

Legume and oilseed herbicide tolerance

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Key findings

- Most IBS treatments trialed had no crop effect on legume and oilseed crops; however, all IBS herbicides showed an increased level of crop damage to chickpeas at Hart in 2021.
- A number of post-emergent treatments applied at 5 – 6 node provided a high level of control on legume and oilseed crops.
- The new generation of Group 14 spike herbicides including Voraxor[®] (saflufenacil + trifludimoxazin) and Terra'dor[®] (tiafenacil) provided an additional level of control across all crop types.

Why do the trial?

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

How was it done?

Plot size	2.0 m x 2.0 m	Fertiliser	MAP (10:22) + 1% Zn + Impact @ 80 kg/ha
Seeding date	May 19, 2021		
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 2021 with 48 herbicide treatments applied across all 17 crops at various timings.

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)	May 19
Post seeding pre-emergent (PSPE)	May 19
Early post emergent (3 – 4 node)	June 28
Post emergent (5 – 6 node)	July 19
Post emergent (Group 14 spike at 3 – 4 node)	June 29

Treatments were visually assessed and scored for herbicide effects approximately six weeks after application (Table 1a and Table 1b).

Crop damage ratings were:

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



Many 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 2021, 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

Herbicide Tolerance

Mateno[®] Complete is a new pre-emergent herbicide included in at Hart in 2021. It combines three active ingredients across three modes of action, including diflufenican, pyroxasulfone and aclonifen (new herbicide mode of action for Australia). It is registered for use IBS in both wheat and barley for the control of grass and some broadleaf weeds. It is also on label for early post-emergent (EPE) control in wheat only. Mateno[®] Complete provided an increasing – severe damage (rating 4 – 5) in canola, but was safe on wheat and barley as expected (Table 1). Reflex[®] was seen to be safe on most legumes (rating 1 = no effect). Overwatch did not cause damage to wheat or barley, however, slight – moderate affects were observed in canola, reducing plant height. Most IBS treatments trialed had no crop effects compared to the nil treatment, however, all IBS herbicides showed an increased level of crop damage to chickpeas when compared to previous years. This result could be due to crop disease which was exacerbated by herbicides.

Balance[®] + simazine applied PSPE, had moderate to high damage across most crops in this trial. This is in contrast to 2020 at Hart, where negligible effects on faba bean, field peas and chickpeas seen. Diuron, simazine and Terbazine displayed severe crop effects on canola varieties without tolerance to triazine herbicides, as well as medic and clover. Slight (negligible) effects were observed across some herbicide treatments on chickpeas.

Thrixtrol Gold[®] is registered for use on medic and clover (2 – 4 L/ha) and has shown good crop safety when applied at 3 – 4 node to Sultan SU medic and Zulu II clover across two seasons at Hart. Kingbale oats are an IMI tolerant variety with a registration of Sentry[®] at IBS only, and when Intercept[®] (active ingredient imazamox + imazapyr) was applied at 3 – 4 leaf, moderate crop damage was observed. Ecopar[®] is registered in faba beans, vetch, field peas and pastures; however similarly to 2020, slight to moderate damage (rating 2 – 3) was observed.

Pulse control

Callisto[®] is registered for the control of volunteer chickpea, faba bean, field pea, lentil and vetch when applied IBS, however only slight – moderate effects were observed at Hart in 2021.

Similarly to Hart in 2020, Saracen[®] + Banjo[®] and Paradigm + MCPA LVE + Uptake[®] and Talinor[®] + Hasten[®] (excluding chickpeas = rating 4) provided excellent control of all oilseed and legume crops (rating 5 – 6) when applied at 5 – 6 node. Lontrel[®] Advanced also had very good control of all legume varieties, which are not registered for on-label use. Triathlon[®] and Flight[®] EC performed equally, providing moderate – severe control across all legume and oilseed crops, except for field peas (slight damage only).

Most Group 14 (previously Group G) herbicides provided a high level of control across oilseed, legume and cereal crops. The new generation of Group 14 spike herbicides including Voraxor[®] (saflufenacil + trifludimoxazin) and Terra'dor[®] (tiafenacil) provided an additional level of control (rating 5 and 6) across all crop types at Hart in 2021. Terra'dor[®] is also registered for grass weed control at higher application rates of 40 g/ha and Voraxor provides residual herbicide activity.

Table 1. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2021.

Trial layout – Part A

CROP SAFETY				Canola			Bean		Pea		C/pea	Lentil		Vetch		Medic	Clover	Wheat	Barley	Oats
				Hy/Tac Trophy	Pioneer 44Y94	Pioneer 43Y29 RR	PBA Bandoc	PBA Samira	Wharton	GIA Ourstar	Genesis090	Jumbo 2	PBA Hellmark XT	RM4	Timok	Sultan SU	Zulu II	Scepter	Compass	Kingbale
	Timing	Treatment	Rate																	
1	IBS May 19	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2		Sakura	118 g	1	1	2	1	1	1	1	4	1	1	1	1	1	2	1	1	3
3		Boxer Gold	2500 mL	1	1	2	1	1	1	1	4	1	1	1	1	1	1	1	1	1
4		Propyzamide	1000mL	1	1	1	1	1	1	1	4	1	1	1	1	1	1	1	1	2
5		Tenet	1800 ml	1	2	1	1	1	1	1	4	1	1	3	1	1	2	1	1	2
6		Ultero	1700 g	1	2	1	1	1	1	1	4	1	1	1	1	1	1	1	2	1
7		Reflex	1000 ml	3	3	4	2	1	1	1	4	1	1	1	1	1	1	1	1	1
8		Luximax	500 ml	2	2	1	1	1	1	1	3	1	1	2	1	1	1	1	1	1
9		Overwatch	1250 ml	1	2	4	1	1	1	1	4	3	1	1	1	1	1	1	1	1
10		Sentry	50g	6	2	5	1	1	1	1	4	3	1	1	3	1	3	3	4	1
11		Mateno Complete	1L	4	4	5	1	2	1	1	4	1	1	1	1	1	3	1	1	3
12		Terrain	180g	3	3	2	1	1	1	1	4	1	1	1	1	1	2	1	1	1
13	PSPE May 19	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
14		Diuron (900 g/kg)	825 g	4	2	3	1	1	1	1	1	3	1	1	1	1	2	1	1	1
15		Simazine (900 g/kg)	825 g	2	5	5	1	1	1	1	2	1	1	1	1	5	3	1	1	1
16		Metribuzin (750 g/kg)	280g	2	6	6	1	1	1	1	1	1	1	2	2	4	5	3	1	1
17		Terbazine (875 g/kg)	1000 g	1	5	6	1	1	1	1	3	1	1	1	1	4	5	1	1	1
18		Balance + Simazine	99 g + 830 g	5	6	6	4	5	2	3	3	5	5	5	4	6	5	1	1	4
19	3-4 Node June 28	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
20		Metribuzin (750 g/kg)	280 g	2	6	6	4	5	1	1	2	2	3	3	3	5	1	1	1	
21		Broadstrike + Wetter 1000	25 g + 0.2%	6	2	5	2	4	2	1	1	2	1	4	5	2	1	1	1	1
22		Thistrol Gold + Banjo	2000 mL + 0.5%	5	5	5	3	4	3	2	1	3	4	4	5	1	1	1	1	1
23		Brodal Options	150 mL	3	3	4	3	4	2	2	3	2	1	2	3	2	2	1	1	1
24		Brodal Options + MCPA Amine 750	150 mL + 100 mL	3	4	5	4	5	2	2	4	2	3	3	4	2	2	1	1	1
25		Spinnaker + Wetter 1000	70 g + 0.2%	5	1	5	1	3	1	2	1	4	1	2	4	2	4	4	3	2
26		Ecopar + Wetter 1000	800 mL + 0.2%	2	3	4	2	2	3	3	2	2	3	1	2	1	2	1	1	1
27	Intercept + Hasten	750ml + 0.5%	6	1	6	1	5	5	1	5	6	1	5	5	1	6	5	6	3	

Table 2. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2021.

Trial layout – Part B

PULSE CONTROL				Canola		Bean		Pea		C/pea	Lentil	Vetch		Medic	Clover	Wheat	Barley	Oats		
				HyT Tac Trophy	Pioneer 44Y94	Pioneer 43Y29 RR	PBA Bendoc	PBA Samira	Wharton	GIA Ourstar	Genesis090	Jumbo 2	PBA Hallmark XT	RM4	Timok	Sultan SU	Zulu II	Scepter	Compass	Kingbate
Timing	Treatment	Rate																		
1	IBS May 19	NIL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2		Callisto	200ml	2	2	2	3	3	3	3	1	1	2	2	2	1	1	1	1	1
3	3-4 Node June 28	NIL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
4		Raptor + Wetter 1000	45 g + 0.2%	6	1	5	1	3	1	1	2	5	1	2	3	2	3	5	6	2
5	5 - 6 node July 19	NIL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
6		Ally + Wetter 1000	7 g + 0.1%	6	1	5	4	5	6	5	5	5	4	6	2	5	6	1	1	1
7		Lontrel Advanced	150 mL	1	1	1	5	5	5	5	6	6	6	5	6	5	5	1	1	1
8		Ecopar + MCPA Amine 750	400 mL + 330 mL	3	3	4	3	2	2	1	1	1	3	1	1	1	1	1	1	1
9		Carfentrazone + MCPA Amine 750	100 mL + 330 mL	5	5	6	3	3	3	3	5	4	4	3	3	5	3	1	1	1
10		Velocity + Uptake	670 mL + 0.5%	5	5	5	4	4	5	5	2	4	4	4	3	5	4	1	1	1
11		Talinor + Hasten	750 mL + 1%	5	5	5	5	5	6	6	4	5	5	5	6	6	6	1	1	3
12		Saracen + Banjo	100 mL + 1.0%	6	4	6	5	6	5	5	6	6	5	6	5	4	5	1	1	1
13		Paradigm + MCPA LVE + Uptake	25 g + 500 mL + 0.5%	6	5	6	5	5	5	5	6	5	5	6	6	5	6	1	1	1
14		NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15		Flight EC	720 mL	4	5	5	4	4	2	2	5	4	4	2	3	3	3	1	1	1
16		Triathlon	1000 mL	5	5	6	4	5	2	2	6	4	5	3	4	4	3	1	1	1
18	Rexade + Wetter 1000	100 g + 0.25%	5	1	5	3	5	5	4	3	5	4	5	5	5	5	1	1	5	
19	Group G spike June 29	NIL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
20		Crucial + MSO	600 mL + 1%	5	6	1	5	4	5	5	4	5	5	4	3	5	5	6	6	6
21		Crucial + MSO	1200 mL + 1%	6	6	1	6	5	5	5	6	6	6	6	5	6	6	6	6	6
22		Carfentrazone 600 + Crucial + MSO	10mL + 600 mL + 1%	6	6	6	5	5	5	5	5	6	5	4	4	6	6	6	6	6
23		Sharpen + Crucial + MSO	17g + 600 mL + 1%	6	6	6	6	6	5	5	6	6	6	5	5	6	6	6	6	6
24		Sledge + Crucial + MSO	50mL + 600 mL + 1%	5	5	4	5	4	5	5	4	4	4	3	3	4	4	6	6	6
25		Valor + Crucial + MSO	30g + 600 mL + 1%	5	5	4	5	5	5	5	6	5	5	5	4	6	6	6	6	6
26		B-Power + Crucial + MSO	55mL + 600 mL + 1%	4	4	4	5	4	5	5	6	5	4	4	4	5	6	6	6	6
27		Terrad'or + Crucial + MSO	15g + 600 mL + 1%	6	6	6	5	6	5	5	6	6	6	5	6	6	6	6	6	6
28		Oxyflurofen 240 + Crucial + MSO	75mL + 600 mL + 1%	5	5	3	5	4	6	5	4	5	5	3	3	5	5	6	6	6
29		Voraxor + Crucial + MSO	100mL + 600 mL + 1%	6	6	6	6	6	5	5	6	6	6	6	6	6	6	6	6	6
30		Terrad'or + Crucial + MSO	40g + 800 mL + 1%	6	6	6	6	6	5	5	6	6	5	5	5	6	6	6	6	6

