

TRIAL REPORT

Envirowet Weed Control in Fallow

Kingsvale, New South Wales, 2024



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SUMMARY

A small plot trial was established near Kingsvale, New South Wales in 2024 compare the effectiveness of Envirowet Multi-Phase Surfactant with industry standard wetting agents when used with Glyphosate and Paraquat herbicides to control weeds in fallow.

Treatments were compared with an untreated control (UTC) and included Glyphosate 450 at 1 L/ha or Paraquat 250 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 annual ryegrass (*Lolium rigidum*) at the four-tiller growth stage (BBCH 24), clover (*Trifolium subterraneum*) at the nine or more side shoots growth stage (BBCH 29) and dock (*Rumex obtusifolius*) at the 6-leaf growth stage (BBCH 16) using a hand-held boom fitted with TeeJet® AIXR flat fan air induction nozzles delivering 100 L/ha and generating coarse spray droplets (ASABE 572.1).

Seasonal conditions were characterised by above-average rainfall. However, this did not affect the reliability of the results of the trial.

Weed counts were conducted by species across the UTC plots prior to treatment application and across all plots at 28 days after application (DA-A). Weed control was visually assessed by species at 4, 7, 13 and 28 DA-A.

Visual control of annual ryegrass was higher at 28 DA-A across plots treated with an adjuvant when compared with the nil adjuvant plots, however this was not significant across the plots treated with Envirowet at 100 mL/100 L.

There were no significant differences in visual annual ryegrass control across the plots treated with Envirowet at 25-100 mL/100 L and Axiwetta or LI700.

There were no significant differences in the level of visual control of either clover or dock between 4 and 28 DA-A across the plots treated with nil adjuvant and the plots treated with Envirowet, Axiwetta, or LI700.

INTRODUCTION

Aims

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

Chronology of events

Date	Days after application A (DA-A)	Annual ryegrass growth stage		Clover growth stage		Dock growth stage		Event
		BBCH scale	Description	BBCH scale	Description	BBCH scale	Description	
17-May-2024	0	13-26	3 leaf – 6 tiller	13-29	3 leaf – 9 or more side shoots	12-19	2-9 or more leaves	Weed counts conducted. Treatments applied (timing A).
21-May-2024	4	13-26	3 leaf – 6 tiller	13-29	3 leaf – 9 or more side shoots	12-19	2-9 or more leaves	Weed control assessed.
24-May-2024	7	13-26	3 leaf – 6 tiller	13-29	3 leaf – 9 or more side shoots	12-19	2-9 or more leaves	Weed control assessed.
30-May-2024	13	13-26	3 leaf – 6 tiller	13-29	3 leaf – 9 or more side shoots	12-19	2-9 or more leaves	Weed control assessed.
14-Jun-2024	28	21-29	Beginning of tillering – end of tillering	16-29	6 leaf – 9 or more side shoots	14-19	4-9 or more leaves	Weed counts conducted. Weed control assessed.

Products

Product	Active ingredient	Active ingredient concentration (g/L or g/kg)	Form type
Glyphosate 450	Glyphosate	450 g/L	SL
Envirowet	-	-	SL
Axiwetta	Alcohol alkoxylate	1000 g/L	L
LI700	Soyal phospholipids + propionic acid	350 g/L + 350 g/L	SL
Paraquat 250	Paraquat	250 g/L	SL

Treatments

Trt No.	Treatment Name	Rate	Rate Unit	Other Rate	Other Rate Unit	Appl Code
Factor A (Herbicide)						
1	Glyphosate 450		1L/ha	450g ai/ha		A
2	Paraquat 250		1.2L/ha	300g ai/ha		A
Factor B (Adjuvant)						
1	Nil	-	-			A
2	Envirowet		25mL/100 L			A
3	Envirowet		50mL/100 L			A
4	Envirowet		100mL/100 L			A
5	Axiwetta		100mL/ha	100g ai/ha		A
6	LI700		250mL/ha	175g 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		1L/ha	450g ai/ha		A
	Nil					A
3	Glyphosate 450		1L/ha	450g ai/ha		A
	Envirowet		25mL/100 L			A
4	Glyphosate 450		1L/ha	450g ai/ha		A
	Envirowet		50mL/100 L			A
5	Glyphosate 450		1L/ha	450g ai/ha		A
	Envirowet		100mL/100 L			A
6	Glyphosate 450		1L/ha	450g ai/ha		A
	Axiwetta		100mL/ha	100g ai/ha		A
7	Glyphosate 450		1L/ha	450g ai/ha		A
	LI700		250mL/ha	175g ai/ha		A
8	Paraquat 250		1.2L/ha	300g ai/ha		A
	Nil		-	-		-
9	Paraquat 250		1.2L/ha	300g ai/ha		A
	Envirowet		25mL/100 L			A
10	Paraquat 250		1.2L/ha	300g ai/ha		A
	Envirowet		50mL/100 L			A
11	Paraquat 250		1.2L/ha	300g ai/ha		A
	Envirowet		100mL/100 L			A
12	Paraquat 250		1.2L/ha	300g ai/ha		A
	Axiwetta		100mL/ha	100g ai/ha		A
13	Paraquat 250		1.2L/ha	300g ai/ha		A
	LI700		250mL/ha	175g ai/ha		A

Factor	Description
A	Herbicide
B	Adjuvant

RESULTS

Table 1 – Ryegrass (*Lolium rigidum*) count per m² at 0 and 28 DA-A (ANOVA)

Assessment Date					17-May-2024	14-Jun-2024
Part Assessed					PLANT, P	PLANT, P
Assessment Type					COUNT	COUNT
Assessment Unit					NUMBER	NUMBER
Reporting Basis					1 m ²	1 m ²
Number of Subsamples					4	4
Pest Stage Majority/Min/Max					24, 13, 26	26, 21, 29
Trt-Eval Interval					0 DA-A	28 DA-A
ARM Action Codes					T1	&AL T4
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	2	20
1	Untreated Control				80.8	77.3a
2	Glyphosate 450		1L/ha	A		0.0c
	Nil			A		
3	Glyphosate 450		1L/ha	A		0.3c
	Envirowet 25		25mL/100 L	A		
4	Glyphosate 450		1L/ha	A		0.0c
	Envirowet 50		50mL/100 L	A		
5	Glyphosate 450		1L/ha	A		0.0c
	Envirowet 100		100mL/100 L	A		
6	Glyphosate 450		1L/ha	A		0.0c
	Axiwetta		100mL/100 L	A		
7	Glyphosate 450		1L/ha	A		0.0c
	LI700		250mL/100 L	A		
8	Paraquat 250		1.2L/ha	A		4.5b
	Nil			A		
9	Paraquat 250		1.2L/ha	A		0.8bc
	Envirowet 25		25mL/100 L	A		
10	Paraquat 250		1.2L/ha	A		1.3c
	Envirowet 50		50mL/100 L	A		
11	Paraquat 250		1.2L/ha	A		2.0bc
	Envirowet 100		100mL/100 L	A		
12	Paraquat 250		1.2L/ha	A		0.8c
	Axiwetta		100mL/100 L	A		
13	Paraquat 250		1.2L/ha	A		0.8c
	LI700		250mL/100 L	A		
LSD P=.05						NA
Standard Deviation						0.22t
CV						79.15t
Levene's F						1.661
Skewness					-0.1869	2.287*
Kurtosis					-0.8832	4.4333*
Replicate F						5.302
Replicate Prob(F)						0.0039
Treatment F						22.054
Treatment Prob(F)						0.0001

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

Could not calculate LSD (% mean diff) or mean separation letters for columns 2,1 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

T1 = [C1]*4

T4 = [C19]*4

Table 2 – Ryegrass (*Lolium rigidum*) count per m² at 28 DA-A (Factorial)

Assessment Date	14-Jun-2024			
Part Assessed	PLANT, P			
Assessment Type	COUNT			
Assessment Unit	NUMBER			
Reporting Basis	1 m ²			
Number of Subsamples	4			
Pest Stage Majority/Min/Max	26, 21, 29			
Trt-Eval Interval	28 DA-A			
ARM Action Codes	T4			
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code
				20
TABLE OF R MEANS				
Replicate 1				0.6
Replicate 2				0.2
Replicate 3				2.6
Replicate 4				0.1
TABLE OF A (Herbicide) MEANS				
1	Glyphosate 450	1L/ha	A	0.0b
2	Paraquat 250	1.2L/ha	A	1.7a
LSD P=.05				1.21
Standard Deviation				2.05
CV				240.44
TABLE OF B (Adjuvant) MEANS				
1	Nil		A	2.3-
2	Envirowet 25	25mL/100 L	A	0.5-
3	Envirowet 50	50mL/100 L	A	0.6-
4	Envirowet 100	100mL/100 L	A	1.0-
5	Axiwetta	100mL/100 L	A	0.4-
6	LI700	250mL/100 L	A	0.4-
LSD P=.05				2.09
Standard Deviation				2.05
CV				240.44
TABLE OF A (Herbicide) B (Adjuvant) MEANS				
1	Glyphosate 450	1L/ha	A	0.0-
1	Nil		A	
2	Paraquat 250	1.2L/ha	A	4.5-
1	Nil		A	
1	Glyphosate 450	1L/ha	A	0.3-
2	Envirowet 25	25mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	0.8-
2	Envirowet 25	25mL/100 L	A	
1	Glyphosate 450	1L/ha	A	0.0-
3	Envirowet 50	50mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	1.3-
3	Envirowet 50	50mL/100 L	A	
1	Glyphosate 450	1L/ha	A	0.0-
4	Envirowet 100	100mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	2.0-
4	Envirowet 100	100mL/100 L	A	
1	Glyphosate 450	1L/ha	A	0.0-
5	Axiwetta	100mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	0.8-
5	Axiwetta	100mL/100 L	A	
1	Glyphosate 450	1L/ha	A	0.0-
6	LI700	250mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	0.8-
6	LI700	250mL/100 L	A	
LSD P=.05				2.95
Standard Deviation				2.05
CV				240.44

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

T4 = [C19]*4

FACTORIAL/POOLED ERROR AOV For 14-Jun-2024 PLANT P COUNT NUMBER 1 m2 4 26 21 29 28 DA-A T4 (Data Column 20)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	263.979167				
R	3	49.562500	16.520833	3.917	0.0170	
A	1	31.687500	31.687500	7.513	0.0098	1.2
B	5	20.854167	4.170833	0.989	0.4394	2.1
AB	5	22.687500	4.537500	1.076	0.3916	3.0
ERROR	33	139.187500	4.217803			

Table 3 – Ryegrass (*Lolium rigidum*) control at 4, 7, 13 and 28 DA-A (ANOVA)

Assessment Date	21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed	PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type	CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit	%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1
Pest Stage Majority/Min/Max	24, 13, 26	24, 13, 26	24, 13, 26	26, 21, 29
Trt-Eval Interval	4 DA-A	7 DA-A	13 DA-A	28 DA-A
Trt Treatment	7	10	13	16
No. Name				
1 Untreated Control	0.0c	0.0b	0.0d	0.0
2 Glyphosate 450 Nil	5.0c	6.3b	50.0c	95.0
3 Glyphosate 450 Envirowet 25	5.0c	7.5b	55.0bc	95.0
4 Glyphosate 450 Envirowet 50	2.5c	6.3b	60.0bc	94.5
5 Glyphosate 450 Envirowet 100	2.5c	3.8b	55.0bc	95.0
6 Glyphosate 450 Axiwetta	2.5c	3.8b	62.5b	95.8
7 Glyphosate 450 LI700	5.0c	0.0b	52.5bc	94.5
8 Paraquat 250 Nil	77.5ab	92.5a	82.5a	82.5
9 Paraquat 250 Envirowet 25	70.0b	93.8a	88.8a	91.3
10 Paraquat 250 Envirowet 50	72.5ab	93.8a	90.0a	92.0
11 Paraquat 250 Envirowet 100	80.0a	93.8a	86.3a	87.5
12 Paraquat 250 Axiwetta	77.5ab	95.0a	90.0a	88.8
13 Paraquat 250 LI700	72.5ab	95.0a	91.3a	90.0
LSD P=.05	7.63	8.49	10.48	3.51
Standard Deviation	5.32	5.92	7.31	2.45
CV	14.64	13.01	11.0	2.89
Levene's F	0.74	1.008	1.697	2.34*
Skewness	0.1671	0.1232	-1.1222*	-3.0927*
Kurtosis	-1.9712*	-2.0211*	1.0568	8.2912*
Replicate F	0.068	1.149	0.681	5.110
Replicate Prob(F)	0.9766	0.3427	0.5692	0.0048
Treatment F	197.151	249.842	50.391	441.822
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001

Means followed by same letter or symbol 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 – Ryegrass (*Lolium rigidum*) control at 4, 7, 13 and 28 DA-A (Factorial)

Assessment Date	21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed	PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type	CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit	%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1
Pest Stage Majority/Min/Max	24, 13, 26	24, 13, 26	24, 13, 26	26, 21, 29
Trt-Eval Interval	4 DA-A	7 DA-A	13 DA-A	28 DA-A
Trt Treatment				
No. Name	7	10	13	16
Rate				
Rate Unit				
Appl Code				
TABLE OF R MEANS				
Replicate 1	40.0	47.1	74.6	93.5
Replicate 2	39.2	51.7	71.7	92.9
Replicate 3	39.2	48.8	71.3	90.0
Replicate 4	39.2	49.6	70.4	90.8
TABLE OF A (Herbicide) MEANS				
1 Glyphosate 450 1L/ha A	3.8b	4.6b	55.8b	95.0a
2 Paraquat 250 1.2L/ha A	75.0a	94.0a	88.1a	88.7b
LSD P=.05	3.26	3.62	4.47	1.48
Standard Deviation	5.56	6.16	7.61	2.51
CV	14.11	12.49	10.58	2.74
TABLE OF B (Adjuvant) MEANS				
1 Nil A	41.3-	49.4-	66.3-	88.8b
2 Envirowet 25 25mL/100 L A	37.5-	50.6-	71.9-	93.1a
3 Envirowet 50 50mL/100 L A	37.5-	50.0-	75.0-	93.3a
4 Envirowet 100 100mL/100 L A	41.3-	48.8-	70.6-	91.3ab
5 Axiwet 100mL/100 L A	40.0-	49.4-	76.3-	92.3a
6 LI700 250mL/100 L A	38.8-	47.5-	71.9-	92.3a
LSD P=.05	5.65	6.26	7.75	2.56
Standard Deviation	5.56	6.16	7.61	2.51
CV	14.11	12.49	10.58	2.74
TABLE OF A (Herbicide) B (Adjuvant) MEANS				
1 Glyphosate 450 1L/ha A	5.0-	6.3-	50.0-	95.0ab
1 Nil A				
2 Paraquat 250 1.2L/ha A	77.5-	92.5-	82.5-	82.5f
1 Nil A				
1 Glyphosate 450 1L/ha A	5.0-	7.5-	55.0-	95.0ab
2 Envirowet 25 25mL/100 L A				
2 Paraquat 250 1.2L/ha A	70.0-	93.8-	88.8-	91.3cd
2 Envirowet 25 25mL/100 L A				
1 Glyphosate 450 1L/ha A	2.5-	6.3-	60.0-	94.5abc
3 Envirowet 50 50mL/100 L A				
2 Paraquat 250 1.2L/ha A	72.5-	93.8-	90.0-	92.0bcd
3 Envirowet 50 50mL/100 L A				
1 Glyphosate 450 1L/ha A	2.5-	3.8-	55.0-	95.0ab
4 Envirowet 100 100mL/100 L A				
2 Paraquat 250 1.2L/ha A	80.0-	93.8-	86.3-	87.5e
4 Envirowet 100 100mL/100 L A				
1 Glyphosate 450 1L/ha A	2.5-	3.8-	62.5-	95.8a
5 Axiwet 100mL/100 L A				
2 Paraquat 250 1.2L/ha A	77.5-	95.0-	90.0-	88.8de
5 Axiwet 100mL/100 L A				
1 Glyphosate 450 1L/ha A	5.0-	0.0-	52.5-	94.5abc
6 LI700 250mL/100 L A				
2 Paraquat 250 1.2L/ha A	72.5-	95.0-	91.3-	90.0de
6 LI700 250mL/100 L A				
LSD P=.05	7.99	8.86	10.95	3.62
Standard Deviation	5.56	6.16	7.61	2.51
CV	14.11	12.49	10.58	2.74

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

FACTORIAL/POOLED ERROR AOV For 21-May-2024 PLOT P CONTRO % 1 PLOT 1 24 13 26 4 DA-A (Data Column 7)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	62281.250000				
R	3	6.250000	2.083333	0.067	0.9768	
A	1	60918.750000	60918.750000	1973.319	0.0001	3.3
B	5	118.750000	23.750000	0.769	0.5786	5.7
AB	5	218.750000	43.750000	1.417	0.2438	8.0
ERROR	33	1018.750000	30.871212			

FACTORIAL/POOLED ERROR AOV For 24-May-2024 PLOT P CONTRO % 1 PLOT 1 24 13 26 7 DA-A (Data Column 10)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	97399.479167				
R	3	130.729167	43.576389	1.150	0.3435	
A	1	95854.687500	95854.687500	2529.510	0.0001	3.6
B	5	46.354167	9.270833	0.245	0.9395	6.3
AB	5	117.187500	23.437500	0.618	0.6866	8.9
ERROR	33	1250.520833	37.894571			

FACTORIAL/POOLED ERROR AOV For 30-May-2024 PLOT P CONTRO % 1 PLOT 1 24 13 26 13 DA-A (Data Column 13)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	15186.979167				
R	3	118.229167	39.409722	0.680	0.5707	
A	1	12513.020833	12513.020833	215.852	0.0001	4.5
B	5	496.354167	99.270833	1.712	0.1592	7.7
AB	5	146.354167	29.270833	0.505	0.7703	11.0
ERROR	33	1913.020833	57.970328			

FACTORIAL/POOLED ERROR AOV For 14-Jun-2024 PLOT P CONTRO % 1 PLOT 1 26 21 29 28 DA-A (Data Column 16)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	1023.312500				
R	3	99.729167	33.243056	5.261	0.0045	
A	1	475.020833	475.020833	75.176	0.0001	1.5
B	5	110.937500	22.187500	3.511	0.0118	2.6
AB	5	129.104167	25.820833	4.086	0.0054	3.6
ERROR	33	208.520833	6.318813			

Table 5 – Clover (*Trifolium subterraneum*) count per m² at 0 and 28 DA-A (ANOVA)

Assessment Date					17-May-2024	14-Jun-2024
Part Assessed					PLANT, P	PLANT, P
Assessment Type					COUNT	COUNT
Assessment Unit					NUMBER	NUMBER
Reporting Basis					1 m2	1 m2
Number of Subsamples					4	1
Pest Stage Majority/Min/Max					29, 13, 29	29, 16, 29
Trt-Eval Interval					0 DA-A	28 DA-A
ARM Action Codes					T2	&AL T5
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	4	22
1	Untreated Control				38.5	40.0a
2	Glyphosate 450		1L/ha	A		3.3b
	Nil			A		
3	Glyphosate 450		1L/ha	A		3.8b
	Envirowet 25		25mL/100 L	A		
4	Glyphosate 450		1L/ha	A		5.8b
	Envirowet 50		50mL/100 L	A		
5	Glyphosate 450		1L/ha	A		3.5b
	Envirowet 100		100mL/100 L	A		
6	Glyphosate 450		1L/ha	A		1.0b
	Axiwetta		100mL/100 L	A		
7	Glyphosate 450		1L/ha	A		2.3b
	LI700		250mL/100 L	A		
8	Paraquat 250		1.2L/ha	A		30.8a
	Nil			A		
9	Paraquat 250		1.2L/ha	A		54.0a
	Envirowet 25		25mL/100 L	A		
10	Paraquat 250		1.2L/ha	A		41.3a
	Envirowet 50		50mL/100 L	A		
11	Paraquat 250		1.2L/ha	A		42.8a
	Envirowet 100		100mL/100 L	A		
12	Paraquat 250		1.2L/ha	A		33.0a
	Axiwetta		100mL/100 L	A		
13	Paraquat 250		1.2L/ha	A		42.8a
	LI700		250mL/100 L	A		
LSD P=.05						NA
Standard Deviation						0.31t
CV						29.78t
Levene's F						1.285
Skewness					0.6392	-0.0221
Kurtosis					-2.3423	-1.1679
Replicate F						5.173
Replicate Prob(F)						0.0045
Treatment F						10.876
Treatment Prob(F)						0.0001

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

Could not calculate LSD (% mean diff) or mean separation letters for columns 4,3 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

T2 = [C3]*4

T5 = [21]*4

Table 6 – Clover (*Trifolium subterraneum*) count per m² at 28 DA-A (Factorial)

Assessment Date	14-Jun-2024			
Part Assessed	PLANT, P			
Assessment Type	COUNT			
Assessment Unit	NUMBER			
Reporting Basis	1 m ²			
Number of Subsamples	4			
Pest Stage Majority/Min/Max	29, 16, 29			
Trt-Eval Interval	28 DA-A			
ARM Action Codes	T5			
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code
				22
TABLE OF R MEANS				
Replicate 1				10.8
Replicate 2				24.7
Replicate 3				12.9
Replicate 4				39.7
TABLE OF A (Herbicide) MEANS				
1	Glyphosate 450	1L/ha	A	3.3b
2	Paraquat 250	1.2L/ha	A	40.8a
LSD P=.05				9.71
Standard Deviation				16.53
CV				75.14
TABLE OF B (Adjuvant) MEANS				
1	Nil		A	17.0-
2	Envirowet 25	25mL/100 L	A	28.9-
3	Envirowet 50	50mL/100 L	A	23.5-
4	Envirowet 100	100mL/100 L	A	23.1-
5	Axiwetta	100mL/100 L	A	17.0-
6	LI700	250mL/100 L	A	22.5-
LSD P=.05				16.82
Standard Deviation				16.53
CV				75.14
TABLE OF A (Herbicide) B (Adjuvant) MEANS				
1	Glyphosate 450	1L/ha	A	3.3-
1	Nil		A	
2	Paraquat 250	1.2L/ha	A	30.8-
1	Nil		A	
1	Glyphosate 450	1L/ha	A	3.8-
2	Envirowet 25	25mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	54.0-
2	Envirowet 25	25mL/100 L	A	
1	Glyphosate 450	1L/ha	A	5.8-
3	Envirowet 50	50mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	41.3-
3	Envirowet 50	50mL/100 L	A	
1	Glyphosate 450	1L/ha	A	3.5-
4	Envirowet 100	100mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	42.8-
4	Envirowet 100	100mL/100 L	A	
1	Glyphosate 450	1L/ha	A	1.0-
5	Axiwetta	100mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	33.0-
5	Axiwetta	100mL/100 L	A	
1	Glyphosate 450	1L/ha	A	2.3-
6	LI700	250mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	42.8-
6	LI700	250mL/100 L	A	
LSD P=.05				23.78
Standard Deviation				16.53
CV				75.14

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

T5 = [21]*4

FACTORIAL/POOLED ERROR AOV For 14-Jun-2024 PLANT P COUNT NUMBER 1 m2 4 29 16 29 28 DA-A T5 (Data Column 22)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	33658.000000				
R	3	6339.500000	2113.166667	7.733	0.0005	
A	1	16875.000000	16875.000000	61.755	0.0001	9.7
B	5	808.250000	161.650000	0.592	0.7064	16.8
AB	5	617.750000	123.550000	0.452	0.8086	23.8
ERROR	33	9017.500000	273.257576			

Table 7 – Clover (*Trifolium subterraneum*) control at 4, 7, 13 and 28 DA-A (ANOVA)

Assessment Date	21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed	PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type	CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit	%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1
Pest Stage Majority/Min/Max	29, 13, 29	29, 13, 29	29, 13, 29	29, 16, 29
Trt-Eval Interval	4 DA-A	7 DA-A	13 DA-A	28 DA-A
Trt Treatment	8	11	14	17
No. Name				
1 Untreated Control	0.0b	0.0e	0.0f	0.0d
2 Glyphosate 450	7.5b	10.0de	23.8b-e	67.5a
Nil				
3 Glyphosate 450	5.0b	8.8de	22.5cde	70.0a
Envirowet 25				
4 Glyphosate 450	2.5b	8.8de	20.0de	55.0b
Envirowet 50				
5 Glyphosate 450	5.0b	13.8d	15.0e	72.5a
Envirowet 100				
6 Glyphosate 450	5.0b	5.0de	23.8b-e	72.5a
Axiwetta				
7 Glyphosate 450	2.5b	5.0de	17.5de	68.8a
LI700				
8 Paraquat 250	72.5a	62.5abc	26.3a-d	12.5c
Nil				
9 Paraquat 250	70.0a	52.5c	25.0bcd	10.0cd
Envirowet 25				
10 Paraquat 250	70.0a	67.5ab	30.0abc	12.5c
Envirowet 50				
11 Paraquat 250	77.5a	75.0a	30.0abc	15.0c
Envirowet 100				
12 Paraquat 250	77.5a	65.0abc	32.5ab	12.5c
Axiwetta				
13 Paraquat 250	72.5a	57.5bc	35.0a	10.0cd
LI700				
LSD P=.05	8.24	12.72	9.74	10.03
Standard Deviation	5.75	8.87	6.79	6.99
CV	15.98	26.74	29.31	18.98
Levene's F	0.534	0.861	1.049	1.172
Skewness	0.1712	0.3277	-0.1519	0.2399
Kurtosis	-1.9492*	-1.5188*	0.0968	-1.7731*
Replicate F	0.369	3.918	5.931	0.062
Replicate Prob(F)	0.7759	0.0161	0.0021	0.9794
Treatment F	158.087	44.756	7.082	74.902
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001

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

Table 8 – Clover (*Trifolium subterraneum*) control at 4, 7, 13 and 28 DA-A (Factorial)

Assessment Date	21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed	PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type	CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit	%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1
Pest Stage Majority/Min/Max	29, 13, 29	29, 13, 29	29, 13, 29	29, 16, 29
Trt-Eval Interval	4 DA-A	7 DA-A	13 DA-A	28 DA-A
Trt Treatment				
No. Name	8	11	14	17
Rate				
Rate Unit				
Appl Code				
TABLE OF R MEANS				
Replicate 1	37.5	31.3	18.3	40.0
Replicate 2	39.2	31.7	29.6	40.0
Replicate 3	39.2	39.2	24.6	39.2
Replicate 4	40.0	41.7	27.9	40.4
TABLE OF A (Herbicide) MEANS				
1 Glyphosate 450 1L/ha A	4.6b	8.5b	20.4b	67.7a
2 Paraquat 250 1.2L/ha A	73.3a	63.3a	29.8a	12.1b
LSD P=.05	3.52	5.37	4.08	4.29
Standard Deviation	5.99	9.14	6.95	7.30
CV	15.38	25.42	27.67	18.30
TABLE OF B (Adjuvant) MEANS				
1 Nil A	40.0-	36.3-	25.0-	40.0-
2 Envirowet 25 25mL/100 L A	37.5-	30.6-	23.8-	40.0-
3 Envirowet 50 50mL/100 L A	36.3-	38.1-	25.0-	33.8-
4 Envirowet 100 100mL/100 L A	41.3-	44.4-	22.5-	43.8-
5 Axiwet 100mL/100 L A	41.3-	35.0-	28.1-	42.5-
6 LI700 250mL/100 L A	37.5-	31.3-	26.3-	39.4-
LSD P=.05	6.10	9.29	7.07	7.43
Standard Deviation	5.99	9.14	6.95	7.30
CV	15.38	25.42	27.67	18.30
TABLE OF A (Herbicide) B (Adjuvant) MEANS				
1 Glyphosate 450 1L/ha A	7.5-	10.0-	23.8-	67.5-
1 Nil A				
2 Paraquat 250 1.2L/ha A	72.5-	62.5-	26.3-	12.5-
1 Nil A				
1 Glyphosate 450 1L/ha A	5.0-	8.8-	22.5-	70.0-
2 Envirowet 25 25mL/100 L A				
2 Paraquat 250 1.2L/ha A	70.0-	52.5-	25.0-	10.0-
2 Envirowet 25 25mL/100 L A				
1 Glyphosate 450 1L/ha A	2.5-	8.8-	20.0-	55.0-
3 Envirowet 50 50mL/100 L A				
2 Paraquat 250 1.2L/ha A	70.0-	67.5-	30.0-	12.5-
3 Envirowet 50 50mL/100 L A				
1 Glyphosate 450 1L/ha A	5.0-	13.8-	15.0-	72.5-
4 Envirowet 100 100mL/100 L A				
2 Paraquat 250 1.2L/ha A	77.5-	75.0-	30.0-	15.0-
4 Envirowet 100 100mL/100 L A				
1 Glyphosate 450 1L/ha A	5.0-	5.0-	23.8-	72.5-
5 Axiwet 100mL/100 L A				
2 Paraquat 250 1.2L/ha A	77.5-	65.0-	32.5-	12.5-
5 Axiwet 100mL/100 L A				
1 Glyphosate 450 1L/ha A	2.5-	5.0-	17.5-	68.8-
6 LI700 250mL/100 L A				
2 Paraquat 250 1.2L/ha A	72.5-	57.5-	35.0-	10.0-
6 LI700 250mL/100 L A				
LSD P=.05	8.62	13.14	9.99	10.50
Standard Deviation	5.99	9.14	6.95	7.30
CV	15.38	25.42	27.67	18.30

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

FACTORIAL/POOLED ERROR AOV For 21-May-2024 PLOT P CONTRO % 1 PLOT 1 29 13 29 4 DA-A (Data Column 8)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	58247.916667				
R	3	39.583333	13.194444	0.367	0.7770	
A	1	56718.750000	56718.750000	1578.954	0.0001	3.5
B	5	185.416667	37.083333	1.032	0.4150	6.1
AB	5	118.750000	23.750000	0.661	0.6553	8.6
ERROR	33	1185.416667	35.921717			

FACTORIAL/POOLED ERROR AOV For 24-May-2024 PLOT P CONTRO % 1 PLOT 1 29 13 29 7 DA-A (Data Column 11)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	41232.812500				
R	3	1001.562500	333.854167	3.999	0.0156	
A	1	36025.520833	36025.520833	431.571	0.0001	5.4
B	5	1017.187500	203.437500	2.437	0.0550	9.3
AB	5	433.854167	86.770833	1.039	0.4111	13.1
ERROR	33	2754.687500	83.475379			

FACTORIAL/POOLED ERROR AOV For 30-May-2024 PLOT P CONTRO % 1 PLOT 1 29 13 29 13 DA-A (Data Column 14)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	4074.479167				
R	3	889.062500	296.354167	6.142	0.0019	
A	1	1054.687500	1054.687500	21.860	0.0001	4.1
B	5	152.604167	30.520833	0.633	0.6762	7.1
AB	5	385.937500	77.187500	1.600	0.1875	10.0
ERROR	33	1592.187500	48.248106			

FACTORIAL/POOLED ERROR AOV For 14-Jun-2024 PLOT P CONTRO % 1 PLOT 1 29 16 29 28 DA-A (Data Column 17)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	39824.479167				
R	3	9.895833	3.298611	0.062	0.9795	
A	1	37129.687500	37129.687500	696.635	0.0001	4.3
B	5	477.604167	95.520833	1.792	0.1417	7.4
AB	5	448.437500	89.687500	1.683	0.1663	10.5
ERROR	33	1758.854167	53.298611			

Table 9 – Dock (*Rumex obtusifolius*) count per m² at 0 and 28 DA-A (ANOVA)

Assessment Date					17-May-2024	14-Jun-2024
Part Assessed					PLANT, P	PLANT, P
Assessment Type					COUNT	COUNT
Assessment Unit					NUMBER	NUMBER
Reporting Basis					0.25 m2	1 m2
Number of Subsamples					4	1
Pest Stage Majority/Min/Max					16, 12, 19	18, 14, 19
Trt-Eval Interval					0 DA-A	28 DA-A
ARM Action Codes					T3	&AL T6
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	6	24
1	Untreated Control				20.5	16.8-
2	Glyphosate 450		1L/ha	A		2.8-
	Nil			A		
3	Glyphosate 450		1L/ha	A		2.3-
	Envirowet 25		25mL/100 L	A		
4	Glyphosate 450		1L/ha	A		10.5-
	Envirowet 50		50mL/100 L	A		
5	Glyphosate 450		1L/ha	A		3.5-
	Envirowet 100		100mL/100 L	A		
6	Glyphosate 450		1L/ha	A		9.0-
	Axiwetta		100mL/100 L	A		
7	Glyphosate 450		1L/ha	A		9.0-
	LI700		250mL/100 L	A		
8	Paraquat 250		1.2L/ha	A		4.8-
	Nil			A		
9	Paraquat 250		1.2L/ha	A		0.3-
	Envirowet 25		25mL/100 L	A		
10	Paraquat 250		1.2L/ha	A		1.8-
	Envirowet 50		50mL/100 L	A		
11	Paraquat 250		1.2L/ha	A		5.8-
	Envirowet 100		100mL/100 L	A		
12	Paraquat 250		1.2L/ha	A		1.5-
	Axiwetta		100mL/100 L	A		
13	Paraquat 250		1.2L/ha	A		1.5-
	LI700		250mL/100 L	A		
LSD P=.05						NA
Standard Deviation						0.46t
CV						91.82t
Levene's F						0.836
Skewness					1.9635	0.639
Kurtosis					3.8736	-0.5887
Replicate F						2.273
Replicate Prob(F)						0.0966
Treatment F						1.266
Treatment Prob(F)						0.2802

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

Could not calculate LSD (% mean diff) or mean separation letters for columns 6,5 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.

T3 = [C5]*4

T6 = [23]*4

Table 10 – Dock (*Rumex obtusifolius*) count per m² at 28 DA-A (Factorial)

Assessment Date	14-Jun-2024			
Part Assessed	PLANT, P			
Assessment Type	COUNT			
Assessment Unit	NUMBER			
Reporting Basis	1 m ²			
Number of Subsamples	4			
Pest Stage Majority/Min/Max	18, 14, 19			
Trt-Eval Interval	28 DA-A			
ARM Action Codes	T6			
Trt No.	Treatment Name	Rate	Unit	Appl Code
				24
TABLE OF R MEANS				
Replicate 1				1.1
Replicate 2				3.6
Replicate 3				5.1
Replicate 4				7.8
TABLE OF A (Herbicide) MEANS				
1	Glyphosate 450	1L/ha	A	6.2-
2	Paraquat 250	1.2L/ha	A	2.6-
LSD P=.05				3.99
Standard Deviation				6.79
CV				155.14
TABLE OF B (Adjuvant) MEANS				
1	Nil		A	3.8-
2	Envirowet 25	25mL/100 L	A	1.3-
3	Envirowet 50	50mL/100 L	A	6.1-
4	Envirowet 100	100mL/100 L	A	4.6-
5	Axiwetta	100mL/100 L	A	5.3-
6	LI700	250mL/100 L	A	5.3-
LSD P=.05				6.90
Standard Deviation				6.79
CV				155.14
TABLE OF A (Herbicide) B (Adjuvant) MEANS				
1	Glyphosate 450	1L/ha	A	2.8-
1	Nil		A	
2	Paraquat 250	1.2L/ha	A	4.8-
1	Nil		A	
1	Glyphosate 450	1L/ha	A	2.3-
2	Envirowet 25	25mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	0.3-
2	Envirowet 25	25mL/100 L	A	
1	Glyphosate 450	1L/ha	A	10.5-
3	Envirowet 50	50mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	1.8-
3	Envirowet 50	50mL/100 L	A	
1	Glyphosate 450	1L/ha	A	3.5-
4	Envirowet 100	100mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	5.8-
4	Envirowet 100	100mL/100 L	A	
1	Glyphosate 450	1L/ha	A	9.0-
5	Axiwetta	100mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	1.5-
5	Axiwetta	100mL/100 L	A	
1	Glyphosate 450	1L/ha	A	9.0-
6	LI700	250mL/100 L	A	
2	Paraquat 250	1.2L/ha	A	1.5-
6	LI700	250mL/100 L	A	
LSD P=.05				9.76
Standard Deviation				6.79
CV				155.14

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

T6 = [23]*4

FACTORIAL/POOLED ERROR AOV For 14-Jun-2024 PLANT P COUNT NUMBER 1 m2 4 18 14 19 28 DA-A T6 (Data Column 24)						
Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	47	2323.250000				
R	3	280.250000	93.416667	2.028	0.1291	
A	1	154.083333	154.083333	3.345	0.0765	4.0
B	5	118.500000	23.700000	0.514	0.7634	6.9
AB	5	250.166667	50.033333	1.086	0.3863	9.8
ERROR	33	1520.250000	46.068182			

Table 11 – Dock (*Rumex obtusifolius*) control at 4, 7, 13 and 28 DA-A (ANOVA)

Assessment Date	21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed	PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type	CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit	%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1
Pest Stage Majority/Min/Max	16, 12, 19	16, 12, 19	16, 12, 19	18, 14, 19
Trt-Eval Interval	4 DA-A	7 DA-A	13 DA-A	28 DA-A
ARM Action Codes	AL		AA	
Trt No.	9	12	15	18
Treatment Name				
Rate				
Unit				
Appl Code				
1 Untreated Control	0.0c	0.0c	0.0e	0.0e
2 Glyphosate 450 Nil	3.3bc	16.7b	8.3d	73.3abc
3 Glyphosate 450 Envirowet 25	5.0b	21.3b	20.0c	58.8cd
4 Glyphosate 450 Envirowet 50	0.0c	13.3b	13.3cd	53.3d
5 Glyphosate 450 Envirowet 100	7.5b	16.3b	12.5cd	71.3abc
6 Glyphosate 450 Axiwetta	0.0c	10.0bc	20.0c	72.5abc
7 Glyphosate 450 LI700	7.5b	11.3bc	11.3cd	61.3bcd
8 Paraquat 250 Nil	90.0a	87.5a	72.5ab	83.8a
9 Paraquat 250 Envirowet 25	50.0a	90.0a	70.0ab	85.0a
10 Paraquat 250 Envirowet 50	80.0a	90.0a	80.0a	75.0ab
11 Paraquat 250 Envirowet 100	85.0a	85.0a	75.0ab	77.5a
12 Paraquat 250 Axiwetta	85.0a	90.0a	73.3ab	75.0ab
13 Paraquat 250 LI700	83.3a	83.3a	63.3b	76.7a
LSD P=.05	NA	13.10	NA	15.08
Standard Deviation	0.35t	9.04	5.14t	10.41
CV	33.86t	19.12	13.91t	15.68
Levene's F	1.558	1.232	1.107	1.065
Skewness	-0.0136	0.2665	0.0791	-1.6656*
Kurtosis	-1.7612*	-1.8171*	-1.3925	2.5213*
Replicate F	1.291	0.377	5.379	1.504
Replicate Prob(F)	0.2976	0.7702	0.0047	0.2350
Treatment F	22.133	75.312	73.097	17.823
Treatment Prob(F)	0.0001	0.0001	0.0001	0.0001

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

Missing data estimates are included in columns: Average=9,12,15,18

AA = Data transformed using arcsine square root % transformation with resulting letters of separation applied to original means.

AL = Data transformed using log transformation of X+1 with resulting letters of separation applied to original means.

Table 12 – Dock (*Rumex obtusifolius*) control at 4, 7, 13 and 28 DA-A (Factorial)

Assessment Date	21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed	PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type	CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit	%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1
Pest Stage Majority/Min/Max	16, 12, 19	16, 12, 19	16, 12, 19	18, 14, 19
Trt-Eval Interval	4 DA-A	7 DA-A	13 DA-A	28 DA-A
Trt Treatment				
No. Name	9	12	15	18
Rate				
Unit				
Appl Code				
TABLE OF R MEANS				
Replicate 1	34.5	48.6	52.1	77.5
Replicate 2	44.6	53.3	45.0	65.8
Replicate 3	40.5	53.1	38.4	71.2
Replicate 4	43.4	49.7	38.5	74.2
TABLE OF A (Herbicide) MEANS				
1 Glyphosate 450 1L/ha A	3.2b	14.5b	15.2b	65.7b
2 Paraquat 250 1.2L/ha A	78.3a	87.9a	71.8a	78.7a
LSD P=.05	8.06	5.50	4.12	6.55
Standard Deviation	13.54	9.25	6.93	11.01
CV	33.21	18.06	15.93	15.26
TABLE OF B (Adjuvant) MEANS				
1 Nil A	45.6-	51.7-	41.8-	79.4-
2 Envirowet 25 25mL/100 L A	28.4-	56.6-	44.1-	70.0-
3 Envirowet 50 50mL/100 L A	38.1-	50.2-	49.0-	66.9-
4 Envirowet 100 100mL/100 L A	46.3-	50.6-	43.8-	74.4-
5 Axiwetta 100mL/100 L A	40.9-	50.3-	45.8-	73.6-
6 LI700 250mL/100 L A	45.4-	47.6-	36.5-	68.8-
LSD P=.05	13.97	9.52	7.13	11.34
Standard Deviation	13.54	9.25	6.93	11.01
CV	33.21	18.06	15.93	15.26
TABLE OF A (Herbicide) B (Adjuvant) MEANS				
1 Glyphosate 450 1L/ha A	1.2-	15.8-	11.2-	75.1-
1 Nil A				
2 Paraquat 250 1.2L/ha A	90.0-	87.5-	72.5-	83.8-
1 Nil A				
1 Glyphosate 450 1L/ha A	5.0-	21.3-	20.0-	58.8-
2 Envirowet 25 25mL/100 L A				
2 Paraquat 250 1.2L/ha A	51.8-	92.0-	68.2-	81.3-
2 Envirowet 25 25mL/100 L A				
1 Glyphosate 450 1L/ha A	-2.1-	12.5-	16.2-	55.1-
3 Envirowet 50 50mL/100 L A				
2 Paraquat 250 1.2L/ha A	78.2-	88.0-	81.8-	78.7-
3 Envirowet 50 50mL/100 L A				
1 Glyphosate 450 1L/ha A	7.5-	16.3-	12.5-	71.3-
4 Envirowet 100 100mL/100 L A				
2 Paraquat 250 1.2L/ha A	85.0-	85.0-	75.0-	77.5-
4 Envirowet 100 100mL/100 L A				
1 Glyphosate 450 1L/ha A	0.0-	10.0-	20.0-	72.5-
5 Axiwetta 100mL/100 L A				
2 Paraquat 250 1.2L/ha A	81.7-	90.6-	71.7-	74.7-
5 Axiwetta 100mL/100 L A				
1 Glyphosate 450 1L/ha A	7.5-	11.3-	11.3-	61.3-
6 LI700 250mL/100 L A				
2 Paraquat 250 1.2L/ha A	83.2-	84.0-	61.7-	76.3-
6 LI700 250mL/100 L A				
LSD P=.05	19.75	13.46	10.09	16.04
Standard Deviation	13.54	9.25	6.93	11.01
CV	33.21	18.06	15.93	15.26

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

FACTORIAL/POOLED ERROR Least square estimation AOV For 21-May-2024 PLOT P CONTRO % 1 PLOT 1 16 12 19 4 DA-A (Data Column 9)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	38	63492.307692				
R	3	1037.762238	345.920746	1.888	0.1586	
A	1	56645.541958	56645.541958	309.145	0.0001	8.1
B	5	920.098577	184.019715	1.004	0.4365	14.0
AB	5	491.315789	98.263158	0.536	0.7468	19.8
ERROR	24	4397.589130	183.232880			

FACTORIAL/POOLED ERROR Least square estimation AOV For 24-May-2024 PLOT P CONTRO % 1 PLOT 1 16 12 19 7 DA-A (Data Column 12)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	39	54799.375000				
R	3	744.324495	248.108165	2.903	0.0547	
A	1	51347.991660	51347.991660	600.762	0.0001	5.5
B	5	313.625125	62.725025	0.734	0.6050	9.5
AB	5	256.648902	51.329780	0.601	0.6999	13.5
ERROR	25	2136.784819	85.471393			

FACTORIAL/POOLED ERROR Least square estimation AOV For 30-May-2024 PLOT P CONTRO % 1 PLOT 1 16 12 19 13 DA-A (Data Column 15)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	39	35940.000000				
R	3	3027.373737	1009.124579	21.026	0.0001	
A	1	30974.041037	30974.041037	645.357	0.0001	4.1
B	5	478.491658	95.698332	1.994	0.1144	7.1
AB	5	260.213178	52.042636	1.084	0.3931	10.1
ERROR	25	1199.880390	47.995216			

FACTORIAL/POOLED ERROR Least square estimation AOV For 14-Jun-2024 PLOT P CONTRO % 1 PLOT 1 18 14 19 28 DA-A (Data Column 18)

Source	DF	Sum of Squares	Mean Square	F	Prob(F)	LSD (.05)
Total	39	6849.375000				
R	3	972.607323	324.202441	2.672	0.0692	
A	1	1662.006548	1662.006548	13.700	0.0011	6.5
B	5	791.406078	158.281216	1.305	0.2938	11.3
AB	5	390.568475	78.113695	0.644	0.6685	16.0
ERROR	25	3032.786576	121.311463			

DISCUSSION

A small plot trial was established near Kingsvale, New South Wales in 2024 compare the effectiveness of Envirowet Multi-Phase Surfactant with industry standard wetting agents when used with Glyphosate and Paraquat herbicides to control weeds in fallow.

Treatments were applied as a single broadcast foliar spray to annual ryegrass (*Lolium rigidum*) at the four-tiller growth stage (BBCH 24), clover (*Trifolium subterraneum*) at the nine or more side shoots growth stage (BBCH 29) and dock (*Rumex obtusifolius*) at the 6-leaf growth stage (BBCH 16) using a hand-held boom fitted with TeeJet® AIXR flat fan air induction nozzles delivering 100 L/ha and generating coarse spray droplets (ASABE 572.1).

Seasonal conditions were characterised by above-average rainfall. However, this did not affect the reliability of the results of the trial.

Weed counts were conducted by species across the UTC plots prior to treatment application and across all plots at 28 days after application (DA-A). Weed control was visually assessed by species at 4, 7, 13 and 28 DA-A.

Annual ryegrass control (Tables 1-4)

Factorial analysis showed that the plots treated with Paraquat provided significantly greater mean visual control of annual ryegrass at 4, 7, and 13 DA-A than the plots treated with Glyphosate. However, at 28 DA-A, mean visual control of annual ryegrass was 95.0% across the plots treated with Glyphosate which was significantly higher than the mean visual control of 88.7% that was observed across the plots treated with Paraquat.

Factorial analysis showed that there were no significant differences in visual control of annual ryegrass at 4, 7, or 13 DA-A between the plots treated with an adjuvant and the plots that received nil adjuvant. However, at 28 DA-A visual control of annual ryegrass was significantly higher across plots treated with an adjuvant when compared with the nil adjuvant plots, except across the plots treated with Envirowet at 100 mL/100 L, which displayed numerically, but not significantly higher control than the nil adjuvant plots. Visual control of annual ryegrass was statistically equivalent at 28 DA-A across the plots treated with Envirowet at 25-100 mL/100 L and Axiwetta or LI700. Count data collected at 28 DA-A showed that the plots treated with an adjuvant displayed numerically lower annual ryegrass densities than the plots that received nil adjuvant.

Clover control (Tables 5-8)

Factorial analysis showed that the plots treated with Paraquat provided significantly greater mean visual control of clover up to 13 DA-A when compared with the plots treated with Glyphosate. However, the level of visual control of clover provided by Paraquat declined during the trial period and at 28 DA-A, mean visual control of clover was on 12.1% across the plots treated with Paraquat, which was significantly less than the 67.7% control provided by Glyphosate.

Factorial analysis showed that there were no significant differences in the level of visual control of clover provided by Envirowet at 25-100 mL/100 L, Axiwetta, LI700, or nil adjuvant at any assessment timing. Count data collected at 28 DA-A, also showed no significant differences in clover densities between adjuvant treatments.

Dock control (Tables 9-12)

Dock densities were lower and less even than those of annual ryegrass and clover. And due to some plots missing data, factorial analysis was conducted using least square estimation, rather than traditional analysis of variation. Factorial analysis showed that Paraquat provided significantly greater control of dock at each assessment timing when compared with Glyphosate.

Factorial analysis did not reveal any significant differences in visual control of dock between the plots treated with nil adjuvant and the plots treated with Envirowet, Axiwetta, or LI700.

CONCLUSIONS

Visual control of annual ryegrass was higher at 28 DA-A across plots treated with an adjuvant when compared with the nil adjuvant plots, however this was not significant across the plots treated with Envirowet at 100 mL/100 L.

There were no significant differences in visual annual ryegrass control across the plots treated with Envirowet at 25-100 mL/100 L and Axiwetta or LI700.

There were no significant differences in the level of visual control of either clover or dock between 4 and 28 DA-A across the plots treated with nil adjuvant and the plots treated with Envirowet, Axiwetta, or LI700.

APPENDICES

Appendix i - Trial details

Trial Site Information

Location	Kingsvale, NSW
GPS Co-ordinates	-34.40261, 148.32618
Treated Plot Width	1.5 m
Treated Plot Length	7 m
Treated Plot Area	10.5 m ²
Replications	4
Treatments	13
Site Type	Field
Experimental Unit	1 Plot
Study Design	Factorial (RCB)

Cooperator

Name	Brett Bushell
Address	77 Prunevale Road, Kingsvale, NSW 2577
Mobile	0429 895 465

Crop Description

Common Name	Fallow
Previous Crop 2023	Fallow
Previous Crop 2022	Pasture

Pest Description

Scientific Name	<i>Lolium rigidum</i>	<i>Trifolium subterraneum</i>	<i>Rumex obtusifolius</i> <i>subsp. sylvestris</i>
Common Name	Mediterranean ryegrass	Clover	Rumex
ARM Code	LOLRI	TRFSS	RUMOS

Application Description

Code	A
Date	17-May-2024
Start Time	11:00 AM
Stop Time	12:30 PM
Method	SPRAY
Timing	ATGRST
Placement	FOLIAR
Air Temperature	19 C
% Relative Humidity	35
Wind Velocity+Dir.	9 KPH, S
Wet Leaves (Y/N)	N, no
Soil Moisture	SLIWET
% Cloud Cover	5

Application Equipment

Code	A
Equipment Name	HBM045
Equipment Type	SPRBAC
Operation Pressure	200 kPa
Nozzle Model	110 015 AIXR
Nozzle Type	TEEJAI
Boom Height	50 cm
Ground Speed	5.8 KPH
Carrier	WATER
Application Amount	100 L/ha
Mix Size	2.0 L

Pest Stage at Each Application

Code	A	A	A
ARM Code	LOLRI	TRFSS	RUMOS
Majority	24	29	16
Minimum	13	13	12
Maximum	26	29	19

Trial plan

Rep Blk

3	2	201 13 A2 B6	202 5 A1 B4	203 9 A2 B2	204 3 A1 B2	205 4 A1 B3	206 2 A1 B1	207 12 A2 B5	208 6 A1 B5	209 10 A2 B3	210 7 A1 B6	211 1 	212 11 A2 B4	213 8 A2 B1
1	1	101 10 A2 B3	102 4 A1 B3	103 2 A1 B1	104 6 A1 B5	105 1 	106 8 A2 B1	107 7 A1 B6	108 3 A1 B2	109 11 A2 B4	110 5 A1 B4	111 12 A2 B5	112 13 A2 B6	113 9 A2 B2

Plots below are to the right of the plots above

3	2	214 6 A1 B5	215 3 A1 B2	216 4 A1 B3	217 7 A1 B6	218 12 A2 B5	219 13 A2 B6	220 1 	221 10 A2 B3	222 11 A2 B4	223 8 A2 B1	224 9 A2 B2	225 5 A1 B4	226 2 A1 B1
1	1	114 7 A1 B6	115 11 A2 B4	116 1 	117 10 A2 B3	118 9 A2 B2	119 2 A1 B1	120 5 A1 B4	121 13 A2 B6	122 4 A1 B3	123 6 A1 B5	124 3 A1 B2	125 8 A2 B1	126 12 A2 B5

Factor	Description
A	Herbicide
B	Adjuvant

Assessment Techniques

Assessment type	Scale	Method
Weed Count	plants/m ²	The number of weeds in 4 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. All mention of significant differences contained within this report refer to statistically significant differences. Levene's test was used to test for homogeneity.

If homogeneity was not met, then 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.

Abbreviation guide

Trial Details

YBRAC, NOSC, Fallow, Fallow = IE
LOLRI, Lolium rigidum, Mediterranean ryegrass = IE
TRFSS, Trifolium sp., Clover = IE
RUMOS, Rumex obtusifolius subsp. sylvestris, Rumex obtusifolius subsp. sylvestris = IE
FACTOR, Factorial (RCB) = Factorial (RCB)
SPRAY = spray
ATGRST = at growing stage
SLIWET = slightly wet, moist|A
SPRBAC = sprayer - backpack, knapsack, hand-held
kpa = kilopascal
TEEJAI = teejet, air induction

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
%UNCK = percent of untreated check
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
AA = Automatic arcsine square root transformation
&=Transformation applied to 'Plot' experimental unit means of subsamples.

Appendix ii - Plot data

Table 1 - Ryegrass (*Lolium rigidum*) count at 0 and 28 DA-A

Assessment Date					17-May-2024	14-Jun-2024
Part Assessed					PLANT, P	PLANT, P
Assessment Type					COUNT	COUNT
Assessment Unit					NUMBER	NUMBER
Reporting Basis					0.25 m2	0.25 m2
Number of Subsamples					4	4
Pest Stage Majority/Min/Max					24, 13, 26	26, 21, 29
Trt-Eval Interval					0 DA-A	28 DA-A
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	
1	Untreated Control				105	17.5
					116	23.5
					211	29.5
					220	10.3
					Mean =	20.2
2	Glyphosate 450	1L/ha	A		103	0.0
	Nil		A		119	0.0
					206	0.0
					226	0.0
					Mean =	0.0
3	Glyphosate 450	1L/ha	A		108	0.3
	Envirowet 25	25mL/100 L	A		124	0.0
					204	0.0
					215	0.0
					Mean =	0.1
4	Glyphosate 450	1L/ha	A		102	0.0
	Envirowet 50	50mL/100 L	A		122	0.0
					205	0.0
					216	0.0
					Mean =	0.0
5	Glyphosate 450	1L/ha	A		110	0.0
	Envirowet 100	100mL/100 L	A		120	0.0
					202	0.0
					225	0.0
					Mean =	0.0
6	Glyphosate 450	1L/ha	A		104	0.0
	Axiwetta	100mL/100 L	A		123	0.0
					208	0.0
					214	0.0
					Mean =	0.0
7	Glyphosate 450	1L/ha	A		107	0.0
	LI700	250mL/100 L	A		114	0.0
					210	0.0
					217	0.0
					Mean =	0.0
8	Paraquat 250	1.2L/ha	A		106	0.8
	Nil		A		125	0.3
					213	3.5
					223	0.0
					Mean =	1.1
9	Paraquat 250	1.2L/ha	A		113	0.0
	Envirowet 25	25mL/100 L	A		118	0.3
					203	0.3
					224	0.3
					Mean =	0.2
10	Paraquat 250	1.2L/ha	A		101	0.0
	Envirowet 50	50mL/100 L	A		117	0.0
					209	1.3
					221	0.0
					Mean =	0.3
11	Paraquat 250	1.2L/ha	A		109	0.3
	Envirowet 100	100mL/100 L	A		115	0.0

				212		1.8
				222		0.0
				Mean =	.	0.5
12	Paraquat 250	1.2L/ha	A	111		0.0
	Axiwetta	100mL/100 L	A	126		0.0
				207		0.8
				218		0.0
				Mean =	.	0.2
13	Paraquat 250	1.2L/ha	A	112		0.5
	LI700	250mL/100 L	A	121		0.0
				201		0.3
				219		0.0
				Mean =	.	0.2

Table 2 - Ryegrass (*Lolium rigidum*) control at 4, 7, 13 and 28 DA-A

Assessment Date					21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed					PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type					CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit					%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis					1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples					1	1	1	1
Pest Stage Majority/Min/Max					24, 13, 26	24, 13, 26	24, 13, 26	26, 21, 29
Trt-Eval Interval					4 DA-A	7 DA-A	13 DA-A	28 DA-A
Trt	Treatment	Rate	Appl	Plot	7	10	13	16
No.	Name	Rate Unit	Code					
1	Untreated Control			105	0.0	0.0	0.0	0.0
				116	0.0	0.0	0.0	0.0
				211	0.0	0.0	0.0	0.0
				220	0.0	0.0	0.0	0.0
				Mean =	0.0	0.0	0.0	0.0
2	Glyphosate 450	1L/ha	A	103	0.0	0.0	50.0	95.0
	Nil		A	119	0.0	0.0	40.0	95.0
				206	10.0	5.0	60.0	95.0
				226	10.0	20.0	50.0	95.0
				Mean =	5.0	6.3	50.0	95.0
3	Glyphosate 450	1L/ha	A	108	10.0	0.0	50.0	95.0
	Envirowet 25	25 mL/100 L	A	124	10.0	30.0	60.0	95.0
				204	0.0	0.0	50.0	95.0
				215	0.0	0.0	60.0	95.0
				Mean =	5.0	7.5	55.0	95.0
4	Glyphosate 450	1L/ha	A	102	10.0	5.0	70.0	98.0
	Envirowet 50	50 mL/100 L	A	122	0.0	20.0	60.0	90.0
				205	0.0	0.0	50.0	95.0
				216	0.0	0.0	60.0	95.0
				Mean =	2.5	6.3	60.0	94.5
5	Glyphosate 450	1L/ha	A	110	10.0	5.0	60.0	95.0
	Envirowet 100	100 mL/100 L	A	120	0.0	0.0	50.0	95.0
				202	0.0	10.0	70.0	95.0
				225	0.0	0.0	40.0	95.0
				Mean =	2.5	3.8	55.0	95.0
6	Glyphosate 450	1L/ha	A	104	0.0	0.0	70.0	98.0
	Axiwetta	100 mL/100 L	A	123	0.0	5.0	60.0	95.0
				208	10.0	5.0	70.0	95.0
				214	0.0	5.0	50.0	95.0
				Mean =	2.5	3.8	62.5	95.8
7	Glyphosate 450	1L/ha	A	107	0.0	0.0	50.0	98.0
	LI700	250 mL/100 L	A	114	10.0	0.0	50.0	95.0
				210	10.0	0.0	60.0	90.0
				217	0.0	0.0	50.0	95.0
				Mean =	5.0	0.0	52.5	94.5
8	Paraquat 250	1.2L/ha	A	106	80.0	90.0	90.0	85.0
	Nil		A	125	70.0	95.0	90.0	85.0
				213	80.0	90.0	70.0	80.0
				223	80.0	95.0	80.0	80.0
				Mean =	77.5	92.5	82.5	82.5
9	Paraquat 250	1.2L/ha	A	113	60.0	90.0	85.0	90.0
	Envirowet 25	25 mL/100 L	A	118	80.0	95.0	90.0	95.0
				203	70.0	95.0	90.0	90.0
				224	70.0	95.0	90.0	90.0
				Mean =	70.0	93.8	88.8	91.3
10	Paraquat 250	1.2L/ha	A	101	80.0	90.0	95.0	98.0
	Envirowet 50	50 mL/100 L	A	117	70.0	95.0	90.0	95.0

				209	70.0	95.0	80.0	85.0
				221	70.0	95.0	95.0	90.0
				Mean =	72.5	93.8	90.0	92.0
11	Paraquat 250	1.2L/ha	A	109	80.0	95.0	90.0	90.0
	Envirowet 100	100 ^{mL/100} _L	A	115	80.0	90.0	85.0	90.0
				212	80.0	95.0	80.0	85.0
				222	80.0	95.0	90.0	85.0
				Mean =	80.0	93.8	86.3	87.5
12	Paraquat 250	1.2L/ha	A	111	80.0	95.0	95.0	90.0
	Axiwetta	100 ^{mL/100} _L	A	126	80.0	95.0	95.0	90.0
				207	70.0	95.0	80.0	85.0
				218	80.0	95.0	90.0	90.0
				Mean =	77.5	95.0	90.0	88.8
13	Paraquat 250	1.2L/ha	A	112	70.0	95.0	90.0	90.0
	LI700	250 ^{mL/100} _L	A	121	70.0	95.0	90.0	95.0
				201	70.0	95.0	95.0	90.0
				219	80.0	95.0	90.0	85.0
				Mean =	72.5	95.0	91.3	90.0

Table 3 - Clover (*Trifolium subterraneum*) count at 0 and 28 DA-A

Assessment Date						17-May-2024	14-Jun-2024
Part Assessed						PLANT, P	PLANT, P
Assessment Type						COUNT	COUNT
Assessment Unit						NUMBER	NUMBER
Reporting Basis						0.25 m2	0.25 m2
Number of Subsamples						4	4
Pest Stage Majority/Min/Max						29, 13, 29	29, 16, 29
Trt-Eval Interval						0 DA-A	28 DA-A
ARM Action Codes							
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	3	21
1	Untreated Control				105	2.5	2.3
					116	13.0	12.3
					211	1.5	1.3
					220	21.5	24.3
					Mean =	9.6	10.0
2	Glyphosate 450	1L/ha	A		103		0.8
	Nil		A		119		1.3
					206		0.8
					226		0.5
					Mean =	.	0.8
3	Glyphosate 450	1L/ha	A		108		0.3
	Envirowet 25	25mL/100 L	A		124		1.0
					204		1.3
					215		1.3
					Mean =	.	0.9
4	Glyphosate 450	1L/ha	A		102		0.5
	Envirowet 50	50mL/100 L	A		122		0.0
					205		2.5
					216		2.8
					Mean =	.	1.4
5	Glyphosate 450	1L/ha	A		110		0.3
	Envirowet 100	100mL/100 L	A		120		1.3
					202		1.8
					225		0.3
					Mean =	.	0.9
6	Glyphosate 450	1L/ha	A		104		0.3
	Axiwetta	100mL/100 L	A		123		0.5
					208		0.3
					214		0.0
					Mean =	.	0.3
7	Glyphosate 450	1L/ha	A		107		0.5
	LI700	250mL/100 L	A		114		0.8
					210		0.0
					217		1.0
					Mean =	.	0.6
8	Paraquat 250	1.2L/ha	A		106		0.8
	Nil		A		125		7.0
					213		6.3
					223		16.8
					Mean =	.	7.7
9	Paraquat 250	1.2L/ha	A		113		4.8
	Envirowet 25	25mL/100 L	A		118		22.0
					203		8.8
					224		18.5
					Mean =	.	13.5
10	Paraquat 250	1.2L/ha	A		101		7.8
	Envirowet 50	50mL/100 L	A		117		11.0
					209		3.0
					221		19.5
					Mean =	.	10.3
11	Paraquat 250	1.2L/ha	A		109		8.3
	Envirowet 100	100mL/100 L	A		115		9.3
					212		2.3

				222		23.0
				Mean =	.	10.7
12	Paraquat 250	1.2L/ha	A	111		3.8
	Axiwetta	100mL/100 L	A	126		6.0
				207		7.0
				218		16.3
				Mean =	.	8.3
13	Paraquat 250	1.2L/ha	A	112		4.5
	LI700	250mL/100 L	A	121		14.0
				201		5.0
				219		19.3
				Mean =	.	10.7

Table 4 - Clover (*Trifolium subterraneum*) control at 4, 7, 13 and 28 DA-A

Assessment Date					21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed					PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type					CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit					%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis					1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples					1	1	1	1
Pest Stage Majority/Min/Max					29, 13, 29	29, 13, 29	29, 13, 29	29, 16, 29
Trt-Eval Interval					4 DA-A	7 DA-A	13 DA-A	28 DA-A
Trt	Treatment	Rate	Appl	Plot	8	11	14	17
No.	Name	Rate Unit	Code					
1	Untreated Control			105	0.0	0.0	0.0	0.0
				116	0.0	0.0	0.0	0.0
				211	0.0	0.0	0.0	0.0
				220	0.0	0.0	0.0	0.0
				Mean =	0.0	0.0	0.0	0.0
2	Glyphosate 450	1L/ha	A	103	10.0	10.0	20.0	70.0
	Nil		A	119	10.0	5.0	30.0	70.0
				206	0.0	5.0	20.0	50.0
				226	10.0	20.0	25.0	80.0
				Mean =	7.5	10.0	23.8	67.5
3	Glyphosate 450	1L/ha	A	108	10.0	5.0	20.0	70.0
	Envirowet 25	25 mL/100 L	A	124	10.0	15.0	30.0	80.0
				204	0.0	10.0	20.0	70.0
				215	0.0	5.0	20.0	60.0
				Mean =	5.0	8.8	22.5	70.0
4	Glyphosate 450	1L/ha	A	102	0.0	0.0	20.0	60.0
	Envirowet 50	50 mL/100 L	A	122	10.0	20.0	20.0	50.0
				205	0.0	5.0	20.0	50.0
				216	0.0	10.0	20.0	60.0
				Mean =	2.5	8.8	20.0	55.0
5	Glyphosate 450	1L/ha	A	110	0.0	0.0	10.0	70.0
	Envirowet 100	100 mL/100 L	A	120	10.0	10.0	30.0	70.0
				202	0.0	15.0	10.0	70.0
				225	10.0	30.0	10.0	80.0
				Mean =	5.0	13.8	15.0	72.5
6	Glyphosate 450	1L/ha	A	104	0.0	0.0	15.0	70.0
	Axiwetta	100 mL/100 L	A	123	10.0	10.0	40.0	80.0
				208	10.0	5.0	20.0	70.0
				214	0.0	5.0	20.0	70.0
				Mean =	5.0	5.0	23.8	72.5
7	Glyphosate 450	1L/ha	A	107	0.0	0.0	10.0	50.0
	LI700	250 mL/100 L	A	114	0.0	0.0	30.0	70.0
				210	0.0	10.0	20.0	80.0
				217	10.0	10.0	10.0	75.0
				Mean =	2.5	5.0	17.5	68.8
8	Paraquat 250	1.2L/ha	A	106	70.0	50.0	20.0	20.0
	Nil		A	125	70.0	70.0	30.0	10.0
				213	80.0	70.0	25.0	10.0
				223	70.0	60.0	30.0	10.0
				Mean =	72.5	62.5	26.3	12.5
9	Paraquat 250	1.2L/ha	A	113	70.0	40.0	15.0	10.0
	Envirowet 25	25 mL/100 L	A	118	70.0	50.0	25.0	10.0
				203	60.0	60.0	30.0	10.0
				224	80.0	60.0	30.0	10.0
				Mean =	70.0	52.5	25.0	10.0
10	Paraquat 250	1.2L/ha	A	101	70.0	70.0	30.0	20.0
	Envirowet 50	50 mL/100 L	A	117	60.0	50.0	20.0	10.0

				209	80.0	70.0	30.0	10.0
				221	70.0	80.0	40.0	10.0
				Mean =	70.0	67.5	30.0	12.5
11	Paraquat 250	1.2L/ha	A	109	80.0	90.0	20.0	20.0
	Envirowet 100	100 ^{mL} /100 _L	A	115	70.0	50.0	30.0	10.0
				212	80.0	80.0	30.0	20.0
				222	80.0	80.0	40.0	10.0
				Mean =	77.5	75.0	30.0	15.0
12	Paraquat 250	1.2L/ha	A	111	70.0	60.0	20.0	10.0
	Axiwetta	100 ^{mL} /100 _L	A	126	80.0	50.0	40.0	10.0
				207	80.0	80.0	30.0	20.0
				218	80.0	70.0	40.0	10.0
				Mean =	77.5	65.0	32.5	12.5
13	Paraquat 250	1.2L/ha	A	112	70.0	50.0	20.0	10.0
	LI700	250 ^{mL} /100 _L	A	121	70.0	50.0	30.0	10.0
				201	80.0	60.0	40.0	10.0
				219	70.0	70.0	50.0	10.0
				Mean =	72.5	57.5	35.0	10.0

Table 5 - Dock (*Rumex obtusifolius*) count at 0 and 28 DA-A

Assessment Date						17-May-2024	14-Jun-2024
Part Assessed						PLANT, P	PLANT, P
Assessment Type						COUNT	COUNT
Assessment Unit						NUMBER	NUMBER
Reporting Basis						0.25 m2	0.25 m2
Number of Subsamples						4	4
Pest Stage Majority/Min/Max						16, 12, 19	18, 14, 19
Trt-Eval Interval						0 DA-A	28 DA-A
ARM Action Codes							
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	Plot	5	23
1	Untreated Control				105	0.5	0.0
					116	2.0	3.8
					211	17.0	12.0
					220	1.0	1.0
					Mean =	5.1	4.2
2	Glyphosate 450	1L/ha		A	103		0.0
	Nil			A	119		2.8
					206		0.0
					226		0.0
					Mean =	.	0.7
3	Glyphosate 450	1L/ha		A	108		0.0
	Envirowet 25	25mL/100 L		A	124		0.0
					204		0.5
					215		1.8
					Mean =	.	0.6
4	Glyphosate 450	1L/ha		A	102		0.0
	Envirowet 50	50mL/100 L		A	122		1.8
					205		2.3
					216		6.5
					Mean =	.	2.6
5	Glyphosate 450	1L/ha		A	110		1.3
	Envirowet 100	100mL/100 L		A	120		0.8
					202		0.5
					225		1.0
					Mean =	.	0.9
6	Glyphosate 450	1L/ha		A	104		0.5
	Axiwetta	100mL/100 L		A	123		1.3
					208		0.0
					214		7.3
					Mean =	.	2.3
7	Glyphosate 450	1L/ha		A	107		0.3
	LI700	250mL/100 L		A	114		1.5
					210		2.0
					217		5.3
					Mean =	.	2.3
8	Paraquat 250	1.2L/ha		A	106		0.0
	Nil			A	125		0.0
					213		4.3
					223		0.5
					Mean =	.	1.2
9	Paraquat 250	1.2L/ha		A	113		0.3
	Envirowet 25	25mL/100 L		A	118		0.0
					203		0.0
					224		0.0
					Mean =	.	0.1
10	Paraquat 250	1.2L/ha		A	101		0.0
	Envirowet 50	50mL/100 L		A	117		1.3
					209		0.5
					221		0.0
					Mean =	.	0.4
11	Paraquat 250	1.2L/ha		A	109		0.0
	Envirowet 100	100mL/100 L		A	115		0.5
					212		5.3

				222		0.0
				Mean =	.	1.4
12	Paraquat 250	1.2L/ha	A	111		0.3
	Axiwetta	100mL/100 L	A	126		0.5
				207		0.0
				218		0.8
				Mean =	.	0.4
13	Paraquat 250	1.2L/ha	A	112		0.8
	LI700	250mL/100 L	A	121		0.5
				201		0.0
				219		0.3
				Mean =	.	0.4

Table 6 - Dock (*Rumex obtusifolius*) control at 4, 7, 13 and 28 DA-A

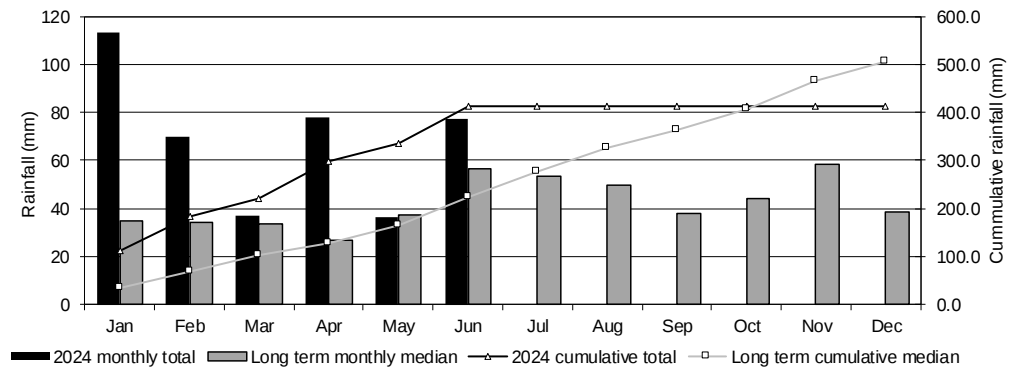
Assessment Date					21-May-2024	24-May-2024	30-May-2024	14-Jun-2024
Part Assessed					PLOT, P	PLOT, P	PLOT, P	PLOT, P
Assessment Type					CONTRO	CONTRO	CONTRO	CONTRO
Assessment Unit					%UNCK	%UNCK	%UNCK	%UNCK
Reporting Basis					1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples					1	1	1	1
Pest Stage Majority/Min/Max					16, 12, 19	16, 12, 19	16, 12, 19	18, 14, 19
Trt-Eval Interval					4 DA-A	7 DA-A	13 DA-A	28 DA-A
ARM Action Codes								
Trt	Treatment	Rate	Appl	Plot	9	12	15	18
No.	Name	Rate Unit	Code					
1	Untreated Control			105	0.0	0.0	0.0	0.0
				116	0.0	0.0	0.0	0.0
				211	0.0	0.0	0.0	0.0
				220	0.0	0.0	0.0	0.0
				Mean =	0.0	0.0	0.0	0.0
2	Glyphosate 450	1L/ha	A	103	3.3*	16.7*	8.3*	73.3*
	Nil		A	119	10.0	10.0	10.0	60.0
				206	0.0	20.0	10.0	75.0
				226	0.0	20.0	5.0	85.0
				Mean =	3.3	16.7	8.3	73.3
3	Glyphosate 450	1L/ha	A	108	10.0	30.0	30.0	50.0
	Envirowet 25	25 ^{mL} /100 ^L	A	124	10.0	30.0	30.0	40.0
				204	0.0	15.0	10.0	70.0
				215	0.0	10.0	10.0	75.0
				Mean =	5.0	21.3	20.0	58.8
4	Glyphosate 450	1L/ha	A	102	0.0*	13.3*	13.3*	53.3*
	Envirowet 50	50 ^{mL} /100 ^L	A	122	0.0	30.0	25.0	50.0
				205	0.0	0.0	5.0	60.0
				216	0.0	10.0	10.0	50.0
				Mean =	0.0	13.3	13.3	53.3
5	Glyphosate 450	1L/ha	A	110	10.0	5.0	20.0	80.0
	Envirowet 100	100 ^{mL} /100 ^L	A	120	10.0	30.0	15.0	70.0
				202	10.0	20.0	10.0	60.0
				225	0.0	10.0	5.0	75.0
				Mean =	7.5	16.3	12.5	71.3
6	Glyphosate 450	1L/ha	A	104	0.0	0.0	30.0	85.0
	Axiwetta	100 ^{mL} /100 ^L	A	123	0.0	20.0	20.0	60.0
				208	0.0	10.0	20.0	75.0
				214	0.0	10.0	10.0	70.0
				Mean =	0.0	10.0	20.0	72.5
7	Glyphosate 450	1L/ha	A	107	10.0	0.0	20.0	50.0
	LI700	250 ^{mL} /100 ^L	A	114	10.0	5.0	10.0	60.0
				210	0.0	30.0	10.0	60.0
				217	10.0	10.0	5.0	75.0
				Mean =	7.5	11.3	11.3	61.3
8	Paraquat 250	1.2L/ha	A	106	90.0	90.0	80.0	95.0
	Nil		A	125	90.0	90.0	70.0	85.0
				213	90.0	90.0	70.0	70.0
				223	90.0	80.0	70.0	85.0
				Mean =	90.0	87.5	72.5	83.8
9	Paraquat 250	1.2L/ha	A	113	10.0	90.0	80.0	90.0
	Envirowet 25	25 ^{mL} /100 ^L	A	118	50.0*	90.0*	70.0*	85.0*
				203	50.0*	90.0*	70.0*	85.0*
				224	90.0	90.0	60.0	80.0
				Mean =	50.0	90.0	70.0	85.0
10	Paraquat 250	1.2L/ha	A	101	80.0*	90.0*	80.0*	75.0*

	Envirowet 50	50 ^{mL/100} _L	A	117	80.0	90.0	90.0	70.0
				209	80.0	90.0	70.0	80.0
				221	80.0*	90.0*	80.0*	75.0*
				Mean =	80.0	90.0	80.0	75.0
11	Paraquat 250	1.2L/ha	A	109	80.0	90.0	80.0	95.0
	Envirowet 100	100 ^{mL/100} _L	A	115	90.0	70.0	70.0	80.0
				212	90.0	90.0	70.0	75.0
				222	80.0	90.0	80.0	60.0
				Mean =	85.0	85.0	75.0	77.5
12	Paraquat 250	1.2L/ha	A	111	85.0*	90.0	80.0	80.0
	Axiwetta	100 ^{mL/100} _L	A	126	90.0	90.0	60.0	60.0
				207	85.0*	90.0*	73.3*	75.0*
				218	80.0	90.0	80.0	85.0
				Mean =	85.0	90.0	73.3	75.0
13	Paraquat 250	1.2L/ha	A	112	70.0	80.0	70.0	80.0
	LI700	250 ^{mL/100} _L	A	121	90.0	80.0	70.0	80.0
				201	83.3*	83.3*	63.3*	76.7*
				219	90.0	90.0	50.0	70.0
				Mean =	83.3	83.3	63.3	76.7

Missing data estimates (Average) are included in columns: 9,12,15,18.

Appendix iii - Weather data

2024 rainfall data - Young Airport, NSW
Observations were drawn from Young Airport {station 73138}.



2024 daily rainfall data - Young Airport, NSW.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1			0.6			4.4	0.4					
2	30.8			9.8								
3	19.8			0.6		0.2						
4	1.8											
5	6.8	5.0		21.6	9.2							
6		34.0		39.8	1.4	23.8						
7				3.2		10.0						
8	21.6			0.6		0.8						
9	3.6											
10						1.0						
11				0.2	0.6	0.2						
12					1.4	3.2						
13					0.2	0.2						
14		11.4										
15						4.4						
16	0.2					0.8						
17	8.4		0.4									
18	20.0		1.8									
19		19.6				0.2						
20			31.8									
21				0.2		7.6						
22												
23						0.4						
24			2.6									
25												
26												
27												
28												
29												
30				2.0		19.8						
31					23.8							

Summary statistics												
2024 monthly total	113.0	70.0	37.2	78.0	36.6	77.0						
2024 cumulative total	113.0	183.0	220.2	298.2	334.8	411.8	411.8	411.8	411.8	411.8	411.8	411.8
Long term monthly median	34.6	34.1	33.6	26.5	37.3	56.6	53.3	49.4	38.0	43.9	58.6	38.7
Long term cumulative median	34.6	68.7	102.3	128.8	166.1	222.7	276.0	325.4	363.4	407.3	465.9	504.6

2024 maximum & minimum temperature data - Young Airport, NSW

Observations were drawn from Young Airport (station 73138).

	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	13.5	30.8	16.6	33.0	18.9	36.2	9.1	31.2	6.9	19.0	1.2	15.4	-2.1	12.3										
2	18.5	30.1	12.9	31.4	18.6	29.5	11.1	21.7	8.4	19.0	2.4	14.4	1.7											
3	19.0	31.3	9.2	34.3	8.5	29.3	5.3	22.7	10.2	19.8	-1.3	11.4												
4	18.7	29.5	12.4	38.5	5.3	29.0	7.2	23.6	12.2	16.9	1.4	12.8												
5	17.8	26.9	20.7	24.2	11.2	30.8	14.4	17.5	11.6	17.5	1.3	12.1												
6	13.6	28.5	19.0	28.6	10.5	33.3	13.7	21.7	9.1	19.0	7.5	13.3												
7	15.9	29.1	13.9	27.5	13.3	35.9	14.9	21.9	6.8	19.6	3.5	15.5												
8	19.8	26.3	15.3	27.2	18.2	33.0	10.7	23.0	8.5	19.7	3.5	16.5												
9	16.7	30.6	11.4	29.7	13.9	33.3	8.6	17.9	8.9	21.5	6.1	11.0												
10	16.7	32.6	16.4	27.0	9.4	32.3	0.8	18.6	12.2	21.2	5.7	14.0												
11	15.2	34.1	15.1	30.2	10.8	32.1	2.0	22.1	13.0	16.7	-0.4	13.5												
12	19.3	32.0	14.9	32.5	10.9	34.0	4.4	22.5	12.1	18.6	4.7	12.5												
13	16.7	33.0	15.3	33.5	16.4	34.2	3.1	22.6	2.7	20.8	-3.0	11.0												
14	17.7	27.6	18.7	27.0	13.5	33.3	2.4	23.2	0.9	19.0	1.4	12.2												
15	16.3	22.4	13.2	28.5	16.0	26.7	0.9	23.3	-0.3	20.1	6.5	11.7												
16	15.4	26.9	16.8	31.5	12.8	24.5	2.2	23.5	0.7	21.6	-1.8	11.7												
17	17.0	23.5	15.2	32.3	15.6	24.2	4.3	22.8	0.2	20.1	-3.6	11.9												
18	16.9	23.9	17.6	32.9	14.9	29.3	5.7	20.0	0.5	14.3	-1.6	12.2												
19	8.2	26.6	15.3	32.0	12.1	31.9	3.0	20.6	-3.8	13.8	-1.5	11.6												
20	10.1	30.5	15.5	29.6	16.8	21.0	4.9	21.0	0.0	15.2	-3.2	13.8												
21	11.0	35.2	15.5	29.1	7.1	23.7	3.6	22.7	-0.9	16.9	3.2	10.9												
22	10.0	30.2	14.2	33.6	6.7	25.7	2.4	24.4	-2.4	16.7	-1.8	14.1												
23	14.4	29.7	15.4	33.6	10.2	20.1	3.3	23.7	-3.3	18.5	-2.3	15.2												
24	13.2	32.5	6.8	30.5	12.9	26.1	5.7	18.5	-2.3	19.1	-3.4	13.5												
25	18.5	36.2	13.1	31.0	2.8	26.9	-1.1	17.8	1.2	18.9	0.0	16.2												
26	22.1	26.3	10.8	32.8	4.9	29.0	-1.0	20.1	-1.1	19.2	-0.4	15.8												
27	11.4	27.7	17.0	32.1	6.9	29.5	1.7	22.1	-2.7	17.9	-3.1	14.9												
28	6.6	30.3	15.0	36.6	8.7	28.9	1.6	23.8	-3.7	19.6	-3.1	15.5												
29	14.7	33.0	18.5	36.8	12.9	29.3	4.6	24.5	-2.1	21.7	-2.5	16.5												
30	16.6	33.9			7.9	30.6	6.8	20.7	0.3	20.0	5.2	11.2												
31	18.4	33.2			8.7	30.1			11.7	15.5														
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
2024 monthly mean	15.5	29.8	14.9	31.3	11.5	29.5	5.2	22.0	3.7	18.6														
Longterm monthly mean	14.9	31.9	14.5	30.4	11.4	27.2	6.7	22.7	3.3	17.7	2.3	13.9	1.0	13.1	1.3	14.6	3.0	18.1	5.5	22.2	9.5	26.0	12.0	29.3

Appendix iv - Photographs

Photographs below depict weeds prior to application and the trial site after application.



Photograph 1

Weeds at application, 17-May-2024, (0 DA-A).



Photograph 3

An untreated plot (treatment 1), 14-Jun-2024, (28 DA-A).



Photograph 2

The trial site, 24-May-2024, (7 DA-A).



Photograph 4

The trial site, 14-Jun-2024, (28 DA-A).

Photographs below are drone images of the trial site.



Photograph 5

Drone image of the trial site (plot 101 in bottom left corner), 21-May-2024, (4 DA-A).



Photograph 6

Drone image of the trial site (plot 101 in bottom left corner), 24-May-2024, (7 DA-A).



Photograph 7

Drone image of the trial site (plot 101 in bottom left corner), 3-Jun-2024, (17 DA-A).



Photograph 8

Drone image of the trial site (plot 101 in bottom left corner), 14-Jun-2024, (28 DA-A).