

## **B7. Faba Bean Growth Regulant trial, Mid North (Tarlee), South Australia**

### **Aim**

To determine whether certain plant growth regulants (PGR's) or non-selective herbicides can be used to modify canopy height and increase grain yield of faba beans in high rainfall regions of SA.

### **Treatments**

Variety: Farah

Sowing Date: 30 April

Chemical treatments:

<b>Chemical name</b>	<b>Active</b>	<b>Rate</b>	<b>Timings</b>
Herbicide			
2,4-D Amine	625g/L 2,4-D	250ml/ha	Single (T1)
Roundup Attack	570g/L Glyphosate	1L/ha	Single (T1)
Hormone			
Cycocel	582g/L Chlormequat	2L/ha	Single (T1) and Double (T1 + 2)
Ethephon	720g/L Ethephon	1L/ha	Single (T1) and Double (T1 + 2)
Moddus	250g/L Trinexapac-ethyl	400ml/ha	Single (T1) and Double (T1 + 2)
Moddus + Cycocel		200ml/ha + 1L/ha	Single (T1) and Double (T1 + 2)

Timings: Single – 5 WAS

Double – 5 WAS and 8 WAS

Fertiliser: Map + Zn @ 100kg/ha at sowing

### **Background**

Penetration of fungicides into large bean canopies is a common problem, particularly in higher rainfall areas where canopies are larger and incidence of disease can be higher due to high humidity and poor fungicide penetration.

Manipulation of bean canopies by reducing height would allow improved fungicide application and efficacy, and may reduce disease intensity and plant lodging, potentially resulting in increased grain yield.

### **Results and Interpretation**

- Plant canopies were large in 2012 due to warm temperature conditions during winter and early spring.
- Disease incidence was low and below detection in 2012, likely due to below average growing season rainfall.
- Vegetative plant height – Glyphosate and the double application of Ethephon were the only treatments to significantly reduce plant height of faba bean at the early measurement timing (mid flowering). These chemicals reduced plant height by 37% and 13%, respectively (Table 1).
- Mature plant height – Five of the ten treatments resulted in a significant reduction in plant height at maturity. These include the herbicide treatments 2,4-D Amine (15% shorter) and Roundup (37%), and the PGR chemistry treatments Moddus T1+2 (9%), Ethephon T1 (12%) and Ethephon T1+2 (21%) (Table 1).
- Lodging – minimal plant lodging was evident at this site in 2012, and the Nil treatment showed no lodging. The herbicide treatments 2,4-D Amine and Glyphosate showed a very low level of increased lodging compared to the Nil (Table 1).
- Grain Yield – All products tested performed similarly to the Nil for grain yield except 2,4-D Amine and Glyphosate, which showed yield penalties of 26% and 32%, respectively (Table 1).

Table 1: Effect of various chemicals applied as growth regulants on the plant height (at flowering and maturity), lodging and grain yield of faba bean, Tarlee 2012.

Treatment	Plant Height (cm)		Lodging * (1-9 score)	Grain Yield (t/ha)
	Flowering	Maturity		
Nil	95 cm	112 cm	8.7	3.94 t/ha
2,4-D Amine T1	90	85	7	74
Glyphosate T1	63	63	8	68
Cycocel T1	98	96	8.3	95
Cycocel T1+2	100	96	9	101
Moddus T1	101	98	8.7	96
Moddus T1+2	94	91	9	101
Moddus + Cycocel T1	100	94	9	100
Moddus + Cycocel T1+2	94	88	8.7	98
Ethephon T1	91	88	9	99
Ethephon T1+2	87	79	9	96
<b>LSD (P&lt;0.05)</b>	<b>12</b>	<b>10</b>	<b>0.6</b>	<b>13</b>

Shaded figures denote significant difference to grain yield of Kaspia

\* Lodging score: 1= prostrate, 9 = erect

### Key Findings and Comments

- This study showed that the two herbicide treatments, 2,4-D Amine applied at 250ml/ha and Glyphosate applied at 1L/ha, produced the largest reduction in mature height, but also caused a large yield penalty.
- In a previous pilot study, Glyphosate applied at 100ml/ha had no effect on plant height or grain yield. It is possible that a rate somewhere between 100-1000ml/ha may suppress plant height with little or no effect on grain yield, although yield recovery from early season herbicide damage is likely to depend on end of season weather conditions.
- Ethephon (single and double applications) and the double application of Moddus were able to significantly reduce faba bean height with no effect on grain yield.
- The effect of PGR's on lodging of faba bean could not be fully assessed due to minimal levels of plant lodging in this trial in 2012, and there was generally no difference in lodging between PGR chemicals and the Nil. Increased plant lodging caused by the use of the herbicides 2,4-D Amine and Glyphosate is likely due to stem weakness caused by herbicide application. Further work across seasons and environments is required to validate these results.
- Further study could examine different rates or alternative products to test whether growth regulants can be employed for canopy management to improve disease management and harvestability of faba bean in high rainfall regions.