TRIAL REPORT

Envirowet Weed Control in Fallow

Beverley, Western Australia, 2024

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Client:

AWT Envirowet

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SUMMARY

A small plot trial was established near Beverley, Western Australia in 2024 compare the effectiveness of Envirowet Multi-Phase Surfactant with industry standard wetting agents when used with Glyphosate 450 and Paraquat 360 herbicides to control weeds in fallow.

Treatments were compared with an untreated control (UTC) and included Glyphosate 450 at 1.5 L/ha or Paraquat 360 at 1.2 L/ha, each applied solo, or with Envirowet at 25, 50, or 100 mL/100 L, Axiwetta at 100 mL/100 L, or LI700 at 250mL/ha.

Treatments were applied as a single broadcast foliar spray to capeweed (*Arctotheca calendula*) at the 7 leaf growth stage (BBCH 17) and annual ryegrass (*Lolium rigidum*) and wild oats (*Avena fatua*) at the first tiller growth stage (BBCH 21) using a hand-held boom fitted with Agrotop Airmix® flat fan air induction nozzles delivering 100 L/ha and generating coarse spray droplets (ASAE/BCPC).

Rainfall was slightly above the long-term median (Appendix iii – Weather Data). The seasonal conditions or other external factors did not compromise the results of the trial.

Weed counts were conducted by species across the UTC plots prior to treatment application and across all plots at 34 days after application (DA-A). Weed control was visually assessed by species at 10, 16 and 28 DA-A.

Factorial analysis showed that there were no significant differences in the level of visual capeweed control provided by Envirowet at 25-100 mL/100 L, Axiwetta, LI700, or nil adjuvant at any assessment timing.

Envirowet at 100 mL/100 L tank-mixed with Glyphosate significantly increased visual annual ryegrass control at 28 DA-A and significantly reduced annual ryegrass density at 34 DA-A when compared with Glyphosate applied with nil adjuvant, however, this was not observed when Envirowet was tank-mixed with Paraquat.

Although factorial analysis showed that the plots treated with Envirowet at 25-100 mL/100 L, Axiwetta, or LI700 displayed significantly greater visual control of wild oats at 10 DA-A than the plots treated with nil adjuvant, this was not observed at 16 or 28 DA-A.

INTRODUCTION

Aims

1. To compare the effectiveness of Envirowet Multi-Phase Surfactant with industry standard wetting agents when used with glyphosate 450 and paraquat 360 herbicides to control weeds in fallow.

Chronology of events

Date	Days after application A (DA-A)	Capeweed growth stage		Annual ryegrass growth stage				Wild oats growth stage	Event
		BBCH scale	Description	BBCH scale	Description	BBCH scale	Description		
16-Jul-2024	0	14-19	4-9 or more leaves unfolded	11-23	First leaf unfolded – 3 tillers visible	13-23	3 leaves unfolded – 3 tillers visible	Weed counts conducted. Treatments applied (timing A).	
26-Jul-2024	10	14-50	4 leaves unfolded – flower buds present, but enclosed	11-26	First leaf unfolded – 6 tillers visible	15-23	5 leaves unfolded – 3 tillers visible	Weed control assessed.	
1-Aug-2024	16	14-50	4 leaves unfolded - flower buds present, but enclosed	11-26	First leaf unfolded – 6 tillers visible	15-23	5 leaves unfolded – 3 tillers visible	Weed control assessed.	
13-Aug-2024	28	14-51	4 leaves unfolded – flower buds visible	11-59	First leaf unfolded – inflorescence fully emerged	17-31	7 leaves unfolded – first node at least 1 cm above tillering node	Weed control assessed.	
19-Aug-2024	34	14-51	4 leaves unfolded – flower buds visible	11-59	First leaf unfolded – inflorescence fully emerged	17-31	7 leaves unfolded – first node at least 1 cm above tillering node	Weed counts conducted.	

Products

Product	Active ingredient	Active ingredient concentration	Form type	Batch no.
Glyphosate 450	Glyphosate	450 g/L	SL	Not provided
Envirowet	-	-	SL	Not provided
Axiwetta	Alcohol alkoxylate	1000 g/L	L	37841
LI700	Soyal phospholipids + propionic acid	350 g/L + 350 g/L	SL	201063K
Paraquat 360	Paraquat	360 g/L	SL	Not provided

Treatments

Trt No.	Treatment Name	Rate	Rate Unit	Other Rate	Other Rate Unit	Appl Code
Factor A (Herbicide)						
1	Glyphosate 450	1.5	L/ha	675	g ai/ha	A
2	Paraquat 360	1.2	L/ha	432	g ai/ha	A
Factor B (Adjuvant)						
1	Nil					A
2	Envirowet 25	25	mL/100 L			A
3	Envirowet 50	50	mL/100 L			A
4	Envirowet 100	100	mL/100 L			A
5	Axiwetta	100	mL/100 L	100	g ai/ha	A
6	LI700	250	mL/100 L	175	g ai/ha	A
Comparison Treatments						
1	Untreated Control					

Trt No.	Treatment Name	Rate	Rate Unit	Other Rate	Other Rate Unit	Appl Code
1	Untreated Control					
2	Glyphosate 450 Nil	1.5	L/ha	675	g ai/ha	A A
3	Glyphosate 450 Envirowet 25	1.5 25	L/ha mL/100 L	675	g ai/ha	A A
4	Glyphosate 450 Envirowet 50	1.5 50	L/ha mL/100 L	675	g ai/ha	A A
5	Glyphosate 450 Envirowet 100	1.5 100	L/ha mL/100 L	675	g ai/ha	A A
6	Glyphosate 450 Axiwetta	1.5 100	L/ha mL/100 L	675 100	g ai/ha g ai/ha	A A
7	Glyphosate 450 LI700	1.5 250	L/ha mL/100 L	675 175	g ai/ha g ai/ha	A A
8	Paraquat 360 Nil	1.2	L/ha	432	g ai/ha	A A
9	Paraquat 360 Envirowet 25	1.2 25	L/ha mL/100 L	432	g ai/ha	A A
10	Paraquat 360 Envirowet 50	1.2 50	L/ha mL/100 L	432	g ai/ha	A A
11	Paraquat 360 Envirowet 100	1.2 100	L/ha mL/100 L	432	g ai/ha	A A
12	Paraquat 360 Axiwetta	1.2 100	L/ha mL/100 L	432 100	g ai/ha g ai/ha	A A
13	Paraquat 360 LI700	1.2 250	L/ha mL/100 L	432 175	g ai/ha g ai/ha	A A

Factor	Description
A	Herbicide
B	Adjuvant

RESULTS

Table 1 – Capeweed (Arctotheca calendula) count per m² at 0 and 34 DA-A (ANOVA)

Assessment Date					16-Jul-2024	19-Aug-2024
Part Assessed					PLANT, P	PLANT, P
Assessment Type					COUNT	COUNT
Assessment Unit					NUMBER	NUMBER
Reporting Basis					1 m2	1 m2
Number of Subsamples					1	3
Pest Stage Majority/Min/Max					17, 14, 19	50, 14, 51
Trt-Eval Interval					0 DA-A	34 DA-A
ARM Action Codes					T4	&AL T5
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	2	22
1	Untreated Control				100.0	230.3a
2	Glyphosate 450		1.5L/ha	A		17.7c
	Nil			A		
3	Glyphosate 450		1.5L/ha	A		11.0c
	Envirowet 25		25mL/100 L	A		
4	Glyphosate 450		1.5L/ha	A		14.0c
	Envirowet 50		50mL/100 L	A		
5	Glyphosate 450		1.5L/ha	A		17.3c
	Envirowet 100		100mL/100 L	A		
6	Glyphosate 450		1.5L/ha	A		16.7c
	Axiwetta		100mL/100 L	A		
7	Glyphosate 450		1.5L/ha	A		12.0c
	LI700		250mL/100 L	A		
8	Paraquat 360		1.2L/ha	A		140.3ab
	Nil			A		
9	Paraquat 360		1.2L/ha	A		148.0ab
	Envirowet 25		25mL/100 L	A		
10	Paraquat 360		1.2L/ha	A		150.3ab
	Envirowet 50		50mL/100 L	A		
11	Paraquat 360		1.2L/ha	A		111.3b
	Envirowet 100		100mL/100 L	A		
12	Paraquat 360		1.2L/ha	A		132.7ab
	Axiwetta		100mL/100 L	A		
13	Paraquat 360		1.2L/ha	A		119.3ab
	LI700		250mL/100 L	A		
LSD P=.05					.	NA
Standard Deviation					.	0.20t
CV					.	12.23t
Levene's F					.	1.106
Skewness					0.0	-0.3388
Kurtosis					1.5	-1.1117
Replicate F						7.268
Replicate Prob(F)						0.0006
Treatment F						27.007
Treatment Prob(F)						0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).
Could not calculate LSD (% mean diff) or mean separation letters for column 2 because error variance is 0.
AL = Data transformed using log transformation of X+1 with resulting letters of separation applied to original means.
&=Transformation applied to 'Plot' experimental unit means of subsamples
T4 = [C1]/20
T5 = [19]/0.25

Table 2 – Capeweed (Arctotheca calendula) count per m^2 at 34 DA-A (Factorial)

Assessment Date					19-Aug-2024
Part Assessed					PLANT, P
Assessment Type					COUNT
Assessment Unit					NUMBER
Reporting Basis					1 m2
Number of Subsamples					3
Pest Stage Majority/Min/Max					50, 14, 51
Trt-Eval Interval					34 DA-A
ARM Action Codes					T5
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	22
TABLE OF R MEANS					
Replicate 1					85.1
Replicate 2					93.6
Replicate 3					63.3
Replicate 4					54.9
TABLE OF A (Herbicide) MEANS					
1	Glyphosate 450		1.5L/ha	A	14.8b
2	Paraquat 360		1.2L/ha	A	133.7a
LSD P=.05					21.94
Standard Deviation					37.36
CV					50.33
TABLE OF B (Adjuvant) MEANS					
1	Nil			A	79.0-
2	Envirowet 25		25mL/100 L	A	79.5-
3	Envirowet 50		50mL/100 L	A	82.2-
4	Envirowet 100		100mL/100 L	A	64.3-
5	Axiwetta		100mL/100 L	A	74.7-
6	LI700		250mL/100 L	A	65.7-
LSD P=.05					38.00
Standard Deviation					37.36
CV					50.33
TABLE OF A (Herbicide) B (Adjuvant) MEANS					
1	Glyphosate 450		1.5L/ha	A	17.7-
1	Nil			A	
2	Paraquat 360		1.2L/ha	A	140.3-
1	Nil			A	
1	Glyphosate 450		1.5L/ha	A	11.0-
2	Envirowet 25		25mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	148.0-
2	Envirowet 25		25mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	14.0-
3	Envirowet 50		50mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	150.3-
3	Envirowet 50		50mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	17.3-
4	Envirowet 100		100mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	111.3-
4	Envirowet 100		100mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	16.7-
5	Axiwetta		100mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	132.7-
5	Axiwetta		100mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	12.0-
6	LI700		250mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	119.3-
6	LI700		250mL/100 L	A	
LSD P=.05					53.74
Standard Deviation					37.36
CV					50.33

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).
T5 = [19]/0.25

FACTORIAL/POOLED ERROR AOV For 19-Aug-2024 PLANT P COUNT NUMBER 1 m2 3 50 14 51 34 DA-A T5 (Data Column 22)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	232577.185185				
R	3	11816.296296	3938.765432	2.823	0.0539	
A	1	169614.814815	169614.814815	121.547	0.0001	21.9
B	5	2279.851852	455.970370	0.327	0.8932	38.0
AB	5	2815.851852	563.170370	0.404	0.8428	53.7
ERROR	33	46050.370370	1395.465769			

Table 3 – Capeweed (Arctotheca calendula) control at 10, 16 and 28 DA-A (ANOVA)

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	26-Jul-2024 12	1-Aug-2024 13	13-Aug-2024 16
Assessment Date					26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed					PLANT, P	PLANT, P	PLANT, P
Assessment Type					CONTRO	CONTRO	CONTRO
Assessment Unit					%UNCK	%UNCK	%UNCK
Reporting Basis					1 PLOT	1 PLOT	1 PLOT
Number of Subsamples					1	1	1
Pest Stage Majority/Min/Max					17, 14, 50	17, 14, 50	50, 14, 51
Trt-Eval Interval					10 DA-A	16 DA-A	28 DA-A
1	Untreated Control				0.0	0.0c	0.0d
2	Glyphosate 450	1.5	L/ha	A	0.0	33.8b	80.0a
	Nil			A			
3	Glyphosate 450	1.5	L/ha	A	0.0	35.0b	77.5a
	Envirowet 25	25	mL/100 L	A			
4	Glyphosate 450	1.5	L/ha	A	0.0	40.0b	80.0a
	Envirowet 50	50	mL/100 L	A			
5	Glyphosate 450	1.5	L/ha	A	0.0	40.0b	81.3a
	Envirowet 100	100	mL/100 L	A			
6	Glyphosate 450	1.5	L/ha	A	0.0	38.8b	78.8a
	Axiwetta	100	mL/100 L	A			
7	Glyphosate 450	1.5	L/ha	A	0.0	38.8b	77.5a
	LI700	250	mL/100 L	A			
8	Paraquat 360	1.2	L/ha	A	30.0	48.8a	37.5c
	Nil			A			
9	Paraquat 360	1.2	L/ha	A	27.5	47.5a	45.0bc
	Envirowet 25	25	mL/100 L	A			
10	Paraquat 360	1.2	L/ha	A	32.5	50.0a	40.0bc
	Envirowet 50	50	mL/100 L	A			
11	Paraquat 360	1.2	L/ha	A	37.5	50.0a	42.5bc
	Envirowet 100	100	mL/100 L	A			
12	Paraquat 360	1.2	L/ha	A	37.5	50.0a	47.5b
	Axiwetta	100	mL/100 L	A			
13	Paraquat 360	1.2	L/ha	A	37.5	48.8a	45.0bc
	LI700	250	mL/100 L	A			
LSD P=.05					10.56	6.65	8.28
Standard Deviation					7.37	4.64	5.77
CV					47.29	11.57	10.24
Levene's F					2.851*	1.791	0.977
Skewness					0.6795*	-1.8674*	-0.6816*
Kurtosis					-0.9816	3.5094*	-0.1884
Replicate F					5.043	2.226	0.635
Replicate Prob(F)					0.0051	0.1019	0.5972
Treatment F					23.197	33.700	74.668
Treatment Prob(F)					0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).
* An asterisk next to the Levene's statistic indicates that homogeneity of variance cannot be assumed, and no statistical differences can be confirmed.

Table 4 – Capeweed (Arctotheca calendula) control at 10, 16 and 28 DA-A (Factorial)

Assessment Date					26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed					PLANT, P	PLANT, P	PLANT, P
Assessment Type					CONTRO	CONTRO	CONTRO
Assessment Unit					%UNCK	%UNCK	%UNCK
Reporting Basis					1 PLOT	1 PLOT	1 PLOT
Number of Subsamples					1	1	1
Pest Stage Majority/Min/Max					17, 14, 50	17, 14, 50	50, 14, 51
Trt-Eval Interval					10 DA-A	16 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	12	13	16
TABLE OF R MEANS							
Replicate 1					24.2	45.0	62.9
Replicate 2					15.8	42.1	60.8
Replicate 3					14.2	45.4	59.6
Replicate 4					13.3	41.3	60.8
TABLE OF A (Herbicide) MEANS							
1	Glyphosate 450	1.5	L/ha	A	0.0b	37.7b	79.2a
2	Paraquat 360	1.2	L/ha	A	33.8a	49.2a	42.9b
LSD P=.05					4.44	2.82	3.53
Standard Deviation					7.56	4.81	6.01
CV					44.79	11.07	9.85
TABLE OF B (Adjuvant) MEANS							
1	Nil			A	15.0-	41.3-	58.8-
2	Envirowet 25	25	mL/100 L	A	13.8-	41.3-	61.3-
3	Envirowet 50	50	mL/100 L	A	16.3-	45.0-	60.0-
4	Envirowet 100	100	mL/100 L	A	18.8-	45.0-	61.9-
5	Axiwetta	100	mL/100 L	A	18.8-	44.4-	63.1-
6	LI700	250	mL/100 L	A	18.8-	43.8-	61.3-
LSD P=.05					7.69	4.89	6.12
Standard Deviation					7.56	4.81	6.01
CV					44.79	11.07	9.85
TABLE OF A (Herbicide) B (Adjuvant) MEANS							
1	Glyphosate 450	1.5	L/ha	A	0.0-	33.8-	80.0-
1	Nil			A			
2	Paraquat 360	1.2	L/ha	A	30.0-	48.8-	37.5-
1	Nil			A			
1	Glyphosate 450	1.5	L/ha	A	0.0-	35.0-	77.5-
2	Envirowet 25	25	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	27.5-	47.5-	45.0-
2	Envirowet 25	25	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	0.0-	40.0-	80.0-
3	Envirowet 50	50	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	32.5-	50.0-	40.0-
3	Envirowet 50	50	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	0.0-	40.0-	81.3-
4	Envirowet 100	100	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	37.5-	50.0-	42.5-
4	Envirowet 100	100	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	0.0-	38.8-	78.8-
5	Axiwetta	100	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	37.5-	50.0-	47.5-
5	Axiwetta	100	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	0.0-	38.8-	77.5-
6	LI700	250	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	37.5-	48.8-	45.0-
6	LI700	250	mL/100 L	A			
LSD P=.05					10.87	6.92	8.65
Standard Deviation					7.56	4.81	6.01
CV					44.79	11.07	9.85

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

FACTORIAL/POOLED ERROR AOV For 26-Jul-2024 PLANT P CONTRO % 1 PLOT 1 17 14 50 10 DA-A (Data Column 12)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	16831.250000				
R	3	889.583333	296.527778	5.190	0.0048	
A	1	13668.750000	13668.750000	239.241	0.0001	4.4
B	5	193.750000	38.750000	0.678	0.6430	7.7
AB	5	193.750000	38.750000	0.678	0.6430	10.9
ERROR	33	1885.416667	57.133838			

FACTORIAL/POOLED ERROR AOV For 1-Aug-2024 PLANT P CONTRO % 1 PLOT 1 17 14 50 16 DA-A (Data Column 13)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	2657.812500				
R	3	155.729167	51.909722	2.245	0.1014	
A	1	1575.520833	1575.520833	68.140	0.0001	2.8
B	5	123.437500	24.687500	1.068	0.3959	4.9
AB	5	40.104167	8.020833	0.347	0.8805	6.9
ERROR	33	763.020833	23.121843			

FACTORIAL/POOLED ERROR AOV For 13-Aug-2024 PLANT P CONTRO % 1 PLOT 1 50 14 51 28 DA-A (Data Column 16)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	17347.916667				
R	3	68.750000	22.916667	0.634	0.5987	
A	1	15768.750000	15768.750000	435.911	0.0001	3.5
B	5	91.666667	18.333333	0.507	0.7690	6.1
AB	5	225.000000	45.000000	1.244	0.3112	8.7
ERROR	33	1193.750000	36.174242			

Table 5 – Annual ryegrass (Lolium rigidum) count per m^2 at 0 and 34 DA-A (ANOVA)

Assessment Date					16-Jul-2024	19-Aug-2024
Part Assessed					PLANT, P	PLANT, P
Assessment Type					COUNT	COUNT
Assessment Unit					NUMBER	NUMBER
Reporting Basis					1 m2	1 m2
Number of Subsamples					1	3
Pest Stage Majority/Min/Max					21, 11, 23	21, 11, 59
Trt-Eval Interval					0 DA-A	34 DA-A
ARM Action Codes					T3	T7
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	4	24
1	Untreated Control				237.5	350.0a
2	Glyphosate 450	1.5	L/ha	A		172.7b
	Nil			A		
3	Glyphosate 450	1.5	L/ha	A		150.0bc
	Envirowet 25	25	mL/100 L	A		
4	Glyphosate 450	1.5	L/ha	A		139.3bc
	Envirowet 50	50	mL/100 L	A		
5	Glyphosate 450	1.5	L/ha	A		110.3c
	Envirowet 100	100	mL/100 L	A		
6	Glyphosate 450	1.5	L/ha	A		142.7bc
	Axiwetta	100	mL/100 L	A		
7	Glyphosate 450	1.5	L/ha	A		116.7c
	LI700	250	mL/100 L	A		
8	Paraquat 360	1.2	L/ha	A		141.3bc
	Nil			A		
9	Paraquat 360	1.2	L/ha	A		142.0bc
	Envirowet 25	25	mL/100 L	A		
10	Paraquat 360	1.2	L/ha	A		135.7bc
	Envirowet 50	50	mL/100 L	A		
11	Paraquat 360	1.2	L/ha	A		140.7bc
	Envirowet 100	100	mL/100 L	A		
12	Paraquat 360	1.2	L/ha	A		137.7bc
	Axiwetta	100	mL/100 L	A		
13	Paraquat 360	1.2	L/ha	A		133.0bc
	LI700	250	mL/100 L	A		
LSD P=.05					.	51.87
Standard Deviation					.	36.17
CV					.	23.37
Levene's F					.	1.018
Skewness					-2.0	2.2591*
Kurtosis					4.0	6.5005*
Replicate F						0.181
Replicate Prob(F)						0.9087
Treatment F						11.196
Treatment Prob(F)						0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).
Could not calculate LSD (% mean diff) or mean separation letters for column 4 because error variance is 0.
T3 = [C3]/20
T7 = [21]/0.25

Table 6 – Annual ryegrass (Lolium rigidum) count per m^2 at 34 DA-A (Factorial)

Assessment Date					19-Aug-2024
Part Assessed					PLANT, P
Assessment Type					COUNT
Assessment Unit					NUMBER
Reporting Basis					1 m2
Number of Subsamples					3
Pest Stage Majority/Min/Max					21, 11, 59
Trt-Eval Interval					34 DA-A
ARM Action Codes					T7
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	24
TABLE OF R MEANS					
Replicate 1					149.9
Replicate 2					141.4
Replicate 3					130.6
Replicate 4					132.1
TABLE OF A (Herbicide) MEANS					
1	Glyphosate 450		1.5L/ha	A	138.6-
2	Paraquat 360		1.2L/ha	A	138.4-
LSD P=.05					19.08
Standard Deviation					32.48
CV					23.45
TABLE OF B (Adjuvant) MEANS					
1	Nil			A	157.0-
2	Envirowet 25		25mL/100 L	A	146.0-
3	Envirowet 50		50mL/100 L	A	137.5-
4	Envirowet 100		100mL/100 L	A	125.5-
5	Axiwetta		100mL/100 L	A	140.2-
6	LI700		250mL/100 L	A	124.8-
LSD P=.05					33.04
Standard Deviation					32.48
CV					23.45
TABLE OF A (Herbicide) B (Adjuvant) MEANS					
1	Glyphosate 450		1.5L/ha	A	172.7-
1	Nil			A	
2	Paraquat 360		1.2L/ha	A	141.3-
1	Nil			A	
1	Glyphosate 450		1.5L/ha	A	150.0-
2	Envirowet 25		25mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	142.0-
2	Envirowet 25		25mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	139.3-
3	Envirowet 50		50mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	135.7-
3	Envirowet 50		50mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	110.3-
4	Envirowet 100		100mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	140.7-
4	Envirowet 100		100mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	142.7-
5	Axiwetta		100mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	137.7-
5	Axiwetta		100mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	116.7-
6	LI700		250mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	133.0-
6	LI700		250mL/100 L	A	
LSD P=.05					46.73
Standard Deviation					32.48
CV					23.45

Means followed by same symbol do not significantly differ (P=.05, LSD).
T7 = [21]/0.25

FACTORIAL/POOLED ERROR AOV For 19-Aug-2024 PLANT P COUNT NUMBER 1 m2 3 21 11 59 34 DA-A T7 (Data Column 24)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	48325.777778				
R	3	2907.703704	969.234568	0.919	0.4425	
A	1	0.592593	0.592593	0.001	0.9812	19.1
B	5	6064.444444	1212.888889	1.150	0.3543	33.0
AB	5	4541.629630	908.325926	0.861	0.5174	46.7
R	3	2907.703704	969.234568	0.919	0.4425	

Table 7 – Annual ryegrass (Lolium rigidum) control at 10, 16 and 28 DA-A (ANOVA)

Assessment Date						26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed						PLANT, P	PLANT, P	PLANT, P
Assessment Type						CONTRO	CONTRO	CONTRO
Assessment Unit						%UNCK	%UNCK	%UNCK
Reporting Basis						1 PLOT	1 PLOT	1 PLOT
Number of Subsamples						1	1	1
Pest Stage Majority/Min/Max						21, 11, 26	21, 11, 26	21, 11, 59
Trt-Eval Interval						10 DA-A	16 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code		10	14	18
1	Untreated Control					0.0	0.0	0.0e
2	Glyphosate 450	1.5	L/ha	A		50.0	50.0	67.5b
	Nil			A				
3	Glyphosate 450	1.5	L/ha	A		53.8	56.3	67.5b
	Envirowet 25	25	mL/100 L	A				
4	Glyphosate 450	1.5	L/ha	A		50.0	57.5	67.5b
	Envirowet 50	50	mL/100 L	A				
5	Glyphosate 450	1.5	L/ha	A		55.0	60.0	72.5a
	Envirowet 100	100	mL/100 L	A				
6	Glyphosate 450	1.5	L/ha	A		52.5	60.0	66.3bc
	Axiwetta	100	mL/100 L	A				
7	Glyphosate 450	1.5	L/ha	A		51.3	56.3	70.0ab
	LI700	250	mL/100 L	A				
8	Paraquat 360	1.2	L/ha	A		57.5	67.5	62.5cd
	Nil			A				
9	Paraquat 360	1.2	L/ha	A		53.8	65.0	61.3d
	Envirowet 25	25	mL/100 L	A				
10	Paraquat 360	1.2	L/ha	A		55.0	63.8	60.0d
	Envirowet 50	50	mL/100 L	A				
11	Paraquat 360	1.2	L/ha	A		60.0	67.5	66.3bc
	Envirowet 100	100	mL/100 L	A				
12	Paraquat 360	1.2	L/ha	A		60.0	70.0	66.3bc
	Axiwetta	100	mL/100 L	A				
13	Paraquat 360	1.2	L/ha	A		68.8	76.3	66.3bc
	LI700	250	mL/100 L	A				
LSD P=.05						7.98	6.02	4.86
Standard Deviation						5.57	4.20	3.39
CV						10.84	7.28	5.55
Levene's F						4.192*	3.656*	1.103
Skewness						-2.2274*	-2.3042*	-2.9517*
Kurtosis						5.3119*	5.3839*	7.7413*
Replicate F						1.179	1.236	0.153
Replicate Prob(F)						0.3312	0.3108	0.9268
Treatment F						34.107	79.055	121.158
Treatment Prob(F)						0.0001	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD).
* An asterisk next to the Levene's statistic indicates that homogeneity of variance cannot be assumed, and no statistical differences can be confirmed.

Table 8 – Annual ryegrass (Lolium rigidum) control at 10, 16 and 28 DA-A (Factorial)

Assessment Date				26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed				PLANT, P	PLANT, P	PLANT, P
Assessment Type				CONTRO	CONTRO	CONTRO
Assessment Unit				%UNCK	%UNCK	%UNCK
Reporting Basis				1 PLOT	1 PLOT	1 PLOT
Number of Subsamples				1	1	1
Pest Stage Majority/Min/Max				21, 11, 26	21, 11, 26	21, 11, 59
Trt-Eval Interval				10 DA-A	16 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	10	14	18
TABLE OF R MEANS							
Replicate 1					54.6	62.9	66.7
Replicate 2					58.3	64.2	65.8
Replicate 3					55.0	62.1	65.8
Replicate 4					54.6	60.8	66.3
TABLE OF A (Herbicide) MEANS							
1	Glyphosate 450	1.5	L/ha	A	52.1b	56.7b	68.5a
2	Paraquat 360	1.2	L/ha	A	59.2a	68.3a	63.8b
LSD P=.05					3.40	2.56	2.08
Standard Deviation					5.79	4.37	3.54
CV					10.41	6.99	5.35
TABLE OF B (Adjuvant) MEANS							
1	Nil			A	53.8-	58.8c	65.0bc
2	Envirowet 25	25	mL/100 L	A	53.8-	60.6bc	64.4c
3	Envirowet 50	50	mL/100 L	A	52.5-	60.6bc	63.8c
4	Envirowet 100	100	mL/100 L	A	57.5-	63.8ab	69.4a
5	Axiwetta	100	mL/100 L	A	56.3-	65.0ab	66.3abc
6	LI700	250	mL/100 L	A	60.0-	66.3a	68.1ab
LSD P=.05					5.89	4.44	3.60
Standard Deviation					5.79	4.37	3.54
CV					10.41	6.99	5.35
TABLE OF A (Herbicide) B (Adjuvant) MEANS							
1	Glyphosate 450	1.5	L/ha	A	50.0-	50.0f	67.5-
1	Nil			A			
2	Paraquat 360	1.2	L/ha	A	57.5-	67.5b	62.5-
1	Nil			A			
1	Glyphosate 450	1.5	L/ha	A	53.8-	56.3ef	67.5-
2	Envirowet 25	25	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	53.8-	65.0bc	61.3-
2	Envirowet 25	25	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	50.0-	57.5de	67.5-
3	Envirowet 50	50	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	55.0-	63.8bcd	60.0-
3	Envirowet 50	50	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	55.0-	60.0cde	72.5-
4	Envirowet 100	100	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	60.0-	67.5b	66.3-
4	Envirowet 100	100	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	52.5-	60.0cde	66.3-
5	Axiwetta	100	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	60.0-	70.0ab	66.3-
5	Axiwetta	100	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	51.3-	56.3ef	70.0-
6	LI700	250	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	68.8-	76.3a	66.3-
6	LI700	250	mL/100 L	A			
LSD P=.05					8.33	6.28	5.09
Standard Deviation					5.79	4.37	3.54
CV					10.41	6.99	5.35

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

FACTORIAL/POOLED ERROR AOV For 26-Jul-2024 PLANT P CONTRO % 1 PLOT 1 21 11 26 10 DA-A (Data Column 10)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	2481.250000				
R	3	118.750000	39.583333	1.181	0.3320	
A	1	602.083333	602.083333	17.960	0.0002	3.4
B	5	318.750000	63.750000	1.902	0.1207	5.9
AB	5	335.416667	67.083333	2.001	0.1043	8.3
ERROR	33	1106.250000	33.522727			

FACTORIAL/POOLED ERROR AOV For 1-Aug-2024 PLANT P CONTRO % 1 PLOT 1 21 11 26 16 DA-A (Data Column 14)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	3000.000000				
R	3	70.833333	23.611111	1.238	0.3114	
A	1	1633.333333	1633.333333	85.669	0.0001	2.6
B	5	343.750000	68.750000	3.606	0.0103	4.4
AB	5	322.916667	64.583333	3.387	0.0140	6.3
ERROR	33	629.166667	19.065657			

FACTORIAL/POOLED ERROR AOV For 13-Aug-2024 PLANT P CONTRO % 1 PLOT 1 21 11 59 28 DA-A (Data Column 18)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	961.979167				
R	3	5.729167	1.909722	0.153	0.9273	
A	1	275.520833	275.520833	22.014	0.0001	2.1
B	5	196.354167	39.270833	3.138	0.0200	3.6
AB	5	71.354167	14.270833	1.140	0.3590	5.1
ERROR	33	413.020833	12.515783			

Table 9 – Wild oats (Avena fatua) count per m^2 at 0 and 34 DA-A (ANOVA)

Assessment Date					16-Jul-2024	19-Aug-2024
Part Assessed					PLANT, P	PLANT, P
Assessment Type					COUNT	COUNT
Assessment Unit					NUMBER	NUMBER
Reporting Basis					1 m2	1 m2
Number of Subsamples					1	3
Pest Stage Majority/Min/Max					21, 13, 23	22, 17, 31
Trt-Eval Interval					0 DA-A	34 DA-A
ARM Action Codes					T1	&AS T6
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	8	23
1	Untreated Control				27.5	43.3a
2	Glyphosate 450	1.5	L/ha	A		35.3ab
	Nil			A		
3	Glyphosate 450	1.5	L/ha	A		19.0bcd
	Envirowet 25	25	mL/100 L	A		
4	Glyphosate 450	1.5	L/ha	A		33.0abc
	Envirowet 50	50	mL/100 L	A		
5	Glyphosate 450	1.5	L/ha	A		21.0a-d
	Envirowet 100	100	mL/100 L	A		
6	Glyphosate 450	1.5	L/ha	A		41.7a
	Axiwetta	100	mL/100 L	A		
7	Glyphosate 450	1.5	L/ha	A		30.0abc
	LI700	250	mL/100 L	A		
8	Paraquat 360	1.2	L/ha	A		30.0abc
	Nil			A		
9	Paraquat 360	1.2	L/ha	A		16.7bcd
	Envirowet 25	25	mL/100 L	A		
10	Paraquat 360	1.2	L/ha	A		14.0bcd
	Envirowet 50	50	mL/100 L	A		
11	Paraquat 360	1.2	L/ha	A		13.3cd
	Envirowet 100	100	mL/100 L	A		
12	Paraquat 360	1.2	L/ha	A		12.7cd
	Axiwetta	100	mL/100 L	A		
13	Paraquat 360	1.2	L/ha	A		9.3d
	LI700	250	mL/100 L	A		
LSD P=.05					.	NA
Standard Deviation					.	1.54t
CV					.	32.92t
Levene's F					.	0.449
Skewness					0.8771	0.3325
Kurtosis					1.9339	-0.2262
Replicate F						0.839
Replicate Prob(F)						0.4816
Treatment F						2.349
Treatment Prob(F)						0.0239

Means followed by same letter do not significantly differ (P=.05, LSD).
Could not calculate LSD (% mean diff) or mean separation letters for column 8 because error variance is 0.
AS = Data transformed using square root transformation of X+0.5 with resulting letters of separation applied to original means.
&=Transformation applied to 'Plot' experimental unit means of subsamples
T1 = [C7]/20
T6 = [20]/0.25

Table 10 – Wild oats (Avena fatua) count per m^2 at 34 DA-A (Factorial)

Assessment Date					19-Aug-2024
Part Assessed					PLANT, P
Assessment Type					COUNT
Assessment Unit					NUMBER
Reporting Basis					1 m2
Number of Subsamples					3
Pest Stage Majority/Min/Max					22, 17, 31
Trt-Eval Interval					34 DA-A
ARM Action Codes					T6
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	23
TABLE OF R MEANS					
Replicate 1					22.9
Replicate 2					20.9
Replicate 3					28.0
Replicate 4					20.2
TABLE OF A (Herbicide) MEANS					
1	Glyphosate 450		1.5L/ha	A	30.0a
2	Paraquat 360		1.2L/ha	A	16.0b
LSD P=.05					8.94
Standard Deviation					15.22
CV					66.19
TABLE OF B (Adjuvant) MEANS					
1	Nil			A	32.7-
2	Envirowet 25		25mL/100 L	A	17.8-
3	Envirowet 50		50mL/100 L	A	23.5-
4	Envirowet 100		100mL/100 L	A	17.2-
5	Axiwetta		100mL/100 L	A	27.2-
6	LI700		250mL/100 L	A	19.7-
LSD P=.05					15.49
Standard Deviation					15.22
CV					66.19
TABLE OF A (Herbicide) B (Adjuvant) MEANS					
1	Glyphosate 450		1.5L/ha	A	35.3-
1	Nil			A	
2	Paraquat 360		1.2L/ha	A	30.0-
1	Nil			A	
1	Glyphosate 450		1.5L/ha	A	19.0-
2	Envirowet 25		25mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	16.7-
2	Envirowet 25		25mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	33.0-
3	Envirowet 50		50mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	14.0-
3	Envirowet 50		50mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	21.0-
4	Envirowet 100		100mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	13.3-
4	Envirowet 100		100mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	41.7-
5	Axiwetta		100mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	12.7-
5	Axiwetta		100mL/100 L	A	
1	Glyphosate 450		1.5L/ha	A	30.0-
6	LI700		250mL/100 L	A	
2	Paraquat 360		1.2L/ha	A	9.3-
6	LI700		250mL/100 L	A	
LSD P=.05					21.90
Standard Deviation					15.22
CV					66.19

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).
T6 = [20]/0.25

FACTORIAL/POOLED ERROR AOV For 19-Aug-2024 PLANT P COUNT NUMBER 1 m2 3 22 17 31 34 DA-A T6 (Data Column 23)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	13000.888889				
R	3	446.222222	148.740741	0.642	0.5936	
A	1	2352.000000	2352.000000	10.149	0.0031	8.9
B	5	1463.111111	292.622222	1.263	0.3032	15.5
AB	5	1091.555556	218.311111	0.942	0.4670	21.9
ERROR	33	7648.000000	231.757576			

Table 11 – Wild oats (Avena fatua) control at 10, 16 and 28 DA-A (ANOVA)

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	26-Jul-2024	1-Aug-2024	13-Aug-2024
Assessment Date					26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed					PLANT, P	PLANT, P	PLANT, P
Assessment Type					CONTRO	CONTRO	CONTRO
Assessment Unit					%UNCK	%UNCK	%UNCK
Reporting Basis					1 PLOT	1 PLOT	1 PLOT
Number of Subsamples					1	1	1
Pest Stage Majority/Min/Max					21, 15, 23	21, 15, 23	22, 17, 31
Trt-Eval Interval					10 DA-A	16 DA-A	28 DA-A
1	Untreated Control				0.0e	0.0c	0.0d
2	Glyphosate 450	1.5	L/ha	A	28.8d	32.5b	40.0c
	Nil			A			
3	Glyphosate 450	1.5	L/ha	A	32.5cd	36.3b	42.5c
	Envirowet 25	25	mL/100 L	A			
4	Glyphosate 450	1.5	L/ha	A	32.5cd	35.0b	37.5c
	Envirowet 50	50	mL/100 L	A			
5	Glyphosate 450	1.5	L/ha	A	37.5c	37.5b	42.5c
	Envirowet 100	100	mL/100 L	A			
6	Glyphosate 450	1.5	L/ha	A	32.5cd	32.5b	42.5c
	Axiwetta	100	mL/100 L	A			
7	Glyphosate 450	1.5	L/ha	A	35.0cd	35.0b	37.5c
	LI700	250	mL/100 L	A			
8	Paraquat 360	1.2	L/ha	A	35.0cd	52.5a	61.3b
	Nil			A			
9	Paraquat 360	1.2	L/ha	A	47.5b	52.5a	61.3b
	Envirowet 25	25	mL/100 L	A			
10	Paraquat 360	1.2	L/ha	A	52.5ab	55.0a	62.5ab
	Envirowet 50	50	mL/100 L	A			
11	Paraquat 360	1.2	L/ha	A	47.5b	55.0a	66.3ab
	Envirowet 100	100	mL/100 L	A			
12	Paraquat 360	1.2	L/ha	A	55.0ab	55.0a	67.5ab
	Axiwetta	100	mL/100 L	A			
13	Paraquat 360	1.2	L/ha	A	56.3a	58.8a	70.0a
	LI700	250	mL/100 L	A			
LSD P=.05					8.64	8.14	8.73
Standard Deviation					6.02	5.68	6.09
CV					15.9	13.73	12.53
Levene's F					1.684	1.122	1.633
Skewness					-0.7996*	-1.0428*	-0.9902*
Kurtosis					0.7965	0.9661	0.7012
Replicate F					1.890	0.537	4.027
Replicate Prob(F)					0.1488	0.6600	0.0144
Treatment F					24.347	32.036	39.895
Treatment Prob(F)					0.0001	0.0001	0.0001

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

Table 12 – Wild oats (Avena fatua) control at 10, 16 and 28 DA-A (Factorial)

Assessment Date					26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed					PLANT, P	PLANT, P	PLANT, P
Assessment Type					CONTRO	CONTRO	CONTRO
Assessment Unit					%UNCK	%UNCK	%UNCK
Reporting Basis					1 PLOT	1 PLOT	1 PLOT
Number of Subsamples					1	1	1
Pest Stage Majority/Min/Max					21, 15, 23	21, 15, 23	22, 17, 31
Trt-Eval Interval					10 DA-A	16 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	11	15	17
TABLE OF R MEANS							
Replicate 1					38.3	44.2	47.5
Replicate 2					44.2	44.2	53.3
Replicate 3					41.7	44.2	56.3
Replicate 4					40.0	46.7	53.3
TABLE OF A (Herbicide) MEANS							
1	Glyphosate 450	1.5	L/ha	A	33.1b	34.8b	40.4b
2	Paraquat 360	1.2	L/ha	A	49.0a	54.8a	64.8a
LSD P=.05					3.67	3.48	3.68
Standard Deviation					6.25	5.92	6.27
CV					15.23	13.22	11.91
TABLE OF B (Adjuvant) MEANS							
1	Nil			A	31.9b	42.5-	50.6-
2	Envirowet 25	25	mL/100 L	A	40.0a	44.4-	51.9-
3	Envirowet 50	50	mL/100 L	A	42.5a	45.0-	50.0-
4	Envirowet 100	100	mL/100 L	A	42.5a	46.3-	54.4-
5	Axiwetta	100	mL/100 L	A	43.8a	43.8-	55.0-
6	LI700	250	mL/100 L	A	45.6a	46.9-	53.8-
LSD P=.05					6.36	6.02	6.38
Standard Deviation					6.25	5.92	6.27
CV					15.23	13.22	11.91
TABLE OF A (Herbicide) B (Adjuvant) MEANS							
1	Glyphosate 450	1.5	L/ha	A	28.8-	32.5-	40.0-
1	Nil			A			
2	Paraquat 360	1.2	L/ha	A	35.0-	52.5-	61.3-
1	Nil			A			
1	Glyphosate 450	1.5	L/ha	A	32.5-	36.3-	42.5-
2	Envirowet 25	25	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	47.5-	52.5-	61.3-
2	Envirowet 25	25	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	32.5-	35.0-	37.5-
3	Envirowet 50	50	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	52.5-	55.0-	62.5-
3	Envirowet 50	50	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	37.5-	37.5-	42.5-
4	Envirowet 100	100	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	47.5-	55.0-	66.3-
4	Envirowet 100	100	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	32.5-	32.5-	42.5-
5	Axiwetta	100	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	55.0-	55.0-	67.5-
5	Axiwetta	100	mL/100 L	A			
1	Glyphosate 450	1.5	L/ha	A	35.0-	35.0-	37.5-
6	LI700	250	mL/100 L	A			
2	Paraquat 360	1.2	L/ha	A	56.3-	58.8-	70.0-
6	LI700	250	mL/100 L	A			
LSD P=.05					8.99	8.52	9.02
Standard Deviation					6.25	5.92	6.27
CV					15.23	13.22	11.91

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

FACTORIAL/POOLED ERROR AOV For 26-Jul-2024 PLANT P CONTRO % 1 PLOT 1 21 15 23 10 DA-A (Data Column 11)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	5897.916667				
R	3	222.916667	74.305556	1.901	0.1486	
A	1	3008.333333	3008.333333	76.982	0.0001	3.7
B	5	941.666667	188.333333	4.819	0.0020	6.4
AB	5	435.416667	87.083333	2.228	0.0747	9.0
ERROR	33	1289.583333	39.078283			

FACTORIAL/POOLED ERROR AOV For 1-Aug-2024 PLANT P CONTRO % 1 PLOT 1 21 15 23 16 DA-A (Data Column 15)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	6197.916667				
	3	56.250000	18.750000	0.535	0.6614	
A	1	4800.000000	4800.000000	136.995	0.0001	3.5
B	5	104.166667	20.833333	0.595	0.7042	6.0
AB	5	81.250000	16.250000	0.464	0.8003	8.5
ERROR	33	1156.250000	35.037879			

FACTORIAL/POOLED ERROR AOV For 13-Aug-2024 PLANT P CONTRO % 1 PLOT 1 22 17 31 28 DA-A (Data Column 17)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	9299.479167				
	3	484.895833	161.631944	4.115	0.0138	
A	1	7129.687500	7129.687500	181.493	0.0001	3.7
B	5	171.354167	34.270833	0.872	0.5101	6.4
AB	5	217.187500	43.437500	1.106	0.3762	9.0
ERROR	33	1296.354167	39.283460			

DISCUSSION

A small plot trial was established near Beverley, Western Australia in 2024 compare the effectiveness of Envirowet Multi-Phase Surfactant with industry standard wetting agents when used with Glyphosate 450 and Paraquat 360 herbicides to control weeds in fallow.

Treatments were applied as a single broadcast foliar spray to capeweed (*Arctotheca calendula*) at the 7 leaf growth stage (BBCH 17) and annual ryegrass (*Lolium rigidum*) and wild oats (*Avena fatua*) at the first tiller growth stage (BBCH 21) using a hand-held boom fitted with Agrotop Airmix® flat fan air induction nozzles delivering 100 L/ha and generating coarse spray droplets (ASAE/BCPC).

Rainfall was slightly above the long-term median (Appendix iii – Weather Data). The seasonal conditions or other external factors did not compromise the results of the trial.

Weed counts were conducted by species across the UTC plots prior to treatment application and across all plots at 34 days after application (DA-A). Weed control was visually assessed by species at 10, 16 and 28 DA-A.

Capeweed control (Tables 1-4)

Factorial analysis showed that there were no significant differences in the level of visual capeweed control provided by Envirowet at 25-100 mL/100 L, Axiwetta, LI700, or nil adjuvant at any assessment timing. Count data collected at 34 DA-A, also showed no significant differences in capeweed densities between adjuvant treatments.

Annual ryegrass control (Tables 5-8)

Factorial analysis showed that the plots treated with Envirowet at 100 mL/100 L, Axiwetta, or LI700 displayed significantly greater visual control of annual ryegrass at 16 DA-A when compared with the plots treated with nil adjuvant. At 28 DA-A factorial analysis showed that only the plots treated with Envirowet at 100 mL/100 L displayed significantly greater visual control of annual ryegrass at then the plots treated with nil adjuvant. However, one way analysis of variance showed it was only when Envirowet at 100 mL/100 L was tank-mixed with Glyphosate that a significant increase in visual annual ryegrass control was observed; the addition of an adjuvant to Paraquat did not significantly increase visual annual ryegrass control at 28 DA-A. One-way analysis of variance of counts conducted at 34 DA-A showed that Glyphosate plus Envirowet at 100 mL/100 L or LI700 displayed significantly lower mean annual ryegrass densities than Glyphosate plus nil adjuvant, Paraquat applied with an adjuvant did not significantly reduce annual ryegrass densities when compared with Paraquat applied with nil adjuvant.

Wild oats control (Tables 9-12)

Factorial analysis showed that the plots treated with Envirowet at 25-100 mL/100 L, Axiwetta, or LI700 displayed significantly greater visual control of wild oats at 10 DA-A than the plots treated with nil adjuvant, however differences between the plots treated with an adjuvant and those treated with nil adjuvant were not significant at 16 or 28 DA-A and although counts conducted at 34 DA-A showed that wild oat densities were lower across the plots treated with an adjuvant when compared with the plots treated with nil adjuvant, this was not significant.

CONCLUSIONS

Factorial analysis showed that there were no significant differences in the level of visual capeweed control provided by Envirowet at 25-100 mL/100 L, Axiwetta, LI700, or nil adjuvant at any assessment timing.

Envirowet at 100 mL/100 L tank-mixed with Glyphosate significantly increased visual annual ryegrass control at 28 DA-A and significantly reduced annual ryegrass density at 34 DA-A when compared with Glyphosate applied with nil adjuvant, however, this was not observed when Envirowet was tank-mixed with Paraquat.

Although factorial analysis showed that the plots treated with Envirowet at 25-100 mL/100 L, Axiwetta, or LI700 displayed significantly greater visual control of wild oats at 10 DA-A than the plots treated with nil adjuvant, this was not observed at 16 or 28 DA-A.

APPENDICES

Appendix i - Trial details

Trial Site Information

Location	Beverley, WA
GPS Co-ordinates	-32.157839, 116.679597
Treated Plot Width	2 m
Treated Plot Length	10 m
Treated Plot Area	10 m^2
Replications	4
Treatments	13
Site Type	Field
Experimental Unit	1 Plot
Study Design	Factorial (RCB)

Cooperator

Name	Antonio Alvaro
Address	1271 Dobaderry Road, Beverley, WA 6304
Mobile	0432 076 399
E-Mail	antonioalvaro007@gmail.com

Crop Description

Common Name	Fallow
ARM Code	YBRAC

Pest Description

Scientific Name	*Arctotheca calendula*	*Lolium rigidum*	*Avena* sp.
Common Name	Capeweed	Annual ryegrass	Wild oats
ARM Code	AROCA	LOLRI	AVESS

Application Description

Code	A
Date	16-Jul-2024
Method	SPRAY
Timing	ATGRST
Placement	FOLIAR
Air Temperature	18.8°C
% Relative Humidity	54.5
Wind Velocity	11 KPH
Wind Direction	SW
Wet Leaves (Y/N)	N, no
Soil Moisture	DRY
% Cloud Cover	0

Application Equipment

Code	A
Type	SPRAYE
Operation Pressure	300 kPa
Nozzle Model	110-015
Nozzle Type	FLAFAI
Nozzle Calibration	600 mL/MIN
Boom Height	60.0 cm
Ground Speed	7.2 KPH
Carrier	WATER
Application Amount	100 L/ha
Mix Size	2.0 L

Pest Stage at Each Application

Code	A
ARM Code	AROCA
Majority, %	17
Minimum, %	14
Maximum, %	19
Diameter Average	12 cm
ARM Code	LOLRI
Majority, %	21
Minimum, %	11
Maximum, %	23
Height Average	10 cm
ARM Code	AVESS
Majority, %	21
Minimum, %	13
Maximum, %	23
Height Average	14 cm

Trial plan

Rep	Blk									
3	2	201 10 A2 B3	202 12 A2 B5	203 9 A2 B2	204 11 A2 B4	205 5 A1 B4	206 7 A1 B6	207 2 A1 B1	208 13 A2 B6	209 1
1	1	101 11 A2 B4	102 3 A1 B2	103 10 A2 B3	104 1	105 9 A2 B2	106 5 A1 B4	107 7 A1 B6	108 2 A1 B1	109 12 A2 B5

Rep	Blk								
3	2	210 6 A1 B5	211 8 A2 B1	212 3 A1 B2	213 4 A1 B3	214 7 A1 B6	215 1	216 6 A1 B5	217 10 A2 B3	218 13 A2 B6
1	1	110 4 A1 B3	111 13 A2 B6	112 8 A2 B1	113 6 A1 B5	114 13 A2 B6	115 4 A1 B3	116 7 A1 B6	117 6 A1 B5	118 2 A1 B1

Rep	Blk								
3	2	219 8 A2 B1	220 4 A1 B3	221 11 A2 B4	222 9 A2 B2	223 3 A1 B2	224 2 A1 B1	225 12 A2 B5	226 5 A1 B4
1	1	119 3 A1 B2	120 1	121 8 A2 B1	122 10 A2 B3	123 9 A2 B2	124 5 A1 B4	125 11 A2 B4	126 12 A2 B5

Factor	Description
A	Herbicide
B	Adjuvant

Assessment Techniques

Assessment type	Scale	Method
(Pre-spray) Weed Count	plants/m^2	The total number of weeds per whole plot (2m x 10m) was counted by species. Data was converted to number of weeds per square metre.
Weed Count	plants/m^2	The number of weeds in 3 x 0.25m^2 quadrats per plot was counted by species and converted to the number of weeds per m^2.
Weed Control	%UNCK	Percent weed control was visually assessed in each plot relative to the untreated in the same replicate whereby: 0 = No control, weed healthy 10 = Some slight discolouration of leaves 20 = Some slight discolouration of leaves; 10% biomass reduction 30 = Some discolouration of leaves; 20% biomass reduction 40 = Some distinct yellowing of leaves; 30% biomass reduction 50 = Most plants yellowing; some plant distortion (if present); some necrosis;40 % biomass reduction 60 = Most plants yellowing; some plant distortion (if present); some necrosis; 50% biomass reduction 70 = Most plants yellowing; some plant distortion (if present); some necrosis; 60% biomass reduction 80 = Most plants dying; significant plant distortion (if present); 70% biomass reduction 90 = Most plants dead or dying; significant plant distortion (if present); 80% biomass reduction 100 = All plants dead

Statistical interpretation

All data from this trial was analysed using a confidence limit of 95%, unless otherwise specified. Mean comparisons were performed only when the treatment probability of F that was calculated during analysis of variance was significant at the observed significance level specified for the mean comparison test. All mention of significant differences contained within this report refer to statistically significant differences. Levene's test was used to test for homogeneity.

If ANOVA assumptions (homogeneity of variance and normality) were not met, where possible, the data was transformed using the appropriate transformation. The ANOVA table provides the original means with the transformed letters of separation. The calculation of F values is developed from transformed data units and as the LSD is calculated from these values it will also apply to the transformed data. This means that comparison of treatment means needs to rely on the letters of significance and not the LSD and that treatment data with the same number and different letters of separation can result from statistics relying on transformed data.

Abbreviation guide

Trial Details

ATGRST = at growing stage
kPa = kilopascal
FLAFAI = flat - fan air induction
mL/MIN = millilitre per minute
L/ha = litres per hectare

Data Tables

Part Assessed
PLANT = plant
PLOT = plot
P = Pest is Part Rated

Assessment Type
COUNT = count
CONTRO = control / burndown or knockdown

Assessment Unit
NUMBER = number
%, 0, 100 = percent
m2 = square meter
PLOT = total plot

ARM Action Codes
AL = Automatic log transformation of X+1
AS = Automatic square root transformation of X+0.5
&=Transformation applied to 'Plot' experimental unit means of subsamples.

Appendix ii - Plot data

Table 1 - Capeweed (Arctotheca calendula) count at 0 and 34 DA-A

Assessment Date						16-Jul-2024	19-Aug-2024
Part Assessed						PLANT, P	PLANT, P
Assessment Type						COUNT	COUNT
Assessment Unit						NUMBER	NUMBER
Reporting Basis						20 m2	0.25 m2
Number of Subsamples						1	3
Pest Stage Majority/Min/Max						17, 14, 19	50, 14, 51
Trt-Eval Interval						0 DA-A	34 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	1	19
1	Untreated Control				104	2000.0	71.3
					120	2500.0	39.7
					209	2000.0	80.0
					215	1500.0	39.3
					Mean =	2000.0	57.6
2	Glyphosate 450	1.5	L/ha	A	108		5.3
	Nil			A	118		9.0
					207		3.0
					224		0.3
					Mean =	.	4.4
3	Glyphosate 450	1.5	L/ha	A	102		5.0
	Envirowet 25	25	mL/100 L	A	119		2.0
					212		1.3
					223		2.7
					Mean =	.	2.8
4	Glyphosate 450	1.5	L/ha	A	110		4.0
	Envirowet 50	50	mL/100 L	A	115		4.3
					213		2.3
					220		3.3
					Mean =	.	3.5
5	Glyphosate 450	1.5	L/ha	A	106		6.0
	Envirowet 100	100	mL/100 L	A	124		6.3
					205		4.0
					226		1.0
					Mean =	.	4.3
6	Glyphosate 450	1.5	L/ha	A	113		8.7
	Axiwetta	100	mL/100 L	A	117		3.7
					210		2.7
					216		1.7
					Mean =	.	4.2
7	Glyphosate 450	1.5	L/ha	A	107		3.0
	LI700	250	mL/100 L	A	116		4.3
					206		3.3
					214		1.3
					Mean =	.	3.0
8	Paraquat 360	1.2	L/ha	A	112		31.0
	Nil			A	121		30.7
					211		50.0
					219		28.7
					Mean =	.	35.1
9	Paraquat 360	1.2	L/ha	A	105		56.0
	Envirowet 25	25	mL/100 L	A	123		34.3
					203		31.0
					222		26.7
					Mean =	.	37.0
10	Paraquat 360	1.2	L/ha	A	103		47.0
	Envirowet 50	50	mL/100 L	A	122		38.0
					201		20.0
					217		45.3
					Mean =	.	37.6
11	Paraquat 360	1.2	L/ha	A	101		18.0
	Envirowet 100	100	mL/100 L	A	125		49.3
					204		26.3

				221		17.7
				Mean =	.	27.8
12	Paraquat 360	1.2L/ha	A	109		45.0
	Axiwetta	100mL/100 L	A	126		57.0
				202		15.3
				225		15.3
				Mean =	.	33.2
13	Paraquat 360	1.2L/ha	A	111		26.3
	LI700	250mL/100 L	A	114		41.7
				208		30.7
				218		20.7
				Mean =	.	29.8

Table 2 - Capeweed (Arctotheca calendula) control at 10, 16 and 28 DA-A

Assessment Date						26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed						PLANT, P	PLANT, P	PLANT, P
Assessment Type						CONTRO	CONTRO	CONTRO
Assessment Unit						%UNCK	%UNCK	%UNCK
Reporting Basis						1 PLOT	1 PLOT	1 PLOT
Number of Subsamples						1	1	1
Pest Stage Majority/Min/Max						17, 14, 50	17, 14, 50	50, 14, 51
Trt-Eval Interval						10 DA-A	16 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	12	13	16
1	Untreated Control				104	0.0	0.0	0.0
					120	0.0	0.0	0.0
					209	0.0	0.0	0.0
					215	0.0	0.0	0.0
					Mean =	0.0	0.0	0.0
2	Glyphosate 450	1.5	L/ha	A	108	0.0	35.0	85.0
	Nil			A	118	0.0	40.0	75.0
					207	0.0	35.0	80.0
					224	0.0	25.0	80.0
					Mean =	0.0	33.8	80.0
3	Glyphosate 450	1.5	L/ha	A	102	0.0	40.0	80.0
	Envirowet 25	25	mL/100 L	A	119	0.0	30.0	75.0
					212	0.0	40.0	75.0
					223	0.0	30.0	80.0
					Mean =	0.0	35.0	77.5
4	Glyphosate 450	1.5	L/ha	A	110	0.0	40.0	85.0
	Envirowet 50	50	mL/100 L	A	115	0.0	40.0	80.0
					213	0.0	40.0	75.0
					220	0.0	40.0	80.0
					Mean =	0.0	40.0	80.0
5	Glyphosate 450	1.5	L/ha	A	106	0.0	40.0	85.0
	Envirowet 100	100	mL/100 L	A	124	0.0	45.0	80.0
					205	0.0	45.0	75.0
					226	0.0	30.0	85.0
					Mean =	0.0	40.0	81.3
6	Glyphosate 450	1.5	L/ha	A	113	0.0	40.0	80.0
	Axiwetta	100	mL/100 L	A	117	0.0	40.0	85.0
					210	0.0	40.0	80.0
					216	0.0	35.0	70.0
					Mean =	0.0	38.8	78.8
7	Glyphosate 450	1.5	L/ha	A	107	0.0	35.0	80.0
	LI700	250	mL/100 L	A	116	0.0	45.0	85.0
					206	0.0	45.0	70.0
					214	0.0	30.0	75.0
					Mean =	0.0	38.8	77.5
8	Paraquat 360	1.2	L/ha	A	112	50.0	50.0	30.0
	Nil			A	121	30.0	45.0	40.0
					211	30.0	50.0	40.0
					219	10.0	50.0	40.0
					Mean =	30.0	48.8	37.5
9	Paraquat 360	1.2	L/ha	A	105	40.0	50.0	40.0
	Envirowet 25	25	mL/100 L	A	123	20.0	40.0	40.0
					203	20.0	50.0	50.0
					222	30.0	50.0	50.0
					Mean =	27.5	47.5	45.0
10	Paraquat 360	1.2	L/ha	A	103	50.0	50.0	40.0
	Envirowet 50	50	mL/100 L	A	122	30.0	45.0	40.0
					201	30.0	50.0	40.0
					217	20.0	55.0	40.0
					Mean =	32.5	50.0	40.0
11	Paraquat 360	1.2	L/ha	A	101	60.0	60.0	50.0
	Envirowet 100	100	mL/100 L	A	125	40.0	40.0	30.0
					204	20.0	50.0	50.0
					221	30.0	50.0	40.0

				Mean =	37.5	50.0	42.5
12	Paraquat 360	1.2L/ha	A	109	40.0	50.0	50.0
	Axiwetta	100mL/100 L	A	126	40.0	50.0	50.0
				202	30.0	50.0	50.0
				225	40.0	50.0	40.0
				Mean =	37.5	50.0	47.5
13	Paraquat 360	1.2L/ha	A	111	50.0	50.0	50.0
	LI700	250mL/100 L	A	114	30.0	45.0	50.0
				208	40.0	50.0	30.0
				218	30.0	50.0	50.0
				Mean =	37.5	48.8	45.0

Table 3 - Annual ryegrass (Lolium rigidum) count at 0 and 34 DA-A

Assessment Date						16-Jul-2024	19-Aug-2024
Part Assessed						PLANT, P	PLANT, P
Assessment Type						COUNT	COUNT
Assessment Unit						NUMBER	NUMBER
Reporting Basis						20 m2	0.25 m2
Number of Subsamples						1	3
Pest Stage Majority/Min/Max						21, 11, 23	21, 11, 59
Trt-Eval Interval						0 DA-A	34 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	3	21
1	Untreated Control				104	5000.0	73.3
					120	4000.0	76.7
					209	5000.0	100.0
					215	5000.0	100.0
					Mean =	4750.0	87.5
2	Glyphosate 450	1.5	L/ha	A	108		49.0
	Nil			A	118		35.7
					207		46.3
					224		41.7
					Mean =	.	43.2
3	Glyphosate 450	1.5	L/ha	A	102		38.3
	Envirowet 25	25	mL/100 L	A	119		44.7
					212		29.3
					223		37.7
					Mean =	.	37.5
4	Glyphosate 450	1.5	L/ha	A	110		40.7
	Envirowet 50	50	mL/100 L	A	115		37.0
					213		16.7
					220		45.0
					Mean =	.	34.8
5	Glyphosate 450	1.5	L/ha	A	106		24.7
	Envirowet 100	100	mL/100 L	A	124		38.7
					205		30.3
					226		16.7
					Mean =	.	27.6
6	Glyphosate 450	1.5	L/ha	A	113		36.0
	Axiwetta	100	mL/100 L	A	117		45.0
					210		35.0
					216		26.7
					Mean =	.	35.7
7	Glyphosate 450	1.5	L/ha	A	107		37.3
	LI700	250	mL/100 L	A	116		36.7
					206		30.3
					214		12.3
					Mean =	.	29.2
8	Paraquat 360	1.2	L/ha	A	112		41.7
	Nil			A	121		34.7
					211		35.7
					219		29.3
					Mean =	.	35.3
9	Paraquat 360	1.2	L/ha	A	105		29.3
	Envirowet 25	25	mL/100 L	A	123		38.3
					203		35.0
					222		39.3
					Mean =	.	35.5
10	Paraquat 360	1.2	L/ha	A	103		38.3
	Envirowet 50	50	mL/100 L	A	122		28.7
					201		30.3
					217		38.3
					Mean =	.	33.9
11	Paraquat 360	1.2	L/ha	A	101		38.3
	Envirowet 100	100	mL/100 L	A	125		29.0
					204		26.7
					221		46.7

				Mean =	.	35.2
12	Paraquat 360	1.2L/ha	A	109		46.0
	Axiwetta	100mL/100 L	A	126		23.3
				202		34.3
				225		34.0
				Mean =	.	34.4
13	Paraquat 360	1.2L/ha	A	111		30.0
	LI700	250mL/100 L	A	114		32.7
				208		41.7
				218		28.7
				Mean =	.	33.3

Table 4 - Annual ryegrass (Lolium rigidum) control at 10, 16 and 28 DA-A

Assessment Date						26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed						PLANT, P	PLANT, P	PLANT, P
Assessment Type						CONTRO	CONTRO	CONTRO
Assessment Unit						%UNCK	%UNCK	%UNCK
Reporting Basis						1 PLOT	1 PLOT	1 PLOT
Number of Subsamples						1	1	1
Pest Stage Majority/Min/Max						21, 11, 26	21, 11, 26	21, 11, 59
Trt-Eval Interval						10 DA-A	16 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	10	14	18
1	Untreated Control				104	0.0	0.0	0.0
					120	0.0	0.0	0.0
					209	0.0	0.0	0.0
					215	0.0	0.0	0.0
					Mean =	0.0	0.0	0.0
2	Glyphosate 450	1.5	L/ha	A	108	50.0	50.0	70.0
	Nil			A	118	50.0	50.0	60.0
					207	50.0	50.0	70.0
					224	50.0	50.0	70.0
					Mean =	50.0	50.0	67.5
3	Glyphosate 450	1.5	L/ha	A	102	55.0	55.0	70.0
	Envirowet 25	25	mL/100 L	A	119	60.0	60.0	70.0
					212	50.0	60.0	60.0
					223	50.0	50.0	70.0
					Mean =	53.8	56.3	67.5
4	Glyphosate 450	1.5	L/ha	A	110	50.0	60.0	65.0
	Envirowet 50	50	mL/100 L	A	115	50.0	60.0	65.0
					213	50.0	60.0	70.0
					220	50.0	50.0	70.0
					Mean =	50.0	57.5	67.5
5	Glyphosate 450	1.5	L/ha	A	106	60.0	60.0	75.0
	Envirowet 100	100	mL/100 L	A	124	50.0	60.0	75.0
					205	60.0	60.0	70.0
					226	50.0	60.0	70.0
					Mean =	55.0	60.0	72.5
6	Glyphosate 450	1.5	L/ha	A	113	60.0	60.0	65.0
	Axiwetta	100	mL/100 L	A	117	50.0	60.0	70.0
					210	50.0	60.0	65.0
					216	50.0	60.0	65.0
					Mean =	52.5	60.0	66.3
7	Glyphosate 450	1.5	L/ha	A	107	55.0	55.0	70.0
	LI700	250	mL/100 L	A	116	50.0	60.0	70.0
					206	50.0	50.0	70.0
					214	50.0	60.0	70.0
					Mean =	51.3	56.3	70.0
8	Paraquat 360	1.2	L/ha	A	112	50.0	65.0	60.0
	Nil			A	121	60.0	60.0	60.0
					211	60.0	75.0	65.0
					219	60.0	70.0	65.0
					Mean =	57.5	67.5	62.5
9	Paraquat 360	1.2	L/ha	A	105	50.0	70.0	60.0
	Envirowet 25	25	mL/100 L	A	123	60.0	70.0	60.0
					203	60.0	60.0	65.0
					222	45.0	60.0	60.0
					Mean =	53.8	65.0	61.3
10	Paraquat 360	1.2	L/ha	A	103	50.0	70.0	60.0
	Envirowet 50	50	mL/100 L	A	122	60.0	65.0	60.0
					201	50.0	60.0	60.0
					217	60.0	60.0	60.0
					Mean =	55.0	63.8	60.0
11	Paraquat 360	1.2	L/ha	A	101	60.0	65.0	70.0
	Envirowet 100	100	mL/100 L	A	125	70.0	75.0	70.0
					204	60.0	70.0	65.0
					221	50.0	60.0	60.0

				Mean =	60.0	67.5	66.3
12	Paraquat 360	1.2L/ha	A	109	50.0	70.0	65.0
	Axiwetta	100mL/100 L	A	126	70.0	70.0	65.0
				202	50.0	70.0	70.0
				225	70.0	70.0	65.0
				Mean =	60.0	70.0	66.3
13	Paraquat 360	1.2L/ha	A	111	65.0	75.0	70.0
	LI700	250mL/100 L	A	114	70.0	80.0	65.0
				208	70.0	70.0	60.0
				218	70.0	80.0	70.0
				Mean =	68.8	76.3	66.3

Table 5 - Wild oats (Avena fatua) count at 0 and 34 DA-A

Assessment Date						16-Jul-2024	19-Aug-2024
Part Assessed						PLANT, P	PLANT, P
Assessment Type						COUNT	COUNT
Assessment Unit						NUMBER	NUMBER
Reporting Basis						20 m2	0.25 m2
Number of Subsamples						1	3
Pest Stage Majority/Min/Max						21, 13, 23	22, 17, 31
Trt-Eval Interval						0 DA-A	34 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	7	20
1	Untreated Control				104	200.0	9.3
					120	500.0	20.0
					209	1000.0	9.0
					215	500.0	5.0
					Mean =	550.0	10.8
2	Glyphosate 450	1.5	L/ha	A	108		4.7
	Nil			A	118		15.0
					207		12.0
					224		3.7
					Mean =	.	8.8
3	Glyphosate 450	1.5	L/ha	A	102		9.7
	Envirowet 25	25	mL/100 L	A	119		4.0
					212		4.0
					223		1.3
					Mean =	.	4.8
4	Glyphosate 450	1.5	L/ha	A	110		8.0
	Envirowet 50	50	mL/100 L	A	115		2.7
					213		13.3
					220		9.0
					Mean =	.	8.3
5	Glyphosate 450	1.5	L/ha	A	106		6.7
	Envirowet 100	100	mL/100 L	A	124		7.3
					205		5.0
					226		2.0
					Mean =	.	5.3
6	Glyphosate 450	1.5	L/ha	A	113		6.7
	Axiwetta	100	mL/100 L	A	117		12.0
					210		14.7
					216		8.3
					Mean =	.	10.4
7	Glyphosate 450	1.5	L/ha	A	107		4.3
	LI700	250	mL/100 L	A	116		2.7
					206		5.7
					214		17.3
					Mean =	.	7.5
8	Paraquat 360	1.2	L/ha	A	112		9.7
	Nil			A	121		4.0
					211		12.7
					219		3.7
					Mean =	.	7.5
9	Paraquat 360	1.2	L/ha	A	105		5.0
	Envirowet 25	25	mL/100 L	A	123		1.7
					203		4.0
					222		6.0
					Mean =	.	4.2
10	Paraquat 360	1.2	L/ha	A	103		5.3
	Envirowet 50	50	mL/100 L	A	122		2.0
					201		5.3
					217		1.3
					Mean =	.	3.5
11	Paraquat 360	1.2	L/ha	A	101		1.3
	Envirowet 100	100	mL/100 L	A	125		1.0
					204		4.7
					221		6.3

				Mean =	.	3.3
12	Paraquat 360	1.2L/ha	A	109		4.3
	Axiwetta	100mL/100 L	A	126		4.7
				202		2.3
				225		1.3
				Mean =	.	3.2
13	Paraquat 360	1.2L/ha	A	111		3.0
	LI700	250mL/100 L	A	114		5.7
				208		0.3
				218		0.3
				Mean =	.	2.3

Table 6 - Wild oats (Avena fatua) control at 10, 16 and 28 DA-A

Assessment Date						26-Jul-2024	1-Aug-2024	13-Aug-2024
Part Assessed						PLANT, P	PLANT, P	PLANT, P
Assessment Type						CONTRO	CONTRO	CONTRO
Assessment Unit						%UNCK	%UNCK	%UNCK
Reporting Basis						1 PLOT	1 PLOT	1 PLOT
Number of Subsamples						1	1	1
Pest Stage Majority/Min/Max						21, 15, 23	21, 15, 23	22, 17, 31
Trt-Eval Interval						10 DA-A	16 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	11	15	17
1	Untreated Control				104	0.0	0.0	0.0
					120	0.0	0.0	0.0
					209	0.0	0.0	0.0
					215	0.0	0.0	0.0
					Mean =	0.0	0.0	0.0
2	Glyphosate 450	1.5	L/ha	A	108	25.0	25.0	30.0
	Nil			A	118	30.0	30.0	50.0
					207	30.0	30.0	40.0
					224	30.0	45.0	40.0
					Mean =	28.8	32.5	40.0
3	Glyphosate 450	1.5	L/ha	A	102	30.0	30.0	40.0
	Envirowet 25	25	mL/100 L	A	119	40.0	40.0	40.0
					212	30.0	30.0	50.0
					223	30.0	45.0	40.0
					Mean =	32.5	36.3	42.5
4	Glyphosate 450	1.5	L/ha	A	110	40.0	40.0	30.0
	Envirowet 50	50	mL/100 L	A	115	30.0	30.0	30.0
					213	30.0	30.0	50.0
					220	30.0	40.0	40.0
					Mean =	32.5	35.0	37.5
5	Glyphosate 450	1.5	L/ha	A	106	40.0	40.0	30.0
	Envirowet 100	100	mL/100 L	A	124	30.0	30.0	40.0
					205	40.0	40.0	50.0
					226	40.0	40.0	50.0
					Mean =	37.5	37.5	42.5
6	Glyphosate 450	1.5	L/ha	A	113	30.0	30.0	40.0
	Axiwetta	100	mL/100 L	A	117	40.0	40.0	40.0
					210	30.0	30.0	40.0
					216	30.0	30.0	50.0
					Mean =	32.5	32.5	42.5
7	Glyphosate 450	1.5	L/ha	A	107	40.0	40.0	30.0
	LI700	250	mL/100 L	A	116	40.0	40.0	30.0
					206	30.0	30.0	40.0
					214	30.0	30.0	50.0
					Mean =	35.0	35.0	37.5
8	Paraquat 360	1.2	L/ha	A	112	20.0	50.0	50.0
	Nil			A	121	50.0	50.0	65.0
					211	40.0	60.0	70.0
					219	30.0	50.0	60.0
					Mean =	35.0	52.5	61.3
9	Paraquat 360	1.2	L/ha	A	105	40.0	50.0	60.0
	Envirowet 25	25	mL/100 L	A	123	50.0	50.0	70.0
					203	50.0	50.0	65.0
					222	50.0	60.0	50.0
					Mean =	47.5	52.5	61.3
10	Paraquat 360	1.2	L/ha	A	103	50.0	60.0	60.0
	Envirowet 50	50	mL/100 L	A	122	50.0	50.0	65.0
					201	60.0	60.0	65.0
					217	50.0	50.0	60.0
					Mean =	52.5	55.0	62.5
11	Paraquat 360	1.2	L/ha	A	101	40.0	60.0	60.0
	Envirowet 100	100	mL/100 L	A	125	60.0	60.0	70.0
					204	50.0	50.0	65.0
					221	40.0	50.0	70.0

				Mean =	47.5	55.0	66.3
12	Paraquat 360	1.2L/ha	A	109	50.0	50.0	70.0
	Axiwetta	100mL/100 L	A	126	50.0	50.0	70.0
				202	60.0	60.0	70.0
				225	60.0	60.0	60.0
				Mean =	55.0	55.0	67.5
13	Paraquat 360	1.2L/ha	A	111	55.0	55.0	70.0
	LI700	250mL/100 L	A	114	60.0	60.0	70.0
				208	50.0	60.0	70.0
				218	60.0	60.0	70.0
				Mean =	56.3	58.8	70.0

Table 7 - General weed brownout at 16 DA-A

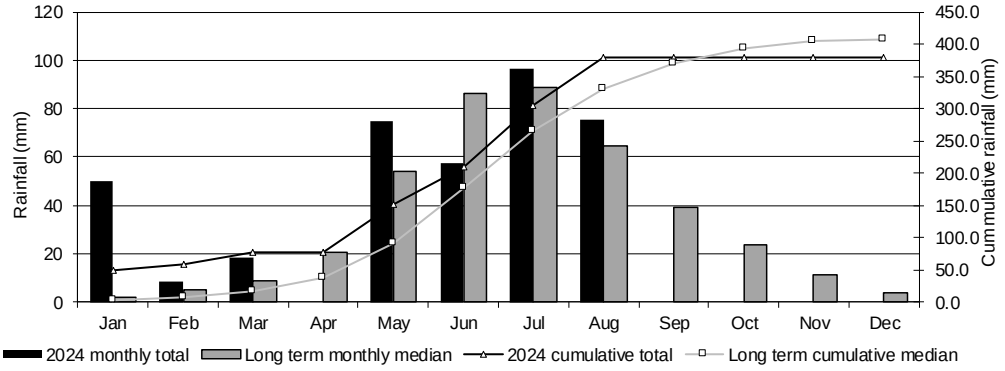
Assessment Date						1-Aug-2024
Part Assessed						PLANT, P
Assessment Type						CONTRO
Assessment Unit						%UNCK
Reporting Basis						1 PLOT
Number of Subsamples						1
Pest Stage Majority/Min/Max						17, 14, 50
Trt-Eval Interval						16 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	13
1	Untreated Control				104	0.0
					120	0.0
					209	0.0
					215	0.0
					Mean =	0.0
2	Glyphosate 450		1.5L/ha	A	108	35.0
	Nil			A	118	40.0
					207	35.0
					224	25.0
					Mean =	33.8
3	Glyphosate 450		1.5L/ha	A	102	40.0
	Envirowet 25		25mL/100 L	A	119	30.0
					212	40.0
					223	30.0
					Mean =	35.0
4	Glyphosate 450		1.5L/ha	A	110	40.0
	Envirowet 50		50mL/100 L	A	115	40.0
					213	40.0
					220	40.0
					Mean =	40.0
5	Glyphosate 450		1.5L/ha	A	106	40.0
	Envirowet 100		100mL/100 L	A	124	45.0
					205	45.0
					226	30.0
					Mean =	40.0
6	Glyphosate 450		1.5L/ha	A	113	40.0
	Axiwetta		100mL/100 L	A	117	40.0
					210	40.0
					216	35.0
					Mean =	38.8
7	Glyphosate 450		1.5L/ha	A	107	35.0
	LI700		250mL/100 L	A	116	45.0
					206	45.0
					214	30.0
					Mean =	38.8
8	Paraquat 360		1.2L/ha	A	112	50.0
	Nil			A	121	45.0
					211	50.0
					219	50.0
					Mean =	48.8
9	Paraquat 360		1.2L/ha	A	105	50.0
	Envirowet 25		25mL/100 L	A	123	40.0
					203	50.0
					222	50.0
					Mean =	47.5
10	Paraquat 360		1.2L/ha	A	103	50.0
	Envirowet 50		50mL/100 L	A	122	45.0
					201	50.0
					217	55.0
					Mean =	50.0
11	Paraquat 360		1.2L/ha	A	101	60.0
	Envirowet 100		100mL/100 L	A	125	40.0
					204	50.0
					221	50.0

				Mean =	50.0
12	Paraquat 360	1.2L/ha	A	109	50.0
	Axiwetta	100mL/100 L	A	126	50.0
				202	50.0
				225	50.0
				Mean =	50.0
13	Paraquat 360	1.2L/ha	A	111	50.0
	LI700	250mL/100 L	A	114	45.0
				208	50.0
				218	50.0
				Mean =	48.8

Appendix iii - Weather data

2024 rainfall data - Redlands, WA

Observations were drawn from Redlands {station 10634}.



2024 daily rainfall data - Redlands, WA.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1					13.6	1.8		18.0				
2					3.0	11.4	1.8					
3			5.0		28.0							
4			10.4									
5												
6					2.0							
7						19.6	2.2	16.0				
8							1.6					
9			2.8			2.4						
10						3.0	12.2					
11					8.0			3.2				
12												
13	0.2							3.0				
14								4.8				
15												
16												
17	50.0					4.6						
18							18.4	12.2				
19							7.0					
20												
21							3.0	3.1				
22						3.6	↓	8.2				
23							30.0	1.0				
24							3.2	5.8				
25		5.4			0.4							
26		2.8			0.6		6.8					
27						6.2						
28						4.6						
29					15.2		10.0					
30					4.2							
31												

Summary statistics												
2024 monthly total	50.2	8.2	18.2	0.0	75.0	57.2	96.2	75.3				
2024 cumulative total	50.2	58.4	76.6	76.6	151.6	208.8	305.0	380.3	380.3	380.3	380.3	380.3
Long term monthly median	2.0	5.2	8.6	20.6	54.1	86.4	88.6	64.6	39.0	23.6	11.1	3.8
Long term cumulative median	2.0	7.2	15.8	36.4	90.5	176.9	265.5	330.1	369.1	392.7	403.8	407.6

2024 maximum & minimum temperature data - Beverley, WA

Observations were drawn from Beverley {station 10515}.

	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept		Oct		Nov		Dec	
Date	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1	13.6	31.6	20.8	45.4	17.0	32.4	11.0	27.0	12.2	24.4	6.2	24.6	2.0	17.8	8.4	13.8	10.0	20.6						
2	16.4	28.0	19.8	45.6	17.4	32.0	11.4	29.8	16.2	25.6	11.6	19.2	5.6	17.6	0.8	15.2	5.2	24.6						
3	14.4	30.2	21.0	39.6	21.0	31.8	10.8	29.8	14.6	23.0	8.4	20.4	0.2	17.0	0.5	17.8	5.4							
4	14.2	31.6	14.0		19.4	33.6	12.0	29.4	8.8	20.4	10.0	22.0	3.0	16.0	-0.2	17.6								
5	13.8	31.4		28.6	17.4	30.8	12.4		6.2	20.0	14.2	22.8	5.0	15.8	1.0	19.0		13.6						
6	14.4	34.6	13.2	32.4	16.6	31.0		34.4	10.0	20.4	9.0	24.2	2.0	15.0	4.4	21.0	3.8	17.0						
7	16.4	36.6	14.4	36.6	17.6	36.0	12.6	35.2	10.2	25.6	12.2	18.4	8.8		10.4	19.0	5.4	19.6						
8	18.6	42.0	15.2	40.6	21.4	32.8	15.0	27.8	10.6	26.2	11.4	18.0		19.0	6.0	18.0	4.4	19.8						
9	17.4	37.0	16.8	43.0	11.0	27.4	11.8	26.6	11.2	26.6	14.4	18.4	10.6	22.2	4.4	20.6	6.0	22.4						
10	14.4	35.4	22.4	44.2	11.8	29.0	11.8	27.0	14.2	27.6	14.4	18.6	13.2	16.8	3.6		6.0							
11	15.4	38.2	18.4	44.2	17.2	30.6	11.2	26.8	14.4	26.6	11.4	18.0	3.8	16.2		21.2								
12	18.4	33.2	18.2	37.2	16.8	29.4	12.0	28.4	11.8	27.2	10.6	17.6	5.0	14.2	10.8									
13	19.4	40.2	15.0	34.2	18.4	28.0	12.0	27.2	11.6	27.2	5.2	16.0	6.4	18.6		19.4								
14	25.2	39.0	14.2	37.2	18.4		9.8	28.0	8.8	28.4	3.8	19.0	2.4	18.0	10.0	17.0								
15	21.0	41.4	17.6	44.0	19.0	30.4	10.4	28.4	6.4	28.6	4.4	20.8	4.2	20.4	6.4									
16	23.0	41.6	22.6	37.2	17.0	35.0	13.4	30.2	6.8	27.8	6.8	22.2	1.8	21.2		18.6								
17	19.4	42.4	15.6	41.2	15.6	36.0	13.6	32.0	11.0	27.4	6.8	19.2	4.8	22.0	8.2	19.0								
18	16.8	33.2	19.4	42.4	16.4	31.4	12.6	32.0	9.0	26.2	4.4	18.4	11.2	16.4	7.6	17.0								
19	14.2	36.4	24.0	43.0	11.0	25.4	10.8	29.2	9.6	25.8	1.4	17.8	2.8	16.2	8.8	18.6								
20	17.0	38.8	19.0	46.0	11.4	27.4	6.4	30.8	10.2	24.4	0.8	17.4	8.2	18.6	6.2	18.2								
21	18.6	41.2	18.4	36.4	11.0	30.0	6.6	31.4	6.4	25.2	2.0	19.2	10.8	19.2	10.0	20.2								
22	16.4	34.4	15.2	32.0	13.4	28.0	8.6	22.4	5.6	26.4	7.2	17.8	9.2	19.2	11.8	21.6								
23	15.4	33.8	15.4	37.8	12.8	27.8	5.4	22.0	2.2	25.6	3.4	16.6	11.2	14.4	12.8	19.0								
24	16.2	35.0	21.8	28.4	13.0	28.0	11.4	22.2	5.2	26.8	0.0	15.8	1.4	15.2	11.0	17.4								
25	15.4	33.0	17.2	22.8	10.4	29.8	7.0	21.2	10.0	25.8	0.6	15.6	7.4	16.4	7.2	20.6								
26	13.4		18.2	33.0	8.4	33.4	10.8	27.0	10.6	25.0	2.6	18.4	8.4	17.6	7.8	21.0								
27		36.8	17.2	31.0	10.0	36.0	7.0	25.6	9.0	24.0	9.4	17.4	7.8	18.0	14.0	20.0								
28	13.4	34.8	16.0	31.2	14.0	36.2	5.4	25.0	11.2	18.2	8.6	18.6	7.4	18.6	5.4	20.6								
29	14.6	34.2	15.0	36.6	10.2	34.6	9.2	25.2	7.6		11.4	17.2	10.8	20.2	12.4	19.2								
30	14.6	39.4			11.8	35.2	12.6	20.2		18.4	6.2	16.4	10.0	20.6	8.8	18.2								
31	18.4	44.2			16.4	30.4			11.2	20.8			6.2	22.2	6.0	20.2								

Summary statistics

	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sept		Oct		Nov		Dec	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Min/Max	13.4	44.2	14.0	46.0	8.4	36.2	5.4	35.2	2.2	28.6	0.0	24.6	0.2	22.2	-0.2	21.6	4.4	24.6						
2024 monthly mean	16.7	36.3	17.7	37.6	14.9	31.3	10.5	27.7	9.8	24.9	7.3	18.9	6.4	18.0										
Longterm monthly mean	16.3	34.4	16.7	33.8	14.8	30.8	11.3	26.2	7.8	21.5	6.0	18.0	5.2	16.9	5.1	17.8	5.9	20.5	8.1	24.6	11.6	28.8	14.4	32.4

Appendix iv - Photographs

Photographs below depict control the trial site prior to application and weed control at 34 DA-A.

Photograph 1

The trial site at application, 16-Jul-2024, (0 DA-A).

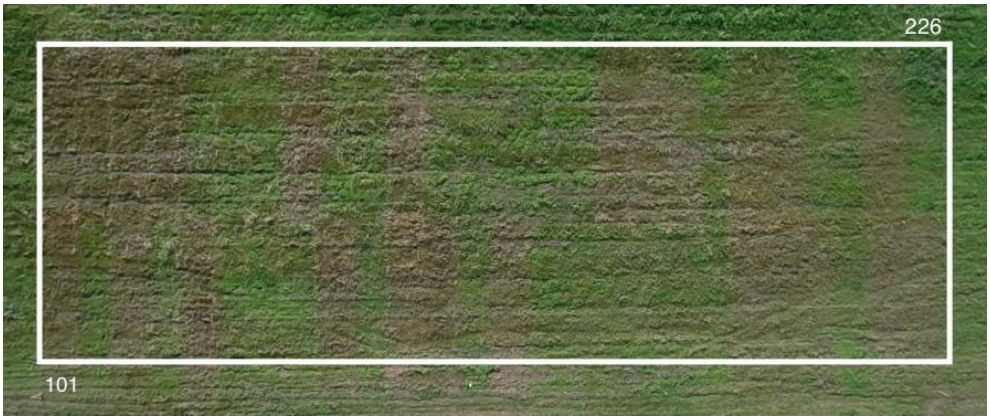
Photograph 2

Plot 104, which was untreated (treatment 1), 19-Aug-24, (34 DA-A).

Photograph 3

Plot 106, which was treated with Glyphosate plus 100 mL/100 L Envirowet (treatment 5), 19-Aug-24, (34 DA-A).

Photographs below are drone images of the trial site.



Photograph 4

Drone image of the trial site (plot 101 in bottom left corner), 18-Jul-2024, (2 DA-A).

Photograph 5

Drone image of the trial site (plot 101 in bottom left corner), 01-Aug-2024, (16 DA-A).

Photograph 6

Drone image of the trial site (plot 101 in bottom left corner), 13-Aug-2024, (28 DA-A).