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## Residual Control of Summer Grasses in Fallow

**Trial ID:** LB2227**Location:** Felton  
**Investigator:** Linda Bailey**Trial Year:** 2023

Glyphosate resistance is increasingly common in awnless barnyard grass. Effective and economic summer fallow management often requires residual chemistry to reduce weed numbers and manage multiple weed flushes. A challenge observed in recent seasons is that the residual efficacy is often waning in late summer or early autumn. Where glyphosate resistance populations are present, growers have very limited tools for knockdown management of barnyard grass prior to winter cereal planting.

This trial was designed to evaluate the potential of residual herbicides when applied in late summer or early autumn for barnyard grass management prior to winter crop planting.

<b>Objective:</b>	<b>To evaluate residual control of autumn emergence of summer grasses in fallow</b>
<b>Previous Crop:</b>	<b>Wheat 2022</b>
<b>Situation:</b>	<b>Fallow with ~30 cm tall cereal stubble and ~57% groundcover</b>
<b>Application Dates:</b>	<b>Application A on 23/02/2023 Application B on 17/03/2023</b>
<b>Application Timing:</b>	<b>Pre-emergent</b>
<b>Nozzles:</b>	<b>AIXR11002</b>
<b>Nozzle Spacing:</b>	<b>50 cm</b>
<b>Volume:</b>	<b>100 L/ha</b>
<b>Trial Design:</b>	<b>Randomised complete block of 14 treatments x 4 replicates (with embedded factorial of 5 treatments x 2 application times)</b>
<b>Plot Size:</b>	<b>4 m x 12 m</b>
<b>Keywords:</b>	<b>Awnless barnyard grass, tarvine, common sowthistle, residual, fallow</b>

The trial was conducted in a fallow paddock near Felton on the southern downs in QLD, ~3 months after wheat harvest in 2022. A commercial fallow spray (glyphosate and 2,4-D) was conducted ~1 week prior to the trial initiation to control volunteer wheat seedlings and low densities of common sowthistle. A 2<sup>nd</sup> commercial knockdown (glyphosate) was conducted at 25 DAA to control the first emergence of weeds.

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A Group 15 herbicide was applied as a benchmark treatment only and does NOT have a registration that would suit this use pattern. Balance was only included at the early application timing to ensure adherence to the >10 weeks recropping interval prior to cereal or chickpea planting. Valor or Voraxor have recropping intervals that can suit a range of crops from an autumn application.

Pest Scientific Name				<i>Echinochloa colona</i>		<i>Boerhavia dominii</i>		<i>Sonchus oleraceus</i>
Pest Name				Awnless Barnyard Grass		Tarvine		Common Sowthistle
Assessment Date				17/03/2023	17/04/2023	17/03/2023	17/04/2023	17/04/2023
Assessment Type				COUNT	COUNT	COUNT	COUNT	COUNT
Assessment Unit				/m <sup>2</sup>	/m <sup>2</sup>	/m <sup>2</sup>	/m <sup>2</sup>	/m <sup>2</sup>
Assessment Area				6 x 0.09 m <sup>2</sup>	6 x 0.09 m <sup>2</sup>	6 x 0.09 m <sup>2</sup>	6 x 0.09 m <sup>2</sup>	6 x 0.09 m <sup>2</sup>
Pest Stage Majority				2 leaf	2 leaf	Cotyledon	2 leaf	4 leaf
Treatment-Evaluation Interval				22 DAA	53 DAA/31 DAB	22 DAA	53 DAA/31 DAB	53 DAA/31 DAB
ARM Action Codes					AL		AL	AL
Trt No.	Treatment	Product Rate	Appln. Code					
1	Untreated	-	-	19.4a	28.1-	32.9a	1.4-	2.6ab
2	Group 15	1000ml/ha	A	0.5b	17.3-	7.4b	1.2-	1.7abc
3	Valor	120g/ha	A	4.2b	22.1-	2.8b	2.1-	0d
4	Valor	180g/ha	A	0.9b	6.4-	0b	2.7-	0.3cd
5	Valor	210g/ha	A	0.9b	11.6-	0b	0.9-	0d
6	Balance	100g/ha	A	0b	12.5-	4.6b	2.3-	4.2a
7	Balance Valor	100g/ha 120g/ha	A A	0.5b	6.3-	0b	0-	0.3cd
8	Balance Voraxor	100g/ha 100ml/ha	A A	0b	5.3-	0b	3.1-	0.9bcd
9	Voraxor	240ml/ha	A	2.3b	12.6-	0b	0.3-	0.3cd
10	Group 15	1000ml/ha	B	-	1.8-	-	2.7-	1.1a-d
11	Valor	120g/ha	B	-	7.7-	-	0.3-	0d
12	Valor	180g/ha	B	-	10.4-	-	1.0-	0d
13	Valor	210g/ha	B	-	7.2-	-	0-	0d
14	Voraxor	240ml/ha	B	-	2.8-	-	0-	0d
LSD P=.05				8.2	nsd	12.6	nsd	2.0 - 3.2
Treatment Prob.(F)=				0.0010	0.4802	0.0002	0.2912	0.0075

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

NB: A weed count of 0 = no surviving weeds were found in any plot

NB: Treatments 10-14 not applied when 22 DAA count conducted

A commercial knockdown of glyphosate 450 at 1.6 L/ha was applied at 25 DAA across all plots.

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### ARM Action Codes

AL = Automatic log transformation of X+1

DAA = Days after Application A

DAB = Days after Application B

### **Conclusions:**

This trial was designed to evaluate residual control of awnless barnyard grasses from autumn emergences. Application A treatments were applied in late February in a paddock previously cropped to wheat in 2022. The wheat stubble was ~30 cm tall and provided ~60% ground cover. The trial received ~10 mm of rainfall at 7 DAA (7 days after application A). Frequent rainfall events were experienced between 8-21 DAA with a total of ~47 mm received.

An initial count of awnless barnyard grass (ABYG) emergence was conducted at 22 DAA. All treatments significantly reduced ABYG counts compared to the untreated. The only treatments providing <95% control were Valor 140 g/ha and Voraxor 240 mL/ha alone. Complete control was found following Balance 100 g/ha and Balance + Voraxor. At this assessment it was clear that ABYG densities were patchy.

Application B treatments were applied at 22 DAA with a commercial application at 25 DAA of glyphosate 450 at 1.6 L/ha to control any emerged weeds. A total of ~55 mm of rain was received in the two weeks following application B with weed counts conducted at 31 DAB.

ABYG counts at 53 DAA/ 31 DAB (31 days after application B) were very patchy across the trial area with no significant treatment differences. The lowest ABYG counts were found from application B treatments of the Group 15 herbicide or Voraxor alone. ABYG control from application B treatments may also have been affected by the ~35 mm of rain received 1-4 days prior to application B. Weeds may have germinated on these rain events but not been emerged when the maintenance fallow knockdown was applied.

The trial was monitored for another month but despite frequent rain events, no additional weed emergence occurred.

A count of tarvine emergence was also conducted at 22 DAA. All treatments significantly reduced tarvine counts with complete control from Valor 180 and 210 g/ha, Balance + Valor, Balance + Voraxor and Voraxor 240 mL/ha alone. Low and variable populations of tarvine were found at 53 DAA/ 31 DAB with no significant treatment differences.

An emergence of common sowthistle was also assessed at 53 DAA/ 31 DAB. Application A treatments of Valor 180 g/ha, Balance + Valor and Voraxor 240 mL/ha provided ~90% control. Application A treatments of Valor 120 and 210 g/ha together with application B treatments of Valor alone at all rates and Voraxor alone provided complete sowthistle control.

Although variability in barnyard grass emergence compromised results, both Valor and Voraxor demonstrated sufficient efficacy to warrant further evaluation for autumn summer grass management. However, no application A treatment provided effective residual barnyard grass control up to ~ 7 weeks after application in this situation.

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Application Description		
	A	B
Application Date:	23/02/2023	17/03/2023
Application Start Time:	10:10 AM	10:30 AM
Application Stop Time:	11:10 AM	11:05 AM
Application Timing:	Pre-emergent	22 days after application A
Air Temperature Start, Stop:	23.8, 28.1 C	32.4, 34.3 C
% Relative Humidity Start, Stop:	59.2, 60.1	52.8, 46.1
Wind Velocity & Direction Start:	10.7 km/h, NE	2.9 km/h, NW
Wind Velocity & Direction Stop:	13.4 km/h, NE	2.6 km/h, NW
Soil Moisture:	DRY	SLIGHTLY DRY
% Cloud Cover:	100	0
First Moisture Occurred On:	2/03/2023	23/03/2023

Application Equipment		
	A	B
Application Equipment:	Polaris	
Equipment Type:	BOOM	
Operation Pressure:	300 kPa	
Nozzle Model:	AIXR11002	
Nozzle Spacing:	50 cm	
Boom Length:	4 m	
Boom Height:	50 cm	60 cm
Ground Speed:	9.5 km/h	
Application Amount:	100 L/ha	

**Rainfall:**

Closest Weather Station:	SIL0 grid point -27.85, 151.80
Distance:	2 km

Date	Amount (mm)	Additional Comments
11/02/2023	9.7	
15/02/2023	12.6	
17/02/2023		Maintenance knockdown spray
23/02/2023	-	Application A
2/03/2023	9.6	
3/03/2023	0.9	
11/03/2023	4.1	
12/03/2023	8.3	
13/03/2023	22.1	
14/03/2023	4.3	
15/03/2023	6.8	
16/03/2023	1.7	
17/03/2023	-	Assessment 1, application B
20/03/2023	-	Maintenance knockdown spray
23/03/2023	4.5	
24/03/2023	0.5	
25/03/2023	0.9	
26/03/2023	4	
29/03/2023	29.5	
30/03/2023	16.5	
5/04/2023	1.5	
7/04/2023	1.2	
8/04/2023	35.2	
11/04/2023	5.3	
17/04/2023	-	Assessment 2