

# Legume and oilseed herbicide tolerance

Hart Field-Site Group

## Aim

This demonstration had two primary objectives. The first was to evaluate the crop safety of canola and legume species when exposed to a range of herbicide products, application timings, and rates. The second was to assess the effectiveness of these herbicides in controlling volunteer canola and legume varieties that may require management either within the subsequent season's crop or prior to its establishment.

Observations from 2025 may differ from expected results that would otherwise be seen in more favorable conditions.

## Methodology

The 2025 legume and oilseed herbicide tolerance trial was established as a demonstration and arranged as a non-replicated matrix (Table 1). Sixteen varieties were sown in strips representing seven crop types: canola, faba bean, field pea, chickpea, lentil, vetch and barrel medic. A total of 45 herbicide treatments were applied across all 16 crops at different timings. The trial was sown on July 3 into a drying soil profile, with 10.6 mm of rainfall recorded in the seven days leading up to sowing.

Table 1. Trial details for legume and oilseed herbicide tolerance at Hart, SA.

<b>Plot size</b>	2.2 m x 2.0 m	<b>Fertiliser</b>	Seeding: MAP (10:22) + Zn 1% @ 80 kg/ha
<b>Location</b>	Hart, SA	<b>GSR*</b>	Decile 3 (223 mm)
<b>Seeding date</b>	June 27, 2025	<b>Soil type</b>	Clay loam

\*GSR = Growing season rainfall

Application timings:

- |                                     |           |
|-------------------------------------|-----------|
| 1. Incorporated by sowing (IBS)     | June 27   |
| 2. Post-seeding pre-emergent (PSPE) | June 27   |
| 3. Early post-emergent (3-4 node)   | August 6  |
| 4. Post-emergent (5-6 node)         | August 19 |
| 5. Knockdown & spikes (5-6 node)    | August 19 |

Treatments were visually assessed and scored (Table 2) for herbicide effects approximately six weeks after each application from August to October (Tables 3 & 4).

*Table 2. Crop damage ratings and descriptions used for visual assessment of legume and oilseed herbicide tolerance demonstration.*

Rating	Crop damage	Explanatory notes
1	No effect	No herbicide effect evident.
2	Slight effect	Some slight or temporary damage, reduced crop vigour and growth. Discoloration, distortion and/or stunting negligible.
3	Moderate effect	Moderate damage with recovery likely expected in most, if not all cases. Can include moderate discoloration, distortion and/or stunting.
4	Irreversible effect	Majority of plants irreversibly damaged. Some discoloration, necrosis and distortion severe.
5	Severe effect	Severe - very severe damage. Majority of plants are dead with the remainder showing distortion or necrosis.
6	Death	Death of plants. Some crop residue may remain but complete loss of plant/and or crop.

Some herbicides used in this demonstration are not registered for the crops to which they were applied, so it is essential to consult product labels before use. In 2025, several treatments produced unexpected differences in crop tolerance. These results should be interpreted with caution, as herbicide performance can vary between seasons and depends heavily on factors such as soil type and weather conditions at the time of application. This trial was not replicated, and all observations are based on a single visual assessment.

### Crop safety

Because conditions were exceptionally dry for more than six months prior to the June sowing period, the performance of pre-emergent herbicides was not fully representative of outcomes expected under more typical seasonal conditions.

Crop responses to IBS treatments were generally slight to moderate. Lentils exhibited minimal sensitivity to most treatments, with the exception of Jumbo 2, which showed irreversible injury in response to Terrain Flow.

Ultra® applied at 1700 g/ha was one of safest across all applied IBS treatments for the crops it is registered in. In 2023, 2024 and 2025 seasons, Ultra provided no effect to slight crop effect on canola and medic, however this use is off-label and is not recommended.

Pyroxasulfone and Overwatch applied IBS had significantly less effect on most varieties this year than in 2024.

Voraxor, evaluated as a new treatment, produced lower than anticipated crop damage ratings across most varieties. Substantial variability was observed among canola and lentil varieties, with some canola lines ranging from no visible effect to moderate injury; similar patterns were noted in lentils. Voraxor is not currently registered for pre-sowing application in canola or pulse crops.



PSPE applications provided lower levels of crop safety than IBS treatments, as expected. Crop effects from diuron, simazine, and metribuzin were less pronounced compared with observations from some previous seasons.

### **Crop control**

Crop control at the 5-6 node timing was lower than previous years for Velocity and Talinor. Florasulam and Paradigm gave the most consistent control of the post emergent treatments which was not unexpected. These treatments did offer poor control of the SU tolerant medic, this is likely due to the MOA being a Group 2 herbicide, which SU chemistry also falls under.

Galaxy with LVE MCPA treatments did not adequately control faba bean or pea varieties, and this aligns well with the label recommendations where other herbicides need to be included for full control at this stage.

### **Knockdown and spikes**

Paraquat at 400 mL/ha with Voraxor at 200 mL/ha offered the most consistent control across all pulse and oilseed varieties. With the exception of GIA Ourstar field peas, Kingsford and Timok vetch, all other varieties were controlled.

Paraquat standalone treatments performed very poorly at both the 400 mL/ha and 900 mL/ha rates as would be expected. The best result was seen on HyTTec Trophy canola with the 800 mL/ha rate causing death.

Low rates of paraquat (400 mL/ha), Sharpen, Terrad'or and Voraxor did not control the vetch. Glufosinate at 4 L/ha although not registered gave control of the medic varieties, Timok vetch, chickpeas, faba beans and field peas.



*Photo: A drone view of the herbicide tolerance trial at Hart in 2025.*

Table 3. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2025.

**Trial layout – CROP SAFETY**

CROP SAFETY				Canola				Bean		Pea		C/pea	Lentil		Vetch		Medic		
				HyTTec Trophy	PY421C	Nuseed Raptor	InVigor LR 4540P	PBA Bencloc	PBA Samira	PBA Wharton	GIA Ourstar	Genesis090	Jumbo 2	GIA Thunder	GIA Mietro	Kingsford	Timok	Jester SU	Sultan SU
	Timing	Treatment	Rate																
1	IBS   June 27	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2		Pyroxasulfone (850 g/kg)	118 g	1	1	1	2	1	1	1	2	2	2	1	1	1	1	1	1
3		Boxer Gold	2500 mL	2	1	2	2	1	1	1	1	2	1	1	1	1	1	2	1
4		Propyzamide	1000 mL	2	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1
5		Tenet	1800 mL	2	2	2	1	1	1	2	2	1	1	1	1	1	1	1	2
6		Ultro	1700 g	1	2	1	1	1	2	1	2	1	1	1	1	1	1	1	1
7		Reflex	1000 mL	2	2	1	2	1	2	2	1	2	1	1	1	1	1	1	2
8		Luximax	500 mL	1	2	2	2	1	1	1	1	2	1	1	1	1	1	1	2
9		Overwatch	1250 mL	2	1	2	1	1	1	2	1	2	1	1	1	1	1	1	1
10		Sentry	50 g	2	1	3	4	2	2	1	1	2	1	1	1	1	1	1	1
11		Mateno Complete	1000 mL	3	3	4	4	3	3	2	2	2	1	1	2	1	1	3	2
12		Terrain Flow	190 mL	3	2	3	2	1	1	2	2	1	4	1	2	2	2	4	4
13		Voraxor	200 mL	2	3	1	2	1	2	No data	1	1	3	1	1	1	1	2	3
14	PSPE   June 27	NIL		1	1	1	1	1	1	No data	1	1	1	1	1	1	1	1	1
15		Diuron (900 g/kg)	825 g	5	3	4	3	1	1	1	1	1	1	1	1	1	5	2	
16		Reflex	1250 mL	6	5	5	4	2	2	1	1	1	2	2	3	1	1	5	5
17		Simazine (900 g/kg)	825 g	1	5	4	4	2	2	1	1	1	2	2	2	1	1	6	6
18		Metribuzin (750 g/kg)	280 g	2	6	6	6	2	2	1	1	1	2	2	1	3	2	6	4
19		Brodal Options	100 mL	4	5	5	6	3	3	2	2	3	2	1	1	2	1	3	2
20		Terbuthylazine (875 g/kg)	1000 g	2	5	5	5	1	2	1	1	1	3	3	3	2	1	6	6
21		Balance + Simazine	100 g + 830 g	5	6	5	6	2	2	1	2	1	4	4	4	3	3	6	6
22	3-4 Node   August 6	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
23		Metribuzin (750 g/kg)	280 g	1	5	5	6	2	2	1	1	2	2	2	1	3	3	2	2
24		Broadstrike + Wetter 1000	25 g + 0.2%	6	1	5	6	1	3	2	1	1	1	1	2	4	3	1	1
25		Thistrol Gold + Cando	2000 mL + 0.5%	6	5	6	6	2	2	2	2	1	2	2	2	4	3	2	1
26		Ecopar Forte + Wetter 1000	400 mL + 0.2%	4	4	4	4	2	2	3	3	1	3	3	3	1	1	2	2
27		Brodal Options + MCPA Amine 750	125 mL + 125 mL	3	3	2	2	2	3	1	1	1	1	1	1	2	3	1	2
28		Terbutryn (500 g/L)	600 mL	1	2	1	2	3	3	1	1	1	1	1	1	1	2	1	2



Table 4. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2025.

**Trial layout – CROP CONTROL**

CROP CONTROL				Canola				Bean		Pea		C/pea	Lentil		Vetch		Medic	
				HyTTec Trophy	PY421C	Nuseed Raptor	InVigor LR 4540P	PBA Bendoc	PBA Samira	PBA Wharton	GIA Ourslar	Genesis090	Jumbo 2	GIA Thunder	GIA Metro	Kingsford	Timok	Jester SU
Timing	Treatment	Rate																
1	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Lontrel Advanced	150 mL	2	1	1	1	6	6	5	6	6	6	6	6	6	6	6	6
3	Metsulfuron Methyl (600 g/kg) + MCPA LVE + Wetter 1000	5 g + 500 ml + 0.1%	6	5	6	6	5	5	6	4	6	6	2	3	6	2	2	2
4	Velocity + Hasten	670 mL + 1.0%	6	5	5	6	5	5	6	5	2	3	3	3	2	2	4	5
5	Talinor + Hasten	750 mL + 1 %	6	5	6	6	6	5	6	5	3	5	4	4	3	5	5	6
6	Infinity Ultra + Hasten	110 mL + 1%	5	3	4	4	3	4	4	5	2	4	3	3	2	1	3	3
7	Frequency + MCPA LVE + Hasten	200 mL + 500 ml + 1%	6	6	6	6	4	3	3	3	1	2	2	4	5	3	4	4
8	Galaxy + MCPA LVE + Hasten	335 mL + 500 ml + 1%	5	5	5	6	4	4	4	4	2	6	5	6	4	2	4	3
9	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	Florasulam (200 g/L) + Uptake	25 mL + 0.5%	6	4	6	6	6	6	6	5	6	6	5	5	6	5	3	2
11	Paradigm + Uptake	25 g + 0.5%	6	5	6	6	5	6	5	5	6	6	5	5	6	4	3	3
12	Quadrant	1000 mL	5	5	4	5	3	3	2	2	2	2	2	2	1	1	1	1
13	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	Paraquat + MSO	800 mL + 1%	6	5	5	5	2	2	2	3	2	1	1	1	1	1	1	1
15	Paraquat + MSO	400 mL + 1%	4	3	3	3	1	2	1	2	3	1	1	1	1	1	1	1
16	Paraquat + Sharpen + MSO	400 mL + 34 g + 1%	6	6	6	6	5	5	5	5	5	5	4	4	2	2	4	4
17	Paraquat + Terrad'or + MSO	400 mL + 40 g + 1%	6	6	6	6	5	6	5	4	5	5	6	5	3	2	5	5
18	Paraquat + Voraxor + MSO	400 mL + 100 mL + 1%	6	6	6	6	5	6	5	4	5	5	5	5	3	4	6	6
19	Paraquat + Voraxor + MSO	400 mL + 200 mL + 1%	6	6	6	6	6	6	6	5	6	6	6	6	4	5	6	6
20	Glufosinate 200 + AMS	2000 mL + 3%	3	3	2	1	5	5	5	5	5	4	2	2	1	3	5	5
21	Glufosinate 200 + AMS	4000 mL + 3%	5	5	5	1	4	6	6	6	6	6	5	5	5	6	6	6
22	Paraquat + Amitrole 250	800 ml + 2000 mL	3	3	3	5	6	5	2	1	2	3	3	3	1	1	5	2
23	Amitrole 250	4000 mL	4	4	4	5	6	6	2	3	5	5	5	5	4	6	6	3