

Disclaimer:

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Double Knock Control of Button Grass in Fallow

Trial ID: LB1815

 Location: Chinchilla
 Investigator: Linda Bailey

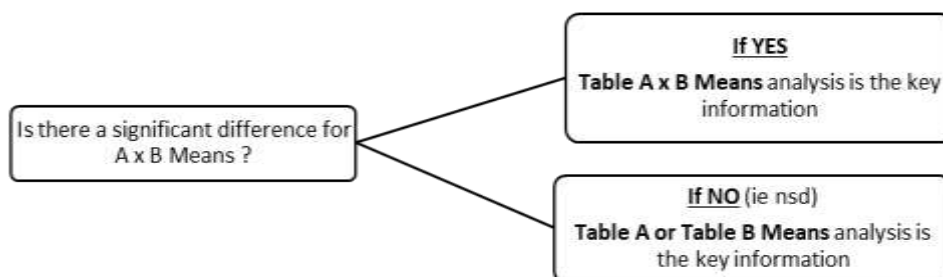
Trial Year: 2018

Objective:	To evaluate double knock timing and options for button grass control			
Situation:	Fallow			
Application:	A	B	C	D
Application Date:	11/04/2019	12/04/2019	16/04/2019	22/04/2019
Application Timing:	Late Post-Emergent (First Knock)	1 Day after Application A (1DAA)	5 Days after Application A (5DAA)	11 Days after Application A (11DAA)
Nozzles:	AIXR110015			
Volume:	100 L/ha			
Weed:	Button Grass		Liverseed Grass	
Weed Population at Application:	72/m ²		35/m ²	
Weed Stage at Application:	95% of population at full head emergence		95% of population at half head emergence	
Keywords:	Button Grass, liverseed Grass, knockdown, double knock, fallow			

Trial designed as Randomised Complete Block and analysed as a Factorial

	In Simple Terms
Table of A Means:	Mean of 'First Knock' performance with ALL 'Second Knock Timing' treatments
Table of B Means:	Mean of 'Second Knock Timing' performance with ALL 'First Knock' treatments
Table of A x B Means:	'First Knock' performance with EACH 'Second Knock Timing' treatment

How to interpret?



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Scientific Pest Name				<i>Dactyloctenium radulans</i> Button Grass	<i>Urochloa panicoides</i> Liverseed Grass	<i>Dactyloctenium radulans</i> Button Grass	
Pest Name				3/05/2019 BURNDOWN	3/05/2019 BURNDOWN	22/05/2019 REGROWING	22/05/2019 TOTAL SURVIVORS
Assessment Date				%	%	/m ²	/m ²
Assessment Type							
Assessment Unit							
Treatment-Evaluation Interval				22DAA/ 21 DAB/ 17DAC/ 11 DAD	22DAA/ 21 DAB/ 17DAC/ 11 DAD	41DAA/ 40 DAB/ 36DAC/ 30 DAD AL	41DAA/ 40 DAB/ 36DAC/ 30 DAD AL
ARM Action Codes							
Trt No.	Treatment	Product Rate	Appl. Code				
TABLE OF A MEANS (First Knock)							
1	Roundup CT Liasé	1000ml/ha 1% v/v		97.5a	97.1a	0.5tc	0.9tc
2	Verdict Uptake	100ml/ha 0.5% v/v		80.4c	78.3c	8.4ta	9.7ta
3	Group A St Liasé Uptake	350ml/ha 1% v/v 0.5% v/v		85.4b	80.8c	2.1tbc	5.0tab
4	Shogun Uptake	500ml/ha 0.5% v/v		84.0b	73.1d	3.5tab	4.7tab
5	Gramoxone	1600ml/ha		95.8a	91.3b	2.9tabc	2.9tbc
TABLE OF B MEANS (Second Knock Timing)							
1	First Knock only	-	A	60.0b	49.3b	13.9ta	37.9ta
2	Gramoxone	1600ml/ha	B	97.9a	94.5a	1.6tb	1.6tb
3	Gramoxone	1600ml/ha	C	99.3a	96.7a	0.6tb	0.6tb
4	Gramoxone	1600ml/ha	D	97.3a	96.0a	2.3tb	2.5tb
TABLE OF A x B MEANS (First Knock x Second Knock Timing)							
1	Roundup CT Liasé	1000ml/ha 1% v/v	A A	93.3bc	93.3abc	1.3t-	5.0t-
1b	Roundup CT Liasé Gramoxone	1000ml/ha 1% v/v 1600ml/ha	A A B	98.3ab	96.7ab	1.1t-	1.1t-
1c	Roundup CT Liasé Gramoxone	1000ml/ha 1% v/v 1600ml/ha	A A C	100.0a	100.0a	0.0t-	0.0t-
1d	Roundup CT Liasé Gramoxone	1000ml/ha 1% v/v 1600ml/ha	A A D	98.3ab	98.3ab	0.0t-	0.0t-
2	Verdict Uptake	100ml/ha 0.5% v/v	A A	33.3f	26.7ef	88.1t-	134.7t-
2b	Verdict Uptake Gramoxone	100ml/ha 0.5% v/v 1600ml/ha	A A B	98.3ab	93.3abc	2.2t-	2.2t-
2c	Verdict Uptake Gramoxone	100ml/ha 0.5% v/v 1600ml/ha	A A C	98.3ab	98.3ab	0.0t-	0.0t-
2d	Verdict Uptake Gramoxone	100ml/ha 0.5% v/v 1600ml/ha	A A D	91.7cd	95.0abc	26.8t-	29.5t-

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.

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Scientific Pest Name				<i>Dactyloctenium radulans</i>	<i>Urochloa panicoides</i>	<i>Dactyloctenium radulans</i>	
Pest Name				Button Grass	Liverseed Grass	Button Grass	
Assessment Date				3/05/2019	3/05/2019	22/05/2019	
Assessment Type				BURNDOWN	BURNDOWN	REGROWING	TOTAL SURVIVORS
Assessment Unit				%	%	/m ²	/m ²
Treatment-Evaluation Interval				22DAA/ 21 DAB/ 17DAC/ 11 DAD	22DAA/ 21 DAB/ 17DAC/ 11 DAD	41DAA/ 40 DAB/ 36DAC/ 30 DAD	41DAA/ 40 DAB/ 36DAC/ 30 DAD
ARM Action Codes						AL	AL
Trt No.	Treatment	Product Rate	Appln. Code				
3	Group A St Liase Uptake	350ml/ha 1% v/v 0.5% v/v	A A A	43.3e	30.0e	6.4t-	104.2t-
3b	Group A St Liase Uptake Gramoxone	350ml/ha 1% v/v 0.5% v/v 1600ml/ha	A A A B	98.3ab	96.7ab	1.6t-	1.6t-
3c	Group A St Liase Uptake Gramoxone	350ml/ha 1% v/v 0.5% v/v 1600ml/ha	A A A C	100.0a	96.7ab	2.0t-	2.0t-
3d	Group A St Liase Uptake Gramoxone	350ml/ha 1% v/v 0.5% v/v 1600ml/ha	A A A D	100.0a	100.0a	0.6t-	0.6t-
4	Shogun Uptake	500ml/ha 0.5% v/v	A A	43.3e	20.0f	15.4t-	34.4t-
4b	Shogun Uptake Gramoxone	500ml/ha 0.5% v/v 1600ml/ha	A A B	97.6ab	92.5bc	1.4t-	1.4t-
4c	Shogun Uptake Gramoxone	500ml/ha 0.5% v/v 1600ml/ha	A A C	98.3ab	91.7bc	1.1t-	1.1t-
4d	Shogun Uptake Gramoxone	500ml/ha 0.5% v/v 1600ml/ha	A A D	96.7abc	88.3c	3.8t-	4.7t-
5	Gramoxone	1600ml/ha	A	86.7d	76.7d	28.6t-	28.6t-
5b	Gramoxone Gramoxone	1600ml/ha 1600ml/ha	A B	96.7abc	93.3abc	1.7t-	1.7t-
5c	Gramoxone Gramoxone	1600ml/ha 1600ml/ha	A C	100.0a	96.7ab	0.6t-	0.6t-
5d	Gramoxone Gramoxone	1600ml/ha 1600ml/ha	A D	100.0a	98.3ab	0.9t-	0.9t-

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Trial Year: 2018

Scientific Pest Name				<i>Urochloa panicoides</i>	
Pest Name				Liverseed Grass	
Assessment Date				22/05/2019	
Assessment Type				REGROWING	TOTAL SURVIVORS
Assessment Unit				/m ²	/m ²
Treatment-Evaluation Interval				41DAA/ 40 DAB/ 36DAC/ 30 DAD	41DAA/ 40 DAB/ 36DAC/ 30 DAD
ARM Action Codes				AL	
Trt No.	Treatment	Product Rate	Appln. Code		
TABLE OF A MEANS (First Knock)					
1	Roundup CT Liase	1000ml/ha 1% v/v		2.8tbc	10.4-
2	Verdict Uptake	100ml/ha 0.5% v/v		2.5tbc	13.9-
3	Group A St Liase Uptake	350ml/ha 1% v/v 0.5% v/v		1.5tc	14.1-
4	Shogun Uptake	500ml/ha 0.5% v/v		13.8ta	30.9-
5	Gramoxone	1600ml/ha		5.5tab	15.3-
TABLE OF B MEANS (Second Knock Timing)					
1	First Knock only	-	A	4.7t-	24.6-
2	Gramoxone	1600ml/ha	B	5.0t-	12.9-
3	Gramoxone	1600ml/ha	C	2.2t-	12.8-
4	Gramoxone	1600ml/ha	D	4.7t-	17.4-
TABLE OF A x B MEANS (First Knock x Second Knock Timing)					
1	Roundup CT Liase	1000ml/ha 1% v/v	A A	4.1t-	18.5-
1a	Roundup CT Liase Gramoxone	1000ml/ha 1% v/v 1600ml/ha	A A B	7.0t-	14.8-
1b	Roundup CT Liase Gramoxone	1000ml/ha 1% v/v 1600ml/ha	A A C	0.0t-	0.0-
1c	Roundup CT Liase Gramoxone	1000ml/ha 1% v/v 1600ml/ha	A A D	4.1t-	8.3-
2	Verdict Uptake	100ml/ha 0.5% v/v	A A	0.9t-	18.5-
2a	Verdict Uptake Gramoxone	100ml/ha 0.5% v/v 1600ml/ha	A A B	6.0t-	12.0-
2b	Verdict Uptake Gramoxone	100ml/ha 0.5% v/v 1600ml/ha	A A C	1.5t-	15.7-
2c	Verdict Uptake Gramoxone	100ml/ha 0.5% v/v 1600ml/ha	A A D	3.6t-	9.3-

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Trial Year: 2018

Scientific Pest Name Pest Name Assessment Date Assessment Type Assessment Unit Treatment-Evaluation Interval ARM Action Codes				<i>Urochloa panicoides</i> Liverseed Grass	
				22/05/2019 REGROWING /m ² 41DAA/ 40 DAB/ 36DAC/ 30 DAD AL	22/05/2019 TOTAL SURVIVORS /m ² 41DAA/ 40 DAB/ 36DAC/ 30 DAD
Trt No.	Treatment	Product Rate	Appln. Code		
3	Group A St Liase Uptake	350ml/ha 1% v/v 0.5% v/v	A A A	0.0t-	25.0-
3a	Group A St Liase Uptake Gramoxone	350ml/ha 1% v/v 0.5% v/v 1600ml/ha	A A A B	3.6t-	9.3-
3b	Group A St Liase Uptake Gramoxone	350ml/ha 1% v/v 0.5% v/v 1600ml/ha	A A A C	2.5t-	13.9-
3c	Group A St Liase Uptake Gramoxone	350ml/ha 1% v/v 0.5% v/v 1600ml/ha	A A A D	1.3t-	8.3-
4	Shogun Uptake	500ml/ha 0.5% v/v	A A	19.2t-	25.9-
4a	Shogun Uptake Gramoxone	500ml/ha 0.5% v/v 1600ml/ha	A A B	7.4t-	23.5-
4b	Shogun Uptake Gramoxone	500ml/ha 0.5% v/v 1600ml/ha	A A C	18.2t-	31.5-
4c	Shogun Uptake Gramoxone	500ml/ha 0.5% v/v 1600ml/ha	A A D	13.6t-	42.6-
5	Gramoxone	1600ml/ha	A	31.0t-	35.2-
5a	Gramoxone Gramoxone	1600ml/ha 1600ml/ha	A B	2.6t-	4.6-
5b	Gramoxone Gramoxone	1600ml/ha 1600ml/ha	A C	1.1t-	2.8-
5c	Gramoxone Gramoxone	1600ml/ha 1600ml/ha	A D	6.4t-	18.5-

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FACTORIAL/POOLED ERROR AOV <i>Dactyloctenium radulans</i> - Button Grass 3/05/2019 BURNDOWN % 22 DAA						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	58	26249.972299				
R	2	4.577562	2.288781	0.216	0.8064	
A	4	2758.409511	689.602378	65.197	0.0001	2.7
B	3	16427.590028	5475.863343	517.700	0.0001	2.4
AB	12	6668.035549	555.669629	52.534	0.0001	5.4
ERROR	37	391.359649	10.577288			

FACTORIAL/POOLED ERROR AOV <i>Urochloa panicoides</i> - Liverseed Grass 3/05/2019 BURNDOWN % 22 DAA						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	58	38710.312500				
R	2	140.625000	70.312500	4.299	0.0210	
A	4	4608.750000	1152.187500	70.440	0.0001	3.3
B	3	24246.145833	8082.048611	494.104	0.0001	3.0
AB	12	9109.583333	759.131944	46.410	0.0001	6.7
ERROR	37	605.208333	16.356982			

FACTORIAL/POOLED ERROR AOV <i>Dactyloctenium radulans</i> - Button Grass 22/05/2019 REGROWING /m² 41 DAA AL						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	58	29.470017				
R	2	1.736857	0.868428	2.943	0.0652	
A	4	4.025500	1.006375	3.410	0.0180	0.4
B	3	7.965125	2.655042	8.997	0.0001	0.4
AB	12	4.824184	0.402015	1.362	0.2274	0.9
ERROR	37	10.918352	0.295091			

FACTORIAL/POOLED ERROR AOV <i>Dactyloctenium radulans</i> - Button Grass 22/05/2019 TOTAL SURVIVORS /m² 41 DAA AL						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	58	36.061070				
R	2	1.669249	0.834625	3.505	0.0404	
A	4	3.696189	0.924047	3.881	0.0099	0.4
B	3	17.279970	5.759990	24.191	0.0001	0.4
AB	12	4.605968	0.383831	1.612	0.1307	0.8
ERROR	37	8.809693	0.238100			

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FACTORIAL/POOLED ERROR AOV <i>Urochloa panicoides</i> - Liverseed Grass 22/05/2019 REGROWING /m² 41 DAA AL						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	58	26.777899				
R	2	8.558116	4.279058	18.845	0.0001	
A	4	4.396441	1.099110	4.840	0.0031	0.4
B	3	0.736400	0.245467	1.081	0.3691	0.4
AB	12	4.685322	0.390444	1.719	0.1021	0.8
ERROR	37	8.401620	0.227071			

FACTORIAL/POOLED ERROR AOV <i>Urochloa panicoides</i> - Liverseed Grass 22/05/2019 TOTAL SURVIVORS /m² 41 DAA						
Source	DF	Sum of Squares	Mean Square	F	Prob.(F)	LSD (.05)
Total	58	23974.067787				
R	2	5840.757804	2920.378902	9.732	0.0004	
A	4	3082.235773	770.558943	2.568	0.0540	14.3
B	3	1400.875038	466.958346	1.556	0.2164	12.8
AB	12	2546.793957	212.232830	0.707	0.7345	28.6
ERROR	37	11103.405214	300.092033			

Assessment Type

BURNDOWN = % Burndown/brown out

ARM Action Codes

AL = Automatic log transformation of X+1

DAA = Days after Application A

DAB = Days after Application B

DAC = Days after Application C

DAD = Days after Application D

Application Description				
	A	B	C	D
Application Date:	11/04/2019	12/04/2019	16/04/2019	22/04/2019
Application Start Time:	12:35 PM	11:10 AM	12:20 PM	12:00 PM
Application Stop Time:	2:05 PM	11:20 AM	12:35 PM	12:15 PM
Application Method:	SPRAY			
Application Timing:	LATE POST-EM	1 Day after Appln A	5 Days after Appln A	11 Days after Appln A
Application Placement:	FOLIAR			
Air Temperature, Unit:	30 C	25 C	27 C	24 C
% Relative Humidity:	39	45	46	58
Wind Velocity, Unit:	6.6 km/h	8.3 km/h	1.6 km/h	15 km/h
Wind Direction:	NE	NE	W	E
Dew Presence (Y/N):	No			
Soil Moisture:	DRY			
% Cloud Cover:	70	10	40	95
Next Moisture Occurred On:	2/05/2019	2/05/2019	2/05/2019	2/05/2019

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Application Equipment				
	A	B	C	D
Application Equipment:	Polaris			
Equipment Type:	BOOM			
Operation Pressure, Unit:	300 kPa			
Nozzle Type:	AIXR			
Nozzle Size:	110015			
Nozzle Spacing, Unit:	50 cm			
Nozzles/Row:	8			
Boom Length, Unit:	4 m			
Boom Height, Unit:	54 cm			
Ground Speed, Unit:	7.2 km/h			
Spray Volume, Unit:	100 L/ha			

Objectives:

To evaluate double knock timing and options for button grass control

Conclusions:

This trial was established to evaluate the impact of herbicide choice and second knock timing on button grass efficacy. Data on liverseed grass was also generated. The first knock was applied to a button grass (inflorescence fully emerged) population of ~72 weeds/m² and a liverseed grass (inflorescence partially emerged) population of ~35 weeds/m². The second knock timings were at 1, 5 or 11 days after the initial application.

At 22 days, burndown of both button grass and liverseed grass was significantly improved in all treatments that had received a second knock of Gramoxone 1.6 L/ha, irrespective of application timing. All but one double knock combination provided >90% burndown of both grass species.

Final weed counts were conducted 41 days after the initial application. All second knock applications significantly improved button grass control with no clear difference between application timing. Surviving populations were generally <2/m². Double knocks where Roundup CT 1 L/ha + Liase was the first knock, provided significantly improved control than all Group A herbicides evaluated. Gramoxone double knock programs were intermediate between the Roundup CT and Group A options.

Liverseed grass results were very different. The second knock of Gramoxone did not have a significant effect on regrowing or surviving weed counts. There was also no clear difference between the first knock treatments. Variable liverseed grass population may explain the lack of significant differences in control but do not explain the poorer efficacy than obtained on button grass.

In this situation, the use of Gramoxone 1.6 L/ha as a second knock on button grass provided large improvements in control but with no clear application timing differences. Double knock combinations of Roundup CT + Liase followed by Gramoxone were generally the most effective option and significantly more effective than Group A double knocks on the advanced button grass population..