Legume and oilseed herbicide tolerance

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Key findings

- Simazine and metribuzin produced more crop effect compared to normal, especially in lentils.
- For all the PSPE application treatments 50% more product significantly increased the crop damage.
- The double knock of glyphosate followed by SpraySeed gave excellent control.

Why do the trial?

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

How was it done?

Plot size	2 m x 3 m	**Fertiliser**	MAP (10:22) + 2% Zinc @ 75 kg/ha
Seeding date	27th May 2013		

Thirteen strips of canola, pasture, vetch, chickpea, faba bean, field pea and lentils were sown. Sixty herbicide treatments were applied across these crops at 5 different timings.

The timings were:

Incorporated by sowing (IBS)	27th May
Post seeding pre-emergent (PSPE)	27th May
Early post emergent (3-4 node)	20th June
Post emergent (5-6 node)	8th July
Late post emergent (9 node)	25th July
Knock-down (4 node)	30th July

Treatments were visually assessed and scored for herbicide effects 4 and 6 weeks after application (Table 1).

Results

Many of the herbicides are not registered for the crops that have been sprayed. It is important to check the herbicide label before following strategies used in this demonstration. Herbicide effects can vary between seasons and depend on soil and weather conditions at time of application.

Pre-emergent herbicides Boxer Gold, Sakura and propyzamide (more commonly known as Kerb or Edge) were incorporated by sowing (IBS) in 2013. It should be noted that for these pre-emergent herbicide, many are not currently registered for many of the crop types in the trial.

Sakura and Boxer Gold produced slight to severe effects on all three canola and pasture varieties, while Avadex Extend was relatively safe. Sakura produced some crop effects on most of the legumes, especially beans. Propyzamide was recorded to give no damage symptoms for any of the canola or legume varieties (except the balansa clover). These results are similar to 2012 for propyzamide applied IBS and 2011 applied as an early post emergent application.

Diuron at the standard 850 g/ha was safe in peas, beans, chickpeas, vetch and lentils (Table 1). Whereas, simazine and metribuzin produced more crop effect compared to normal, especially in lentils. This is likely to be a result of the wet conditions after sowing. For all the PSPE application treatments 50% more product significantly increased the crop damage, especially for simazine and metribuzin. This may be a useful indicator of the crop damage possible from heavy rain following herbicide application or use on lighter soils.

At the 3rd node stage simazine and Broadstrike were the safest herbicide options. At both rates, metribuzin, Brodal and Sniper produced significant crop damage to all included legumes (Table 1).

In the post emergent treatments a range of herbicides produced very good control of all the non-herbicide tolerant legume species. For the herbicide tolerant Hurricane lentils Eclipse, Logran, Ally, Intervix, Hussar and Atlantis all produced no more than a slight effect.

Frontier balansa clover was significantly damaged by most herbicides, except for Spinnaker and Broadstrike. The group B tolerant Angel medic showed very good tolerance to PSPE or post Spinnaker and Raptor. However, as shown in previous trials it does not tolerate Logran, Ally or Eclipse. Intervix, Hussar, Crusader, Atlantis and Broadstrike only damage it slightly.

All the knockdown treatments gave good control on legumes and canola. The double knock of glyphosate followed by SpraySeed gave excellent control.

Table 1. Crop damage ratings for legume and oil seed herbicide tolerance trial at Hart 2013.

Crop damage ratings:

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

				Canola			Bean	Pea	C/pea	Vetch		Lentil		Pasture		
				CL44Y84	ATR Gem	Conv, Garnet	Farah	Gunya	Genesis 090	Capello	Rasina	Hurricane	Flash	Sulla	Frontier	Angel
Number	**Timing**	**Treatment**	**Rate kg/ha**	5	5	5	140	100	80	45	45	45	55	15	15	10
1		NIL		1	1	1	1	1	1	1	1	1	1	1	1	1
2		Boxer Gold	2500 mL	2	3	4	1	1	1	1	1	1	1	2	4	1
3		Sakura	118 g	2	3	4	3	2	1	2	2	2	2	2	4	2
4	**IBS**	Propyzamide	1000 mL	1	1	1	1	1	1	1	1	1	1	1	3	1
5	27-05-13	Experimental 1	115 g/ha	2	2	2	1	1	1	1	2	2	1	1	2	1
6		Experimental 2	120g/ha	4	4	4	2	2	1	3	3	4	4	4	4	3
7		Avadex Xtend	2700 mL	2	2	1	1	1	1	1	1	2	2	2	1	1
8		Experimental 3	1000 mL	3	4	4	2	2	2	4	3	4	4	4	5	4
9		Diuron	850 g	4	4	4	1	1	1	1	1	1	1	1	5	4
10		Diuron	1275 g	5	5	5	2	2	3	1	1	2	2	2	5	5
11		Simazine	850 g	4	1	5	1	2	2	2	2	3	3	3	5	4
12		Simazine	1275 g	5	1	5	2	3	3	3	2	4	4	4	5	4
13		Diuron + Simazine	410 g /410 g	4	2	5	1	2	2	1	1	2	2	2	5	3
14		Metribuzin	280 g	5	1	5	2	2	2	1	1	2	2	2	3	3
15	**PSPE**	Metribuzin	420 g	5	2	5	3	3	3	4	3	3	3	3	4	4
16	27-05-13	Terbyne	1000 g	4	2	5	2	1	2	1	1	2	2	2	5	5
17		Terbyne	1500 g	5	3	5	2	1	2	2	2	3	3	3	5	5
18		Spinnaker	100g	2	4	4	1	1	1	1	1	1	1	1	1	1
19		Spinnaker + Simazine	40 g/850 g	4	3	4	1	1	1	1	1	2	4	4	5	4
20		Balance	100 g	4	4	4	4	3	1	4	4	4	4	4	5	4
21		Balance + Simazine	100 g /830 g	5	4	5	5	5	2	5	4	4	4	4	5	5
22		NIL		1	1	1	1	1	1	1	1	1	1	1	1	1
23		Simazine	850 g	3	1	2	1	1	2	1	1	1	2	3	5	2
24		Simazine	1275 g	3	1	4	2	3	2	2	2	2	2	3	5	3
25		Metribuzin	280 g	5	1	5	3	3	3	4	3	3	4	4	5	5
26		Metribuzin	420 g	5	1	5	5	4	4	5	4	5	5	5	5	5
27		Broadstrike	25 g	1	4	4	3	1	2	2	1	2	2	1	1	1
28	**3 Node**	Brodal Options	150 mL	4	5	4	4	2	4	4	4	3	3	4	3	3
29	20-06-13	Brodal Options	225 mL	4	5	5	4	3	4	4	4	3	3	5	3	3
30		Brodal Options + MCPA Amine	150 mL/150 mL	5	5	5	4	3	4	4	3	3	3	5	2	2
31		Sniper 750W	50 g	4	4	4	4	3	4	3	3	3	3	4	3	3
32		Spinnaker + wetter	70 g/0.2%	1	5	4	2	1	3	2	3	1	4	2	1	1
33		Raptor + wetter	45 g/0.2%	1	5	5	1	1	2	2	2	1	4	2	4	1
34		NIL		1	1	1	1	1	1	1	1	1	1	1	1	1
35		Logran + wetter	10 g/0.1%	1	4	4	4	4	3	4	4	2	4	3	4	3
36		Ally + wetter	7 g/0.1%	1	4	4	4	4	3	4	2	2	3	3	4	3
37		Eclipse SC + wetter	50 mL/0.5%	1	4	4	4	4	4	3	3	1	3	3	4	3
38		Ecopar + MCPA Amine	400 mL/500 mL	3	4	4	4	4	4	3	3	1	3	2	3	2
39		Affinity Force + MCPA Amine	100 mL/500 mL	5	5	5	5	4	5	3	3	4	4	4	4	3
40		Conclude + Uptake	700 mL/0.5%	3	4	4	4	4	4	4	4	4	4	4	4	2
41		Precept + Hasten	750 mL/1%	4	4	4	4	3	4	3	3	3	4	2	3	4
42	**5-6 Node**	Velocity + Hasten	670 mL/1%	5	5	5	4	5	4	4	4	4	4	5	4	4
43	08-07-13	Flight EC	720 mL	4	5	4	4	4	4	4	4	3	4	4	3	3
44		Banvel M	1000 mL	3	3	3	4	4	4	4	4	4	4	3	4	2
45		Intervix + Hasten	600 mL/1%	1	4	4	2	3	2	3	3	1	2	4	4	1
46		Hussar OD + wetter	100 mL/0.25%	1	4	4	4	3	3	4	4	2	4	3	4	2
47		Crusader + wetter	500 mL/0.25%	1	4	4	4	3	3	4	4	3	3	3	5	2
48		Atlantis OD + Hasten	330 mL/0.5%	1	4	4	4	3	3	3	3	1	2	3	4	2
49		Atrazine + Hasten	833 g/1%	3	1	3	3	3	3	2	2	3	3	3	4	3
50		Lontrel 600	150 mL	1	1	1	4	3	4	4	3	4	4	1	4	3
51		Starane	300 mL	1	1	1	3	3	4	3	3	4	4	1	1	2
52		MCPA Sodium	700 mL	3	3	3	4	2	2	3	3	3	3	2	2	2
53	**9 Node**	MCPA Amine	350 mL	3	3	3	4	2	3	3	3	3	3	2	3	2
54	25-07-13	Amicide Advance 700	1200 mL	4	4	4	4	4	4	4	4	4	4	4	3	2
55		2,4-D Ester	70 mL	3	4	3	4	4	3	3	3	3	3	2	3	1
56		NIL		1	1	1	1	1	1	1	1	1	1	1	1	1
57	**4 Node**	Sprayseed	2000 mL	5	5	5	4	4	4	4	4	4	4	5	5	5
58	30-07-13	Gramoxone	1000 mL	4	4	4	3	4	4	3	4	4	4	4	4	4
59	**knock-down**	Glyphosphate	1000 mL	4	5	4	4	4	4	4	3	5	5	5	5	5
60		Glyphosphate // Sprayseed 3DAS	1200 mL//1200 mL	5	5	5	5	5	5	5	5	5	5	5	5	5