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Residual Control of Summer Grasses in Wheat

Trial ID: LB2102
Location:
St Ruth
Trial Year: 2021
Investigator:
Linda Bailey

Feathertop Rhodes grass (*Chloris virgata*) has become a management issue in broadacre farming in many areas of Qld and northern NSW during the last decade. Common fallow herbicide treatments such as glyphosate and paraquat applied alone or even as a sequential (double knock) program, rarely provide useful levels of suppression. Although generally considered a summer grass, feathertop Rhodes grass (FTR) can emerge, establish and set seed within winter crops, particularly when crop establishment or vigour is poor. These winter and spring FTR cohorts can prove a major challenge for management in fallow.

This trial was designed to evaluate the efficacy and potential of a wide range of residual herbicides to manage FTR in wheat. The objective was to screen a range of herbicides, at existing wheat use patterns, to evaluate for FTR efficacy and potential label registration.

Objective:	To evaluate herbicides for the residual control of feathertop Rhodes grass in wheat		
Previous Crop:	Sorghum 2019/20		
Crop:	Wheat cv. LRPB Hellfire		
Planting Date:	27/05/2021		
Planting Method:	Direct drilled by disc planter on 28cm row spacings		
Weeds:	Fleabane (mixture of flaxleaf and tall, ~3:1) and feathertop Rhodes grass		
Application:	A	B	C
Application Date:	24/05/2021	31/05/2021	23/07/2021
Crop at Stage Application:	Pre-emergent (IBS)	Pre-emergent (PSPE)	2-4 tillers (50% 3 tillers)
Weeds at Application:	Pre-emergent	Pre-emergent	Fleabane 2-6 leaf FTR pre-emergent
Nozzles:	AIXR110015		
Volume:	100 L/ha		
Trial Design:	Randomised Complete Block, 16 treatments x 4 replicates		
Plot Size:	4m x 12m		
Keywords:	Feathertop Rhodes grass, fleabane, wheat, residual		

IBS = incorporated by sowing

PSPE = post sowing, pre-emergent

The trial was established in a paddock with a history of FTR management issues. Additional efficacy data was generated on the residual control of a mixed population of flaxleaf and tall fleabane. The site had very low stubble levels after a long fallow from sorghum in 2019/20.

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Residual data is included for the control of a mixed population of flaxleaf and tall fleabane. These species could not be accurately distinguished at the time of weed counts but later assessment in the untreated indicated a ratio of ~3:1 flaxleaf to tall fleabane. NB very low stubble levels were present.

NB None of these products have registered claims for residual FTR or fleabane control in wheat.

Scientific Pest Name				Wheat LRPB Hellfire 14/06/2021 EMERGENCE /m² 4m of row 21 DAA/ 14 DAB 18 DAP	<i>Conyza spp</i> Mixed popn of flaxleaf and tall fleabane	<i>Chloris virgata</i> Feathertop Rhodes grass
Pest Name						
Crop						
Assessment Date					14/07/2021	28/10/2021
Assessment Type					COUNT	COUNT
Assessment Unit					/m²	/m²
Sample Area					20 m²	15 m²
Pest Stage Majority					16	11
Treatment-Evaluation Interval					51 DAA/ 44 DAB	157 DAA/ 150 DAB/ 97 DAC
Plant-Evaluation Interval						
ARM Action Codes					AA	AA
Trt No.	Treatment	Product Rate	Appln. Code			
1	Untreated	-	-	104abc	3.55ab	1.45ab
2	Sakura	118g/ha	A	99abc	0.00d	0.38a-e
3	Boxer Gold	2500ml/ha	A	105ab	0.01d	0.13cde
4	Boxer Gold	1750ml/ha	A	101abc	0.01d	0.45a-e
	Boxer Gold	750ml/ha	B			
5	TriflurX	2000ml/ha	A	65e	1.80abc	0.50a-e
6	TriflurX	3000ml/ha	A	45f	0.86bcd	0.02e
7	Avadex Xtra	2400ml/ha	A	65e	0.33cd	0.04de
	TriflurX	2000ml/ha	A			
8	Rifle 440	1350ml/ha	A	72de	0.74bcd	0.41a-e
9	Luximax	500ml/ha	A	89bcd	0.83bcd	0.85abc
10	Overwatch	1250ml/ha	A	87cd	0.13cd	0.35b-e
11	Bolta Duo	3000ml/ha	A	72de	0.02d	0.58a-e
12	Diablo Duo	3000ml/ha	A	96abc	0.02d	1.65a
13	Arcade	3000ml/ha	A	106ab	0.00d	0.70a-d
14	Dual Gold	250ml/ha	A	106ab	0.25cd	0.98abc
15	Arcade	3000ml/ha	C	109a	4.64a	0.80abc
16	Mateno Complete	1000ml/ha	C	105ab	3.51ab	0.01e
LSD P=.05				18.0	5.962t	3.842t
Treatment Prob.(F)=				0.0001	0.0003	0.0224

Means followed by same letter do not significantly differ (P=.05, LSD)

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

Missing data estimates are included in columns: Average=2,5,8

NB Treatments 15 and 16 were in-crop herbicide applications and were not applied until 9 days after the July fleabane assessment. Crop emergence counts and the July fleabane assessment are additional untreated assessments. These results are shaded in grey.

Pest Stage Majority

16 = 6 leaf

11 = 1 leaf

ARM Action Codes

AA = Automatic arcsine square root % transformation

DAA = Days after Application A

DAB = Days after Application B

DAC = Days after Application C

DAP = Days after Planting

Residual Control of Summer Grasses in Wheat

Trial ID: LB2102 **Location:** St Ruth **Trial Year:** 2021

NB All treatments in this trial are registered for use in wheat at the rates and use patterns evaluated. However, none of these treatments have a feathertop Rhodes grass or fleabane registration.

Conclusions:

This trial was established to evaluate the residual control of Feathertop Rhodes (FTR) grass in wheat. Stubble levels were extremely low with the paddock long fallowed from sorghum in 2019/20.

The majority of treatments were applied 3 days prior to planting (-3 DAP) and incorporated by sowing (IBS) using a commercial disc planter on 28cm row spacing. The post sowing pre-emergent treatment (PSPE) was applied 4 days after planting. No rainfall was recorded between the IBS and PSPE applications with ~24 mm recorded in the first 9 days after the PSPE application. The in-crop application was applied at a crop stage of 2-4 tillers, 57 days after planting (57 DAP) and received ~11mm of rain the following day.

A total of 175mm was received during the 5-month duration of the trial. Monthly totals of less than 10mm of rain were recorded in August and September with a total of ~65mm in October.

Wheat establishment was assessed at 18 DAP with ~104 plants/m² in the untreated plots. Treatments containing TriflurX, Rifle 440 or Bolta Duo significantly reduced emergence counts by ~23-57% compared to the untreated. Impacts on crop biomass were still evident at 48 DAP.

Residual control of a mixed population of flaxleaf and tall fleabane (~3:1 ratio) was assessed 51 days after application A (51 DAA) with an untreated population of ~4/m² at the 2-6 leaf stage. This cohort was not present at the crop emergence count at 21 DAA. Sakura, Boxer Gold, Bolta Duo, Diablo Duo and Arcade (IBS) all provided >99% control. Avadex Xtra + TriflurX, Overwatch and Dual Gold all provided ~90-95% control. There was no significant difference between these herbicides.

The only FTR emergence was assessed in late October as the crop ripened for harvest. It is expected that weed emergence occurred following ~54mm received 9-16 days prior to the assessment (~141-148 DAA and ~81-88 DAC). The untreated had a population of ~1.5/m² at the 1-3 leaf stage. Boxer Gold 2.5 L/ha, TriflurX at 3 L/ha, and Avadex Xtra + TriflurX all provided significant levels of residual FTR control (>90%) up to ~20 weeks after application. The in-crop application of Mateno Complete provided >99% residual control at ~12 weeks after application.

In this situation, all treatments containing group 3 herbicides (TriflurX, Bolta Duo and Rifle 400) together caused significant reductions in wheat establishment. A wide range of options provided significant levels of residual fleabane control when weed emergence occurred between 3-7 weeks after application. Boxer Gold 2.5 L/ha, TriflurX 3 L/ha and Avadex Xtra + TriflurX all provided extended residual FTR control up to ~20 weeks after application, however only Boxer Gold provided adequate crop safety in this trial. Mateno Complete provided promising levels of residual FTR control up to ~12 weeks after application when applied in-crop.

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Crop Description	
Crop & Variety:	Wheat cv. LRPB Hellfire
Planting Date:	27/05/2021
Planting Method:	Direct Drilled
Planting Equipment:	Disc
Row Spacing:	28cm

Application Description			
	A	B	C
Application Date:	24/05/2021	31/05/2021	23/07/2021
Application Start Time:	10:00 AM	3:10 PM	9:30 AM
Application Stop Time:	12:30 PM	3:20 PM	10:00 AM
Application Method:	SPRAY		
Application Timing:	IBS	PSPE	POEMCR
Application Placement:	SOIL	SOIL	FOLIAR
Air Temperature, Unit:	20.1 C	24.4 C	12.7 C
% Relative Humidity:	60.1	38.4	67.5
Wind Velocity, Unit:	12 km/h	3.5 km/h	7.8 km/h
Wind Direction:	E		
Soil Moisture:	DRY		
% Cloud Cover:	0	20	98

Crop Stage at Each Application			
	A	B	C
Crop:	Wheat cv. LRPB Hellfire		
Stage Majority %:	Preplant	PSPE	23 50%
Stage Minimum %:			22 20%
Stage Maximum %:			24 30%

Pest Stage at Each Application			
	A	B	C
Weeds 1 and 2:	<i>Conyza bonariensis</i> , <i>Conyza sumatrensis</i> Flaxleaf and tall fleabane		
Stage Majority, %:	0 %	0 %	26 40 %
Weed 3:	<i>Chloris virgata</i> Feathertop Rhodes grass		
Stage Majority, %:	0 %	0 %	0 %

Application Equipment			
	A	B	C
Application Equipment:	Polaris		
Equipment Type:	BOOM		
Operation Pressure, Unit:	300 kPa		
Nozzle Type:	AIXR		
Nozzle Size:	110015		
Nozzle Spacing, Unit:	50 cm		
Boom Length, Unit:	4 m		
Boom Height, Unit:	50 cm		
Ground Speed, Unit:	7.2 km/h		
Spray Volume, Unit:	100 L/ha		

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Rainfall:

Closest Weather Station:	SILO grid pt -27.35, 151.35
Distance:	~1.2km

Date	Amount	Unit	
24/05/2021	-	mm	Application A (IBS)
27/05/2021	-	mm	Planting
31/05/2021	-	mm	Application B (PSPE)
3/06/2021	3.1	mm	
4/06/2021	9.8	mm	
9/06/2021	11.2	mm	
14/06/2021	-	mm	Emergence count
15/06/2021	12.7	mm	
16/06/2021	3.6	mm	
17/06/2021	2.1	mm	
22/06/2021	0.9	mm	
23/06/2021	0.2	mm	
25/06/2021	0.9	mm	
26/06/2021	7.3	mm	
27/06/2021	1.8	mm	
30/06/2021	0.1	mm	
2/07/2021	5.5	mm	
3/07/2021	8.3	mm	
4/07/2021	1.1	mm	
9/07/2021	9	mm	
10/07/2021	1.9	mm	
14/07/2021	-	mm	Fleabane assessment
15/07/2021	2.6	mm	
16/07/2021	2	mm	
17/07/2021	0.1	mm	
21/07/2021	0.1	mm	
23/07/2021	-	mm	Application C
24/07/2021	11.1	mm	
29/07/2021	0.2	mm	
4/08/2021	2	mm	
5/08/2021	0.3	mm	
16/08/2021	0.2	mm	
24/08/2021	4.4	mm	
5/09/2021	0.1	mm	
6/09/2021	2.4	mm	
17/09/2021	0.1	mm	
21/09/2021	1.4	mm	
28/09/2021	1.1	mm	
29/09/2021	0.2	mm	
30/09/2021	2.3	mm	
1/10/2021	5.7	mm	
2/10/2021	1.7	mm	
7/10/2021	0.1	mm	
12/10/2021	7.9	mm	
13/10/2021	3.7	mm	
14/10/2021	32.2	mm	
15/10/2021	0.3	mm	
19/10/2021	10.3	mm	
21/10/2021	0.1	mm	
25/10/2021	0.3	mm	
26/10/2021	2.5	mm	
27/10/2021	0.4	mm	
28/10/2021	-	mm	FTR assessment