

TRIAL SUMMARIES

LENTIL

Lentil, Herbicide Tolerance (Group C), LRZ Southern Mallee (Curyo), Victoria

Authors

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Aim

To compare the level of herbicide tolerance in SP1333 (a new genotype with improved tolerance to Group C herbicides) against PBA Hallmark XT to pre- and post-emergent applications of 'Gp C' at various rates.

Treatments

Varieties: PBA Hallmark XT and SP1333

Treatments: 'Gp C' rates and times See Table 1

***Some of the herbicide treatments in this research contain unregistered herbicides, application rates and timings and were undertaken for experimental purposes only. The results within this document do not constitute a recommendation for that particular use by the author or author's organization.*

Other Site Details

	Curyo
Sowing date	06 May
Stubble height (cm)	Standing (15)
Row Spacing (cm)	36
Plant density (plants/m ²)	120

Results and Interpretation

- Key Messages: SP1333 and PBA Hallmark XT showed little to no signs of herbicide damage at x0.25 gai/ha and 376 gai/ha. At higher herbicide rates SP1333 showed lower herbicide damage than PBA Hallmark XT, but grain yield results were unreliable due to shattering in SP1333.
- Establishment and Plant Growth: Application of 'Gp C' PSPE had little or no impact on emergence and early plant growth. Lentils had optimum establishment and growth as a result of adequate soil moisture at sowing and favourable conditions during the rest of the season. Growth, development and yield were not affected by the few frost events, which occurred in the spring.
- Herbicide Damage: Both varieties did not show symptoms of herbicide damage at lower rates (x0.25 and x0.5 gai/ha) irrespective of the time of application (Table 1). However, at higher rates (x1 and x2 gai/ha) the new variety SP1333 showed less damage than PBA Hallmark XT. At x2 gai/ha, PSPE damaged SP1333 more whereas application at 4 node stage was more detrimental for PBA Hallmark XT.
- Number of weeds: Better control of weeds were achieved when 'Gp C' was applied as PSPE or 4 node applications at rates above x0.5 gai/ha (Table 2). Almost full weed control was seen in the x1 gai/ha and above for both PSPE and 4 node treatments. Weed densities were not different between varieties.
- Biomass at flowering: At flowering varieties were not significantly different in biomass. In PBA Hallmark XT biomass improved when low rates (x0.25 and x0.5 gai/ha) were applied as PSPE spray but decreased at the highest 'Gp C' rate (x2 gai/ha) applied as PSPE or 4 node stage spray, compared to the plants which did not receive herbicides (Table 3). This indicates that application of 'Gp C' at lower rates as PSPE sprays in PBA Hallmark XT can effectively control weeds without the crop damage or biomass loss, as oppose to higher rates. However, rates or times of herbicide application did not cause any biomass change in SP1333.

Table 1. Effect of pre and post emergent application of 'Gp C' at different rates on the symptoms of herbicide damage observed on lentil varieties grown at Curyo, Victoria in 2019

Rate of application (gai/ha) ¹	Time of application	Herbicide Damage ²	
		PBA Hallmark XT	SP1333
0	Nil	0	0
x0.25	PSPE ³	0	0
	4 Node	0	0
x0.5	PSPE	0	0
	4 Node	3	0
x1	PSPE	15	2
	4 Node	10	0
x2	PSPE	47	30
	4 Node	53	3

LSD (P<0.05) Treatment x Variety = 13; Treatment = 10; Variety = 2.0 CV (%) = 20

¹ grams of active ingredient per hectare

² Scored two months after sowing on a scale of 0 – 100, where lack of any damage is 0 and plant death is 100

³ Post sowing pre-emergent

Table 2. Effect of pre and post emergent application of 'Gp C' at different rates on the number of weeds present among two lentil varieties grown at Curyo, Victoria in 2019

Rate of application (gai/ha) ¹	Time of application	Number of weeds per plot		
		PBA Hallmark XT	SP1333	Average
0	Nil	57	45	51
x0.25	PSPE ²	31	33	32
	4 Node	25	26	25
x0.5	PSPE	11	8	9
	4 Node	16	19	18
x1	PSPE	2	1	2
	4 Node	5	1	3
x2	PSPE	0	0	0
	4 Node	0	0	0

LSD (P<0.05) Treatment X Variety = ns; Treatment = 16; Variety = ns. CV (%) = 3

¹ grams of active ingredient per hectare

² Post sowing pre-emergent

Table 3. Effect of pre and post emergent application of 'Gp C' at different rates on the biomass of flowering plants of two lentil varieties grown at Curyo, Victoria 2019

Rate of application (gai/ha) ¹	Time of application	Biomass at flowering (t/ha)		
		PBA Hallmark XT	SP1333	Average
0	Nil	3.53	3.91	3.72
x0.25	PSPE ²	4.75	3.62	4.19
	4 Node	4.30	3.97	4.14
x0.5	PSPE	4.54	3.70	4.12
	4 Node	3.95	3.47	3.71
x1	PSPE	3.60	3.21	3.41
	4 Node	3.65	3.43	3.54
x2	PSPE	2.50	2.37	2.44
	4 Node	1.76	3.02	2.39

LSD (P<0.05) Treatment X Variety = 0.83; Treatment = 0.59; Variety = ns. CV (%) = 3

¹ grams of active ingredient per hectare

² Post sowing pre-emergent

- Grain yield: Herbicide treatments were not significant on the yields of the SP1333, which was lower than PBA Hallmark XT across all treatments (Table 5). However, grain yield of SP1333 is not a reliable indicator of herbicide damage because of its high level of pod shattering. PBA Hallmark XT produced better yields compared to the nil treatment when 'Gp C' rate was x0.25, x0.5 and x1 gai/ha PSPE (Table 4). In PBA Hallmark XT highest yield was produced at the PSPE application of x1 gai/ha, where weed control was optimised, despite a low level of herbicide damage. 'Gp C' at x2 gai/ha applied as PSPE or 4 node spray significantly reduced grain yield of PBA Hallmark XT due to the significant herbicide damage.

Table 4. Effect of pre and post emergent application of 'Gp C' at different rates on the grain yield of lentil varieties grown at Curyo, Victoria 2019

Rate of application (gai/ha) ¹	Time of application	Grain Yield (t/ha)		
		PBA Hallmark XT	SP1333	Average
0	Nil	2.38	0.93	1.66
x0.25	PSPE ²	2.65	0.90	1.78
	4 Node	2.66	0.88	1.77
x0.5	PSPE	2.79	0.87	1.83
	4 Node	2.63	0.93	1.78
x1	PSPE	2.83	1.07	1.95
	4 Node	2.50	1.00	1.75
x2	PSPE	2.16	0.94	1.55
	4 Node	2.05	0.98	1.52

LSD (P<0.05) Treatment X Variety = 0.30; Treatment = 0.22; Variety = 0.10. CV (%) = 3

¹ grams of active ingredient per hectare

² Post sowing pre-emergent