

Legume and oilseed herbicide tolerance

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Key findings

- Most IBS treatments had no effect on legume and oilseed crops at Hart in 2022. A number of post-emergent treatments applied at 3-4 and 5-6 node either had moderate damage impacting crop safety of legume and oil seed crops, or a high level of control.
- The new generation of Group 14 spike herbicides Voraxor[®] and Terra'dor[®] provided an additional level of control (rating 5 and 6) across all crop types at Hart in 2021 when compared to carfentrazone, Sledge[®], Terrain Flow and Butafenacil.
- Lontrel[®] Advanced had the highest control (rating 6) for chickpea, lentil and vetch. Talinor + Hasten was also the most effective combination to control medic and clover.

Introduction

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

Methodology

Plot size	2.2 m x 2.0 m	Fertiliser	MAP (10:22) + 1% Zn + Impact @ 80 kg/ha
Seeding date	June 22, 2021	Soil type	Clay loam
Location	Hart, SA		

This trial was set up as a demonstration and is a non-replicated matrix. Seventeen varieties were sown in strips across 11 different crop types including canola, faba bean, field pea, chickpea, lentil, vetch, sub clover and barrel medic. Wheat, barley and oats were also included in 2022 and 47 herbicide treatments were applied across all 17 crops at various timings. The trial was split into two components; crop safety (1A) and pulse control (1B). The trial was sown dry, with 23 mm rainfall received within the first two weeks of the applied IBS and PSPE treatments, providing good conditions for herbicide activity.

Application timings:

Incorporated by sowing (IBS)	June 22
Post seeding pre-emergent (PSPE)	June 22
Early post emergent (3-4 node)	August 8
Post emergent (5-6 node)	August 26
Post emergent (Group 14 spike at 3-4 node)	August 26

Treatments were visually assessed and scored for herbicide effects approximately six weeks after each application from June – August (Table 1). Crop damage ratings were:

- 1 = no effect,
- 2 = slight effect
- 3 = moderate effect
- 4 = increasing effect
- 5 = severe effect
- 6 = death

Some of the 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 2022, 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.

Results and discussion

Crop safety

Most IBS treatments had no effect on legume and oilseed crops at Hart in 2022 (Table 1). This was similar to observations in 2020 – 2021. BoxerGold® and Luximax® provided moderate crop effects to Pioneer 44Y90 as they are not registered for use in canola, however no crop effects were observed for grain legumes and other oilseed varieties. Overall, good crop safety (rating 1) was observed for most post sowing, pre-emergent herbicides when applied at Hart on June 22. As expected, slight to increasing damage was observed for canola varieties, resulting from PSPE applications of Balance® + simazine or Terbazine. Crop effects were also observed from all PSPE herbicides for Zulu II clover. A number of post-emergent treatments applied at 3-4 node displayed moderate damage across many legume and oil seed crops (Table 1).

Pulse control

At Hart in 2022, Lontrel® Advanced had the highest level of control (rating 6) for chickpea, lentil and vetch (Table 2). In addition to Lontrel, Saracen® + Cando® and Paradigm + MCPA LVE + Uptake® and Talinor® + Hasten® provided excellent control of all oilseed and legume crops (rating 5 – 6) when applied at 5 – 6 node. Triathlon® and Flight® EC performed equally, providing slight to severe control across all legume and oilseed crops. Herbicide efficacy was observed to be lower for these two products when compared to 2021. Talinor + Hasten was the most effective combination when controlling Sultan SU medic and Zulu II clover (rating 6). This was expected as Talinor is on label at rates of 500 – 750 mL for the control of clover and medic when applied no later than 6 – 8 leaf.

As expected, most Group 14 (previously Group G) herbicides provided a high level of control across oilseed, legume and cereal crops. Similarly to 2021, the new generation of Group 14 spike herbicides Voraxor® and Terra'dor® provided an additional level of control (rating 5 and 6) across all crop types at Hart when compared to carfentrazone, Sledge®, Terrain Flow and butafenacil. Both herbicides offer a great option for controlling glyphosate tolerant canola. Crucial was applied standalone at 800 and 1200 mL /ha and provided a good level of control across cereals and some legumes. In most cases, pulse and oilseed control was improved when applied with a Group 14 herbicide.



Table 1. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2022.

CROP SAFETY – Part 1A

CROP SAFETY			Canola		Bean		Pea		C/pea	Lentil		Vetch		Medic	Clover	Wheat	Barley	Oats	
			HYTtec Trophy	Pioneer 44Y94 CL	Pioneer 44Y30 RR	PBA Bendoc	PBA Samira	Wharton	GIA Ourstar	Genesis090	Jumbo 2	PBA Hallmark XT	RM4	Timok	Sultan SU	Zulu II	Scepter	Compass	Kingbale
Timing	Treatment	Rate																	
IBS June 22	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Sakura	118 g	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Boxer Gold	2500 mL	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Propyzamide	1000 mL	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Tenet	1800 mL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Ultro	1700 g	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Reflex	1000 mL	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
	Luximax	500 mL	1	3	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
	Overwatch	1250 mL	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1
	Sentry	50 g	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Mateno Complete	1000 mL	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Terrain Flow	190 mL	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
PSPE June 22	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	Reflex	1250 mL	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	
	Diuron (900 g/kg)	825 g	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	
	Simazine (900 g/kg)	825 g	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	
	Metribuzin (750 g/kg)	280 g	1	1	1	1	2	1	1	1	1	1	1	1	3	1	1	1	
	Terbazine (875 g/kg)	1000 g	1	4	2	1	1	1	1	1	1	1	1	2	5	1	1	1	
3-4 Node August 8	Balance + Simazine	100 g + 830 g	3	4	4	1	1	1	1	1	1	1	1	3	5	1	1	1	
	NIL		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	5	4	3	1	4	3	3	5	4	4	6	2	1	3
	Broadstrike + Wetter 1000	25 g + 0.2%	4	3	4	2	3	1	1	1	1	1	2	1	1	3	1	1	1
	Thistrol Gold + Banjo	2000 mL + 0.5%	5	5	5	2	3	3	3	3	3	3	3	2	1	4	1	1	1
	Brodal Options	150 mL	2	2	2	4	3	1	2	3	2	2	1	1	1	3	1	1	1
	Spinnaker + Wetter 1000	70 g + 0.2%	6	1	5	1	2	1	1	3	3	1	1	1	1	3	4	1	1
	Ecopar + Wetter 1000	800 mL + 0.2%	2	2	2	1	3	3	4	2	3	4	1	1	1	4	1	1	1
Intercept + Hasten	750 mL + 0.5%	6	1	6	1	4	5	1	5	5	1	1	1	1	5	6	6	2	



Table 2. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2022.

PULSE CONTROL – Part 1B

PULSE CONTROL				Canola		Bean		Pea		C/pea	Lentil	Vetch		Medic	Clover	Wheat	Barley	Oats		
				HYTtec Trophy	Pioneer 44Y94 CL	Pioneer 44Y30 RR	PBA Bendoc	PBA Samira	Wharton	G/A Ourstar	Genesis090	Jumbo 2	PBA Hallmark XT	RM4	Timok	Sultan SU	Zulu II	Scepter	Compass	Kingpale
	Timing	Treatment	Rate																	
1	5 - 6 node August 26	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2		Ally + Wetter 1000	7 g + 0.1%	6	2	6	5	6	6	5	5	5	4	6	4	5	4	2	1	2
3		Lontrel Advanced	150 mL	1	1	1	5	5	5	5	6	6	6	6	6	5	5	1	1	1
4		Ecopar + MCPA Amine 750	400 mL + 330 mL	4	4	4	3	3	2	2	2	3	3	3	3	1	2	1	1	1
5		Carfentrazone + MCPA Amine 750	100 mL + 330 mL	5	6	5	3	3	3	3	4	4	4	3	3	4	2	1	1	1
6		Velocity + Hasten	670 mL + 1.0%	5	5	5	5	4	6	6	3	5	5	5	5	6	5	1	1	1
7		Talinor + Hasten	750 mL + 1 %	5	5	5	5	5	6	6	5	5	5	5	6	6	6	2	1	3
9		Saracen + Cando	100 mL + 0.5%	6	3	6	5	6	5	5	5	5	5	6	5	2	5	1	1	1
10		Paradigm + MCPA LVE +	25 g + 500 mL +	6	5	6	5	5	5	5	5	5	5	6	6	5	5	1	1	1
11		Flight EC	720 mL	4	5	5	4	4	2	2	3	4	4	3	4	4	3	1	1	2
12		Triathlon	1000 mL	5	5	5	4	4	2	2	3	4	4	3	4	4	2	1	1	1
13		Rexade + Wetter 1000	100 g + 0.25%	5	2	5	4	6	5	5	5	5	5	6	6	5	5	2	3	4
14		Brodal Options + MCPA Amine 750	125 mL + 125 mL	4	4	4	3	3	1	2	2	3	2	2	2	2	3	1	1	1
14		Group G spike August 26	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	Crucial		800 mL	6	5	1	5	3	6	6	4	5	5	1	3	5	5	6	6	6
16	Crucial		1200 mL	6	6	1	5	4	6	6	5	6	6	4	3	6	6	6	6	6
17	Carfentrazone 400 +		15 mL + 800 mL +	5	5	4	4	4	6	5	4	5	5	3	2	5	5	6	6	6
18	Sharpen + Crucial + MSO		17g + 800 mL +	5	6	5	5	5	6	6	4	6	6	4	4	6	6	6	6	6
19	Sledge + Crucial + MSO		50 mL + 800 mL +	5	5	2	4	3	6	5	4	5	5	2	2	5	5	6	6	6
20	Terrain Flow + Crucial + MSO		30 mL + 800 mL +	5	5	3	4	4	6	6	4	5	5	4	4	5	5	6	6	6
21	Butafenacil + Crucial + MSO		55 mL + 800 mL +	5	5	3	3	3	6	6	4	5	5	4	4	5	5	6	6	6
22	Terrad'or + Crucial + MSO		15 g + 800 mL +	6	6	5	6	6	6	6	4	6	6	5	5	6	6	6	6	6
23	Oxyflurofen 240 + Crucial + MSO		75 mL + 800 mL +	5	5	1	4	3	6	6	4	5	5	3	3	6	5	6	6	6
24	Voraxor + Crucial + MSO		100 mL + 800 mL +	6	6	6	5	5	6	6	5	6	6	5	5	6	6	6	6	6
25	Terrad'or + Crucial + MSO	40 g + 800 mL +	6	6	6	6	6	5	6	5	6	6	5	5	6	6	6	6	6	