F4. Field Pea Crop-topping/Desiccation, Yorke Peninsula (Melton), South Australia

Aim

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

Treatments

Varieties: Table 1
Sowing date: 6 June
Treatments: see tables for dates
- Nil - no desiccant applied
- Early - applied 13 days pre ryegrass milky dough stage (12 Oct)
- Recommended - applied at ryegrass milky dough stage (25 Oct)

Fertiliser: Map + Zn @ 90kg/ha

Results and Interpretation

- Significant two way interactions (Timing x Variety) were observed for grain yield and grain weight (Table 1).
- Grain Yield – all varieties showed a significant yield loss from crop-topping at the Early timing (2 weeks prior to Recommended) (Table 1). The latest maturing variety, Glenroy, was the only variety to show a significant yield loss from crop-topping at the Recommended timing for ryegrass control.
  Long term summary of crop-top timing on grain yield (Table 2) 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 older common cultivars Kaspa and Parafield are less suited than newer earlier maturing cultivars, with Parafield showing yield loss in three of seven trials at the Recommended timing. 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, all varieties showed reduced grain weight from crop-topping at the Early treatment timing. None of the varieties tested showed reduced grain weight from treatment at the Recommended timing, however two cultivars, Parafield and Alma, showed increased grain weight from crop-topping at this timing.

Table 1. Effect of crop-top timing on grain yield (t/ha) and grain weight (g/100 seeds) of field pea varieties, Melton 2012. Varieties are ranked according to their visual maturity rating from earliest to latest (E = Early, M = Mid, L = Late)

Treatment	Maturity Profile		Yield (t/ha)	Yield (% of Nil)		Grain Wt. (g/100)	Grain Weight (% of Nil)	
Variety	Flower Timing	Maturity Timing	Nil	Early 12-Oct	Recommended 25-Oct	Nil	Early 12-Oct	Recommended 25-Oct
PSL-RESEL	VE	VE	2.12	73	100	20.9	80	98
PBA Twilight	E	E	2.31	70	87	20.3	82	104
SW Celine	E	E	2.3	72	93	23.1	77	101
PBA Oura	M	E	2.26	73	93	22.7	74	102
PBA Gunyah	E	E	2.08	72	110	20.3	80	105
OZP0903	M	E-M	2.49	74	95	20.9	75	101
PBA Pearl	M	E-M	2.61	67	93	21.0	74	103
Sturt	M	M	2.18	68	89	19.9	79	104
Yarrum	L	M	2.28	57	100	20.4	69	98
Kaspa	L	M	2.32	54	90	21.4	70	102
Dundale	E	M-L	1.81	67	92	20.2	80	102
Parafield	M-L	M-L	1.87	72	112	20.7	82	114
Alma	L	L	1.79	62	104	19.5	79	112
Glenroy	L	VL	1.87	44	81	20.0	78	100
Mean			**2.16**	**66**	**95**	**20.8**	**77**	**103**

lsd (P<0.05)timing.var = 0.31, (Grain Yield), 1.37 (Grain Weight)

NB: Shading denotes significant difference from the Nil treatment.

Table 2. Long term summary (2008-2012) 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	6 (8)	0 (8)	28 [20-57]	0 [0-9]
PBA Oura	6 (8)	0 (8)	28 [23-58]	0 [0-11]
PBA Gunyah	5 (8)	0 (8)	31 [13-61]	0 [0-10]
Yarrum	4 (7)	1 (7)	36 [13-68]	4 [0-28]
Kaspa	7 (8)	0 (8)	41 [26-69]	8 [0-19]
Parafield	7 (7)	3 (7)	41 [20-55]	8 [0-27]

Key Findings and Comments

- Yield losses from Early crop-topping generally followed cultivar maturity, with latest maturating varieties (eg Glenroy) showing the highest yield losses. Glenroy was also the only variety to show yield loss at the Recommended timing, supporting previous findings that later maturing varieties are not as well suited to crop-topping as earlier maturing recent releases PBA Twilight, PBA Gunyah and PBA Oura.
- Kaspa and Yarrum continue to show variable results across treatments and seasons. Both varieties are rated as having late flowering and mid maturity timing. Previous research has shown Yarrum to be better suited to crop-topping than Kaspa due to its more rapid maturity, and has shown relatively low yield loss from this practice in some seasons. This was not evident in 2012, as both varieties showed high yield losses at the Early treatment timing, but

no yield losses at the Recommended treatment timing. Long term results show that these varieties are not as well suited to crop-topping than some earlier maturing varieties.

- Previous results have found poor correlation between maturity timing at crop-topping and grain weight, and that crop-topping may sometimes be linked to increased grain weight in some (particularly later maturing) varieties. This is thought to be due to the removal of small seeds in the harvested sample through either abortion or elimination of seed development in the uppermost (immature) pods.