

Legume and oilseed herbicide tolerance

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Key findings

- Most IBS treatments had slight to moderate effects on legume and oilseed crops at Hart in 2023. This was likely contributed to wet conditions at seeding favouring herbicide activity coupled with late seeding in June slowing crop emergence and growth.
- When applied standalone at 800 and 1200 mL /ha, Crucial® provided a good level of control across cereals and some legumes. The new generation of Group 14 spike herbicides Voraxor® and Terrad'or® provided an additional level of control (rating 5 and 6) across most crop types at Hart.

Aim

To compare the tolerance and control of canola and legume varieties to a range of herbicide timings and rates.

Methodology

The 2023 legume and oilseed herbicide tolerance trial was set up as a demonstration and is a non-replicated matrix (Table 1). Eighteen varieties were sown in strips across 10 different crop types including canola, faba bean, field pea, chickpea, lentil, vetch, sub clover and barrel medic. Barley and oats were also included in 2023 and 48 herbicide treatments were applied across all 18 crops at various timings. The trial was split into two components: pulse crop safety (1A) and pulse control (1B). The trial was sown into wet soils on June 20 providing good conditions for pre-emergent and post sowing pre-emergent (PSPE) herbicide activity.

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

Plot size	2.2 m x 2.0 m	Fertiliser	MAP (10:22) + 1% Zn + Impact @ 80 kg/ha
Seeding date	June 20, 2023		
Location	Hart, SA	Soil type	Clay loam

Some herbicides used in this demonstration are not registered for crops that have been sprayed. It is important to check herbicide labels before following these strategies used. In 2023, a number of herbicide treatments displayed varying crop tolerances that were not expected. Care should be taken when interpreting these results, as herbicide effects can vary between seasons and is also dependent upon conditions at application, soil type and weather conditions. This trial is an un-replicated matrix and observations are based on visual assessment at one point in time only.

Application timings:

Incorporated by sowing (IBS)	June 20
Post seeding pre-emergent (PSPE)	June 20
Early post emergent (3-4 node)	July 27
Post emergent (5-6 node)	August 21
Post emergent (Group 14 spike at 5-6 node)	September 1

Treatments were visually assessed and scored for herbicide effects approximately six weeks after each application from June – September (Table 2 & 3). Crop damage ratings were:

1 = no effect

2 = slight effect

3 = moderate effect

4 = increasing effect

5 = severe effect

6 = death

Results and discussion

Crop safety

Most IBS treatments had slight – moderate effects on legume and oilseed crops at Hart in 2023 (Table 2). This was in contrast to previous seasons (2020 – 2022) and was likely due to wet conditions at seeding and significant rainfall post seeding (30 mm in three days), increasing herbicide activity. This coupled with a late seeding in June which saw slow crop emergence and growth, particularly for crops such as Zulu II clover.

Pre-emergent herbicides with the highest levels of visual crop damage were Terrain[®] Flow, Sentry[®], Reflex[®] and Tenet[®]. Observed crop damage (rating 4 – 5) could be expected across oilseed crops for Terrain Flow as this product is not registered for this use. Some unexpected and moderate damage was seen across lentil and chickpeas, which could be due to physical soil movement into the furrow.

Tenet[®] and Ultro[®], both registered for control or suppression of some grasses had increasing effect on Compass barley and Kingbale oats. Tenet[®] showed moderate damage on some of the pasture species, along with some of the pulses and vetch.

A number of PSPE treatments displayed severe effects to crop death across a range of canola, pasture and pulse treatments (Table 2).

Pulse control

A range of treatments provided high levels of control (rating 5 – 6) at Hart in 2023 (Table 3).

Saracen[®] + Cando[®], Paradigm + MCPA LVE + Uptake[®], Talinor[®] + Hasten[®] and Velocity[®] + Hasten provided excellent control of most oilseed and legume species when applied at 5 – 6 node. Similar to 2022, Triathlon[®] and Flight[®] EC performed equally, providing slight to severe control across all legume and oilseed crops. The least effective herbicide combination for controlling a range of oilseed, pulses and pasture was Brodal[®] Options + MCPA Amine 750, with most ratings between 1 – 3 (no – moderate effect).

As expected, most Group 14 (previously Group G) herbicides provided a high level of control across oilseed, legume and cereal crops. Similarly to 2021 – 2022, the new generation of Group 14 spike herbicides Voraxor[®] and Terrad'or[®] provided an additional level of control (rating 5 and 6) across most crop types at Hart when compared to carfentrazone, Sledge[®], Terrain[®] Flow and butafenacil, particularly for crop types such as canola and volunteer lentil or chickpea.

Crucial[®] was applied standalone at 800 and 1200 mL /ha and provided a good level of control across cereals and some legumes. In previous years, pulse and oilseed control was improved when applied with a Group 14 herbicide, however in 2023, glyphosate standalone visually performed similar to older Group 14 herbicides applied with Crucial[®]. Control was slightly improved in 2023 with the addition of Group 14 chemistry for crop types such as glyphosate tolerant canola, field peas and pasture.

Acknowledgements

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Table 2. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2023.

CROP SAFETY – Part 1A

CROP SAFETY			Canola				Barley	Oats	Bean		Pea		C/pea	Lentil		Vetch			Medic	Clover	
			HyTTec Trophy	Pioneer 44V94 CL	Pioneer 44V30 RR	InVigor LR 4540P	Compass	Kingdale	PBA Bendoc	PBA Samira	Wharton	G/A Ourstar	Genesis090	Jumbo 2	PBA Hallmark XT	RM4	Trinok	GIA202V	Sultan SU	Zulu II	
Timing	Treatment	Rate																			
IBS June 20	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Sakura	118 g	5	3	2	3	2	4	2	2	2	2	2	3	2	3	1	3	3	5	
	Boxer Gold	2500 mL	1	2	1	1	1	1	2	2	2	2	2	2	2	2	1	1	1	4	
	Propyzamide	1000 mL	2	1	1	1	2	3	2	3	2	2	2	2	1	2	1	1	2	2	
	Tenet	1800 mL	3	2	2	3	4	4	2	3	4	3	2	4	3	3	4	4	4	3	
	Ultro	1700 g	1	1	1	2	4	4	2	2	2	1	1	2	2	1	2	1	1	1	
	Reflex	1000 mL	3	3	3	5	1	2	1	1	1	1	1	1	1	1	2	1	5	5	
	Luximax	500 mL	1	1	1	2	2	3	1	1	1	1	1	3	2	2	1	2	1	4	
	Overwatch	1250 mL	1	2	1	2	1	2	1	2	1	2	2	3	2	3	2	4	1	4	
	Sentry	50 g	5	2	5	5	3	2	2	2	2	2	1	4	1	2	3	3	1	5	
	Mateno Complete	1000 mL	2	3	2	4	2	4	3	2	3	3	2	3	2	2	1	2	2	5	
	Terrain Flow	190 mL	5	4	4	4	1	1	2	3	2	2	3	3	3	3	1	1	4	6	
PSPE June 20	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Reflex	1250 mL	6	6	6	6	1	2	2	2	1	1	2	2	3	2	2	2	6	6	
	Diuron (900 g/kg)	825 g	4	5	5	5	2	1	2	2	2	2	3	2	2	2	1	5	6		
	Simazine (900 g/kg)	825 g	2	6	5	5	3	3	2	3	2	2	2	3	3	3	2	6	6		
	Metribuzin (750 g/kg)	280 g	3	6	6	6	4	5	2	2	2	2	4	4	4	3	1	1	6		
	Terbazine (875 g/kg)	1000 g	1	6	6	6	3	3	2	3	2	2	3	3	3	3	2	1	6	6	
	Balance + Simazine	100 g + 830 g	5	6	6	6	4	5	3	4	4	4	4	6	6	6	4	4	6	6	
3-4 Node July 27	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Metribuzin (750 g/kg)	280 g	2	6	6	6	2	1	2	2	1	2	3	2	1	4	4	3	5	6	
	Broadstrike + Wetter 1000	25 g + 0.2%	5	1	5	5	3	1	1	3	2	1	2	1	1	5	3	4	3	4	
	Thistrol Gold + Cando	2000 mL + 0.5%	6	5	5	6	1	1	2	3	3	2	3	5	5	5	5	4	4	4	
	Brodal Options	150 mL	2	2	2	3	1	1	3	2	2	1	4	2	1	1	3	3	3	4	
	Spinnaker + Wetter 1000	70 g + 0.2%	5	3	5	5	4	2	2	2	2	1	3	3	1	1	1	2	1	2	
	Ecopar + Wetter 1000	800 mL + 0.2%	4	4	4	5	1	1	2	2	4	4	1	4	4	2	1	3	2	1	
Intercept + Hasten	750 mL + 0.5%	6	2	6	5	6	2	3	5	5	3	5	5	1	5	4	2	2	6		

Table 3. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2023.

PULSE CONTROL – Part 1B

PULSE CONTROL	Canola				Barley	Oats	Bean		Pea	C/pea	Lentil	Vetch		Medic	Clover					
	HyTtec Trophy	Pioneer 44Y94	Pioneer 44Y30 RR	InVigor LR 4540P	Compass	Kingbale	PBA Bendoc	PBA Samira	Wharton	GIA Ourstar	Genesis090	Jumbo 2	PBA Hallmark XT	RM4	Trinok	GIA2202V	Sultan SU	Zulu II		
Timing	Treatment	Rate																		
1	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	1	1
2	Ally + Wetter 1000	7 g + 0.1%	6	1	4	6	2	1	4	5	4	3	5	5	3	5	5	5	2	6
3	Lontrel Advanced	150 mL	1	2	1	1	2	1	6	6	4	5	6	5	6	6	6	6	6	6
4	Ecopar + MCPA Amine 750	400 mL + 330 mL	3	4	4	4	1	1	3	3	3	2	4	3	4	3	5	5	2	2
5	Carfentrazone + MCPA Amine 750	100 mL + 330 mL	6	6	6	6	3	1	4	3	3	3	4	5	5	4	5	5	3	3
6	Velocity + Hasten	670 mL + 1.0%	6	6	6	6	2	2	6	6	6	6	4	6	6	6	6	6	6	6
7	Talinor + Hasten	750 mL + 1%	6	6	6	6	2	3	6	6	6	6	6	6	6	6	6	6	6	6
8	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	5	5	1	1
9	Saracen + Cando	100 mL + 0.5%	6	4	6	6	1	3	6	6	5	5	6	6	5	6	6	6	2	6
10	Paradigm + MCPA LVE + Uptake	25 g + 500 mL + 0.5%	6	6	6	6	1	1	6	5	5	5	6	6	5	6	6	6	6	6
11	Flight EC	720 mL	6	6	6	5	1	2	6	6	2	2	6	5	5	4	6	6	4	2
12	Triathlon	1000 mL	6	6	6	6	1	2	6	5	2	2	6	4	4	4	6	6	3	2
13	Rexade + Wetter 1000	100 g + 0.25%	5	1	6	6	4	4	5	6	4	4	4	5	4	5	5	5	5	6
14	Brodal Options + MCPA Amine 750	125 mL + 125 mL	2	2	2	4	1	1	2	3	1	1	3	2	2	2	5	5	1	4
15	Liberty (double knock)	2 L	6	4	5	1	5	5	6	6	6	6	6	6	6	6	6	6	6	6
16	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	1	1
17	Crucial	800 mL	6	6	1	2	6	6	6	5	4	4	5	6	6	4	6	5	4	4
18	Crucial	1200 mL	6	6	1	2	6	6	6	5	5	6	5	6	6	4	6	6	5	5
19	Carfentrazone 400 + Crucial + MSO	15 mL + 800 mL + 1%	6	6	4	4	6	6	6	5	5	5	5	6	5	4	5	5	5	6
20	Sharpen + Crucial + MSO	17g + 800 mL + 1%	6	6	5	5	6	6	6	6	5	6	6	6	6	5	6	6	6	6
21	Sledge + Crucial + MSO	50 mL + 800 mL + 1%	5	5	3	4	6	6	5	4	5	5	5	5	5	4	6	6	5	4
22	Terrain Flow + Crucial + MSO	30 mL + 800 mL + 1%	5	5	4	4	6	6	6	6	5	5	5	6	6	5	6	6	5	5
23	Butafenacil + Crucial + MSO	55 mL + 800 mL + 1%	5	5	4	4	6	6	6	6	5	5	5	5	5	4	6	6	4	4
24	Terrad'or + Crucial + MSO	15 g + 800 mL + 1%	6	6	6	6	6	6	6	6	6	6	5	6	6	5	6	6	6	6
25	Oxyflurofen 240 + Crucial + MSO	75 mL + 800 mL + 1%	5	5	2	3	6	6	6	4	4	4	5	6	5	5	6	5	4	4
26	Voraxor + Crucial + MSO	100 mL + 800 mL + 1%	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	6	6
27	Terrad'or + Crucial + MSO	40 g + 800 mL + 1%	6	6	6	6	6	6	6	6	5	5	5	6	6	4	6	6	6	6

