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Residual Weed Control in Chickpea
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Trial ID: LB2303	Location: Felton	Trial Year: 2023
	Investigator: Linda Bailey	

For more than 25 years, broadleaf weed control in northern region chickpeas has been heavily reliant on herbicides from just two modes of action; Group 27 eg Balance or Group 5 eg Terbyne Xtreme or Simazine. Recent registrations of Group 14 herbicides (Terrad'or, Terrain, Reflex and Voraxor) for use in pulses has provided new options that may reduce the herbicide resistance selection pressure.

The primary objective of this project was to validate the benefits and fit of the Group 14 herbicides alone or in combination with existing chemistry to refine weed management strategies in chickpeas. Similar trials were conducted in winter 2022.

In addition, all the evaluated group 14 herbicides have equivalent use patterns in faba beans. Generating sound residual efficacy data in faba beans can be challenging because of the rapid crop development and canopy closure. Instead of duplicating trials in faba beans, 3 extra herbicide treatments, that are ONLY registered in faba beans, were included in the chickpea trials.

Objective:	To evaluate Group 14 herbicide options in chickpeas when applied alone, or with Balance and Terbyne Xtreme	
Crop & Variety:	Chickpea cv. CBA Captain	
Planting Date:	2/06/2023	
Previous Crop:	Barley 2022	
Planting Details:	John Deere MaxEmerge 1700 disc planter on 1 m row spacing and ~30 seeds/m ² planting rate, ~90% ground cover	
Application:	A	B
Application Timing:	Pre-plant	PSPE (Post-sowing, pre-emergence)
Application Date:	30/05/2023 (3 days pre-plant)	7/06/2023 (5 days post-plant)
Days After Previous Application:	-	8 days
Nozzles:	AIXR11002	
Volume:	100 L/ha	
Trial Design:	Randomised complete block with 18 treatments x 4 replicates	
Plot Size:	4 m x 12 m	
Keywords:	Chickpea, common sowthistle, prickly lettuce, residual	

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Conclusions:

This project was designed to evaluate the residual efficacy of three Group 14 herbicides (Reflex, Terrad'or and Terrain) and the relative crop safety when applied as standalone options or in combination with Balance or Terbyne Xtreme. The previous crop was barley in 2022 with ~10 cm tall standing stubble and groundcover levels of ~90% at trial initiation. A fallow knockdown spray was applied prior to the trial commencement to control a range of small broadleaf weeds.

The Group 2 S and Group 5 D herbicides - not registered for use in chickpea - were included in the trial to benchmark Group 14 efficacy data for use in faba beans.

Application A (pre-plant treatments) were applied at the end of May with CBA Captain chickpeas planted 3 days later using a double disc planter. Application B (PSPE treatments) were applied at 5 DAP (5 days after planting). Soil moisture was adequate at planting but dry conditions were experienced for the majority of the trial. Only ~16 mm of rainfall was received in total between application B and trial conclusion (~16 weeks).

Crop establishment was assessed at 31 DAP. Emergence in the untreated was ~16 plants/m². There was no significant difference for chickpea establishment or visual crop effects.

Residual weed efficacy was assessed at 64 DAA/ 56 DAB (64 days after application A/ 56 days after application B). Weed densities of common sowthistle and prickly lettuce in the untreated were only ~0.2 - 0.3 weeds/m².

All treatments significantly reduced common sowthistle counts except Terrad'or alone, Terrad'or followed by Terbyne Xtreme or the Group 5 herbicide. Balance alone or in mixture with Terbyne Xtreme, Simazine or Reflex and Voraxor alone, all provided complete common sowthistle control.

Similar patterns were evident for prickly lettuce control. All treatments significantly reduced prickly lettuce counts except Terrad'or alone, Terrad'or followed by Terbyne Xtreme or the Group 5 herbicide. All treatments that included Balance, Terbyne Xtreme + Reflex, the Group 2 herbicide + Terbyne Xtreme and Voraxor provided complete prickly lettuce control.

In this situation, all treatments demonstrated good crop safety in chickpeas. Weed densities were very low with <20 mm of rainfall in total over the 4 month trial duration. Residual efficacy was assessed at 64 DAA/ 56 DAB with weed germination initiated from ~16 mm of rainfall at ~4-5 weeks after application. In the absence of incorporating rainfall prior to weed germination, treatments of Terrain or Reflex alone provided effective residual control of both weed species, equivalent to Balance or Terbyne Xtreme alone. Balance alone or in mixture with Terbyne Xtreme, Simazine or Reflex and Voraxor alone, all provided complete control of both weed species present.

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Application Description		
	A	B
Application Date:	30/05/2023	7/06/2023
Application Start Time:	10:00 AM	11:50 AM
Application Stop Time:	10:35 AM	2:10 PM
Interval to Previous Application:		8 DAYS
Application Timing:	PREPLANT	PSPE
Air Temperature Start, Stop:	14.8, 18.3 C	20.5, 21.1 C
% Relative Humidity Start, Stop:	43.3, 47.5	55.3, 46.2
Wind Velocity & Direction Start:	4.1 km/h, SSW	7.3 km/h, ESE
Wind Velocity & Direction Stop:	7.6 km/h, SSW	9.6 km/h, E
Soil Moisture:	DRY	
% Cloud Cover:	0	20
First Moisture Occurred On:	5/06/2023	5/07/2023

Application Equipment		
	A	B
Application Equipment:	Polaris	
Equipment Type:	BOOM	
Operation Pressure:	400 kPa	
Nozzle Model:	AIXR11002	
Nozzle Spacing:	50 cm	
Boom Length:	4 m	
Boom Height:	60 cm	
Ground Speed:	9.5 km/h	
Application Amount:	100 L/ha	

Rainfall:

Closest Weather Station:	SILO grid point -27.80, 151.75
Distance:	3.5 km

Date	Amount	Unit	Comments
15/05/2023	4.4	mm	
16/05/2023	56.3	mm	
30/05/2023	-		Application A (preplant)
2/06/2023	-		Planting
5/06/2023	2.7	mm	
6/06/2023	1.4	mm	
7/06/2023	-		Application B (PSPE)
3/07/2023	-		Assessment 1 - chickpea emergence
5/07/2023	15.8	mm	
2/08/2023	-		Assessment 2 - weed counts
28/09/2023	-		Final inspection - trial terminated