

Legume and oilseed herbicide tolerance

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Key findings

- Most incorporated by sowing (IBS) treatments were safe to use across several crop types at Hart in 2020.
- A range of post-emergent herbicides applied at 3-6 node, provided excellent control of all oilseed and legume crops in this trial.
- Dry surface soil conditions were observed post-seeding due to below average winter rainfall, affecting herbicide activity.

Why do the trial?

To compare the tolerance of canola and legume varieties to a range of herbicides and timings.

How was it done?

Plot size	2.0 m x 3.0 m	Fertiliser	MAP (10:22) + 1% Zn + Impact @ 80 kg/ha
Seeding date	May 29, 2020		

This trial was set up as a demonstration and is a non-replicated matrix. Sixteen varieties were sown in strips across eight crop types which include canola, faba bean, field pea, chickpea, lentil, vetch, sub clover and barrel medic. Fifty herbicide treatments were applied across all 16 crops at various timings.

Application timings:

Incorporated by sowing (IBS)	May 29
Post seeding pre-emergent (PSPE)	May 29
Early post emergent (3-4 node)	July 8
Post emergent (5-6 node)	July 24

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

Crop damage ratings were:

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

IBS treatments were re-assessed 12 weeks after application, due to an increase in visual crop damage after rainfall events in August. Conditions at Hart post-seeding were dry with a total of 3.2 mm rainfall received within two weeks of the applied IBS treatments.

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 2020, 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

IBS

A new pre-emergent herbicide, Callisto[®] was included in the 2020 trial at Hart.

Callisto[®] (480 g/L Mesotrione) is a pre-emergent herbicide registered for the control of various broadleaf weeds in wheat and barley. Callisto[®] provided moderate suppression across most crops 12 weeks after application (Table 1). The delay in observed crop damage was due to dry surface soil conditions across the months of June and July (38.4mm). As expected, Reflex[®] provided moderate crop damage (rating 3) across all canola varieties and was seen to be safe across all other legumes. Sentry[®] also offered very good control (rating 5-6) for canola varieties that did not have Clearfield[®] (imidazolinone tolerant) traits.

Most IBS treatments included in this trial, had no effect on crop growth compared to nil treatment (Table 1).

PSPE

Post sowing pre-emergent treatments (PSPE) including Palmero TX[®] and Balance[®] + Simazine, had moderate to high damage across almost all crops in this trial but were safe to use on faba beans, field peas and chickpeas at Hart in 2020. Severe damage was observed across all crop types for these herbicides at Hart in 2019, except for chickpeas where these products are registered.

Post-emergent (3-4 node)

Simazine has continued to be the safest option across all oilseed and legume crops at the 3-4 node timing across many seasons, with nil to slight effects (rating 1-2) observed in 2020. Saracen[®] (50 g/L Florasulam) plus Banjo[®] was a new addition to this trial and is registered for post-emergent control of broadleaf weeds in wheat and barley. Saracen[®] provided excellent control of all oilseed and legume crops (rating 5-6).

Thirstrol Gold[®] plus Banjo[®] was a new addition to this trial in 2019 and is registered for use on medic (2 L/ha) and clover (2-4 L/ha) and has shown to be safe on Sultan SU medic and Zulu II clover.

Ecopar[®] is registered in faba beans, vetch, field peas and pastures; however slight to moderate damage (rating 2-3) was seen across both pasture varieties. It is important to note that poor crop establishment and vigour was observed across pasture varieties due to very dry conditions and late emergence, causing some herbicides like Ecopar[®] to show an increase in crop damage.

Metribuzin was safe on canola at Hart in 2020 (rating 1-2); however, this result was not expected, and the application is not recommended.

Post-emergent (5-6 node)

Lontrel Advanced[®] was safe on canola and the new pre-commercial GIA1703L lentil (Group I, B tolerant) when applied at the 5-6 node timing. It also had very good control of all other legume varieties, which are not registered for on-label use. Talinor[®] + Hasten has been the most robust herbicide in this section across a number of years, providing excellent control (rating 5-6) across all oilseed and legume crops. Pixxaro[®] has shown to be safe on canola over several years at Hart while also providing good legume control. Flight[®] EC, Triathlon[®], Quadrant[®] and frequency[®] provided moderate suppression and crop damage to most oilseed and legume crops at Hart in 2020 (Table 1).

Table 1. Crop damage ratings for the legume and oilseed herbicide tolerance trial at Hart in 2020.

	Timing	Treatment	Rate	Canola				Bean		Pea		C/pea	Lentil		Vetch		Medic	Clover	
				Museed Quartz	Hy/Tec Trophy	Pioneer 4A190	CT90008	PBA Berdec	PBA Samira	Wharton	GIA Ourstar	Genesis90	Jumbo 2	PBA Halmark XT	GIA1703L	RMA	Tinok	Sulion SU	Zulu II
1	IBS August 27	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2		Trifluralin	1500 ml	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
3		Sakura	118 g	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4		Boxer Gold	2500 mL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5		Propyzamide	560 g	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6		Butisan	1800 ml	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7		Devrinol C	2000 g	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8		Ultro	1700 g	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9		Reflex	1000 ml	3	3	3	3	1	1	1	1	1	1	1	2	1	1	1	1
10		Luximax	500 ml	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11		Overwatch	1250 ml	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12		Callisto	200ml	4	2	3	2	3	3	4	4	1	3	3	2	4	3	2	5
13		sentry	50g	5	6	1	1	1	1	1	1	1	1	1	4	1	1	1	6
14		Terrain	180g	1	2	1	1	1	1	2	1	1	1	1	1	1	1	1	6
15	PSPE May 29	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
16		Duron (900 g/kg)	825 g	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1
17		Simazine (900 g/kg)	825 g	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
18		Metribuzin (750 g/kg)	280g	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
19		Terbyne (750 g/kg)	1000 g	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20		Balance + Simazine	99 g + 830 g	3	3	5	4	2	1	1	1	1	3	3	3	3	3	5	6
21		Palmero TX	1000 g	3	3	5	3	2	1	1	1	1	3	3	3	2	2	5	6
22	3-4 Node July 8	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
23		Simazine (900 g/kg)	850 g	1	2	2	2	1	1	1	1	1	1	1	2	1	1	1	1
24		Metribuzin (750 g/kg)	280 g	2	2	1	2	1	1	3	2	3	1	1	2	3	3	1	1
25		Broadstrike + Wetter 1000	25 g + 0.2%	5	5	1	2	2	2	3	1	3	1	1	2	4	3	1	1
26		Thistrol Gold + Banjo	2000 mL + 0.5%	6	6	5	5	2	3	3	2	3	4	5	4	5	4	2	1
27		Brodal Options	150 mL	3	3	3	3	3	3	2	1	4	3	1	2	4	3	3	3
28		Brodal Options + MCPA Amine 750	150 mL + 100 mL	3	3	3	3	3	4	1	1	4	3	1	2	4	4	3	3
29		Spinnaker + Wetter 1000	70 g + 0.2%	5	5	1	1	2	1	2	2	3	4	1	2	2	3	1	2
30		Raptor + Wetter 1000	45 g + 0.2%	5	5	1	3	2	1	2	1	4	4	1	2	3	3	1	3
31		Ecopar + Wetter 1000	800 mL + 0.2%	3	3	2	3	2	2	4	4	3	3	5	4	2	3	2	1
32		Intercept	750ml + 1.0%	5	5	1	1	1	2	3	1	5	4	1	1	5	3	1	4
33		Saracen + Banjo	100 mL + 1.0%	6	6	5	5	5	5	6	5	6	6	5	5	6	5	5	5
34	5 - 6 node July 24	NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
35		Ally + Wetter 1000	7 g + 0.1%	5	5	1	3	4	6	5	5	6	6	4	4	6	4	5	3
36		Atrazine + Hasten	1000 g + 1%	2	1	3	1	2	1	2	3	4	2	3	2	3	4	5	6
37		Lontrel Advanced	150 mL	1	1	1	1	6	6	4	5	6	6	6	1	6	6	6	6
38		Ecopar + MCPA Amine 750	400 mL + 330 mL	1	1	1	3	3	3	1	2	3	1	2	2	3	2	3	2
39		Carfentrazone + MCPA Amine 750	100 mL + 330 mL	1	1	3	4	2	3	2	2	4	2	1	2	3	2	4	3
40		Velocity + Uptake	670 mL + 0.5%	5	5	5	6	5	5	6	6	3	5	5	5	6	6	6	3
41		Talinor + Hasten	750 mL + 1%	5	6	6	5	6	6	6	6	6	6	6	6	6	6	6	5
42		Paradigm + MCPA LVE + Uptake	25 g + 500 mL + 0.5%	6	5	4	4	5	5	5	5	6	6	5	5	6	6	5	6
43		NIL		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
44		Flight EC	720 mL	3	3	4	4	4	3	1	2	2	3	2	3	4	4	3	2
45		Triathlon	1000 mL	3	4	5	5	4	3	2	3	3	3	2	4	4	4	2	1
46		Quadrant	1000 mL	4	5	4	5	2	3	4	4	2	3	4	4	5	4	6	4
47		Frequency	200 mL + 1.0%	4	4	4	4	4	4	2	3	4	3	3	2	4	4	3	3
48		Poxaro + Uptake	300 mL + 0.5%	1	2	2	2	5	5	5	5	6	6	6	6	6	6	6	6
49		Rexade + Wetter 1000	100 g + 0.25%	3	3	2	3	4	5	5	4	5	5	4	4	6	5	5	6
50	Atlantis OD + Hasten	330 mL + 0.5%	5	5	2	2	4	5	5	5	5	4	1	1	6	5	5	5	