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Residual Control of Summer Grasses in Wheat
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Trial ID: LB2101	Location: Felton	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 then also 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.

Despite the trial being established in a paddock with a history of FTR, common sowthistle was the only weed to emerge over the following 5 months. No data was generated on residual herbicide efficacy against FTR.

Objective:	To evaluate herbicides for the residual control of summer grasses in wheat		
Situation:	Wheat cv. LRPB Lancer		
Planting Date:	22/06/2021		
Planting Equipment:	Gyral TX series combine on 25cm row spacings with cultivation tynes removed		
Weed:	Common sowthistle		
Application:	A	B	C
Application Date:	17/06/2021	24/06/2021	11/08/2021
Crop Stage at Application:	Pre-emergent (IBS)	Pre-emergent (PSPE)	3-4 tillers
Weed Stage at Application:	Pre-emergent	Pre-emergent	Pre-emergent
Nozzles:	AIXR110015		
Volume:	100 L/ha		
Trial Design:	Randomised Complete Block, 16 treatments x 4 replicates		
Plot Size:	4m x 12m		
Keywords:	Common sowthistle, wheat, residual		

IBS = incorporated by sowing

PSPE = post sowing, pre-emergent

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The table below shows the impact of treatments on crop emergence and the seedling counts of common sowthistle. NB the trial area was sprayed commercially with MCPA on the 1/08/21 to control the first emergence of common sowthistle.

Scientific Pest Name				Wheat LRPB Lancer 7/07/2021 EMERGENCE /m ² 4m of row 20 DAA/ 13 DAB 15 DAP	Sonchus oleraceus Common sowthistle		
Pest Name					6/08/2021 SEEDLINGS COUNT /m ² 15 m ² 12-14	8/09/2021 SEEDLINGS COUNT /m ² 15 m ² 13-14 83 DAA/ 76 DAB/ 28 DAC	15/11/2021 SEEDLINGS COUNT /m ² 15 m ² 13-14 151 DAA/ 144 DAB/ 96 DAC
Crop							
Variety							
Assessment Date							
Description							
Assessment Type							
Assessment Unit							
Sample Area							
Pest Stage Majority							
Treatment-Evaluation Interval							
Plant-Evaluation Interval							
ARM Action Codes							
Trt No.	Treatment	Product Rate	Appln. Code		AA	AA	AA
1	Untreated	-	-	106ab	1.80ab	4.30a	0.7-
2	Sakura	118g/ha	A	102abc	0.01de	0.13ef	0.0-
3	Boxer Gold	2500ml/ha	A	96a-d	0.03cde	0.25def	0.0-
4	Boxer Gold	1750ml/ha	A	101abc	0.00de	0.13ef	0.1-
	Boxer Gold	750ml/ha	B				
5	TriflurX	2000ml/ha	A	88b-e	1.63ab	2.84ab	0.8-
6	TriflurX	3000ml/ha	A	57g	0.69bc	1.21b-e	0.5-
7	Avadex Xtra	2400ml/ha	A	84c-f	0.47bcd	1.77a-d	0.3-
	TriflurX	2000ml/ha	A				
8	Rifle 440	1350ml/ha	A	72efg	0.48bcd	1.02b-f	0.1-
9	Luximax	500ml/ha	A	79def	0.02de	0.20ef	0.1-
10	Overwatch	1250ml/ha	A	102abc	0.00e	0.02f	0.0-
11	Bolta Duo	3000ml/ha	A	67fg	0.05cde	0.40c-f	0.0-
12	Diablo Duo	3000ml/ha	A	93a-d	0.09cde	0.40c-f	0.2-
13	Arcade	3000ml/ha	A	93a-d	0.04cde	0.36c-f	0.0-
14	Dual Gold	250ml/ha	A	97a-d	0.35cde	2.03abc	0.6-
15	Arcade	3000ml/ha	C	111a	1.64ab	1.87a-d	0.2-
16	Mateno Complete	1000ml/ha	C	102abc	2.40a	2.09abc	0.2-
LSD P=.05				19.0	3.841t	5.015t	nsd
Treatment Prob.(F)=				0.0001	0.0001	0.0007	0.4798

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.

nsd = no significant difference

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

Pest Stage Majority

14 = 4 true leaves

13 = 3 true leaves

12 = 2 true leaves

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

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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 registration and only Overwatch has a label claim for residual common sowthistle control.

Conclusions:

This trial was established to evaluate the residual control of Feathertop Rhodes (FTR) grass in wheat. Stubble levels were very low as the paddock was fallowed from chickpea harvest in 2020.

The majority of treatments were applied 5 days prior to planting and incorporated by sowing (IBS) using a commercial tyne planter on 25cm row spacing. The post sowing pre-emergent treatment (PSPE) was applied 2 days after planting. Rainfall of ~30 mm was recorded in the first 11 days after PSPE application. The in-crop application was applied at 50 days after planting (50 DAP) when the crop had 3 to 4 tillers. Rainfall of ~230 mm was received during the 5-month duration of the trial. June, August and September all received less than 25 mm in total. Rainfall totals of ~50–70 mm were recorded in July, October and November.

Insufficient feathertop Rhodes grass emerged during the trial to allow assessment. Common sowthistle (*Sonchus oleraceus*) was only weed to emerge in sufficient numbers to allow a useful evaluation of residual efficacy.

Wheat establishment was assessed at 15 DAP with ~105 plants/m² in the untreated plots. Treatments containing TriflurX, Rifle 440, Bolta Duo or Luximax reduced emergence counts by ~17-46% compared to the untreated. Impacts on crop biomass were still evident at 50 DAP.

Residual common sowthistle control was assessed 50 days after application A (50 DAA) with an untreated population of ~1.8/m² at the 2-4 leaf stage. This cohort is likely to have emerged following ~27 mm of rainfall between 22-33 DAA. Sakura, Boxer Gold, Luximax, Overwatch, Bolta Duo, Diablo Duo and Arcade (IBS) all provided >95% control. There was no significant difference between these herbicides. Overwatch was the only treatment to provide complete control. This cohort was successfully controlled with an in-crop application of MCPA.

A second emergence of common sowthistle was assessed at 83 DAA with an untreated population of ~4/m² at the 3-4 leaf stage. This cohort is likely to have emerged following ~7 mm of rainfall between 47-50 DAA and 11 mm at 67-68 DAA. The in-crop applications occurred between these two rain events. Sakura, Boxer Gold, Luximax, Overwatch, Bolta Duo, Diablo Duo and Arcade (IBS) all provided >90% control. There was no significant difference between these herbicides. Overwatch provided >99% control. The two in-crop treatments only provided poor levels of suppression but this may be due to the timing of weed germination and emergence.

A final common sowthistle cohort was assessed at 151 DAA following ~100 mm between 116-144 DAA. The untreated population was ~0.7/m² at the 3-4 leaf stage. There were no significant differences between treatments evident at this count.

In this situation, all treatments containing group 3 herbicides (TriflurX, Bolta Duo and Rifle 400) together with Luximax caused significant reductions in crop establishment. A wide range of options provided significant levels of residual common sowthistle control when weed emergence occurred up to ~7-10 weeks after application. The effective residual control from Overwatch supported the label claim. No data was generated on the residual control of FTR.

Crop Description	
Crop & Variety:	Wheat cv. LRPB Lancer
Planting Date:	22/06/2021
Planting Method:	Direct Drilled
Planter:	Gyral TX combine
Row Spacing:	25cm

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Application Description			
	A	B	C
Application Date:	17/06/2021	24/06/2021	11/08/2021
Application Start Time:	12:00 PM	10:15 AM	12:45 PM
Application Stop Time:	2:10 PM	10:20 AM	12:55 PM
Application Method:	SPRAY		
Application Timing (crop):	IBS	PSPE	EPE
Application Placement:	SOIL	SOIL	FOLIAR
Air Temperature, Unit:	18.2 C	17.6 C	19.6 C
% Relative Humidity:	46.6	67.7	53.7
Wind Velocity, Unit:	12.3 km/h	11.7 km/h	12.7 km/h
Wind Direction:	W	NE	NE
Soil Moisture:	SLIWET	SLIDRY	DRY
% Cloud Cover:	0	98	20
Next Moisture Occurred On:	17/06/2021	17/06/2021	23/08/2021

Crop Stage at Each Application			
	A	B	C
Crop 1:	Wheat cv. LRPB Lancer		
Stage Majority, %:	Preplant	PSPE	24 60 %
Stage Minimum, %:			21 10 %
Stage Maximum, %:			24 60 %

Pest Stage at Each Application			
	A	B	C
Weed 1:	<i>Sonchus oleraceus</i> Common Sowthistle		
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 -27.80, 151.80
Distance, Unit:	~4km

Date	Amount	Unit	
15/06/2021	4.7	mm	
16/06/2021	2.6	mm	
17/06/2021	1	mm	Application A
22/06/2021	0	mm	Planting
23/06/2021	0.4	mm	
24/06/2021	0	mm	Application B
26/06/2021	5.7	mm	
27/06/2021	0.3	mm	
28/06/2021	2	mm	
2/07/2021	12.1	mm	
3/07/2021	6.4	mm	
4/07/2021	1	mm	
5/07/2021	3.2	mm	
7/07/2021	0	mm	Wheat Emergence Count
9/07/2021	10.3	mm	
10/07/2021	4.6	mm	
11/07/2021	1	mm	
12/07/2021	4	mm	
15/07/2021	1.7	mm	
16/07/2021	2.2	mm	
17/07/2021	0.3	mm	
18/07/2021	1.7	mm	
19/07/2021	1.6	mm	
24/07/2021	5.6	mm	
29/07/2021	1	mm	
3/08/2021	1.8	mm	
4/08/2021	3.7	mm	
6/08/2021	0.2	mm	Weed Assessment 1
9/08/2021	0.9	mm	
11/08/2021	0	mm	Application C
23/08/2021	2.5	mm	
24/08/2021	8.5	mm	
1/09/2021	0.6	mm	
2/09/2021	0.4	mm	
3/09/2021	0.1	mm	
6/09/2021	0.7	mm	
7/09/2021	0.5	mm	
9/09/2021	0	mm	Weed Assessment 2
21/09/2021	2.5	mm	
29/09/2021	0.5	mm	
30/09/2021	3.9	mm	
1/10/2021	1.1	mm	
2/10/2021	7.1	mm	
8/10/2021	3.1	mm	
12/10/2021	10.2	mm	
13/10/2021	0.2	mm	
14/10/2021	14.9	mm	
15/10/2021	1.7	mm	
18/10/2021	1.5	mm	
19/10/2021	16	mm	
21/10/2021	0.3	mm	
24/10/2021	1.9	mm	
26/10/2021	2.4	mm	
27/10/2021	0.5	mm	
29/10/2021	9.7	mm	

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Date	Amount	Unit	
30/10/2021	1	mm	
31/10/2021	0.3	mm	
1/11/2021	1.8	mm	
2/11/2021	0.4	mm	
3/11/2021	0.1	mm	
6/11/2021	0.2	mm	
7/11/2021	3.8	mm	
8/11/2021	31.7	mm	
9/11/2021	1.3	mm	
10/11/2021	3.5	mm	
11/11/2021	3	mm	
12/11/2021	19.5	mm	
15/11/2021	0	mm	Weed Assessment 3

June: ~24 mm
 July: ~57 mm
 August: ~18 mm
 September: ~9 mm
 October: ~72 mm
 November: ~65 mm