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Any product referred to in this document must be used strictly as directed, and in accordance with all label or permit instructions. Always consult the label prior to use.

Residual Weed Control in Sorghum

Trial ID: **LB2202** **Location:** **Felton** **Trial Year:** **2022**
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 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.

Objective:	**To evaluate Group 14 herbicide options in chickpeas when applied alone, or with Balance or Terbyne Xtreme**
Situation:	**Fallow prior to Sorghum cv. MR Bazley**
Planting Date:	**26/09/2022**
Planting Equipment:	**Tyne planter on 1 m row spacings at ~70,000 seeds/ha**
Application Date:	**28/06/2022**
Crop Stage at Application:	**Pre-plant**
Weed Stage at Application:	**Pre-emergent**
Nozzles:	**AIXR 110015**
Volume:	**100 L/ha**
Trial Design:	**Randomised complete block, 12 treatments planned but only 4 treatments initiated**
Plot Size:	**12m x 4m**
Keywords:	**Sorghum, African turnip weed, residual**

The treatments in this project were scheduled for application either prior to sowing or post sowing pre-emergent. Treatments for application prior to sowing were applied in late June 2022 with chickpea planting expected in the following 7 days. Each Group 14 herbicide was applied to three separate treatments to enable assessment when applied alone or when followed by Balance or Terbyne Xtreme.

Rainfall totalling ~28 mm was received between 3-9 days after this application. Soil conditions became too wet for planting and did not allow planting during the next six weeks. Due to the lateness in sowing window, the grower changed plans and planted sorghum in late September. The scheduled treatments for post sowing, pre-emergent were not applied. This meant there were actually 12 replicates of each of the herbicide treatments for assessment and analysis. The use of the Group 14 herbicides prior to sorghum planting is supported by the product labels.

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Reflex and Terrain both have registrations for providing residual weed control at the rates evaluated. The Terrad'or use pattern allows for use prior to pulse sowing but is only registered for knockdown activity.

Pest Scientific Name				*Sisymbrium thellungii*
Pest Name				**African Turnip Weed**
Crop Name			**Sorghum**	
Crop Variety			**MR Bazley**	
Assessment Date			**12/10/2022**	**12/10/2022**
Assessment Type			**EMERGENCE**	**COUNT**
Assessment Unit			**/m²**	**/m²**
Assessment Date			**12/10/2022**	**12/10/2022**
Assessment Area			**4 m row**	**2 m x 10 m**
Treatment-Evaluation Interval			**106 DAA**	**106 DAA**
Plant-Evaluation Interval			**16 DAP**	**16 DAP**
Trt No.	**Treatment**	**Product Rate**		
1	Untreated	-	6.7-	1.11a
2	Reflex	1250ml/ha	6.2-	0.05c
3	Terrain	180g/ha	6.1-	0.04c
4	Terrad'or	40g/ha	6.7-	0.77b
		LSD P=.05	nsd	0.327
		Treatment Prob.(F)=	0.1747	0.0001

Means followed by same letter or symbol (-) do not significantly differ (P=.05, LSD).
Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.
nsd = no significant difference

DAA = Days after Application
DAP = Days after Planting

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Conclusions:

This project was designed to evaluate the residual efficacy of three Group 14 herbicides (Reflex, Terrad'or and Terrain) when applied as standalone options, or in combination with Balance or Terbyne Xtreme. The previous crop was sorghum in 2021/22 with ~20-30 cm tall standing stubble and groundcover levels of ~45% at trial initiation. A fallow knockdown spray was applied prior to the trial commencement to control a range of broadleaf weeds and volunteer sorghum.

Pre-plant treatments were applied at the end of June with the site recording ~32 mm of rainfall over the next nine days. Crop planting was further delayed due to frequent small rain events throughout July and August. Following ~40 mm of rainfall in early September, the grower changed his planting plan and swapped from chickpeas to sorghum.

At the end of September, sorghum cv. MR Bazley was planted on 1 m rows at ~70,000 seeds/ha. The intended post sowing pre-emergent treatments were not applied but the original Group 14 treatments were still assessed for crop safety and weed efficacy.

Sorghum emergence was assessed 16 days after planting (16 DAP) and 106 days after herbicide application (106 DAA). There was no significant difference in sorghum emergence with an untreated establishment of ~7 seedlings/m^2. All treatments appeared safe with no visual crop effects apparent.

Weed assessment was also conducted at 106 DAA. African turnip weed was present at low density (untreated ~1 plant/m^2) with most at stem elongation or flowering. Reflex and Terrain both provided >95% control of African turnip weed with low but significant levels of suppression from Terrad'or. Due to poor access, the site was not able to be inspected between the herbicide application in late June and sorghum planting. Although Reflex and Terrain provided significant levels of weed control, the actual length of residual control was unable to be determined.

The trial was concluded at 44 DAP when no further weed emergence had occurred.

Although the trial was not able to be conducted as planned, useful information was still collected. All herbicides were crop safe when sorghum was planted, ~3 months after application with a total of ~160 mm of rainfall recorded between application and planting. Reflex and Terrain both provided high levels of residual African turnip control. Although Terrad'or is registered for use prior to pulse planting as a knockdown, useful levels of suppression of African turnip weed were evident.

Application Description	
Application Date:	**28/06/2022**
Application Start Time:	**10:15 AM**
Application Stop Time:	**11:25 AM**
Application Method:	**SPRAY**
Application Timing:	**PRE-PLANT**
Application Placement:	**SOIL**
Air Temperature Start, Stop:	**14.1, 18.4 C**
% Relative Humidity Start, Stop:	**50.2, 48.3**
Wind Velocity & Direction Start:	**10.4 km/h, SW**
Wind Velocity & Direction Stop:	**11.6 km/h, SW**
Soil Moisture:	**DRY**
% Cloud Cover:	**0**
First Moisture Occurred On:	**1/07/2022**

Application Equipment	
Application Equipment:	**Polaris**
Equipment Type:	**BOOM**
Operation Pressure:	**300 kPa**
Nozzle Model:	**AIXR110015**
Nozzle Spacing:	**50 cm**
Boom Length:	**4 m**
Boom Height:	**50 cm**
Ground Speed:	**7.2 km/h**
Application Amount:	**100 L/ha**

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Crop Description	
Crop:	Sorghum cv. MR Bazley
Planting Date:	26/09/2022
Planting Rate:	70,000 seeds/ha
Planting Method:	Direct Drilled
Row Spacing:	1m
Planting Equipment:	Tyne Planter

Rainfall:

Closest Weather Station:	SILO grid pt -27.80, 151.75
Distance:	4 km

Date	Total	Unit	
28/06/2022	-		Application
1/07/2022	5.2	mm	
2/07/2022	18.7	mm	
3/07/2022	1	mm	
4/07/2022	1.4	mm	
6/07/2022	4.2	mm	
7/07/2022	1	mm	
13/07/2022	0.7	mm	
22/07/2022	0.6	mm	
2/08/2022	2.1	mm	
6/08/2022	14.1	mm	
13/08/2022	9.9	mm	
24/08/2022	2.8	mm	
31/08/2022	2.6	mm	
3/09/2022	27.2	mm	
4/09/2022	15.7	mm	
5/09/2022	1.1	mm	
9/09/2022	17	mm	
12/09/2022	0.8	mm	
16/09/2022	17	mm	
22/09/2022	15	mm	
26/09/2022	-		Sorghum planting
28/09/2022	2	mm	
2/10/2022	19.4	mm	
4/10/2022	0.5	mm	
9/10/2022	21.5	mm	
11/10/2022	0.9	mm	
12/10/2022	-		Emergence and weed assessment
9/11/2022	-		Trial concluded