yield loss than Kaspa at the Early timing, but more at the Recommended timing.

- Grain Weight – as for grain yield, there was no effect of crop-topping on grain weight of field pea at the Late timing, and little effect at the Recommended timing. Only two cultivars (PBA

Oura and OZP0903) showed reduced grain weight from crop-topping at the Recommended timing, while ten of the 13 cultivars showed reduced grain weight from Early crop-topping. Interestingly more of the earlier maturing pea cultivars showed reduced grain weight than the later maturing cultivars at both Early and Recommended timings and little correlation between yield and grain weight occurred. Previous results have also found poor correlation between maturity at crop-topping and grain weight.

- Grain Mould – The effect of crop-topping on occurrence of mould in grain samples was investigated in the 2011 trials. Assessments of a number of varieties detected increased incidence of mould in the Early crop-top treatment (Table F3.4). Recommended and Late treatment timings had similar mould levels to the Nil. These data show that maturity at timing of crop-topping may influence the incidence of mould in crop-topped field pea crops.

**Table F3.2.** Effect of crop-top timing on grain yield and grain weight of field peas, Balaklava 2011  
Varieties are ranked according to their visual maturity rating from earliest to latest

Treatment Variety	Yield (t/ha)	Yield (% of Nil)			Grain Wt. (g/100)	Grain Weight (% of Nil)		
		- 2 wks <sup>a</sup> (20/10)	Recommended (28/10)	+ 2 wks <sup>b</sup> (4/11)		- 2 wks <sup>a</sup> (20/10)	Recommended (28/10)	+ 2 wks <sup>b</sup> (4/11)
PBA Twilight	2.56	95	113	98	20.2	91	99	99
PBA Oura	2.39	110	127	121	22.3	89	91	100
OZP0903	2.66	101	124	115	20.1	87	91	94
PBA Gunyah	2.89	87	102	106	19.9	83	97	93
Celine	2.5	104	130	107	23.1	93	96	98
Sturt	2.7	94	103	104	19.7	96	94	98
Bundi	2.75	77	100	107	19.5	91	105	100
Yarrum	2.89	88	110	106	18.9	82	100	103
Kaspa	2.95	81	86	100	18.5	79	106	105
Parafield	2.68	77	82	84	16.7	92	92	101
Dundale	2.93	73	87	87	18.3	102	102	103
Alma	2.88	70	73	85	17.4	89	98	98
Glenroy	2.23	65	99	94	13.9	91	98	101
<b>Mean</b>	<b>2.69</b>	<b>2.29</b>	<b>2.73</b>	<b>2.68</b>	<b>19.1</b>	<b>90.2</b>	<b>97.7</b>	<b>99.5</b>

lsd (P<0.05)timing.var = 0.48, (Grain Yield), 1.3 (Grain Weight)

NB: Shading denotes significant difference from the Nil treatment.

<sup>a</sup> = 2 weeks prior to Recommended timing

<sup>b</sup> = 2 weeks after Recommended timing

**Table F3.3.** Long term summary (2008-2011) of grain yield response of selected field pea cultivars to crop-topping, Early and Recommended timings.

Varieties are ranked according to their visual maturity rating from earliest to latest.

Variety	Incidence of significant yield losses (# trials)		Average Yield Loss [Range] (% of Control)	
	Early	Rec.	Early	Rec.
PBA Twilight	5 (7)	0 (7)	27 [20-57]	0 [0-9]
PBA Oura	5 (7)	0 (7)	28 [23-58]	0 [0-11]
PBA Gunyah	4 (7)	0 (7)	32 [13-61]	0 [0-10]
Yarrum	3 (6)	1 (6)	35 [13-68]	0 [0-28]
Kaspa	6 (7)	0 (7)	41 [26-69]	8 [0-19]
Parafield	6 (6)	3 (6)	40 [20-55]	1 [0-27]

**Table F3.4.** Effect of crop-topping timing on incidence of mould on field pea seed (# infected seeds/sample) at Balaklava, SA 2011.

Treatment Timing	Early	Recommended	Late	Nil
No. Infected seeds/sample	10 <sup>a</sup>	5 <sup>b</sup>	3 <sup>b</sup>	3.9 <sup>b</sup>

lsd (P<0.05) = 3.7

### Key Findings and Comments

Yield losses from Early crop-topping generally followed cultivar maturity, with latest maturities showing highest losses. Parafield and Alma were the only varieties to show yield loss at the Recommended timing, supporting previous findings that these later maturing varieties are not as well suited to crop-topping as recent releases PBA Twilight, PBA Gunyah and PBA Oura. Kaska and Yarrum continue to show a variable result across seasons at this timing.

The effect of crop-topping on grain weight of field peas was opposite to the effect on grain yield in 2011, with later maturing cultivars showing less effect on grain weight from crop-topping at Early and Recommended timings. A similar trend has been observed in previous seasons, with some extremely late maturing cultivars actually showing increased grain weight from Early crop-topping. It was supposed that this was due to removal of smaller seeds by removal of either later maturing plants before pod set or by abortion of uppermost (immature) pods.

Preliminary results from the 2011 trials have shown that mould in pea samples may be associated with plant maturity at timing of crop-topping. This finding may have implications when crop-topping paddocks which may have varying levels of crop maturity due to variable soil types. Work is ongoing in this area.