Australian National University

Independent review of statistical analysis for weed control

Produced for Advanced Wetting Technology

Version 2.0

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Table of contents

List of Figures

List of Tables

1. Overview

Advanced Wetting Technology (AWT) requested a statistical review of field trials conducted by Kalyx Australia and Arvensis Research, comparing the effectiveness of various wetting agents, including AWT's Envirowet surfactant, for weed control in fallow. Two sets of experiments were performed:

- The **2024 experiment**, conducted by Kalyx Australia, included four field trials that evaluated the effectiveness of Envirowet surfactant (at 25, 50, and 100 mL/100L rates), compared with two industry standard wetting agents (Axiwetta and LI700), in combination with either Glyphosate 450 or Paraquat 250 or Paraquat 360 herbicides.
- The **2025 experiment**, conducted by Arvensis Research, consisted of one field trial with a similar design as the 2024 experiment, except that Gramoxone 360 Pro was used as the herbicide instead of Glyphosate 450, and the combination of Glyphosate 450 with LI700 was not included.

The trials measured the pest count or relative assessment of pest control with the untreated plot for particular set of pest species at different time points. This review will evaluate the statistical analysis and interpretation of the results from these experiments to answer the following questions:

1. Do AWT's Envirowet 50 surfactant enhance non-selective herbicidal activity for specific pests?
2. Is AWT's Envirowet 50 surfactant non-inferior to the industry standards for specific pests?

All analysis and graphics in this report were produced using the statistical programming language R (R Core Team 2025) with outputs seamlessly and reproducibly embedded using Quarto (Allaire 2023). As this is a statistical review, operational or procedural aspects of the experiments are considered outside the scope of this report.

This report is organised as follows: Section 2 describes the data sources and provides several numerical summaries (with field layouts and additional graphical summaries available in Section A), Section 3 presents the statistical method used, while Section 4 highlights the key results (with expanded results in Section A). We follow with conclusion in Section 5.

2. Data description

The data were provided by Dr. Raymond Roberts (AWT) in two files: a Microsoft Word document containing the 2025 experimental data, and a PDF file containing the 2024 experimental data. The PDF was converted to Microsoft Word format, and data were extracted

from the tables using the `docxtractr` R package (Rudis and Muir 2020). Custom functions were subsequently employed to reformat the data into a tidy structure (Wickham 2014).

2.1. Treatments

Table 2.1 contains the list of treatments used for each trial. The treatments have a factorial structure where one treatment factor is the herbicide used and the other factor is the adjuvant (wetting agent). Two of the trials deviated from protocol by using Paraquat 250 (which contains a built-in adjuvant). It should be noted that the herbicide rate differ across the trials, as such that there are no two trials that have the same set of treatments.

Table 2.1. Treatment codes with corresponding herbicide and adjuvant names and their rates by trial (with Kalyx trial ID in bracket where applicable). The 2024 experiment comprised four field trials at Bellata (NSW), Beverley (WA), Horsham (VIC), and Young (NSW). The 2025 experiment consisted of one field trial at Bundaberg (QLD).

Code	Herbicide	Adjuvant
Bellata, NSW (KA24-0740)		
1	None	None
2	Glyphosate 450 (1.5 L/ha)	None
3	Glyphosate 450 (1.5 L/ha)	Envirowet 25 (25mL/100L)
4	Glyphosate 450 (1.5 L/ha)	Envirowet 50 (50mL/100L)
5	Glyphosate 450 (1.5 L/ha)	Envirowet 100 (100mL/100L)
6	Glyphosate 450 (1.5 L/ha)	Axiwetta (100mL/ha)
7	Glyphosate 450 (1.5 L/ha)	LI700 (250mL/ha)
8	Paraquat 250 (1.2 L/ha)	None
9	Paraquat 250 (1.2 L/ha)	Envirowet 25 (25mL/100L)
10	Paraquat 250 (1.2 L/ha)	Envirowet 50 (50mL/100L)
11	Paraquat 250 (1.2 L/ha)	Envirowet 100 (100mL/100L)
12	Paraquat 250 (1.2 L/ha)	Axiwetta (100mL/ha)
13	Paraquat 250 (1.2 L/ha)	LI700 (250mL/ha)
Beverley, WA (KA24-0727)		
1	None	None
2	Glyphosate 450 (1.5 L/ha)	None
3	Glyphosate 450 (1.5 L/ha)	Envirowet 25 (25mL/100L)
4	Glyphosate 450 (1.5 L/ha)	Envirowet 50 (50mL/100L)
5	Glyphosate 450 (1.5 L/ha)	Envirowet 100 (100mL/100L)
6	Glyphosate 450 (1.5 L/ha)	Axiwetta (100mL/100L)
7	Glyphosate 450 (1.5 L/ha)	LI700 (250mL/100L)
8	Paraquat 360 (1.2 L/ha)	None
9	Paraquat 360 (1.2 L/ha)	Envirowet 25 (25mL/100L)
10	Paraquat 360 (1.2 L/ha)	Envirowet 50 (50mL/100L)
11	Paraquat 360 (1.2 L/ha)	Envirowet 100 (100mL/100L)
12	Paraquat 360 (1.2 L/ha)	Axiwetta (100mL/100L)
13	Paraquat 360 (1.2 L/ha)	LI700 (250mL/100L)
Bundaberg, QLD		

1	None	None
2	Glyphosate 450 (1.6 L/ha)	None
3	Glyphosate 450 (1.6 L/ha)	Envirowet 25 (25mL/100L)
4	Glyphosate 450 (1.6 L/ha)	Envirowet 50 (50mL/100L)
5	Glyphosate 450 (1.6 L/ha)	Envirowet 100 (100mL/100L)
6	Glyphosate 450 (1.6 L/ha)	Axiwetta (100mL/100L)
7	Glyphosate 450 (1.6 L/ha)	LI700 (250mL/100L)
8	Gramoxone 360 Pro (835mL/100 L)	None
9	Gramoxone 360 Pro (835mL/100 L)	Envirowet 25 (25mL/100L)
10	Gramoxone 360 Pro (835mL/100 L)	Envirowet 50 (50mL/100L)
11	Gramoxone 360 Pro (835mL/100 L)	Envirowet 100 (100mL/100L)
12	Gramoxone 360 Pro (835mL/100 L)	Axiwetta (100mL/100L)
Horsham, VIC (KA24-0729)		
1	None	None
2	Glyphosate 450 (1.5 L/ha)	None
3	Glyphosate 450 (1.5 L/ha)	Envirowet 25 (25mL/100L)
4	Glyphosate 450 (1.5 L/ha)	Envirowet 50 (50mL/100L)
5	Glyphosate 450 (1.5 L/ha)	Envirowet 100 (100mL/100L)
6	Glyphosate 450 (1.5 L/ha)	Axiwetta (100mL/100L)
7	Glyphosate 450 (1.5 L/ha)	LI700 (250mL/100L)
8	Paraquat 360 (1.2 L/ha)	None
9	Paraquat 360 (1.2 L/ha)	Envirowet 25 (25mL/100L)
10	Paraquat 360 (1.2 L/ha)	Envirowet 50 (50mL/100L)
11	Paraquat 360 (1.2 L/ha)	Envirowet 100 (100mL/100L)
12	Paraquat 360 (1.2 L/ha)	Axiwetta (100mL/100L)
13	Paraquat 360 (1.2 L/ha)	LI700 (250mL/100L)
Young, NSW (KA24-0728)		
1	None	None
2	Glyphosate 450 (1 L/ha)	None
3	Glyphosate 450 (1 L/ha)	Envirowet 25 (25mL/100L)
4	Glyphosate 450 (1 L/ha)	Envirowet 50 (50mL/100L)
5	Glyphosate 450 (1 L/ha)	Envirowet 100 (100mL/100L)
6	Glyphosate 450 (1 L/ha)	Axiwetta (100mL/ha)
7	Glyphosate 450 (1 L/ha)	LI700 (250mL/ha)
8	Paraquat 250 (1.2 L/ha)	None
9	Paraquat 250 (1.2 L/ha)	Envirowet 25 (25mL/100L)
10	Paraquat 250 (1.2 L/ha)	Envirowet 50 (50mL/100L)
11	Paraquat 250 (1.2 L/ha)	Envirowet 100 (100mL/100L)
12	Paraquat 250 (1.2 L/ha)	Axiwetta (100mL/ha)
13	Paraquat 250 (1.2 L/ha)	LI700 (250mL/ha)

2.2. Experimental design

Each trial was laid out as a rectangular array and used a randomised complete block design with four blocks replicates. The plot code in the 2025 experiment was encoded such that the first digit in the plot code corresponded to the row number and the next two digits correspond to the column number. The row and column numbers of the field trials in the 2024

experiment was assumed to follow the same logic as the 2025 experiment, and therefore extracted from the plot code in the same manner. The block (also referred to as replicate) number is inferred from contiguous plots such that it contains the whole set of treatment exactly once. This field layout for each site is shown in Figure 2.1. The response values mapped to the layout is shown in Section A.1. Note that the word block and replicate are used interchangeably throughout this report.

Figure 2.1. The field layout for each site. The number represents the treatment code and the color represents the inferred block number.

2.3. Response

The number of weeds were counted in a particular dimension of quadrats per plot by pest species (referred henceforth as COUNT) at particular day before or after the treatment application. The percentage of weed control was then visually assessed relative to the untreated control plot in the same block, such that 0 means no weed control and 100 means all weed eradicated (referred henceforth as CONTRO). There were 17 pest species (*Ageratum sp., Arctotheca calendula, Avena fatua, Bidens pilosa, Digitaria cilia, Eleusine indica, Ipomoea*

plebeia, Lactuca serriola, Lepidium draba, Lolium rigidum, Physalis minima, Pisum sativum, Rumex spp, Silybum marianum, Sonchus oleraceus, Trifolium subteraneum, and *Vicia sativa*), but not all are observed at each site. Table 2.2 shows the 122 datasets for plot-level observations available from the two files received.

Table 2.2. The list of plot level datasets with observed pest species (Pests) at the day after application (DA-A) using assessment type with the reporting basis in brackets (Assessment). The subsequent columns show whether the value has been transformed (T), the number of non-missing values with untreated plot removed for CONTRO (N) and its minimum (Min), mean (Mean), median (Median) and maximum (Max).

Pests	DA-A	Assessment	T	N	Min	Mean	Median	Max
Bellata, NSW								
Lolium rigidum	0	COUNT (0.25 m2)		4	20.5	26.5	25.5	34.5
Lolium rigidum	0	COUNT (1 m2)	Y	4	82.0	106.0	102.0	138.0
Lolium rigidum	3	CONTRO (1 PLOT)		48	0.0	24.6	20.0	60.0
Lolium rigidum	10	CONTRO (1 PLOT)		48	10.0	49.8	47.5	90.0
Lolium rigidum	15	CONTRO (1 PLOT)		48	10.0	49.6	50.0	90.0
Lolium rigidum	34	CONTRO (1 PLOT)		48	5.0	52.6	50.0	95.0
Lolium rigidum	34	COUNT (0.25 m2)		52	2.0	25.6	24.0	52.0
Lolium rigidum	34	COUNT (1 m2)	Y	52	8.0	102.3	96.0	208.0
Sonchus oleraceus	0	COUNT (1 m2)	Y	4	0.8	3.2	1.9	8.3
Sonchus oleraceus	0	COUNT (24 m2)		4	20.0	77.2	45.0	199.0
Sonchus oleraceus	3	CONTRO (1 PLOT)		48	0.0	47.5	45.0	95.0
Sonchus oleraceus	10	CONTRO (1 PLOT)	Y	48	15.0	56.2	60.0	95.0
Sonchus oleraceus	15	CONTRO (1 PLOT)	Y	48	10.0	56.2	60.0	95.0
Sonchus oleraceus	34	CONTRO (1 PLOT)	Y	48	15.0	56.8	50.0	95.0
Sonchus oleraceus	34	COUNT (0.25 m2)		52	0.0	1.0	1.0	6.0
Sonchus oleraceus	34	COUNT (1 m2)	Y	52	0.0	4.2	4.0	24.0
Beverley, WA								
Arctotheca calendula	0	COUNT (1 m2)	Y	4	75.0	100.0	100.0	125.0
Arctotheca calendula	0	COUNT (20 m2)		4	1500.0	2000.0	2000.0	2500.0
Arctotheca calendula	10	CONTRO (1 PLOT)	Y	48	0.0	16.9	5.0	60.0
Arctotheca calendula	16	CONTRO (1 PLOT)		48	25.0	43.4	45.0	60.0
Arctotheca calendula	28	CONTRO (1 PLOT)		48	30.0	61.0	60.0	85.0
Arctotheca calendula	34	COUNT (0.25 m2)		52	0.3	21.6	16.5	80.0
Arctotheca calendula	34	COUNT (1 m2)	Y	52	1.3	86.2	66.0	320.0
Avena fatua	0	COUNT (1 m2)	Y	4	10.0	27.5	25.0	50.0
Avena fatua	0	COUNT (20 m2)		4	200.0	550.0	500.0	1000.0
Avena fatua	10	CONTRO (1 PLOT)		48	20.0	41.0	40.0	60.0
Avena fatua	16	CONTRO (1 PLOT)		48	25.0	44.8	47.5	60.0
Avena fatua	28	CONTRO (1 PLOT)		48	30.0	52.6	50.0	70.0
Avena fatua	34	COUNT (0.25 m2)		52	0.3	6.1	5.0	20.0
Avena fatua	34	COUNT (1 m2)	Y	52	1.3	24.6	20.0	80.0
Lolium rigidum	0	COUNT (1 m2)	Y	4	200.0	237.5	250.0	250.0
Lolium rigidum	0	COUNT (20 m2)		4	4000.0	4750.0	5000.0	5000.0
Lolium rigidum	10	CONTRO (1 PLOT)		48	45.0	55.6	50.0	70.0
Lolium rigidum	16	CONTRO (1 PLOT)		48	50.0	62.5	60.0	80.0

Lolium rigidum	28	CONTRO (1 PLOT)		48	60.0	66.1	65.0	75.0
Lolium rigidum	34	COUNT (0.25 m2)		52	12.3	38.7	36.4	100.0
Lolium rigidum	34	COUNT (1 m2)	Y	52	49.3	154.8	145.3	400.0
Unknown	2	CONTRO (1 PLOT)		48	0.0	17.9	15.0	45.0
Bundaberg, QLD								
Ageratum sp.	-2	COUNT (1 PLOT)		48	0.0	9.5	10.0	25.0
Ageratum sp.	3	CONTRO (1 PLOT)		44	0.0	45.9	17.5	100.0
Ageratum sp.	7	CONTRO (1 PLOT)		44	10.0	61.1	50.0	100.0
Ageratum sp.	14	CONTRO (1 PLOT)		44	50.0	91.9	100.0	100.0
Ageratum sp.	27	CONTRO (1 PLOT)		44	0.0	17.6	2.6	100.0
Ageratum sp.	27	COUNT (1 PLOT)		48	0.0	4.5	3.0	25.0
Bidens pilosa	-2	COUNT (1 PLOT)		48	0.0	3.8	3.5	12.0
Bidens pilosa	3	CONTRO (1 PLOT)		44	0.0	46.5	20.0	100.0
Bidens pilosa	7	CONTRO (1 PLOT)		44	5.0	67.0	72.5	100.0
Bidens pilosa	14	CONTRO (1 PLOT)		44	30.0	88.0	99.0	100.0
Bidens pilosa	27	CONTRO (1 PLOT)		44	40.0	96.5	100.0	100.0
Bidens pilosa	27	COUNT (1 PLOT)		48	0.0	1.4	0.0	12.0
Digitaria cilia	-2	COUNT (1 PLOT)		48	3.0	7.8	8.0	12.0
Digitaria cilia	3	CONTRO (1 PLOT)		44	50.0	76.7	80.0	100.0
Digitaria cilia	7	CONTRO (1 PLOT)		44	30.0	89.4	90.0	100.0
Digitaria cilia	14	CONTRO (1 PLOT)		44	50.0	91.8	95.0	100.0
Digitaria cilia	27	CONTRO (1 PLOT)		44	20.0	83.1	97.5	100.0
Digitaria cilia	27	COUNT (1 PLOT)		48	0.0	3.1	1.0	12.0
Eleusine indica	-2	COUNT (1 PLOT)		48	0.0	3.4	3.0	9.0
Eleusine indica	3	CONTRO (1 PLOT)		44	5.0	43.3	30.0	100.0
Eleusine indica	7	CONTRO (1 PLOT)		44	5.0	49.1	47.5	100.0
Eleusine indica	14	CONTRO (1 PLOT)		44	10.0	63.9	70.0	95.0
Eleusine indica	27	CONTRO (1 PLOT)		44	0.0	39.5	40.0	100.0
Eleusine indica	27	COUNT (1 PLOT)		48	0.0	3.2	3.0	9.0
Ipomoea plebeia	-2	COUNT (1 PLOT)		48	0.0	1.1	1.0	5.0
Ipomoea plebeia	3	CONTRO (1 PLOT)		44	5.0	35.3	30.0	95.0
Ipomoea plebeia	7	CONTRO (1 PLOT)		44	5.0	29.4	25.0	80.0
Ipomoea plebeia	14	CONTRO (1 PLOT)		44	10.0	31.2	30.0	80.0
Ipomoea plebeia	27	CONTRO (1 PLOT)		44	0.0	15.8	10.0	60.0
Ipomoea plebeia	27	COUNT (1 PLOT)		48	0.0	1.4	1.0	5.0
Physalis minima	-2	COUNT (1 PLOT)		48	0.0	1.2	1.0	6.0
Physalis minima	3	CONTRO (1 PLOT)		44	0.0	56.9	41.6	100.0
Physalis minima	7	CONTRO (1 PLOT)		44	5.0	77.5	96.7	100.0
Physalis minima	14	CONTRO (1 PLOT)		44	30.0	93.3	100.0	100.0
Physalis minima	27	CONTRO (1 PLOT)		44	25.0	93.3	100.0	100.0
Physalis minima	27	COUNT (1 PLOT)		48	0.0	0.3	0.0	3.0
Horsham, VIC								
Lactuca serriola	-1	COUNT (0.25 m2)		52	0.0	1.9	1.5	8.5
Lactuca serriola	-1	COUNT (1 m2)	Y	52	0.0	7.5	6.0	34.0
Lactuca serriola	8	CONTRO (1 PLOT)		48	0.0	53.0	55.0	100.0
Lactuca serriola	17	CONTRO (1 PLOT)		48	30.0	72.5	70.0	100.0
Lepidium draba	-1	COUNT (0.25 m2)		52	0.0	3.6	0.2	24.0
Lepidium draba	-1	COUNT (1 m2)	Y	52	0.0	14.5	1.0	96.0
Lepidium draba	8	CONTRO (1 PLOT)		48	5.0	50.8	55.0	95.0

Lepidium draba	17	CONTRO (1 PLOT)		48	10.0	41.7	38.5	95.0
Lolium rigidum	-1	COUNT (0.25 m2)		52	0.0	0.5	0.5	4.5
Lolium rigidum	-1	COUNT (1 m2)	Y	52	0.0	2.2	2.0	18.0
Lolium rigidum	8	CONTRO (1 PLOT)	Y	48	0.0	45.2	35.0	95.0
Lolium rigidum	17	CONTRO (1 PLOT)		48	10.0	66.2	70.0	100.0
Pisum sativum	-1	COUNT (0.25 m2)		52	0.0	1.6	1.0	8.0
Pisum sativum	-1	COUNT (1 m2)	Y	52	0.0	6.5	4.0	32.0
Pisum sativum	8	CONTRO (1 PLOT)		48	5.0	50.3	55.0	95.0
Pisum sativum	17	CONTRO (1 PLOT)		48	60.0	91.7	95.0	100.0
Silybum marianum	-1	COUNT (0.25 m2)		52	6.5	15.0	14.8	25.0
Silybum marianum	-1	COUNT (1 m2)	Y	52	26.0	60.0	59.0	100.0
Silybum marianum	8	CONTRO (1 PLOT)		48	5.0	55.8	72.5	100.0
Silybum marianum	17	CONTRO (1 PLOT)		48	30.0	74.8	90.0	100.0
Vicia sativa	-1	COUNT (0.25 m2)		52	0.0	1.8	1.5	5.5
Vicia sativa	-1	COUNT (1 m2)	Y	52	0.0	7.2	6.0	22.0
Vicia sativa	8	CONTRO (1 PLOT)	Y	48	0.0	33.0	35.0	90.0
Vicia sativa	17	CONTRO (1 PLOT)	Y	48	20.0	32.8	30.0	95.0
Young, NSW								
Lolium rigidum	0	COUNT (0.25 m2)		4	10.3	20.2	20.5	29.5
Lolium rigidum	0	COUNT (1 m2)	Y	4	41.0	80.8	82.0	118.0
Lolium rigidum	4	CONTRO (1 PLOT)		48	0.0	39.4	35.0	80.0
Lolium rigidum	7	CONTRO (1 PLOT)		48	0.0	49.3	60.0	95.0
Lolium rigidum	13	CONTRO (1 PLOT)		48	40.0	72.0	70.0	95.0
Lolium rigidum	28	CONTRO (1 PLOT)		48	80.0	91.8	95.0	98.0
Lolium rigidum	28	COUNT (0.25 m2)		52	0.0	1.7	0.0	24.8
Lolium rigidum	28	COUNT (1 m2)	Y	52	0.0	6.7	0.0	99.0
Rumex spp	0	COUNT (0.25 m2)	Y	4	2.0	20.5	6.0	68.0
Rumex spp	0	COUNT (0.25 m2)		4	0.5	5.1	1.5	17.0
Rumex spp	4	CONTRO (1 PLOT)		48	0.0	41.4	10.0	90.0
Rumex spp	7	CONTRO (1 PLOT)		48	0.0	51.2	50.0	90.0
Rumex spp	13	CONTRO (1 PLOT)	Y	48	5.0	43.3	40.0	90.0
Rumex spp	28	CONTRO (1 PLOT)		48	40.0	71.9	75.0	95.0
Rumex spp	28	COUNT (0.25 m2)		52	0.0	1.3	0.5	12.0
Rumex spp	28	COUNT (1 m2)	Y	52	0.0	5.3	2.0	48.0
Trifolium subteraneum	0	COUNT (0.25 m2)		4	1.5	9.6	7.8	21.5
Trifolium subteraneum	0	COUNT (1 m2)	Y	4	6.0	38.5	31.0	86.0
Trifolium subteraneum	4	CONTRO (1 PLOT)		48	0.0	39.0	35.0	80.0
Trifolium subteraneum	7	CONTRO (1 PLOT)		48	0.0	35.9	35.0	90.0
Trifolium subteraneum	13	CONTRO (1 PLOT)		48	10.0	25.1	22.5	50.0
Trifolium subteraneum	28	CONTRO (1 PLOT)		48	10.0	39.9	35.0	80.0
Trifolium subteraneum	28	COUNT (0.25 m2)		52	0.0	5.9	2.4	24.3
Trifolium subteraneum	28	COUNT (1 m2)	Y	52	0.0	23.4	9.5	97.0

3. Statistical methods

3.1. Approach by Kalyx Australia

The statistical analysis conducted by Kalyx Australia involved performing an analysis of variance (ANOVA) on COUNT or CONTRO data for each site and time point, separately for each pest species. When the assumptions of homogeneity of variance and normality were not met, the response variable was transformed. Specifically, for the treatment number $i = 1, \dots, t$ (where $t = 12$ or $t = 13$ depending on the trial – see Table 2.1) and replicate number $k = 1, \dots, 4$, the response y_{ij}, with some transformation function f, was modelled as

$$f(y_{ik}) = \mu + \alpha_i + \beta_k + \epsilon_{ik}, \qquad \epsilon_{ik} \sim NID(0, \sigma^2) \tag{3.1}$$

where ϵ_{ik} represents the error terms, which are assumed to be independent and identically distributed according to a normal distribution with mean 0 and variance σ^2, μ is the overall mean and α_i is the effect of treatment i, and β_k is the effect of replicate k. When y_{ik} is CONTRO, $y_{1k} = 0$ for all replicates by definition, as such it is removed from the data and $i = 1$ is not included in the model.

If the treatment effects are found to be statistically significant, as determined by the F-test for $H_0 : \alpha_1 = \dots = \alpha_t = 0$, then pairwise treatment comparisons are made. It is not clear if corrections for multiple comparisons are made. It should be noted that corrections to significance testing may also need to be made for multiple testing across pest species, time points and possibly locations depending on the aim, but this does not seem to be made.

Furthermore, they considered a factorial model to the responses y_{ijk}, such that

$$f(y_{ijk}) = \mu + \gamma_i + \tau_j + (\gamma\tau)_{ij} + \beta_k + \epsilon_{ijk}, \qquad \epsilon_{ijk} \sim NID(0, \sigma^2) \tag{3.2}$$

where ϵ_{ijk} again represents the error terms with the same distributional assumptions as before, μ is the overall mean and γ_i is the main effect of herbicide i, τ_j is the main effect of adjuvant (wetting agent) j, $(\gamma\tau)_{ij}$ is the interaction effect between herbicide i and adjuvant j, and β_k is the effect of replicate k. Note that i here denotes the i-th herbicide and is different to the i in Equation 3.1. When y_{ijk} is CONTRO, then the untreated plot is by definition equal to zero and thus removed from the data for downstream analysis.

3.2. Our approach

As the wetting agent serve as an adjuvant to the herbicide, we adopt a model in which only the main effects of the herbicide are separated from the combined effects of the wetting agent and herbicide. Specifically, we model the response y_{ijk} as

$$f(y_{ijk}) = \mu + \gamma_i + (\gamma\upsilon)_{ij} + \beta_k + \epsilon_{ijk}, \qquad \epsilon_{ijk} \sim NID(0, \sigma^2) \tag{3.3}$$

where the terms are defined the same as Equation 3.2, except $(\gamma v)_{ij}$ represents the combination of the adjuvant main effect and the interaction effect of herbicide and adjuvant. This distinction from Equation 3.2 is important, as the adjuvant can only be used in conjunction with a herbicide. The model (3.3) was fitted using the `lm()` function from the `stats` package in R.

As every site used different type or rate of herbicide, no two sites tested the same set of treatments (see Table 2.1). Therefore, we do not pool data across the sites. The treatment effects generally become more pronounced at later time points following application(see Figure A11), so we also avoid combining data across time. Similarly, we do not aggregate data across pest species, assuming that responses are species-specific. Consequently, we fit model (3.3) separately for each unique combination of site, pest, post-application time, assessment type and reporting basis. Due to limitations in available information and/or data, we use the transformed values provided in the original dataset without applying any additional transformations. Finally, we analyze only the CONTRO response, since CONTRO and COUNT convey similar information.

3.2.1. Model diagnostics

Two statistical tests were performed to assess the model assumptions. Homogeneity of variances across treatment group was evaluated within each dataset using the Levene test, implemented via the `leveneTest()` function from the `car` package (Fox and Weisberg 2019). To check the assumption of normality, the `shapiro.test()` function from the `stats` package was applied to the model residuals. However, it is important to note that numerical tests alone are not ideal for model diagnostics (Li et al. 2024); therefore, additional diagnostic assessments were conducted by inspecting quantile-quantile plots of the residuals (see Section A.5).

3.2.2. Step 1: Testing if any tested adjuvant treatment significantly differ

In the first step, we conduct the null hypothesis significance testing:

$$H_0 : (\gamma v)_{11} = (\gamma v)_{12} = ... = (\gamma v)_{26} = 0 \tag{3.4}$$

to determine whether the joint effects of herbicide and adjuvant (removing herbicide main effect) differ significantly. Rejecting this null hypothesis provides evidence that the joint effects of herbicide and adjuvant differ significantly among treatments. The p-value for this test is obtained using the `anova()` function from the `stats` package.

3.2.3. Step 2: Testing if Envirowet 50 adjuvant enhance non-selective herbicidal activity

In the next step, we estimate the marginal effects for each treatment using the `emmeans()` function from the `emmeans` package (Lenth 2025). Let μ_i represent the marginal effect of the i-th treatment. We then construct the following contrast:

$$d_e = \frac{\mu_4 + \mu_{10}}{2} - \frac{\mu_2 + \mu_8}{2}$$

which measure the average difference of herbicidal activity between Envirowet 50 and control. We then form a one-sided hypothesis test:

$$H_0 : d_e = 0 \quad \text{vs.} \quad H_A : d_e > 0 \tag{3.5}$$

to determine the effectiveness of Envirowet 50 to enhance herbicidal activity.

3.2.4. Step 3: Testing if Envirowet 50 is non-inferior to tested industry standards

If the null hypothesis (3.6) is rejected at a 5% significance threshold, we proceed with the next step to formulate the contrast

$$d_{ni} = \begin{cases} \dfrac{\mu_4 + \mu_{10}}{2} - \dfrac{\mu_6 + \mu_7 + \mu_{12} + \mu_{13}}{4}, & \text{for } t = 13 \\ \dfrac{\mu_4 + \mu_{10}}{2} - \dfrac{\mu_6 + \mu_7 + \mu_{12}}{3}, & \text{for } t = 12, \end{cases}$$

which is the average difference in herbicidal activity between the Envirowet 50 and the industry standards (Axiwetta and LI700). Then we formulate a non-inferiority test:

$$H_0 : d_{ni} = -\delta \quad \text{vs.} \quad H_A : d_{ni} > -\delta$$

where δ is the maximum acceptable difference with industry standard such that Envirowet 50 is considered acceptable for usage. If $\delta = 0$, then this is equivalent to testing if Envirowet 50 is superior to tested industry standards in enhancing herbicidal activity. We estimate δ per dataset by using the average absolute difference between Axiwetta and LI700 within the same herbicide in the same replicate block, i.e.,

$$\widehat{\delta} = \begin{cases} \frac{1}{8} \sum_{k=1}^{4} \left(|f(y_{6k}) - f(y_{7k})| + |f(y_{12k}) - f(y_{13k})| \right), & \text{for } t = 13 \\ \frac{1}{4} \sum_{k=1}^{4} |f(y_{6k}) - f(y_{7k})|, & \text{for } t = 12 \end{cases} \tag{3.6}$$

where y_{ik} is the response for i-th treatment in the k-th replicate block with transformation f (if any). Note that if $\delta = 0$, then this is equivalent to testing the superiority of Envirowet 50 compared to the tested industry standards.

Note that initially a generalised linear model (GLM) with a binomial family with logit link was considered for modelling CONTRO. However, further information suggested that CONTRO is not exactly a percentage, but rather resembles a rating system. The fit from the linear model generally sufficed from diagnostics, as such, GLM was not further considered.

4. Key results

In total, there were 66 fitted models using Equation 3.3 with results summarised in Table 4.1. Each individual ANOVA tables, the marginal treatment means, and model diagnostics are shown in are shown in Sections A.3, A.4, and A.5, respectively.

Table 4.1. The summary of results from the fitted model in Equation 3.3 for the relevant datasets presented in Table 2.2. The columns contains the following information: pest species name (Pest), days after application (DA-A), whether the response was transformed or not (T), p-value from the hypothesis test in (3.4) (H:A), p-value from Envirowet 50 effectiveness with respect to control (Effectiveness), p-value from the non-inferiority test (Non-Inferiority) with estimated acceptable margin ($\widehat{\delta}$), followed by the p-values from Levene (Levene) and Shapiro-Wilk (Shapiro) tests (see Section 3.2.1). The results of the non-inferiority tests are only shown if the p-value in Effectiveness is less than 0.05. The significance of p-values are coded with the superscript such that *** <0.001, ** <0.01, * <0.05, · <0.1.

Pests	DA-A	T	H:A	Effectiveness	Non-Inferiority	$\widehat{\delta}$	Levene	Shapiro
Bellata, NSW								
Lolium rigidum	3		0.011*	0.025*	0.260	5.62	0.166	0.613
Lolium rigidum	10		0.020*	0.002**	0.008**	5.00	0.911	0.131
Lolium rigidum	15		0.013*	0.000***	0.025*	3.12	0.461	0.246
Lolium rigidum	34		0.000***	0.000***	0.000***	10.00	0.358	0.629
Sonchus oleraceus	3		0.017*	0.000***	0.001***	6.25	0.953	0.488
Sonchus oleraceus	10	Y	0.009**	0.001***	0.009**	4.38	0.844	0.823
Sonchus oleraceus	15	Y	0.192	0.006**	0.029*	5.00	0.320	0.893
Sonchus oleraceus	34	Y	0.000***	0.000***	0.000***	6.25	0.842	0.061·
Beverley, WA								
Arctotheca calendula	10	Y	0.736	0.371			0.012*	0.020*
Arctotheca calendula	16		0.711	0.064·			0.148	0.422
Arctotheca calendula	28		0.564	0.340			0.672	0.062·
Avena fatua	10		0.003**	0.001***	0.212	4.38	0.211	0.996
Avena fatua	16		0.857	0.202			0.693	0.002**
Avena fatua	28		0.472	0.578			0.264	0.876
Lolium rigidum	10		0.073·	0.666			0.001**	0.752
Lolium rigidum	16		0.003**	0.198			0.004**	0.841
Lolium rigidum	28		0.049*	0.758			0.536	0.005**
Unknown	2		0.890	0.361			0.016*	0.009**
Bundaberg, QLD								
Ageratum sp.	3		0.588	0.717			0.517	0.000***
Ageratum sp.	7		0.950	0.633			0.332	0.085·
Ageratum sp.	14		0.394	0.228			0.111	0.000***
Ageratum sp.	27		0.701	0.181			0.075·	0.146
Bidens pilosa	3		0.813	0.237			0.723	0.000***
Bidens pilosa	7		0.229	0.066·			0.227	0.001***

Bidens pilosa	14		0.358	0.311			0.189	0.001**
Bidens pilosa	27		0.636	0.280			0.691	0.000***
Digitaria cilia	3		0.707	0.142			0.974	0.471
Digitaria cilia	7		0.390	0.126			0.550	0.000***
Digitaria cilia	14		0.782	0.539			0.361	0.000***
Digitaria cilia	27		0.492	0.764			0.676	0.207
Eleusine indica	3		0.340	0.394			0.629	0.532
Eleusine indica	7		0.938	0.427			0.932	0.753
Eleusine indica	14		0.963	0.565			0.238	0.753
Eleusine indica	27		0.694	0.040*	0.000***	40.00	0.692	0.339
Ipomoea plebeia	3		0.038*	0.009**	0.000***	8.75	0.115	0.028*
Ipomoea plebeia	7		0.084·	0.618			0.603	0.191
Ipomoea plebeia	14		0.001**	0.683			0.835	0.559
Ipomoea plebeia	27		0.001***	0.006**	0.000***	28.75	0.111	0.244
Physalis minima	3		0.009**	0.081·			0.014*	0.000***
Physalis minima	7		0.002**	0.001**	0.001**	20.00	0.035*	0.001**
Physalis minima	14		0.006**	0.011*	0.141	5.00	0.005**	0.000***
Physalis minima	27		0.002**	0.001**	0.002**	13.32	0.012*	0.000***
Horsham, VIC								
Lactuca serriola	8		0.206	0.232			0.826	0.288
Lactuca serriola	17		0.342	0.092·			0.787	0.001**
Lepidium draba	8		0.718	0.165			0.705	0.000***
Lepidium draba	17		0.248	0.841			0.447	0.388
Lolium rigidum	8	Y	0.071·	0.028*	0.130	4.38	0.031*	0.124
Lolium rigidum	17		0.813	0.175			0.148	0.020*
Pisum sativum	8		0.781	0.420			0.320	0.043*
Pisum sativum	17		0.526	0.013*	0.006**	7.50	0.035*	0.003**
Silybum marianum	8		0.039*	0.827			0.000***	0.000***
Silybum marianum	17		0.118	0.199			0.480	0.000***
Vicia sativa	8	Y	0.942	0.366			0.053·	0.080·
Vicia sativa	17	Y	0.558	0.440			0.581	0.032*
Young, NSW								
Lolium rigidum	4		0.395	0.907			0.850	0.128
Lolium rigidum	7		0.920	0.420			0.514	0.000***
Lolium rigidum	13		0.385	0.014*	0.005**	8.12	0.258	0.671
Lolium rigidum	28		0.002**	0.001***	0.001**	2.50	0.046*	0.124
Rumex spp	4		0.001**	0.895			0.032*	0.000***
Rumex spp	7		0.685	0.540			0.132	0.410
Rumex spp	13	Y	0.017*	0.028*	0.000***	11.91	0.697	0.524
Rumex spp	28		0.067·	0.998			0.271	0.619
Trifolium subteraneum	4		0.589	0.890			0.974	0.482
Trifolium subteraneum	7		0.113	0.342			0.883	0.641
Trifolium subteraneum	13		0.380	0.500			0.643	0.973
Trifolium subteraneum	28		0.113	0.952			0.448	0.005**

Where the joint effects of herbicide and adjuvant was significant under a false positive rate

of 0.05, the minimum δ was computed such that the non-inferiority test results in a p-value less than 0.05. These results are shown in Table 4.2.

Table 4.2. The tested herbicide and its rate (Herbicide) at site (Site), the pest species (Pest), days after application (DA-A), whether the data is tranformed (T), the estimated δ ($\widehat{\delta}$), and the minimum $\delta \geq 0$ (δ_{min}) such that the non-inferiority test results in a p-value less than 0.05.

Herbicides	Site	Pest	DA-A	T	$\widehat{\delta}$	δ_{min}
Glyphosate 450 (1.5 L/ha), Paraquat 250 (1.2 L/ha)	Bellata, NSW	Lolium rigidum	3		5.62	8.13
Glyphosate 450 (1.5 L/ha), Paraquat 250 (1.2 L/ha)	Bellata, NSW	Lolium rigidum	10		5.00	3.10
Glyphosate 450 (1.5 L/ha), Paraquat 250 (1.2 L/ha)	Bellata, NSW	Lolium rigidum	15		3.12	2.45
Glyphosate 450 (1.5 L/ha), Paraquat 250 (1.2 L/ha)	Bellata, NSW	Lolium rigidum	34		10.00	2.17
Glyphosate 450 (1.5 L/ha), Paraquat 250 (1.2 L/ha)	Bellata, NSW	Sonchus oleraceus	3		6.25	2.33
Glyphosate 450 (1.5 L/ha), Paraquat 250 (1.2 L/ha)	Bellata, NSW	Sonchus oleraceus	10	Y	4.38	2.87
Glyphosate 450 (1.5 L/ha), Paraquat 250 (1.2 L/ha)	Bellata, NSW	Sonchus oleraceus	15	Y	5.00	4.40
Glyphosate 450 (1.5 L/ha), Paraquat 250 (1.2 L/ha)	Bellata, NSW	Sonchus oleraceus	34	Y	6.25	0.98
Glyphosate 450 (1.5 L/ha), Paraquat 360 (1.2 L/ha)	Beverley, WA	Avena fatua	10		4.38	6.77
Glyphosate 450 (1.6 L/ha), Gramoxone 360 Pro (835mL/100 L)	Bundaberg, QLD	Eleusine indica	27		40.00	13.85
Glyphosate 450 (1.6 L/ha), Gramoxone 360 Pro (835mL/100 L)	Bundaberg, QLD	Ipomoea plebeia	3		8.75	0.00
Glyphosate 450 (1.6 L/ha), Gramoxone 360 Pro (835mL/100 L)	Bundaberg, QLD	Ipomoea plebeia	27		28.75	5.76
Glyphosate 450 (1.6 L/ha), Gramoxone 360 Pro (835mL/100 L)	Bundaberg, QLD	Physalis minima	7		20.00	8.43
Glyphosate 450 (1.6 L/ha), Gramoxone 360 Pro (835mL/100 L)	Bundaberg, QLD	Physalis minima	14		5.00	7.74
Glyphosate 450 (1.6 L/ha), Gramoxone 360 Pro (835mL/100 L)	Bundaberg, QLD	Physalis minima	27		13.32	5.64
Glyphosate 450 (1.5 L/ha), Paraquat 360 (1.2 L/ha)	Horsham, VIC	Lolium rigidum	8	Y	4.38	6.30
Glyphosate 450 (1.5 L/ha), Paraquat 360 (1.2 L/ha)	Horsham, VIC	Pisum sativum	17		7.50	3.55
Glyphosate 450 (1 L/ha), Paraquat 250 (1.2 L/ha)	Young, NSW	Lolium rigidum	13		8.12	4.65
Glyphosate 450 (1 L/ha), Paraquat 250 (1.2 L/ha)	Young, NSW	Lolium rigidum	28		2.50	0.85

Glyphosate 450 (1 L/ha), Paraquat 250 (1.2 L/ha)	Young, NSW	Rumex spp	13	Y	11.91	0.00

5. Conclusion

Table 4.1 suggests that Envirowet 50 are effective in enhancing tested herbicidal activity for

- *Lolium rigidum* with Glyphosate 450 (1 and 1.5 L/ha) and Paraquat 250 (1.2 L/ha),
- *Sonchus oleraceus* with Glyphosate 450 (1.5 L/ha) and Paraquat 250 (1.2 L/ha),
- *Ipomoea plebeia* and *Physalis minima* with Glyphosate 450 (1.6 L/ha) and Gramoxone 360 Pro (835mL/100 L), and
- *Pisum sativum* with Glyphosate 450 (1.5 L/ha) and Paraquat 360 (1.2 L/ha).

In general, these enhancement tend to be more noticeable compared to control at a later stage after application (2-4 weeks after application).

Where Envirowet 50 was deemed effective, Table 4.2 shows that it was generally non-inferior to tested industry standards (Axiwetta and LI700) at its tested rate for estimated acceptable average CONTRO margin of 4.5%.

A. Appendix

A.1. Field layout

This section shows a series of figures that depicts the response in the field layout.

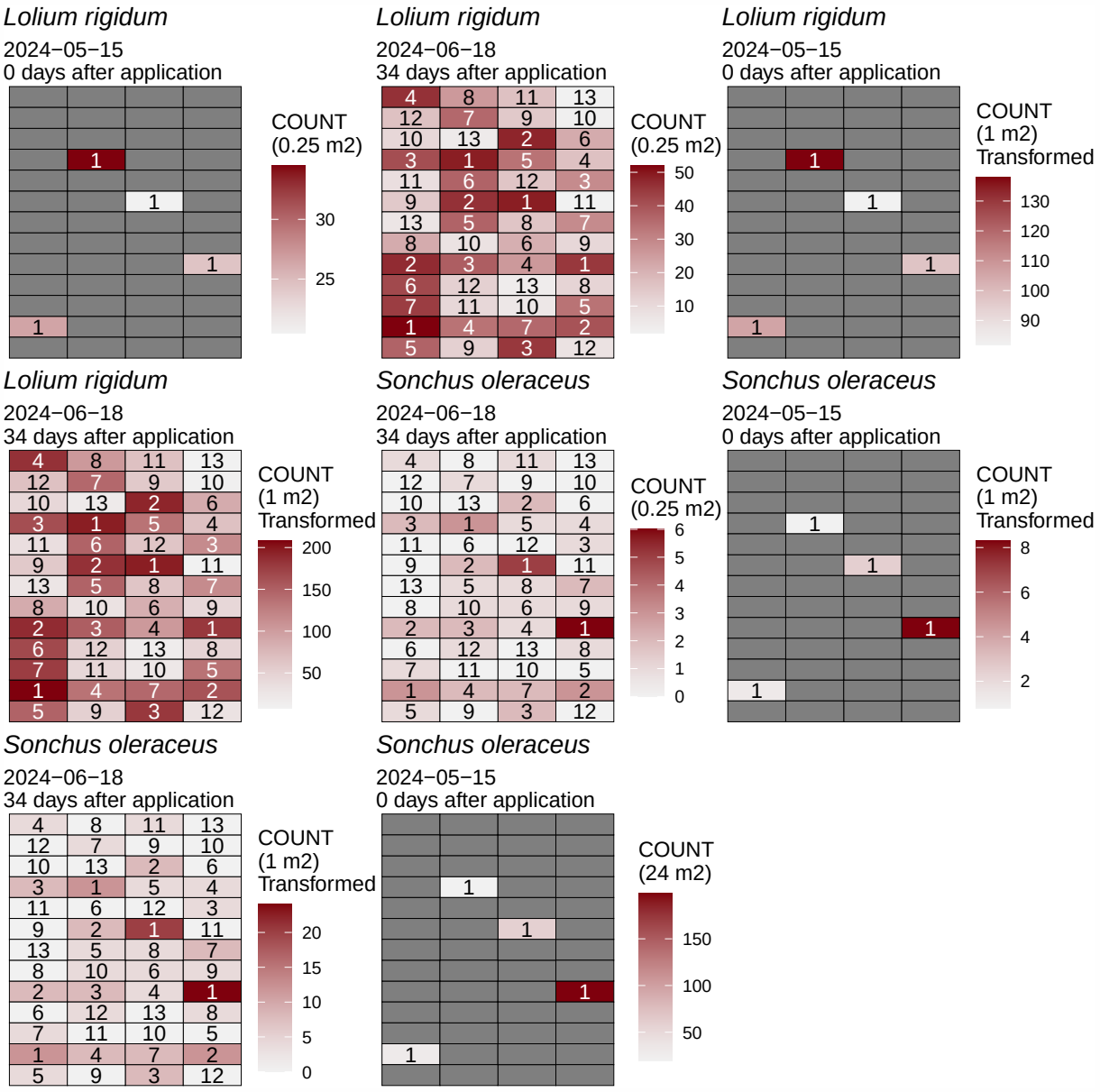

Figure A1. The field layout for **Bellata**. The color shows the **COUNT** for the corresponding pest species and day in the title. If the response has been transformed, it is indicated in the legend. The number in the tile shows the treatment applied.

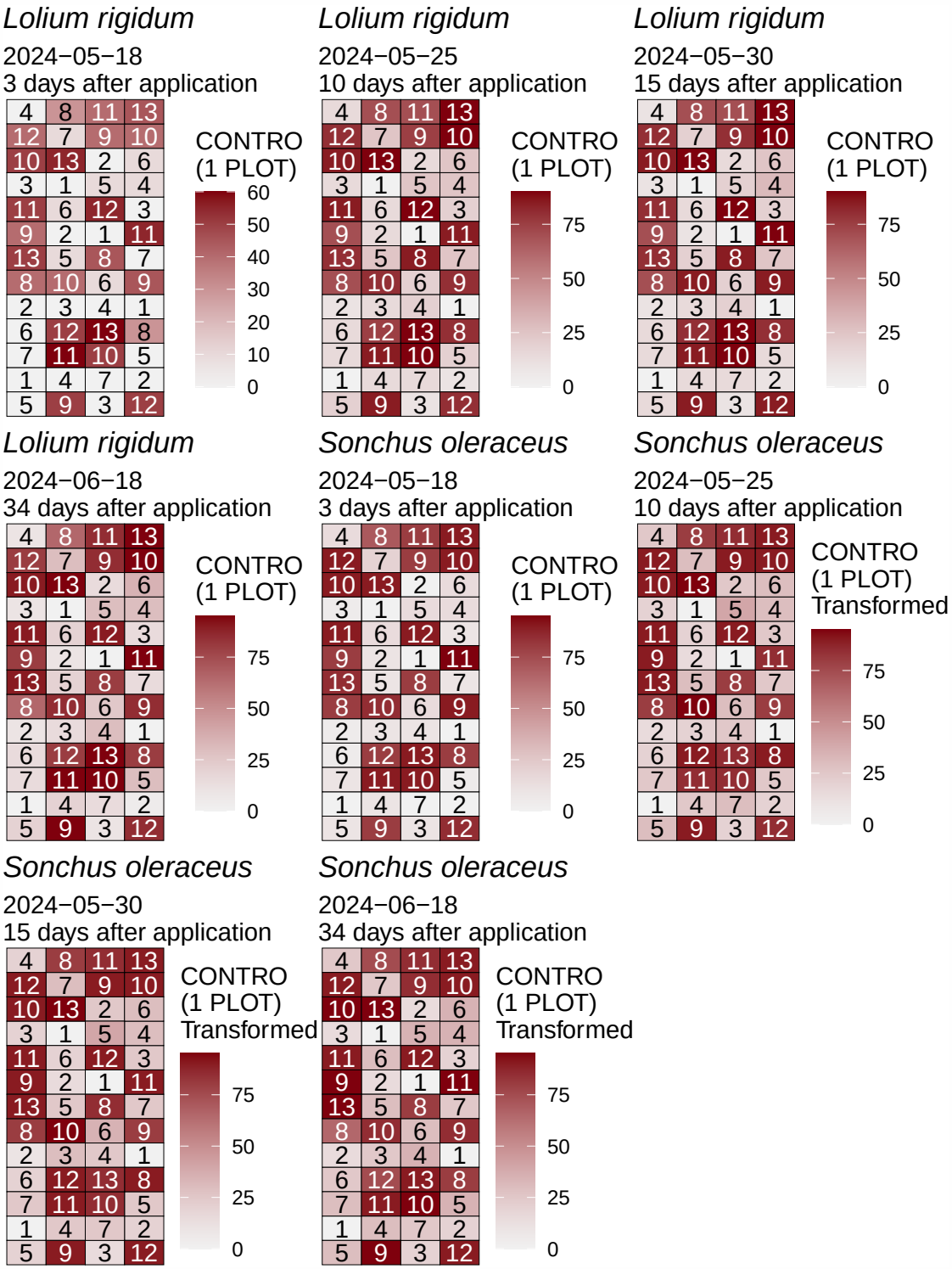

Figure A2. The field layout for **Bellata**. The color shows the **CONTRO** for the corresponding pest species and day in the title. If the response has been transformed, it is indicated in the legend. The number in the tile shows the treatment applied.

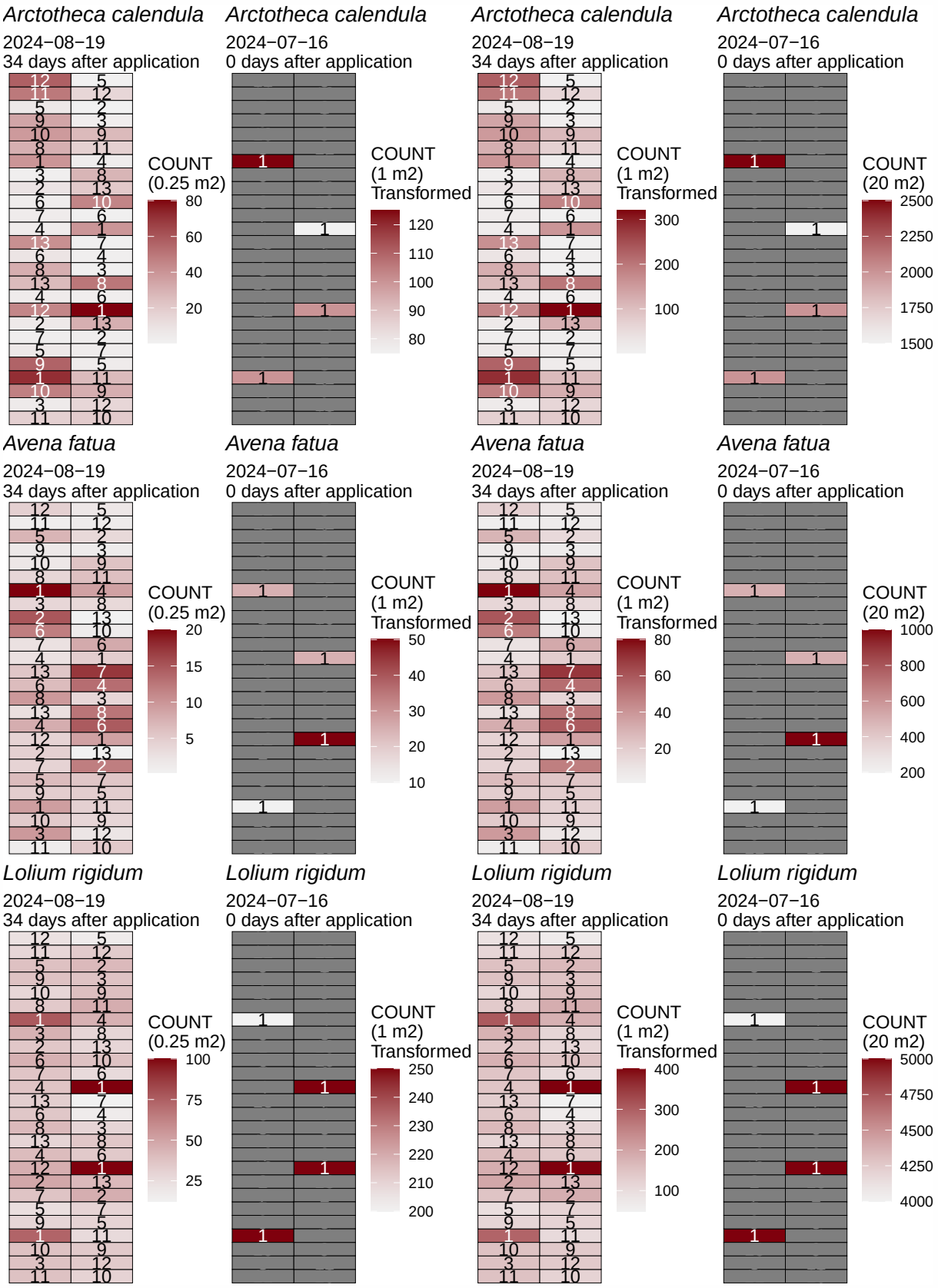

Figure A3. The field layout for **Beverley**. The color shows the **COUNT** for the corresponding pest species and day in the title. If the response has been transformed, it is indicated in the legend. The number in the tile shows the treatment applied.

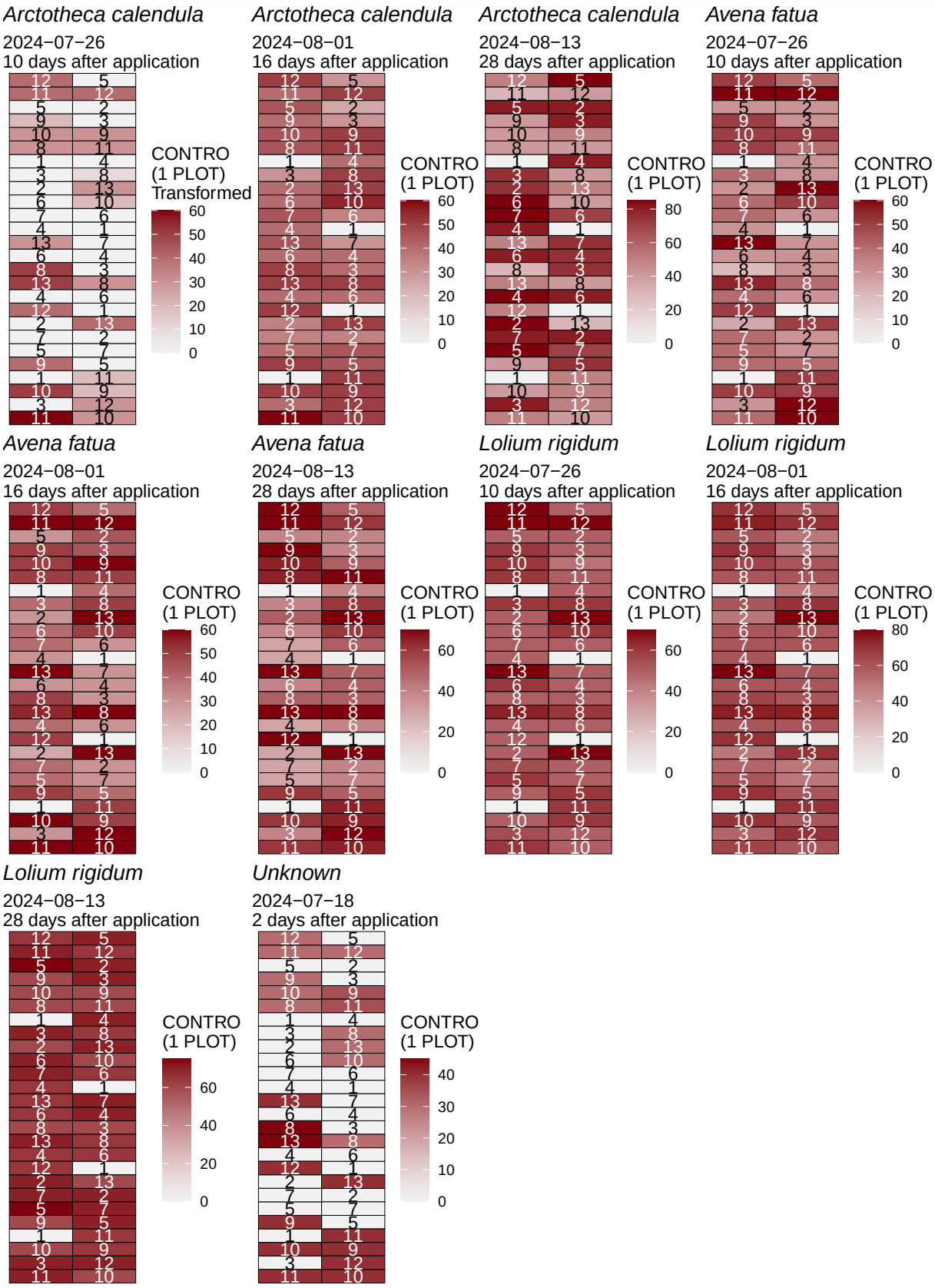

Figure A4. The field layout for **Beverley**. The color shows the **CONTRO** for the corresponding pest species and day in the title. If the response has been transformed, it is indicated in the legend. The number in the tile shows the treatment applied.

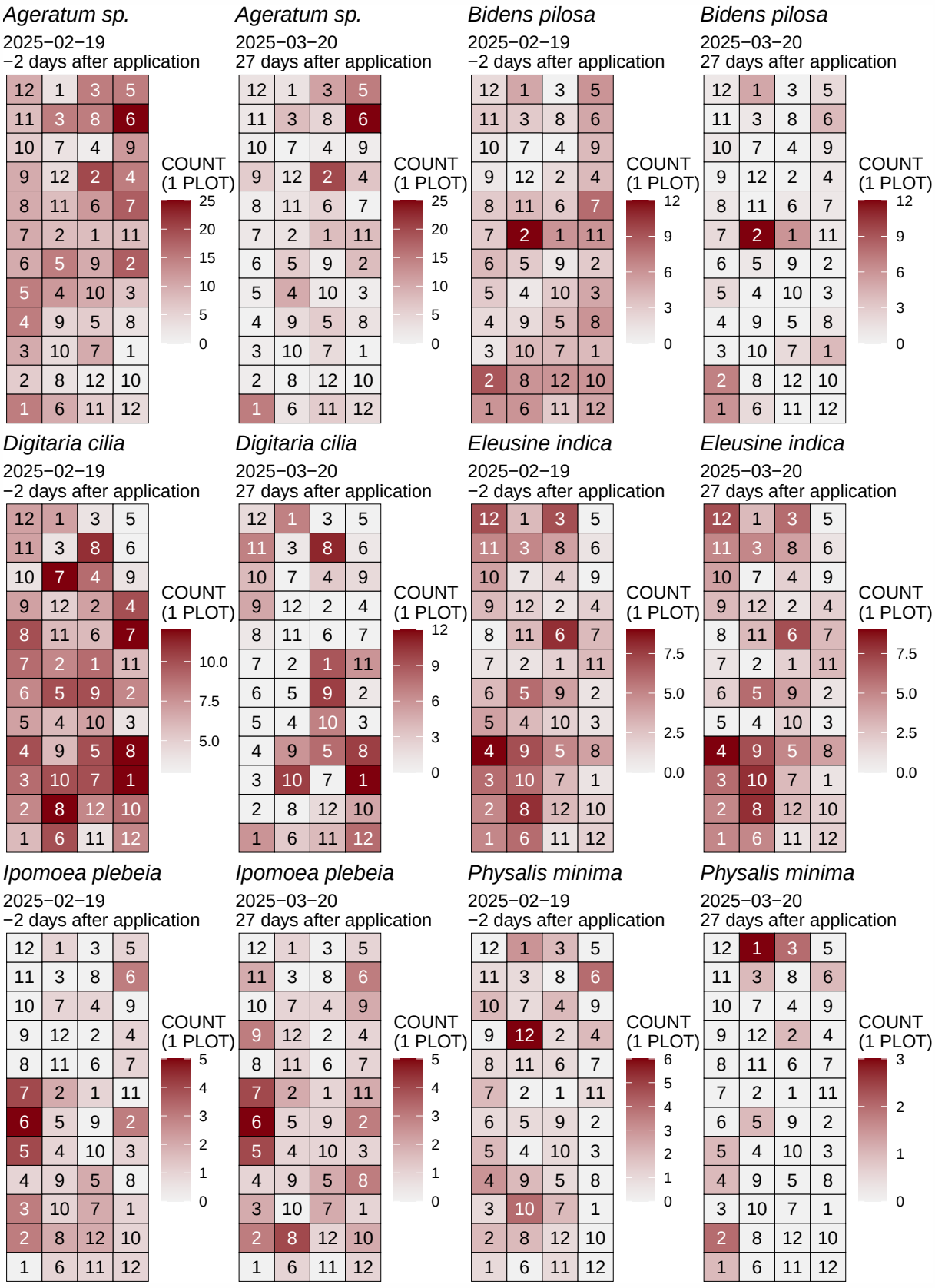

Figure A5. The field layout for **Bundaberg**. The color shows the **COUNT** for the corresponding pest species and day in the title. The number in the tile shows the treatment applied.

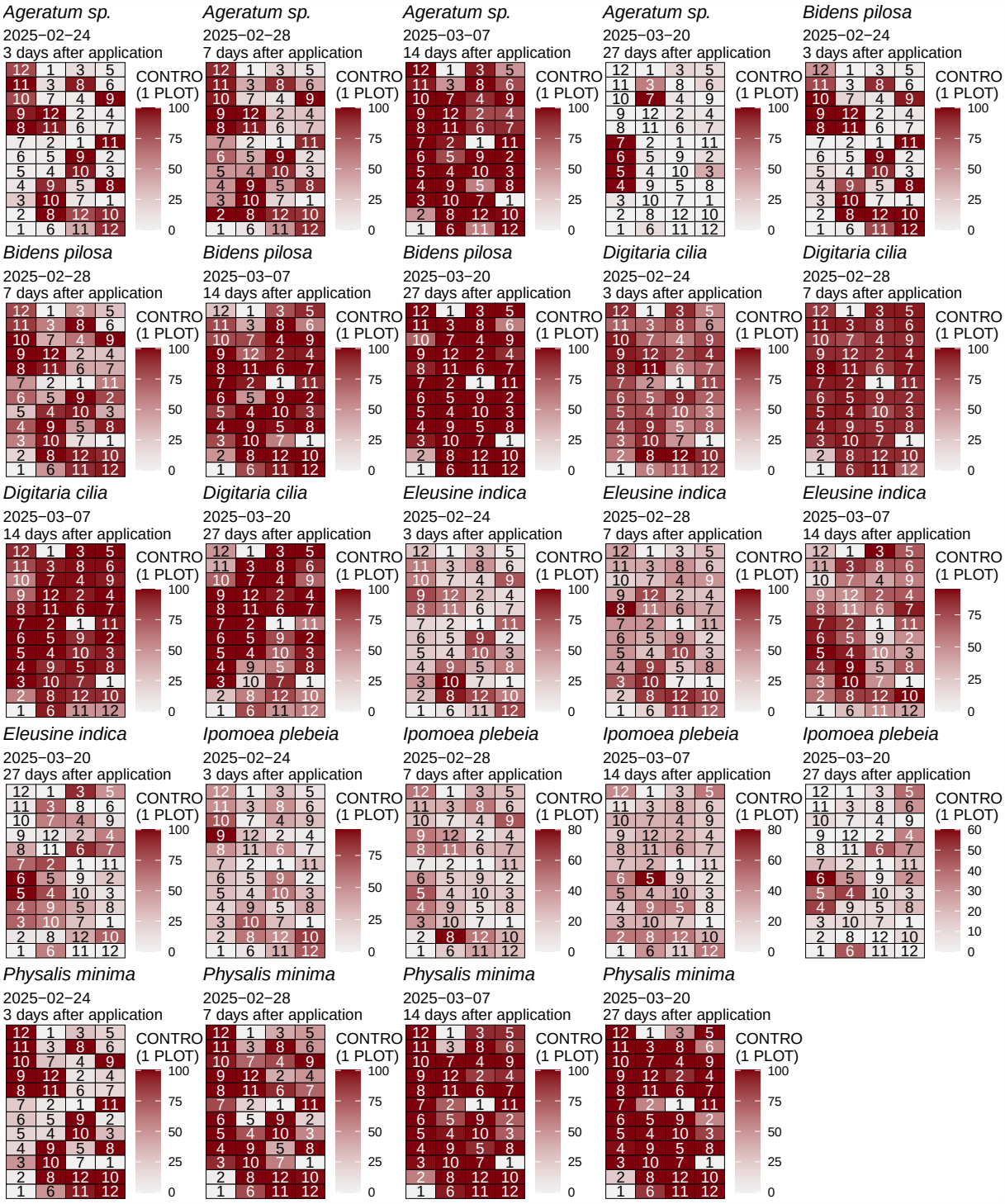

Figure A6. The field layout for **Bundaberg**. The color shows the **CONTRO** for the corresponding pest species and day in the title. The number in the tile shows the treatment applied.

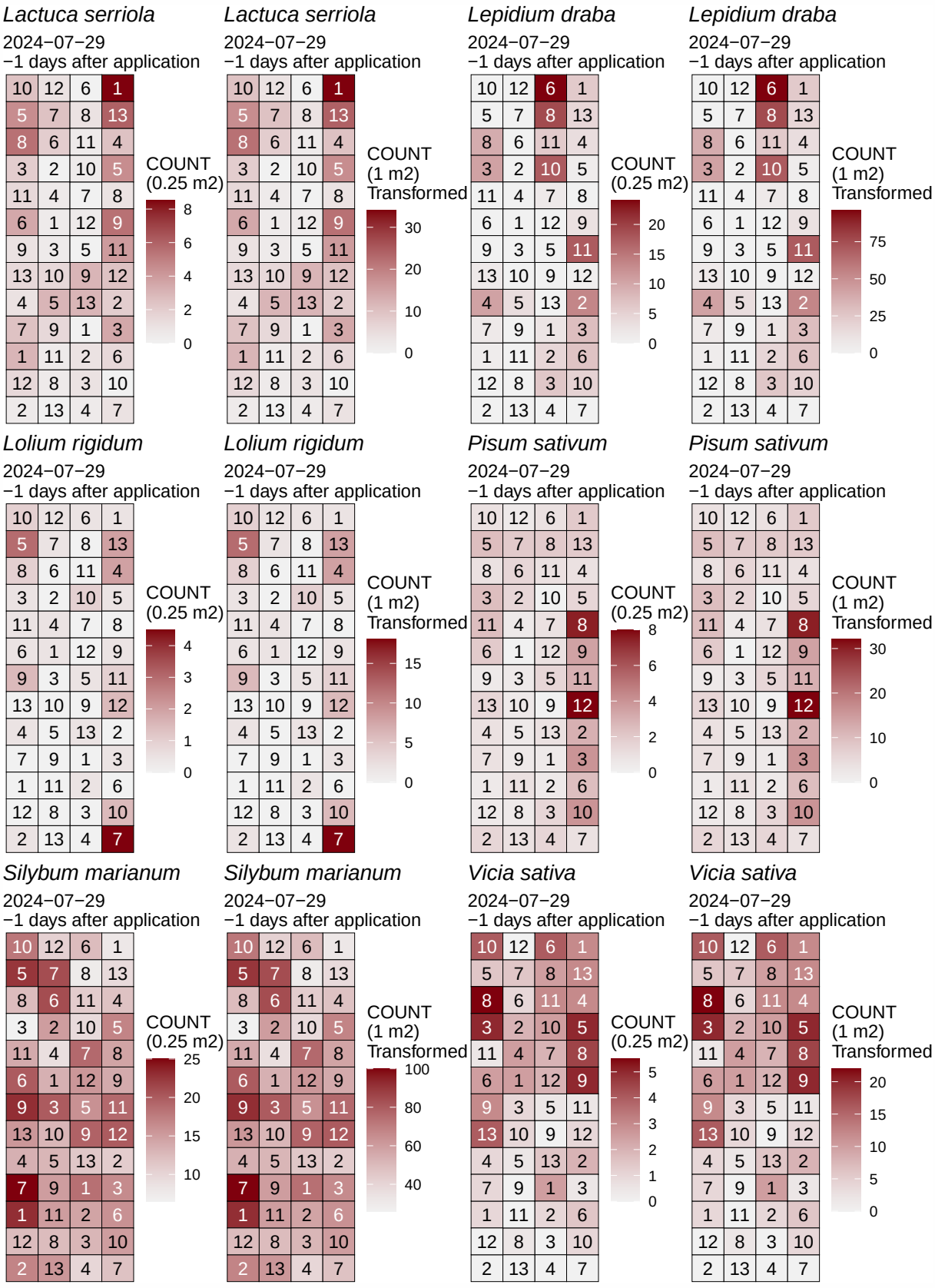

Figure A7. The field layout for **Horsham**. The color shows the **COUNT** for the corresponding pest species and day in the title. If the response has been transformed, it is indicated in the legend. The number in the tile shows the treatment applied.

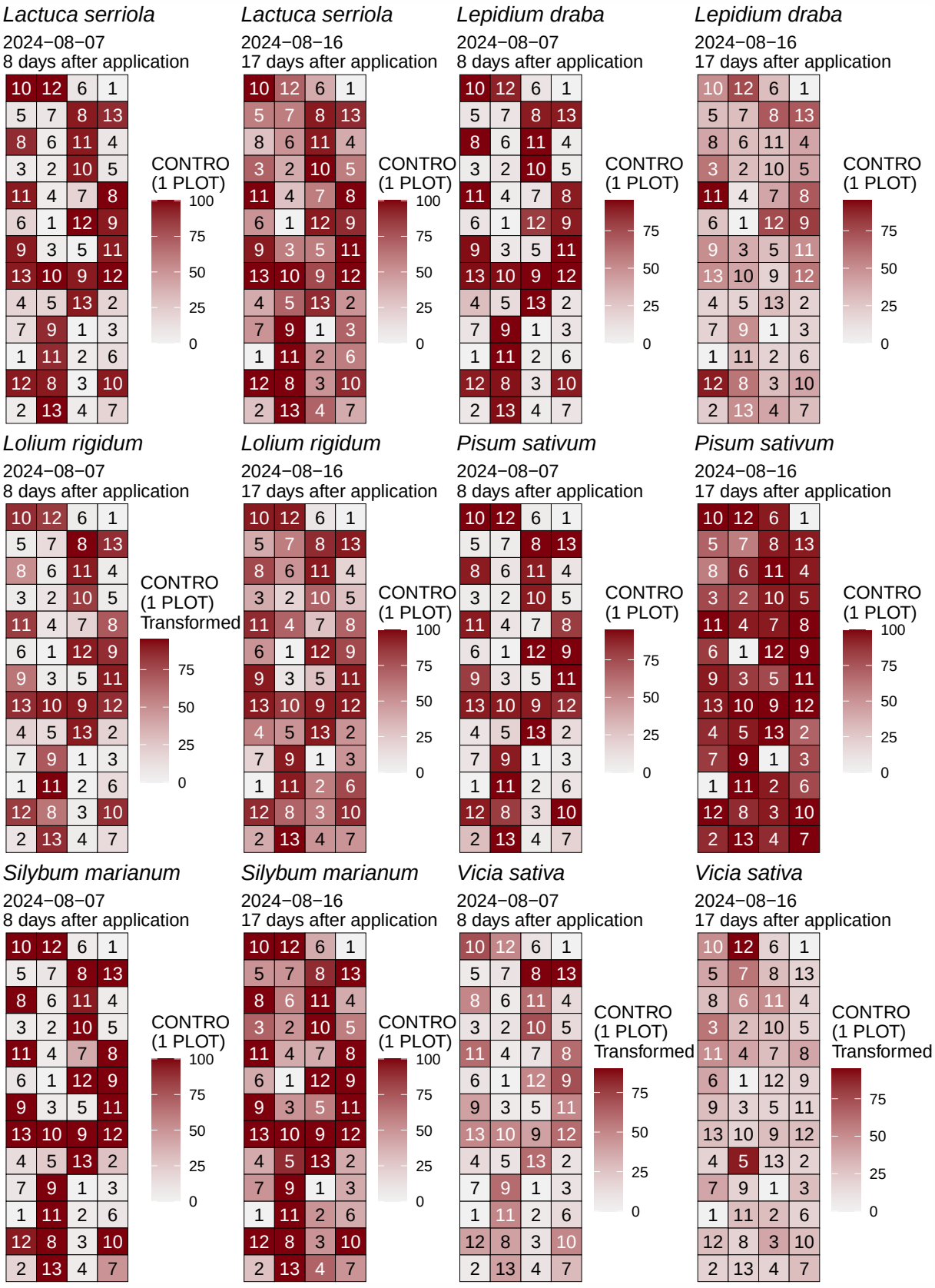

Figure A8. The field layout for **Horsham**. The color shows the **CONTRO** for the corresponding pest species and day in the title. If the response has been transformed, it is indicated in the legend. The number in the tile shows the treatment applied.

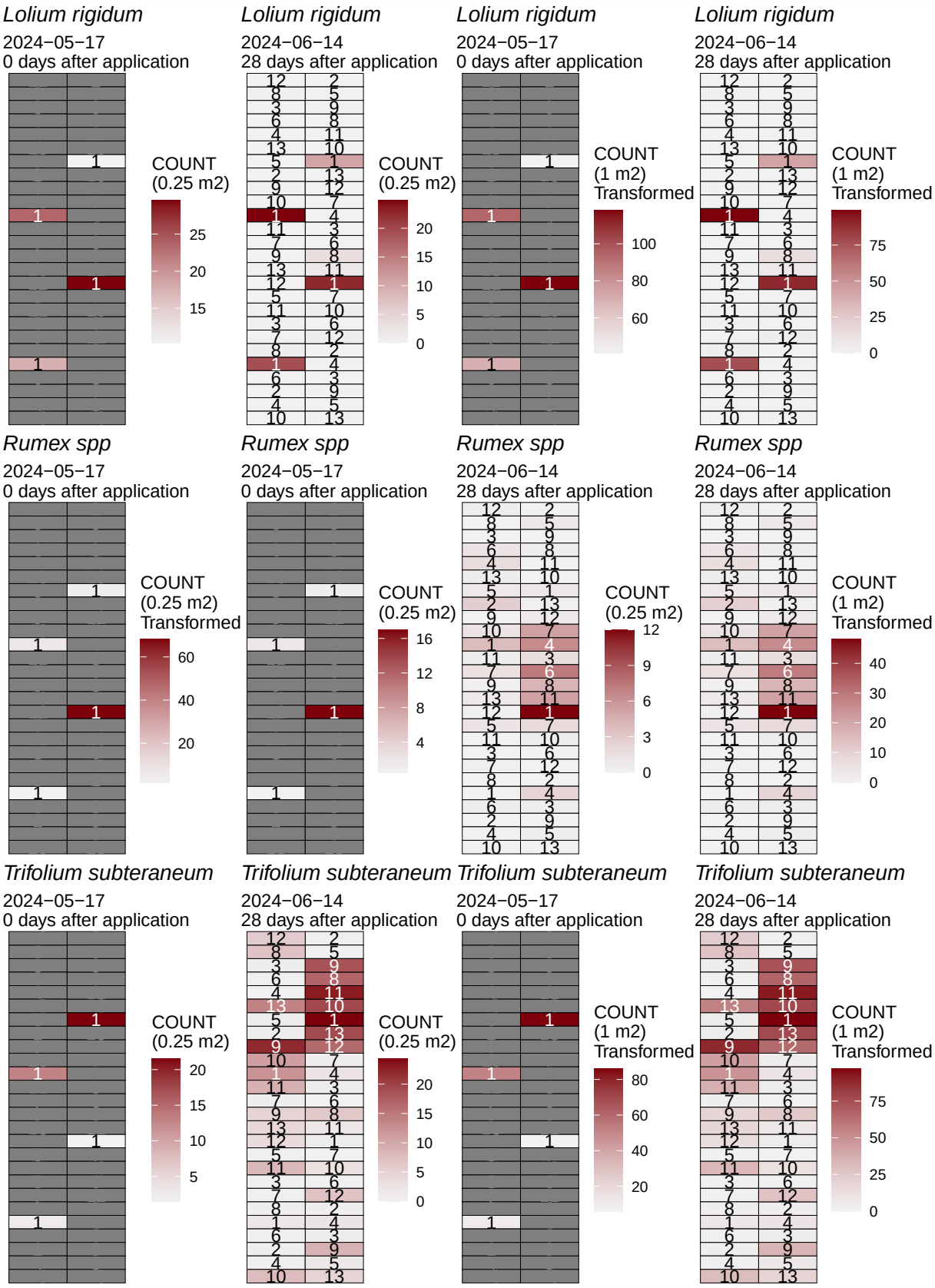

Figure A9. The field layout for **Young**. The color shows the **COUNT** for the corresponding pest species and day in the title. If the response has been transformed, it is indicated in the legend. The number in the tile shows the treatment applied.

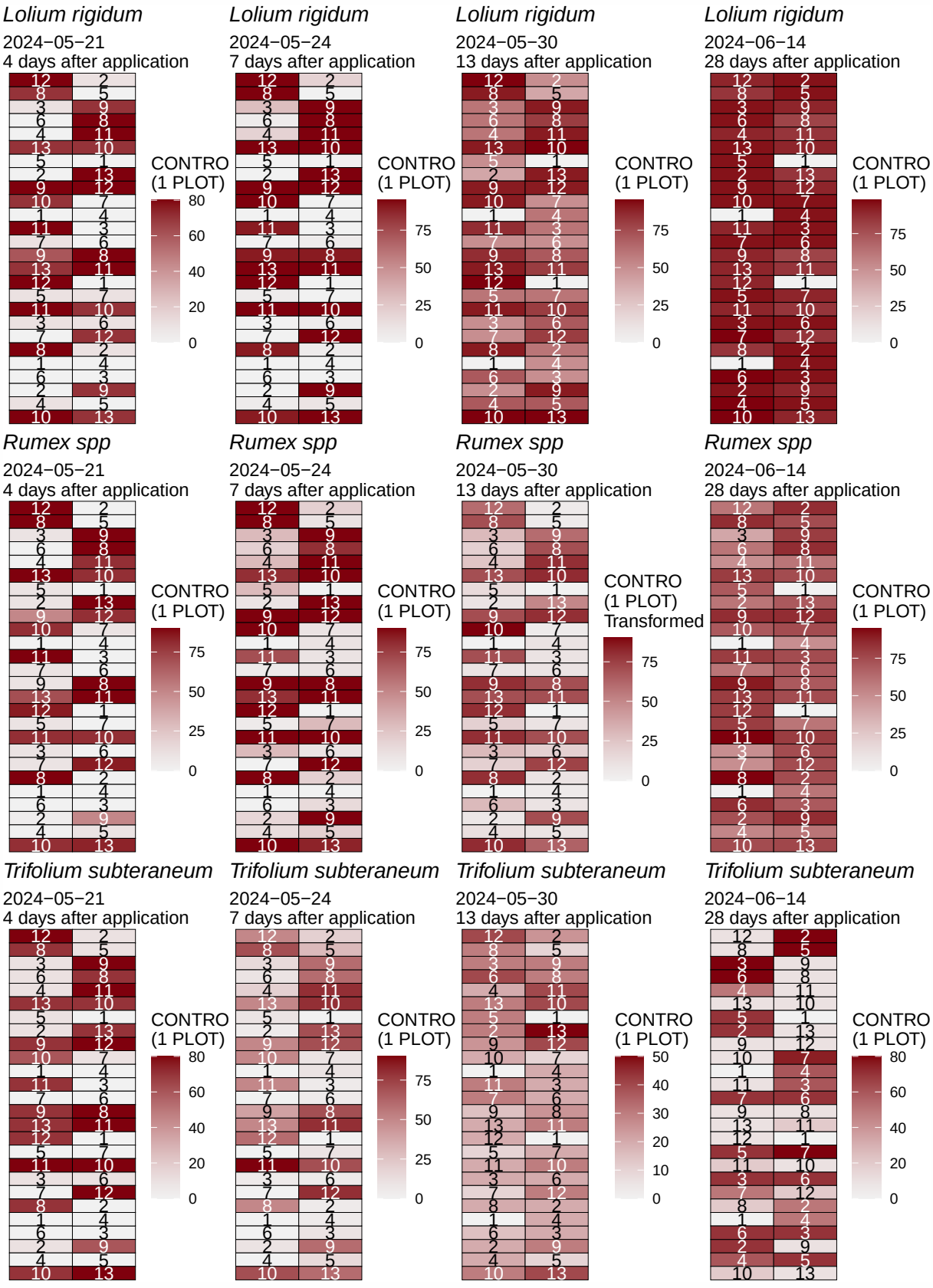

Figure A10. The field layout for **Young**. The color shows the **CONTRO** for the corresponding pest species and day in the title. If the response has been transformed, it is indicated in the legend. The number in the tile shows the treatment applied.

A.2. Response over time

The CONTRO response over time by site and pest species is shown in Figure A11.

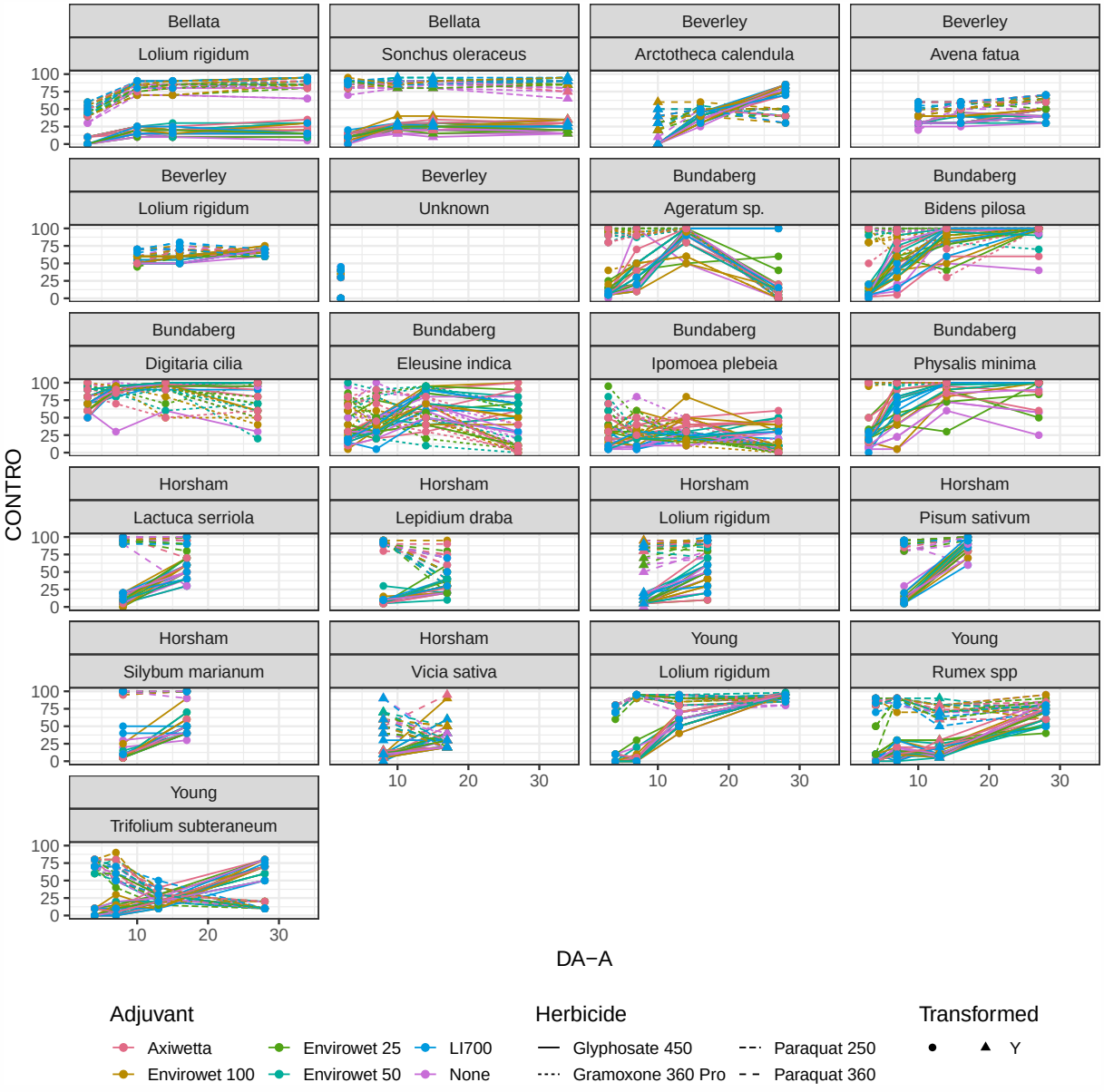

Figure A11. The CONTRO response over days after application (DA-A) by site and pest species. The color indicates the adjuvant treatment and the linetype indicate the herbicide treatment. If the response shown is a transformed value, it is indicated by a triangle, otherwise it is a circle point.

A.3. ANOVA results

This section shows all the individual ANOVA tables. If the response have been transformed then CONTRO has a superscript ^{T}.

Table A1. The ANOVA results for CONTRO, Lolium rigidum, at 3 days after application, Bellata, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	112.500	37.500	1.222	0.317
herbicide	1	22533.333	22533.333	734.420	0.000
herbicide:adjuvant	10	883.333	88.333	2.879	0.011
Residuals	33	1012.500	30.682		

Table A2. The ANOVA results for CONTRO, Lolium rigidum, at 10 days after application, Bellata, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	210.417	70.139	2.716	0.06
herbicide	1	48768.750	48768.750	1888.746	0.00
herbicide:adjuvant	10	666.667	66.667	2.582	0.02
Residuals	33	852.083	25.821		

Table A3. The ANOVA results for CONTRO, Lolium rigidum, at 15 days after application, Bellata, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	470.833	156.944	7.355	0.001
herbicide	1	52668.750	52668.750	2468.263	0.000
herbicide:adjuvant	10	597.917	59.792	2.802	0.013
Residuals	33	704.167	21.338		

Table A4. The ANOVA results for CONTRO, Lolium rigidum, at 34 days after application, Bellata, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	405.729	135.243	4.461	0.01
herbicide	1	55013.021	55013.021	1814.485	0.00
herbicide:adjuvant	10	1980.208	198.021	6.531	0.00
Residuals	33	1000.521	30.319		

Table A5. The ANOVA results for CONTRO, Sonchus oleraceus, at 3 days after application, Bellata, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	29.167	9.722	0.410	0.747
herbicide	1	69008.333	69008.333	2907.160	0.000
herbicide:adjuvant	10	629.167	62.917	2.651	0.017
Residuals	33	783.333	23.737		

Table A6. The ANOVA results for CONTRO^T, Sonchus oleraceus, at 10 days after application, Bellata, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	16.667	5.556	0.295	0.828
herbicide	1	46875.000	46875.000	2491.611	0.000
herbicide:adjuvant	10	562.500	56.250	2.990	0.009
Residuals	33	620.833	18.813		

Table A7. The ANOVA results for CONTRO^T, Sonchus oleraceus, at 15 days after application, Bellata, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	100.000	33.333	1.257	0.305
herbicide	1	49408.333	49408.333	1863.400	0.000
herbicide:adjuvant	10	391.667	39.167	1.477	0.192
Residuals	33	875.000	26.515		

Table A8. The ANOVA results for CONTRO^T, Sonchus oleraceus, at 34 days after application, Bellata, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	51.562	17.187	0.764	0.522
herbicide	1	45325.521	45325.521	2015.316	0.000
herbicide:adjuvant	10	1705.208	170.521	7.582	0.000
Residuals	33	742.188	22.491		

Table A9. The ANOVA results for CONTRO^T, Arctotheca calendula, at 10 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	889.583	296.528	5.190	0.005
herbicide	1	13668.750	13668.750	239.241	0.000
herbicide:adjuvant	10	387.500	38.750	0.678	0.736
Residuals	33	1885.417	57.134		

Table A10. The ANOVA results for CONTRO, Arctotheca calendula, at 16 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	155.729	51.910	2.245	0.101
herbicide	1	1575.521	1575.521	68.140	0.000
herbicide:adjuvant	10	163.542	16.354	0.707	0.711
Residuals	33	763.021	23.122		

Table A11. The ANOVA results for CONTRO, Arctotheca calendula, at 28 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	68.750	22.917	0.634	0.599
herbicide	1	15768.750	15768.750	435.911	0.000
herbicide:adjuvant	10	316.667	31.667	0.875	0.564
Residuals	33	1193.750	36.174		

Table A12. The ANOVA results for CONTRO, Avena fatua, at 10 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	222.917	74.306	1.901	0.149
herbicide	1	3008.333	3008.333	76.982	0.000
herbicide:adjuvant	10	1377.083	137.708	3.524	0.003
Residuals	33	1289.583	39.078		

Table A13. The ANOVA results for CONTRO, Avena fatua, at 16 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	56.250	18.750	0.535	0.661
herbicide	1	4800.000	4800.000	136.995	0.000
herbicide:adjuvant	10	185.417	18.542	0.529	0.857
Residuals	33	1156.250	35.038		

Table A14. The ANOVA results for CONTRO, Avena fatua, at 28 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	484.896	161.632	4.115	0.014
herbicide	1	7129.688	7129.688	181.493	0.000
herbicide:adjuvant	10	388.542	38.854	0.989	0.472
Residuals	33	1296.354	39.283		

Table A15. The ANOVA results for CONTRO, Lolium rigidum, at 10 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	118.750	39.583	1.181	0.332
herbicide	1	602.083	602.083	17.960	0.000
herbicide:adjuvant	10	654.167	65.417	1.951	0.073
Residuals	33	1106.250	33.523		

Table A16. The ANOVA results for CONTRO, Lolium rigidum, at 16 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	70.833	23.611	1.238	0.311
herbicide	1	1633.333	1633.333	85.669	0.000
herbicide:adjuvant	10	666.667	66.667	3.497	0.003
Residuals	33	629.167	19.066		

Table A17. The ANOVA results for CONTRO, Lolium rigidum, at 28 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	5.729	1.910	0.153	0.927
herbicide	1	275.521	275.521	22.014	0.000
herbicide:adjuvant	10	267.708	26.771	2.139	0.049
Residuals	33	413.021	12.516		

Table A18. The ANOVA results for CONTRO, Unknown, at 2 days after application, Beverley, WA.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	225.000	75.000	6.187	0.002
herbicide	1	15408.333	15408.333	1271.187	0.000
herbicide:adjuvant	10	58.333	5.833	0.481	0.890
Residuals	33	400.000	12.121		

Table A19. The ANOVA results for CONTRO, Ageratum sp., at 3 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	140.909	46.970	0.404	0.751
herbicide	1	76212.803	76212.803	656.235	0.000
herbicide:adjuvant	9	875.833	97.315	0.838	0.588
Residuals	30	3484.091	116.136		

Table A20. The ANOVA results for CONTRO, Ageratum sp., at 7 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	4272.270	1424.090	5.216	0.005
herbicide	1	36474.959	36474.959	133.592	0.000
herbicide:adjuvant	9	856.266	95.141	0.348	0.950
Residuals	30	8190.948	273.032		

Table A21. The ANOVA results for CONTRO, Ageratum sp., at 14 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	254.702	84.901	0.407	0.749
herbicide	1	1224.975	1224.975	5.877	0.022
herbicide:adjuvant	9	2057.425	228.603	1.097	0.394
Residuals	30	6253.018	208.434		

Table A22. The ANOVA results for CONTRO, Ageratum sp., at 27 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	6624.534	2208.178	3.021	0.045
herbicide	1	10725.120	10725.120	14.671	0.001
herbicide:adjuvant	9	4628.987	514.332	0.704	0.701
Residuals	30	21931.776	731.059		

Table A23. The ANOVA results for CONTRO, Bidens pilosa, at 3 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	103.341	34.447	0.323	0.809
herbicide	1	80215.227	80215.227	751.217	0.000
herbicide:adjuvant	9	545.000	60.556	0.567	0.813
Residuals	30	3203.409	106.780		

Table A24. The ANOVA results for CONTRO, Bidens pilosa, at 7 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	736.892	245.631	0.861	0.472
herbicide	1	26210.548	26210.548	91.891	0.000
herbicide:adjuvant	9	3613.028	401.448	1.407	0.229
Residuals	30	8557.063	285.235		

Table A25. The ANOVA results for CONTRO, Bidens pilosa, at 14 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	1188.612	396.204	1.283	0.298
herbicide	1	679.831	679.831	2.201	0.148
herbicide:adjuvant	9	3207.650	356.406	1.154	0.358
Residuals	30	9264.266	308.809		

Table A26. The ANOVA results for CONTRO, Bidens pilosa, at 27 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	652.665	217.555	1.609	0.208
herbicide	1	93.121	93.121	0.689	0.413
herbicide:adjuvant	9	948.960	105.440	0.780	0.636
Residuals	30	4057.155	135.238		

Table A27. The ANOVA results for CONTRO, Digitaria cilia, at 3 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	578.977	192.992	1.465	0.244
herbicide	1	3340.909	3340.909	25.359	0.000
herbicide:adjuvant	9	825.000	91.667	0.696	0.707
Residuals	30	3952.273	131.742		

Table A28. The ANOVA results for CONTRO, Digitaria cilia, at 7 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	169.886	56.629	0.493	0.69
herbicide	1	0.170	0.170	0.001	0.97
herbicide:adjuvant	9	1141.875	126.875	1.104	0.39
Residuals	30	3448.864	114.962		

Table A29. The ANOVA results for CONTRO, Digitaria cilia, at 14 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	597.636	199.212	1.252	0.309
herbicide	1	1284.245	1284.245	8.069	0.008
herbicide:adjuvant	9	867.800	96.422	0.606	0.782
Residuals	30	4774.864	159.162		

Table A30. The ANOVA results for CONTRO, Digitaria cilia, at 27 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	88.068	29.356	0.070	0.976
herbicide	1	5563.712	5563.712	13.176	0.001
herbicide:adjuvant	9	3640.833	404.537	0.958	0.492
Residuals	30	12668.182	422.273		

Table A31. The ANOVA results for CONTRO, Eleusine indica, at 3 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	162.252	54.084	0.257	0.856
herbicide	1	21544.512	21544.512	102.438	0.000
herbicide:adjuvant	9	2240.963	248.996	1.184	0.340
Residuals	30	6309.516	210.317		

Table A32. The ANOVA results for CONTRO, Eleusine indica, at 7 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	847.297	282.432	0.700	0.560
herbicide	1	8514.588	8514.588	21.089	0.000
herbicide:adjuvant	9	1362.469	151.385	0.375	0.938
Residuals	30	12112.170	403.739		

Table A33. The ANOVA results for CONTRO, Eleusine indica, at 14 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	1244.046	414.682	0.727	0.544
herbicide	1	1028.377	1028.377	1.802	0.190
herbicide:adjuvant	9	1634.844	181.649	0.318	0.963
Residuals	30	17119.679	570.656		

Table A34. The ANOVA results for CONTRO, Eleusine indica, at 27 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	2431.818	810.606	1.157	0.343
herbicide	1	16155.303	16155.303	23.051	0.000
herbicide:adjuvant	9	4485.921	498.436	0.711	0.694
Residuals	30	21025.127	700.838		

Table A35. The ANOVA results for CONTRO, Ipomoea plebeia, at 3 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	1586.515	528.838	3.340	0.032
herbicide	1	10785.635	10785.635	68.110	0.000
herbicide:adjuvant	9	3361.676	373.520	2.359	0.038
Residuals	30	4750.652	158.355		

Table A36. The ANOVA results for CONTRO, Ipomoea plebeia, at 7 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	970.606	323.535	1.718	0.184
herbicide	1	2874.776	2874.776	15.264	0.000
herbicide:adjuvant	9	3292.088	365.788	1.942	0.084
Residuals	30	5650.229	188.341		

Table A37. The ANOVA results for CONTRO, Ipomoea plebeia, at 14 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	1132.924	377.641	3.481	0.028
herbicide	1	69.966	69.966	0.645	0.428
herbicide:adjuvant	9	4249.136	472.126	4.352	0.001
Residuals	30	3254.578	108.486		

Table A38. The ANOVA results for CONTRO, Ipomoea plebeia, at 27 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	669.097	223.032	2.179	0.111
herbicide	1	4083.905	4083.905	39.900	0.000
herbicide:adjuvant	9	4286.951	476.328	4.654	0.001
Residuals	30	3070.570	102.352		

Table A39. The ANOVA results for CONTRO, Physalis minima, at 3 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	154.924	51.641	0.906	0.450
herbicide	1	67231.682	67231.682	1179.736	0.000
herbicide:adjuvant	9	1613.862	179.318	3.147	0.009
Residuals	30	1709.663	56.989		

Table A40. The ANOVA results for CONTRO, Physalis minima, at 7 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	1856.935	618.978	2.344	0.093
herbicide	1	18013.865	18013.865	68.215	0.000
herbicide:adjuvant	9	9313.025	1034.781	3.919	0.002
Residuals	30	7922.235	264.075		

Table A41. The ANOVA results for CONTRO, Physalis minima, at 14 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	497.726	165.909	1.662	0.196
herbicide	1	1621.492	1621.492	16.247	0.000
herbicide:adjuvant	9	2988.563	332.063	3.327	0.006
Residuals	30	2994.109	99.804		

Table A42. The ANOVA results for CONTRO, Physalis minima, at 27 days after application, Bundaberg, QLD.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	103.961	34.654	0.219	0.882
herbicide	1	1622.600	1622.600	10.260	0.003
herbicide:adjuvant	9	5479.547	608.839	3.850	0.002
Residuals	30	4744.542	158.151		

Table A43. The ANOVA results for CONTRO, Lactuca serriola, at 8 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	101.562	33.854	1.327	0.282
herbicide	1	87125.521	87125.521	3413.898	0.000
herbicide:adjuvant	10	367.708	36.771	1.441	0.206
Residuals	33	842.187	25.521		

Table A44. The ANOVA results for CONTRO, Lactuca serriola, at 17 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	229.167	76.389	0.399	0.755
herbicide	1	19200.000	19200.000	100.240	0.000
herbicide:adjuvant	10	2250.000	225.000	1.175	0.342
Residuals	33	6320.833	191.540		

Table A45. The ANOVA results for CONTRO, Lepidium draba, at 8 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	75.083	25.028	1.211	0.321
herbicide	1	83000.333	83000.333	4016.636	0.000
herbicide:adjuvant	10	144.583	14.458	0.700	0.718
Residuals	33	681.917	20.664		

Table A46. The ANOVA results for CONTRO, Lepidium draba, at 17 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	757.750	252.583	1.044	0.386
herbicide	1	7701.333	7701.333	31.823	0.000
herbicide:adjuvant	10	3256.583	325.658	1.346	0.248
Residuals	33	7986.250	242.008		

Table A47. The ANOVA results for CONTRO^T, Lolium rigidum, at 8 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	360.417	120.139	1.800	0.166
herbicide	1	63075.000	63075.000	945.230	0.000
herbicide:adjuvant	10	1310.417	131.042	1.964	0.071
Residuals	33	2202.083	66.730		

Table A48. The ANOVA results for CONTRO, Lolium rigidum, at 17 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	29.167	9.722	0.039	0.990
herbicide	1	26133.333	26133.333	104.586	0.000
herbicide:adjuvant	10	1466.667	146.667	0.587	0.813
Residuals	33	8245.833	249.874		

Table A49. The ANOVA results for CONTRO, Pisum sativum, at 8 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	9.896	3.299	0.086	0.967
herbicide	1	78813.021	78813.021	2066.029	0.000
herbicide:adjuvant	10	238.542	23.854	0.625	0.781
Residuals	33	1258.854	38.147		

Table A50. The ANOVA results for CONTRO, Pisum sativum, at 17 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	362.500	120.833	1.457	0.244
herbicide	1	1302.083	1302.083	15.696	0.000
herbicide:adjuvant	10	764.583	76.458	0.922	0.526
Residuals	33	2737.500	82.955		

Table A51. The ANOVA results for CONTRO, Silybum marianum, at 8 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	137.500	45.833	0.747	0.532
herbicide	1	91875.000	91875.000	1497.222	0.000
herbicide:adjuvant	10	1379.167	137.917	2.248	0.039
Residuals	33	2025.000	61.364		

Table A52. The ANOVA results for CONTRO, Silybum marianum, at 17 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	239.583	79.861	1.039	0.388
herbicide	1	29502.083	29502.083	383.988	0.000
herbicide:adjuvant	10	1320.833	132.083	1.719	0.118
Residuals	33	2535.417	76.831		

Table A53. The ANOVA results for CONTRO^T, Vicia sativa, at 8 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	1018.229	339.410	2.899	0.050
herbicide	1	25900.521	25900.521	221.256	0.000
herbicide:adjuvant	10	455.208	45.521	0.389	0.942
Residuals	33	3863.021	117.061		

Table A54. The ANOVA results for CONTRO^T, Vicia sativa, at 17 days after application, Horsham, VIC.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	2005.729	668.576	2.475	0.079
herbicide	1	42.188	42.188	0.156	0.695
herbicide:adjuvant	10	2384.375	238.438	0.883	0.558
Residuals	33	8913.021	270.092		

Table A55. The ANOVA results for CONTRO, Lolium rigidum, at 4 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	6.25	2.083	0.067	0.977
herbicide	1	60918.75	60918.750	1973.319	0.000
herbicide:adjuvant	10	337.50	33.750	1.093	0.395
Residuals	33	1018.75	30.871		

Table A56. The ANOVA results for CONTRO, Lolium rigidum, at 7 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	130.729	43.576	1.150	0.344
herbicide	1	95854.688	95854.688	2529.510	0.000
herbicide:adjuvant	10	163.542	16.354	0.432	0.920
Residuals	33	1250.521	37.895		

Table A57. The ANOVA results for CONTRO, Lolium rigidum, at 13 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	118.229	39.410	0.680	0.571
herbicide	1	12513.021	12513.021	215.852	0.000
herbicide:adjuvant	10	642.708	64.271	1.109	0.385
Residuals	33	1913.021	57.970		

Table A58. The ANOVA results for CONTRO, Lolium rigidum, at 28 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	99.729	33.243	5.261	0.004
herbicide	1	475.021	475.021	75.176	0.000
herbicide:adjuvant	10	240.042	24.004	3.799	0.002
Residuals	33	208.521	6.319		

Table A59. The ANOVA results for CONTRO, Rumex spp, at 4 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	338.741	112.914	1.037	0.389
herbicide	1	67500.000	67500.000	619.681	0.000
herbicide:adjuvant	10	4446.038	444.604	4.082	0.001
Residuals	33	3594.594	108.927		

Table A60. The ANOVA results for CONTRO, Rumex spp, at 7 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	100.097	33.366	0.483	0.697
herbicide	1	63678.185	63678.185	921.191	0.000
herbicide:adjuvant	10	509.422	50.942	0.737	0.685
Residuals	33	2281.155	69.126		

Table A61. The ANOVA results for CONTRO^T, Rumex spp, at 13 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	818.161	272.720	6.571	0.001
herbicide	1	40827.500	40827.500	983.675	0.000
herbicide:adjuvant	10	1097.932	109.793	2.645	0.017
Residuals	33	1369.667	41.505		

Table A62. The ANOVA results for CONTRO, Rumex spp, at 28 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	529.602	176.534	1.945	0.142
herbicide	1	2270.125	2270.125	25.010	0.000
herbicide:adjuvant	10	1808.190	180.819	1.992	0.067
Residuals	33	2995.400	90.770		

Table A63. The ANOVA results for CONTRO, Trifolium subteraneum, at 4 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	39.583	13.194	0.367	0.777
herbicide	1	56718.750	56718.750	1578.954	0.000
herbicide:adjuvant	10	304.167	30.417	0.847	0.589
Residuals	33	1185.417	35.922		

Table A64. The ANOVA results for CONTRO, Trifolium subteraneum, at 7 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	1001.562	333.854	3.999	0.016
herbicide	1	36025.521	36025.521	431.571	0.000
herbicide:adjuvant	10	1451.042	145.104	1.738	0.113
Residuals	33	2754.687	83.475		

Table A65. The ANOVA results for CONTRO, Trifolium subteraneum, at 13 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	889.062	296.354	6.142	0.002
herbicide	1	1054.688	1054.688	21.860	0.000
herbicide:adjuvant	10	538.542	53.854	1.116	0.380
Residuals	33	1592.188	48.248		

Table A66. The ANOVA results for CONTRO, Trifolium subteraneum, at 28 days after application, Young, NSW.

Term	Df	Sum of Sq.	Mean Sq.	F-statistic	p-value
block	3	9.896	3.299	0.062	0.980
herbicide	1	37129.688	37129.688	696.635	0.000
herbicide:adjuvant	10	926.042	92.604	1.737	0.113
Residuals	33	1758.854	53.299		

A.4. Marginal treatment means

This section shows all the marginal treatment means and its 95% confidence interval. If the response have been transformed then CONTRO has a superscript ^{T}.

Table A67. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 3 days after application, Bellata, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 250	52.50	(46.9, 58.1)
Envirowet 100	Paraquat 250	51.25	(45.6, 56.9)
Axiwetta	Paraquat 250	48.75	(43.1, 54.4)
Envirowet 50	Paraquat 250	45.00	(39.4, 50.6)
Envirowet 25	Paraquat 250	43.75	(38.1, 49.4)
None	Paraquat 250	36.25	(30.6, 41.9)
Axiwetta	Glyphosate 450	7.50	(1.9, 13.1)
Envirowet 100	Glyphosate 450	5.00	(-0.6, 10.6)
Envirowet 50	Glyphosate 450	2.50	(-3.1, 8.1)
LI700	Glyphosate 450	2.50	(-3.1, 8.1)
Envirowet 25	Glyphosate 450	0.00	(-5.6, 5.6)
None	Glyphosate 450	0.00	(-5.6, 5.6)

Table A68. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 10 days after application, Bellata, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 250	87.50	(82.3, 92.7)
Envirowet 50	Paraquat 250	86.25	(81.1, 91.4)
Axiwetta	Paraquat 250	81.25	(76.1, 86.4)
Envirowet 100	Paraquat 250	81.25	(76.1, 86.4)
Envirowet 25	Paraquat 250	77.50	(72.3, 82.7)
None	Paraquat 250	76.25	(71.1, 81.4)
Envirowet 100	Glyphosate 450	22.50	(17.3, 27.7)
LI700	Glyphosate 450	20.00	(14.8, 25.2)
Axiwetta	Glyphosate 450	18.75	(13.6, 23.9)
Envirowet 50	Glyphosate 450	18.75	(13.6, 23.9)
Envirowet 25	Glyphosate 450	15.00	(9.8, 20.2)
None	Glyphosate 450	12.50	(7.3, 17.7)

Table A69. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 15 days after application, Bellata, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 50	Paraquat 250	87.50	(82.8, 92.2)
LI700	Paraquat 250	87.50	(82.8, 92.2)
Axiwetta	Paraquat 250	83.75	(79.1, 88.4)
Envirowet 100	Paraquat 250	81.25	(76.6, 85.9)
Envirowet 25	Paraquat 250	80.00	(75.3, 84.7)
None	Paraquat 250	76.25	(71.6, 80.9)
LI700	Glyphosate 450	18.75	(14.1, 23.4)
Axiwetta	Glyphosate 450	18.75	(14.1, 23.4)
Envirowet 50	Glyphosate 450	18.75	(14.1, 23.4)
Envirowet 100	Glyphosate 450	17.50	(12.8, 22.2)
Envirowet 25	Glyphosate 450	13.75	(9.1, 18.4)
None	Glyphosate 450	11.25	(6.6, 15.9)

Table A70. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 34 days after application, Bellata, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 250	93.75	(88.1, 99.4)
Envirowet 100	Paraquat 250	91.25	(85.6, 96.9)
Envirowet 50	Paraquat 250	91.25	(85.6, 96.9)
Envirowet 25	Paraquat 250	86.25	(80.6, 91.9)
Axiwetta	Paraquat 250	83.75	(78.1, 89.4)
None	Paraquat 250	72.50	(66.9, 78.1)
Envirowet 100	Glyphosate 450	25.00	(19.4, 30.6)
Axiwetta	Glyphosate 450	23.75	(18.1, 29.4)
Envirowet 50	Glyphosate 450	22.50	(16.9, 28.1)
LI700	Glyphosate 450	18.75	(13.1, 24.4)
Envirowet 25	Glyphosate 450	12.50	(6.9, 18.1)
None	Glyphosate 450	10.00	(4.4, 15.6)

Table A71. The marginal treatment means and its 95% confidence interval for CONTRO, Sonchus oleraceus, at 3 days after application, Bellata, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Paraquat 250	88.75	(83.8, 93.7)
Envirowet 50	Paraquat 250	88.75	(83.8, 93.7)
LI700	Paraquat 250	88.75	(83.8, 93.7)
Axiwetta	Paraquat 250	86.25	(81.3, 91.2)
Envirowet 25	Paraquat 250	82.50	(77.5, 87.5)
None	Paraquat 250	77.50	(72.5, 82.5)
Axiwetta	Glyphosate 450	12.50	(7.5, 17.5)
Envirowet 50	Glyphosate 450	12.50	(7.5, 17.5)
LI700	Glyphosate 450	10.00	(5.0, 15.0)
Envirowet 100	Glyphosate 450	10.00	(5.0, 15.0)
Envirowet 25	Glyphosate 450	8.75	(3.8, 13.7)
None	Glyphosate 450	3.75	(-1.2, 8.7)

Table A72. The marginal treatment means and its 95% confidence interval for CONTRO^T, Sonchus oleraceus, at 10 days after application, Bellata, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 50	Paraquat 250	90.00	(85.6, 94.4)
LI700	Paraquat 250	90.00	(85.6, 94.4)
Axiwetta	Paraquat 250	88.75	(84.3, 93.2)
Envirowet 25	Paraquat 250	87.50	(83.1, 91.9)
Envirowet 100	Paraquat 250	86.25	(81.8, 90.7)
None	Paraquat 250	82.50	(78.1, 86.9)
Envirowet 100	Glyphosate 450	31.25	(26.8, 35.7)
LI700	Glyphosate 450	27.50	(23.1, 31.9)
Envirowet 50	Glyphosate 450	26.25	(21.8, 30.7)
Axiwetta	Glyphosate 450	25.00	(20.6, 29.4)
Envirowet 25	Glyphosate 450	21.25	(16.8, 25.7)
None	Glyphosate 450	18.75	(14.3, 23.2)

Table A73. The marginal treatment means and its 95% confidence interval for CONTRO^T, Sonchus oleraceus, at 15 days after application, Bellata, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 250	90.00	(84.8, 95.2)
Envirowet 50	Paraquat 250	90.00	(84.8, 95.2)
LI700	Paraquat 250	90.00	(84.8, 95.2)
Envirowet 100	Paraquat 250	88.75	(83.5, 94.0)
Envirowet 25	Paraquat 250	87.50	(82.3, 92.7)
None	Paraquat 250	83.75	(78.5, 89.0)
Envirowet 100	Glyphosate 450	27.50	(22.3, 32.7)
Axiwetta	Glyphosate 450	26.25	(21.0, 31.5)
LI700	Glyphosate 450	26.25	(21.0, 31.5)
Envirowet 50	Glyphosate 450	25.00	(19.8, 30.2)
Envirowet 25	Glyphosate 450	22.50	(17.3, 27.7)
None	Glyphosate 450	17.50	(12.3, 22.7)

Table A74. The marginal treatment means and its 95% confidence interval for CONTRO^T, Sonchus oleraceus, at 34 days after application, Bellata, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 250	92.50	(87.7, 97.3)
Envirowet 50	Paraquat 250	91.25	(86.4, 96.1)
Envirowet 25	Paraquat 250	90.00	(85.2, 94.8)
Envirowet 100	Paraquat 250	90.00	(85.2, 94.8)
Axiwetta	Paraquat 250	86.25	(81.4, 91.1)
None	Paraquat 250	75.00	(70.2, 79.8)
Envirowet 100	Glyphosate 450	32.50	(27.7, 37.3)
Envirowet 50	Glyphosate 450	31.25	(26.4, 36.1)
Axiwetta	Glyphosate 450	30.00	(25.2, 34.8)
LI700	Glyphosate 450	26.25	(21.4, 31.1)
Envirowet 25	Glyphosate 450	20.00	(15.2, 24.8)
None	Glyphosate 450	16.25	(11.4, 21.1)

Table A75. The marginal treatment means and its 95% confidence interval for CONTRO^T, Arctotheca calendula, at 10 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	37.5	(29.8, 45.2)
Axiwetta	Paraquat 360	37.5	(29.8, 45.2)
Envirowet 100	Paraquat 360	37.5	(29.8, 45.2)
Envirowet 50	Paraquat 360	32.5	(24.8, 40.2)
None	Paraquat 360	30.0	(22.3, 37.7)
Envirowet 25	Paraquat 360	27.5	(19.8, 35.2)
Axiwetta	Glyphosate 450	0.0	(-7.7, 7.7)
LI700	Glyphosate 450	0.0	(-7.7, 7.7)
Envirowet 100	Glyphosate 450	0.0	(-7.7, 7.7)
Envirowet 50	Glyphosate 450	0.0	(-7.7, 7.7)
Envirowet 25	Glyphosate 450	0.0	(-7.7, 7.7)
None	Glyphosate 450	0.0	(-7.7, 7.7)

Table A76. The marginal treatment means and its 95% confidence interval for CONTRO, Arctotheca calendula, at 16 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 360	50.00	(45.1, 54.9)
Envirowet 100	Paraquat 360	50.00	(45.1, 54.9)
Envirowet 50	Paraquat 360	50.00	(45.1, 54.9)
LI700	Paraquat 360	48.75	(43.9, 53.6)
None	Paraquat 360	48.75	(43.9, 53.6)
Envirowet 25	Paraquat 360	47.50	(42.6, 52.4)
Envirowet 100	Glyphosate 450	40.00	(35.1, 44.9)
Envirowet 50	Glyphosate 450	40.00	(35.1, 44.9)
Axiwetta	Glyphosate 450	38.75	(33.9, 43.6)
LI700	Glyphosate 450	38.75	(33.9, 43.6)
Envirowet 25	Glyphosate 450	35.00	(30.1, 39.9)
None	Glyphosate 450	33.75	(28.9, 38.6)

Table A77. The marginal treatment means and its 95% confidence interval for CONTRO, Arctotheca calendula, at 28 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Glyphosate 450	81.25	(75.1, 87.4)
None	Glyphosate 450	80.00	(73.9, 86.1)
Envirowet 50	Glyphosate 450	80.00	(73.9, 86.1)
Axiwetta	Glyphosate 450	78.75	(72.6, 84.9)
Envirowet 25	Glyphosate 450	77.50	(71.4, 83.6)
LI700	Glyphosate 450	77.50	(71.4, 83.6)
Axiwetta	Paraquat 360	47.50	(41.4, 53.6)
Envirowet 25	Paraquat 360	45.00	(38.9, 51.1)
LI700	Paraquat 360	45.00	(38.9, 51.1)
Envirowet 100	Paraquat 360	42.50	(36.4, 48.6)
Envirowet 50	Paraquat 360	40.00	(33.9, 46.1)
None	Paraquat 360	37.50	(31.4, 43.6)

Table A78. The marginal treatment means and its 95% confidence interval for CONTRO, Avena fatua, at 10 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	56.25	(49.9, 62.6)
Axiwetta	Paraquat 360	55.00	(48.6, 61.4)
Envirowet 50	Paraquat 360	52.50	(46.1, 58.9)
Envirowet 100	Paraquat 360	47.50	(41.1, 53.9)
Envirowet 25	Paraquat 360	47.50	(41.1, 53.9)
Envirowet 100	Glyphosate 450	37.50	(31.1, 43.9)
None	Paraquat 360	35.00	(28.6, 41.4)
LI700	Glyphosate 450	35.00	(28.6, 41.4)
Axiwetta	Glyphosate 450	32.50	(26.1, 38.9)
Envirowet 50	Glyphosate 450	32.50	(26.1, 38.9)
Envirowet 25	Glyphosate 450	32.50	(26.1, 38.9)
None	Glyphosate 450	28.75	(22.4, 35.1)

Table A79. The marginal treatment means and its 95% confidence interval for CONTRO, Avena fatua, at 16 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	58.75	(52.7, 64.8)
Axiwetta	Paraquat 360	55.00	(49.0, 61.0)
Envirowet 100	Paraquat 360	55.00	(49.0, 61.0)
Envirowet 50	Paraquat 360	55.00	(49.0, 61.0)
Envirowet 25	Paraquat 360	52.50	(46.5, 58.5)
None	Paraquat 360	52.50	(46.5, 58.5)
Envirowet 100	Glyphosate 450	37.50	(31.5, 43.5)
Envirowet 25	Glyphosate 450	36.25	(30.2, 42.3)
LI700	Glyphosate 450	35.00	(29.0, 41.0)
Envirowet 50	Glyphosate 450	35.00	(29.0, 41.0)
Axiwetta	Glyphosate 450	32.50	(26.5, 38.5)
None	Glyphosate 450	32.50	(26.5, 38.5)

Table A80. The marginal treatment means and its 95% confidence interval for CONTRO, Avena fatua, at 28 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	70.00	(63.6, 76.4)
Axiwetta	Paraquat 360	67.50	(61.1, 73.9)
Envirowet 100	Paraquat 360	66.25	(59.9, 72.6)
Envirowet 50	Paraquat 360	62.50	(56.1, 68.9)
None	Paraquat 360	61.25	(54.9, 67.6)
Envirowet 25	Paraquat 360	61.25	(54.9, 67.6)
Axiwetta	Glyphosate 450	42.50	(36.1, 48.9)
Envirowet 100	Glyphosate 450	42.50	(36.1, 48.9)
Envirowet 25	Glyphosate 450	42.50	(36.1, 48.9)
None	Glyphosate 450	40.00	(33.6, 46.4)
LI700	Glyphosate 450	37.50	(31.1, 43.9)
Envirowet 50	Glyphosate 450	37.50	(31.1, 43.9)

Table A81. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 10 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	68.75	(62.9, 74.6)
Axiwetta	Paraquat 360	60.00	(54.1, 65.9)
Envirowet 100	Paraquat 360	60.00	(54.1, 65.9)
None	Paraquat 360	57.50	(51.6, 63.4)
Envirowet 100	Glyphosate 450	55.00	(49.1, 60.9)
Envirowet 50	Paraquat 360	55.00	(49.1, 60.9)
Envirowet 25	Paraquat 360	53.75	(47.9, 59.6)
Envirowet 25	Glyphosate 450	53.75	(47.9, 59.6)
Axiwetta	Glyphosate 450	52.50	(46.6, 58.4)
LI700	Glyphosate 450	51.25	(45.4, 57.1)
Envirowet 50	Glyphosate 450	50.00	(44.1, 55.9)
None	Glyphosate 450	50.00	(44.1, 55.9)

Table A82. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 16 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	76.25	(71.8, 80.7)
Axiwetta	Paraquat 360	70.00	(65.6, 74.4)
Envirowet 100	Paraquat 360	67.50	(63.1, 71.9)
None	Paraquat 360	67.50	(63.1, 71.9)
Envirowet 25	Paraquat 360	65.00	(60.6, 69.4)
Envirowet 50	Paraquat 360	63.75	(59.3, 68.2)
Axiwetta	Glyphosate 450	60.00	(55.6, 64.4)
Envirowet 100	Glyphosate 450	60.00	(55.6, 64.4)
Envirowet 50	Glyphosate 450	57.50	(53.1, 61.9)
Envirowet 25	Glyphosate 450	56.25	(51.8, 60.7)
LI700	Glyphosate 450	56.25	(51.8, 60.7)
None	Glyphosate 450	50.00	(45.6, 54.4)

Table A83. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 28 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Glyphosate 450	72.50	(68.9, 76.1)
LI700	Glyphosate 450	70.00	(66.4, 73.6)
Envirowet 50	Glyphosate 450	67.50	(63.9, 71.1)
Envirowet 25	Glyphosate 450	67.50	(63.9, 71.1)
None	Glyphosate 450	67.50	(63.9, 71.1)
Axiwetta	Glyphosate 450	66.25	(62.7, 69.8)
Axiwetta	Paraquat 360	66.25	(62.7, 69.8)
Envirowet 100	Paraquat 360	66.25	(62.7, 69.8)
LI700	Paraquat 360	66.25	(62.7, 69.8)
None	Paraquat 360	62.50	(58.9, 66.1)
Envirowet 25	Paraquat 360	61.25	(57.7, 64.8)
Envirowet 50	Paraquat 360	60.00	(56.4, 63.6)

Table A84. The marginal treatment means and its 95% confidence interval for CONTRO, Unknown, at 2 days after application, Beverley, WA. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	38.75	(35.2, 42.3)
Envirowet 100	Paraquat 360	36.25	(32.7, 39.8)
Envirowet 25	Paraquat 360	36.25	(32.7, 39.8)
Axiwetta	Paraquat 360	35.00	(31.5, 38.5)
Envirowet 50	Paraquat 360	35.00	(31.5, 38.5)
None	Paraquat 360	33.75	(30.2, 37.3)
Axiwetta	Glyphosate 450	0.00	(-3.5, 3.5)
LI700	Glyphosate 450	0.00	(-3.5, 3.5)
Envirowet 100	Glyphosate 450	0.00	(-3.5, 3.5)
Envirowet 50	Glyphosate 450	0.00	(-3.5, 3.5)
None	Glyphosate 450	0.00	(-3.5, 3.5)
Envirowet 25	Glyphosate 450	0.00	(-3.5, 3.5)

Table A85. The marginal treatment means and its 95% confidence interval for CONTRO, Ageratum sp., at 3 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
None	Gramoxone 360 Pro	98.75	(87.7, 109.8)
Envirowet 25	Gramoxone 360 Pro	96.25	(85.2, 107.3)
Envirowet 50	Gramoxone 360 Pro	91.25	(80.2, 102.3)
Axiwetta	Gramoxone 360 Pro	87.50	(76.5, 98.5)
Envirowet 100	Gramoxone 360 Pro	83.75	(72.7, 94.8)
Envirowet 25	Glyphosate 450	15.00	(4.0, 26.0)
Envirowet 100	Glyphosate 450	8.75	(-2.3, 19.8)
Axiwetta	Glyphosate 450	6.25	(-4.8, 17.3)
Envirowet 50	Glyphosate 450	6.25	(-4.8, 17.3)
LI700	Glyphosate 450	6.25	(-4.8, 17.3)
None	Glyphosate 450	5.00	(-6.0, 16.0)

Table A86. The marginal treatment means and its 95% confidence interval for CONTRO, Ageratum sp., at 7 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 25	Gramoxone 360 Pro	100.000	(83.1, 116.9)
None	Gramoxone 360 Pro	95.000	(78.1, 111.9)
Envirowet 50	Gramoxone 360 Pro	93.075	(76.2, 109.9)
Axiwetta	Gramoxone 360 Pro	92.500	(75.6, 109.4)
Envirowet 100	Gramoxone 360 Pro	82.500	(65.6, 99.4)
None	Glyphosate 450	38.750	(21.9, 55.6)
Envirowet 100	Glyphosate 450	37.500	(20.6, 54.4)
Axiwetta	Glyphosate 450	35.000	(18.1, 51.9)
Envirowet 50	Glyphosate 450	35.000	(18.1, 51.9)
Envirowet 25	Glyphosate 450	32.500	(15.6, 49.4)
LI700	Glyphosate 450	30.000	(13.1, 46.9)

Table A87. The marginal treatment means and its 95% confidence interval for CONTRO, Ageratum sp., at 14 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Gramoxone 360 Pro	100.00	(85.3, 114.7)
Envirowet 25	Gramoxone 360 Pro	100.00	(85.3, 114.7)
None	Gramoxone 360 Pro	100.00	(85.3, 114.7)
Envirowet 50	Gramoxone 360 Pro	99.65	(84.9, 114.4)
LI700	Glyphosate 450	97.50	(82.8, 112.2)
Axiwetta	Glyphosate 450	92.50	(77.8, 107.2)
Envirowet 50	Glyphosate 450	92.50	(77.8, 107.2)
Envirowet 100	Gramoxone 360 Pro	88.75	(74.0, 103.5)
Envirowet 25	Glyphosate 450	86.25	(71.5, 101.0)
None	Glyphosate 450	81.25	(66.5, 96.0)
Envirowet 100	Glyphosate 450	72.50	(57.8, 87.2)

Table A88. The marginal treatment means and its 95% confidence interval for CONTRO, Ageratum sp., at 27 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Glyphosate 450	53.75	(26.1, 81.4)
Axiwetta	Glyphosate 450	36.25	(8.6, 63.9)
Envirowet 25	Glyphosate 450	32.50	(4.9, 60.1)
Envirowet 100	Glyphosate 450	31.25	(3.6, 58.9)
Envirowet 50	Glyphosate 450	31.25	(3.6, 58.9)
None	Glyphosate 450	6.25	(-21.4, 33.9)
Axiwetta	Gramoxone 360 Pro	1.25	(-26.4, 28.9)
Envirowet 25	Gramoxone 360 Pro	1.25	(-26.4, 28.9)
Envirowet 50	Gramoxone 360 Pro	0.05	(-27.6, 27.7)
None	Gramoxone 360 Pro	0.05	(-27.6, 27.7)
Envirowet 100	Gramoxone 360 Pro	0.00	(-27.6, 27.6)

Table A89. The marginal treatment means and its 95% confidence interval for CONTRO, Bidens pilosa, at 3 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 50	Gramoxone 360 Pro	97.50	(86.9, 108.1)
None	Gramoxone 360 Pro	97.50	(86.9, 108.1)
Envirowet 25	Gramoxone 360 Pro	93.75	(83.2, 104.3)
Envirowet 100	Gramoxone 360 Pro	90.00	(79.4, 100.6)
Axiwetta	Gramoxone 360 Pro	87.50	(76.9, 98.1)
Envirowet 100	Glyphosate 450	11.25	(0.7, 21.8)
Envirowet 50	Glyphosate 450	11.25	(0.7, 21.8)
Envirowet 25	Glyphosate 450	7.50	(-3.1, 18.1)
LI700	Glyphosate 450	7.50	(-3.1, 18.1)
None	Glyphosate 450	3.75	(-6.8, 14.3)
Axiwetta	Glyphosate 450	3.75	(-6.8, 14.3)

Table A90. The marginal treatment means and its 95% confidence interval for CONTRO, Bidens pilosa, at 7 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 25	Gramoxone 360 Pro	100.000	(82.8, 117.2)
None	Gramoxone 360 Pro	98.750	(81.5, 116.0)
Envirowet 50	Gramoxone 360 Pro	95.000	(77.8, 112.2)
Axiwetta	Gramoxone 360 Pro	92.500	(75.3, 109.7)
Envirowet 100	Gramoxone 360 Pro	82.500	(65.3, 99.7)
Envirowet 50	Glyphosate 450	64.900	(47.7, 82.1)
Envirowet 25	Glyphosate 450	53.250	(36.0, 70.5)
Axiwetta	Glyphosate 450	41.575	(24.3, 58.8)
Envirowet 100	Glyphosate 450	37.500	(20.3, 54.7)
LI700	Glyphosate 450	36.175	(18.9, 53.4)
None	Glyphosate 450	35.000	(17.8, 52.2)

Table A91. The marginal treatment means and its 95% confidence interval for CONTRO, Bidens pilosa, at 14 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
None	Gramoxone 360 Pro	100.000	(82.1, 117.9)
Envirowet 25	Gramoxone 360 Pro	100.000	(82.1, 117.9)
Envirowet 50	Glyphosate 450	98.750	(80.8, 116.7)
Envirowet 50	Gramoxone 360 Pro	95.000	(77.1, 112.9)
Envirowet 100	Gramoxone 360 Pro	91.250	(73.3, 109.2)
LI700	Glyphosate 450	85.200	(67.3, 103.1)
Axiwetta	Glyphosate 450	85.000	(67.1, 102.9)
None	Glyphosate 450	85.000	(67.1, 102.9)
Envirowet 100	Glyphosate 450	80.750	(62.8, 98.7)
Axiwetta	Gramoxone 360 Pro	75.200	(57.3, 93.1)
Envirowet 25	Glyphosate 450	71.675	(53.7, 89.6)

Table A92. The marginal treatment means and its 95% confidence interval for CONTRO, Bidens pilosa, at 27 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Glyphosate 450	100.00	(88.1, 111.9)
Axiwetta	Gramoxone 360 Pro	100.00	(88.1, 111.9)
Envirowet 100	Gramoxone 360 Pro	100.00	(88.1, 111.9)
Envirowet 25	Gramoxone 360 Pro	100.00	(88.1, 111.9)
LI700	Glyphosate 450	100.00	(88.1, 111.9)
Envirowet 25	Glyphosate 450	98.75	(86.9, 110.6)
None	Gramoxone 360 Pro	98.15	(86.3, 110.0)
Envirowet 50	Glyphosate 450	97.50	(85.6, 109.4)
Envirowet 50	Gramoxone 360 Pro	92.50	(80.6, 104.4)
Axiwetta	Glyphosate 450	90.00	(78.1, 101.9)
None	Glyphosate 450	85.00	(73.1, 96.9)

Table A93. The marginal treatment means and its 95% confidence interval for CONTRO, Digitaria cilia, at 3 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Gramoxone 360 Pro	90.00	(78.3, 101.7)
Envirowet 25	Gramoxone 360 Pro	88.75	(77.0, 100.5)
Envirowet 50	Gramoxone 360 Pro	86.25	(74.5, 98.0)
None	Gramoxone 360 Pro	86.25	(74.5, 98.0)
Envirowet 100	Gramoxone 360 Pro	80.00	(68.3, 91.7)
Envirowet 50	Glyphosate 450	77.50	(65.8, 89.2)
Envirowet 25	Glyphosate 450	72.50	(60.8, 84.2)
Envirowet 100	Glyphosate 450	67.50	(55.8, 79.2)
LI700	Glyphosate 450	67.50	(55.8, 79.2)
None	Glyphosate 450	65.00	(53.3, 76.7)
Axiwetta	Glyphosate 450	62.50	(50.8, 74.2)

Table A94. The marginal treatment means and its 95% confidence interval for CONTRO, Digitaria cilia, at 7 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Glyphosate 450	93.75	(82.8, 104.7)
Envirowet 50	Glyphosate 450	93.75	(82.8, 104.7)
Envirowet 100	Gramoxone 360 Pro	93.75	(82.8, 104.7)
Envirowet 25	Glyphosate 450	92.50	(81.6, 103.4)
None	Gramoxone 360 Pro	92.50	(81.6, 103.4)
Axiwetta	Glyphosate 450	90.00	(79.1, 100.9)
LI700	Glyphosate 450	90.00	(79.1, 100.9)
Envirowet 25	Gramoxone 360 Pro	90.00	(79.1, 100.9)
Envirowet 50	Gramoxone 360 Pro	87.50	(76.6, 98.4)
Axiwetta	Gramoxone 360 Pro	83.75	(72.8, 94.7)
None	Glyphosate 450	76.25	(65.3, 87.2)

Table A95. The marginal treatment means and its 95% confidence interval for CONTRO, Digitaria cilia, at 14 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Glyphosate 450	99.50	(86.6, 112.4)
Envirowet 50	Glyphosate 450	99.50	(86.6, 112.4)
Axiwetta	Glyphosate 450	98.25	(85.4, 111.1)
Envirowet 25	Glyphosate 450	97.50	(84.6, 110.4)
LI700	Glyphosate 450	97.00	(84.1, 109.9)
None	Gramoxone 360 Pro	95.75	(82.9, 108.6)
None	Glyphosate 450	88.75	(75.9, 101.6)
Envirowet 25	Gramoxone 360 Pro	86.25	(73.4, 99.1)
Envirowet 50	Gramoxone 360 Pro	83.75	(70.9, 96.6)
Axiwetta	Gramoxone 360 Pro	82.50	(69.6, 95.4)
Envirowet 100	Gramoxone 360 Pro	81.25	(68.4, 94.1)

Table A96. The marginal treatment means and its 95% confidence interval for CONTRO, Digitaria cilia, at 27 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 50	Glyphosate 450	100.00	(79.0, 121.0)
Envirowet 25	Glyphosate 450	98.75	(77.8, 119.7)
LI700	Glyphosate 450	97.50	(76.5, 118.5)
Axiwetta	Glyphosate 450	92.50	(71.5, 113.5)
Envirowet 100	Glyphosate 450	90.00	(69.0, 111.0)
None	Gramoxone 360 Pro	88.75	(67.8, 109.7)
None	Glyphosate 450	81.25	(60.3, 102.2)
Envirowet 25	Gramoxone 360 Pro	75.00	(54.0, 96.0)
Axiwetta	Gramoxone 360 Pro	72.50	(51.5, 93.5)
Envirowet 100	Gramoxone 360 Pro	62.50	(41.5, 83.5)
Envirowet 50	Gramoxone 360 Pro	55.00	(34.0, 76.0)

Table A97. The marginal treatment means and its 95% confidence interval for CONTRO, Eleusine indica, at 3 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 25	Gramoxone 360 Pro	77.600	(62.8, 92.4)
Envirowet 50	Gramoxone 360 Pro	72.500	(57.7, 87.3)
None	Gramoxone 360 Pro	68.550	(53.7, 83.4)
Axiwetta	Gramoxone 360 Pro	64.175	(49.4, 79.0)
Envirowet 100	Gramoxone 360 Pro	55.000	(40.2, 69.8)
Envirowet 25	Glyphosate 450	37.500	(22.7, 52.3)
Envirowet 100	Glyphosate 450	22.500	(7.7, 37.3)
Envirowet 50	Glyphosate 450	21.250	(6.4, 36.1)
None	Glyphosate 450	21.250	(6.4, 36.1)
LI700	Glyphosate 450	18.750	(3.9, 33.6)
Axiwetta	Glyphosate 450	17.500	(2.7, 32.3)

Table A98. The marginal treatment means and its 95% confidence interval for CONTRO, Eleusine indica, at 7 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
None	Gramoxone 360 Pro	71.250	(50.7, 91.8)
Axiwetta	Gramoxone 360 Pro	71.250	(50.7, 91.8)
Envirowet 50	Gramoxone 360 Pro	67.500	(47.0, 88.0)
Envirowet 25	Gramoxone 360 Pro	56.500	(36.0, 77.0)
Envirowet 100	Gramoxone 360 Pro	55.000	(34.5, 75.5)
Envirowet 25	Glyphosate 450	41.250	(20.7, 61.8)
Envirowet 50	Glyphosate 450	38.750	(18.2, 59.3)
Envirowet 100	Glyphosate 450	38.175	(17.7, 58.7)
Axiwetta	Glyphosate 450	37.500	(17.0, 58.0)
LI700	Glyphosate 450	31.250	(10.7, 51.8)
None	Glyphosate 450	31.250	(10.7, 51.8)

Table A99. The marginal treatment means and its 95% confidence interval for CONTRO, Eleusine indica, at 14 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
None	Gramoxone 360 Pro	72.700	(48.3, 97.1)
LI700	Glyphosate 450	72.500	(48.1, 96.9)
Envirowet 50	Glyphosate 450	71.250	(46.9, 95.6)
Envirowet 25	Glyphosate 450	70.000	(45.6, 94.4)
Envirowet 100	Glyphosate 450	68.875	(44.5, 93.3)
None	Glyphosate 450	65.000	(40.6, 89.4)
Axiwetta	Glyphosate 450	62.500	(38.1, 86.9)
Envirowet 50	Gramoxone 360 Pro	62.500	(38.1, 86.9)
Envirowet 25	Gramoxone 360 Pro	55.525	(31.1, 79.9)
Envirowet 100	Gramoxone 360 Pro	52.500	(28.1, 76.9)
Axiwetta	Gramoxone 360 Pro	50.000	(25.6, 74.4)

Table A100. The marginal treatment means and its 95% confidence interval for CONTRO, Eleusine indica, at 27 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 50	Glyphosate 450	65.000	(38.0, 92.0)
Axiwetta	Glyphosate 450	62.500	(35.5, 89.5)
Envirowet 100	Glyphosate 450	60.275	(33.2, 87.3)
Envirowet 25	Glyphosate 450	60.000	(33.0, 87.0)
LI700	Glyphosate 450	57.500	(30.5, 84.5)
Envirowet 50	Gramoxone 360 Pro	37.500	(10.5, 64.5)
None	Glyphosate 450	36.950	(9.9, 64.0)
Envirowet 25	Gramoxone 360 Pro	20.275	(-6.8, 47.3)
None	Gramoxone 360 Pro	17.500	(-9.5, 44.5)
Axiwetta	Gramoxone 360 Pro	13.750	(-13.3, 40.8)
Envirowet 100	Gramoxone 360 Pro	3.750	(-23.3, 30.8)

Table A101. The marginal treatment means and its 95% confidence interval for CONTRO, Ipomoea plebeia, at 3 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 50	Gramoxone 360 Pro	70.000	(57.2, 82.8)
Envirowet 25	Gramoxone 360 Pro	56.250	(43.4, 69.1)
Axiwetta	Gramoxone 360 Pro	50.000	(37.2, 62.8)
None	Gramoxone 360 Pro	49.500	(36.7, 62.3)
Envirowet 100	Gramoxone 360 Pro	36.675	(23.8, 49.5)
Envirowet 25	Glyphosate 450	30.000	(17.2, 42.8)
Axiwetta	Glyphosate 450	27.500	(14.7, 40.3)
Envirowet 50	Glyphosate 450	21.250	(8.4, 34.1)
Envirowet 100	Glyphosate 450	18.750	(5.9, 31.6)
LI700	Glyphosate 450	18.750	(5.9, 31.6)
None	Glyphosate 450	10.000	(-2.8, 22.8)

Table A102. The marginal treatment means and its 95% confidence interval for CONTRO, Ipomoea plebeia, at 7 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
None	Gramoxone 360 Pro	50.000	(36.0, 64.0)
Axiwetta	Gramoxone 360 Pro	41.250	(27.2, 55.3)
Envirowet 25	Gramoxone 360 Pro	40.000	(26.0, 54.0)
Envirowet 100	Gramoxone 360 Pro	35.000	(21.0, 49.0)
Envirowet 25	Glyphosate 450	30.000	(16.0, 44.0)
Envirowet 100	Glyphosate 450	28.750	(14.7, 42.8)
Envirowet 50	Glyphosate 450	27.500	(13.5, 41.5)
Axiwetta	Glyphosate 450	26.675	(12.7, 40.7)
Envirowet 50	Gramoxone 360 Pro	25.000	(11.0, 39.0)
LI700	Glyphosate 450	12.500	(-1.5, 26.5)
None	Glyphosate 450	6.675	(-7.3, 20.7)

Table A103. The marginal treatment means and its 95% confidence interval for CONTRO, Ipomoea plebeia, at 14 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Glyphosate 450	55.000	(44.4, 65.6)
Axiwetta	Gramoxone 360 Pro	43.325	(32.7, 54.0)
Axiwetta	Glyphosate 450	36.675	(26.0, 47.3)
Envirowet 50	Gramoxone 360 Pro	30.000	(19.4, 40.6)
None	Glyphosate 450	30.000	(19.4, 40.6)
None	Gramoxone 360 Pro	30.000	(19.4, 40.6)
Envirowet 25	Gramoxone 360 Pro	27.500	(16.9, 38.1)
LI700	Glyphosate 450	25.000	(14.4, 35.6)
Envirowet 50	Glyphosate 450	25.000	(14.4, 35.6)
Envirowet 25	Glyphosate 450	22.500	(11.9, 33.1)
Envirowet 100	Gramoxone 360 Pro	18.325	(7.7, 29.0)

Table A104. The marginal treatment means and its 95% confidence interval for CONTRO, Ipomoea plebeia, at 27 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Glyphosate 450	45.000	(34.7, 55.3)
Envirowet 50	Glyphosate 450	35.000	(24.7, 45.3)
Envirowet 100	Glyphosate 450	30.000	(19.7, 40.3)
LI700	Glyphosate 450	16.250	(5.9, 26.6)
None	Glyphosate 450	11.250	(0.9, 21.6)
Envirowet 25	Glyphosate 450	10.000	(-0.3, 20.3)
Envirowet 50	Gramoxone 360 Pro	10.000	(-0.3, 20.3)
None	Gramoxone 360 Pro	6.675	(-3.7, 17.0)
Envirowet 100	Gramoxone 360 Pro	6.250	(-4.1, 16.6)
Envirowet 25	Gramoxone 360 Pro	3.250	(-7.1, 13.6)
Axiwetta	Gramoxone 360 Pro	0.000	(-10.3, 10.3)

Table A105. The marginal treatment means and its 95% confidence interval for CONTRO, Physalis minima, at 3 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Gramoxone 360 Pro	100.000	(92.3, 107.7)
Envirowet 25	Gramoxone 360 Pro	100.000	(92.3, 107.7)
Envirowet 50	Gramoxone 360 Pro	100.000	(92.3, 107.7)
None	Gramoxone 360 Pro	100.000	(92.3, 107.7)
Envirowet 100	Gramoxone 360 Pro	98.750	(91.0, 106.5)
Envirowet 25	Glyphosate 450	33.325	(25.6, 41.0)
Axiwetta	Glyphosate 450	28.325	(20.6, 36.0)
Envirowet 100	Glyphosate 450	21.675	(14.0, 29.4)
LI700	Glyphosate 450	18.325	(10.6, 26.0)
Envirowet 50	Glyphosate 450	18.325	(10.6, 26.0)
None	Glyphosate 450	7.500	(-0.2, 15.2)

Table A106. The marginal treatment means and its 95% confidence interval for CONTRO, Physalis minima, at 7 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Gramoxone 360 Pro	100.000	(83.4, 116.6)
Envirowet 100	Gramoxone 360 Pro	100.000	(83.4, 116.6)
Envirowet 25	Gramoxone 360 Pro	100.000	(83.4, 116.6)
None	Gramoxone 360 Pro	100.000	(83.4, 116.6)
Envirowet 50	Gramoxone 360 Pro	98.325	(81.7, 114.9)
Axiwetta	Glyphosate 450	80.000	(63.4, 96.6)
Envirowet 50	Glyphosate 450	76.675	(60.1, 93.3)
LI700	Glyphosate 450	70.000	(53.4, 86.6)
Envirowet 25	Glyphosate 450	56.675	(40.1, 73.3)
Envirowet 100	Glyphosate 450	48.325	(31.7, 64.9)
None	Glyphosate 450	22.500	(5.9, 39.1)

Table A107. The marginal treatment means and its 95% confidence interval for CONTRO, Physalis minima, at 14 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
None	Gramoxone 360 Pro	100.000	(89.8, 110.2)
LI700	Glyphosate 450	100.000	(89.8, 110.2)
Axiwetta	Gramoxone 360 Pro	100.000	(89.8, 110.2)
Envirowet 100	Gramoxone 360 Pro	100.000	(89.8, 110.2)
Envirowet 25	Gramoxone 360 Pro	100.000	(89.8, 110.2)
Envirowet 50	Gramoxone 360 Pro	100.000	(89.8, 110.2)
Envirowet 50	Glyphosate 450	96.675	(86.5, 106.9)
Axiwetta	Glyphosate 450	95.000	(84.8, 105.2)
Envirowet 100	Glyphosate 450	90.000	(79.8, 100.2)
Envirowet 25	Glyphosate 450	72.675	(62.5, 82.9)
None	Glyphosate 450	72.500	(62.3, 82.7)

Table A108. The marginal treatment means and its 95% confidence interval for CONTRO, Physalis minima, at 27 days after application, Bundaberg, QLD. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Gramoxone 360 Pro	100.000	(87.2, 112.8)
Envirowet 100	Glyphosate 450	100.000	(87.2, 112.8)
LI700	Glyphosate 450	100.000	(87.2, 112.8)
Envirowet 100	Gramoxone 360 Pro	100.000	(87.2, 112.8)
Envirowet 25	Gramoxone 360 Pro	100.000	(87.2, 112.8)
Envirowet 50	Gramoxone 360 Pro	100.000	(87.2, 112.8)
None	Gramoxone 360 Pro	100.000	(87.2, 112.8)
Envirowet 50	Glyphosate 450	99.325	(86.5, 112.2)
Axiwetta	Glyphosate 450	86.675	(73.8, 99.5)
Envirowet 25	Glyphosate 450	83.325	(70.5, 96.2)
None	Glyphosate 450	57.500	(44.7, 70.3)

Table A109. The marginal treatment means and its 95% confidence interval for CONTRO, Lactuca serriola, at 8 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 360	98.75	(93.6, 103.9)
Envirowet 50	Paraquat 360	97.50	(92.4, 102.6)
LI700	Paraquat 360	95.00	(89.9, 100.1)
None	Paraquat 360	95.00	(89.9, 100.1)
Envirowet 100	Paraquat 360	93.75	(88.6, 98.9)
Envirowet 25	Paraquat 360	93.75	(88.6, 98.9)
LI700	Glyphosate 450	16.25	(11.1, 21.4)
Axiwetta	Glyphosate 450	12.50	(7.4, 17.6)
Envirowet 50	Glyphosate 450	10.00	(4.9, 15.1)
Envirowet 100	Glyphosate 450	10.00	(4.9, 15.1)
None	Glyphosate 450	8.75	(3.6, 13.9)
Envirowet 25	Glyphosate 450	5.00	(-0.1, 10.1)

Table A110. The marginal treatment means and its 95% confidence interval for CONTRO, Lactuca serriola, at 17 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Paraquat 360	98.75	(84.7, 112.8)
Envirowet 50	Paraquat 360	97.50	(83.4, 111.6)
LI700	Paraquat 360	95.00	(80.9, 109.1)
Axiwetta	Paraquat 360	91.25	(77.2, 105.3)
Envirowet 25	Paraquat 360	91.25	(77.2, 105.3)
None	Paraquat 360	81.25	(67.2, 95.3)
Envirowet 100	Glyphosate 450	62.50	(48.4, 76.6)
Envirowet 25	Glyphosate 450	62.50	(48.4, 76.6)
LI700	Glyphosate 450	52.50	(38.4, 66.6)
Axiwetta	Glyphosate 450	50.00	(35.9, 64.1)
Envirowet 50	Glyphosate 450	45.00	(30.9, 59.1)
None	Glyphosate 450	42.50	(28.4, 56.6)

Table A111. The marginal treatment means and its 95% confidence interval for CONTRO, Lepidium draba, at 8 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Paraquat 360	95.00	(90.4, 99.6)
Envirowet 25	Paraquat 360	93.25	(88.6, 97.9)
Envirowet 50	Paraquat 360	93.25	(88.6, 97.9)
LI700	Paraquat 360	92.75	(88.1, 97.4)
None	Paraquat 360	91.75	(87.1, 96.4)
Axiwetta	Paraquat 360	88.25	(83.6, 92.9)
Envirowet 50	Glyphosate 450	11.25	(6.6, 15.9)
Envirowet 100	Glyphosate 450	10.00	(5.4, 14.6)
LI700	Glyphosate 450	10.00	(5.4, 14.6)
None	Glyphosate 450	8.25	(3.6, 12.9)
Envirowet 25	Glyphosate 450	8.25	(3.6, 12.9)
Axiwetta	Glyphosate 450	7.50	(2.9, 12.1)

Table A112. The marginal treatment means and its 95% confidence interval for CONTRO, Lepidium draba, at 17 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 360	75.00	(59.2, 90.8)
None	Paraquat 360	60.00	(44.2, 75.8)
Envirowet 100	Paraquat 360	51.25	(35.4, 67.1)
LI700	Paraquat 360	50.00	(34.2, 65.8)
Envirowet 25	Paraquat 360	50.00	(34.2, 65.8)
Envirowet 50	Paraquat 360	40.00	(24.2, 55.8)
Envirowet 25	Glyphosate 450	36.75	(20.9, 52.6)
Envirowet 100	Glyphosate 450	30.00	(14.2, 45.8)
LI700	Glyphosate 450	30.00	(14.2, 45.8)
Envirowet 50	Glyphosate 450	27.50	(11.7, 43.3)
Axiwetta	Glyphosate 450	26.75	(10.9, 42.6)
None	Glyphosate 450	23.25	(7.4, 39.1)

Table A113. The marginal treatment means and its 95% confidence interval for CONTRO^T, Lolium rigidum, at 8 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Paraquat 360	88.75	(80.4, 97.1)
LI700	Paraquat 360	86.25	(77.9, 94.6)
Envirowet 50	Paraquat 360	85.00	(76.7, 93.3)
Axiwetta	Paraquat 360	83.75	(75.4, 92.1)
Envirowet 25	Paraquat 360	76.25	(67.9, 84.6)
None	Paraquat 360	68.75	(60.4, 77.1)
LI700	Glyphosate 450	13.75	(5.4, 22.1)
Envirowet 50	Glyphosate 450	10.00	(1.7, 18.3)
None	Glyphosate 450	10.00	(1.7, 18.3)
Envirowet 100	Glyphosate 450	7.50	(-0.8, 15.8)
Axiwetta	Glyphosate 450	7.50	(-0.8, 15.8)
Envirowet 25	Glyphosate 450	5.00	(-3.3, 13.3)

Table A114. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 17 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	96.25	(80.2, 112.3)
Axiwetta	Paraquat 360	93.75	(77.7, 109.8)
Envirowet 100	Paraquat 360	93.75	(77.7, 109.8)
Envirowet 25	Paraquat 360	91.25	(75.2, 107.3)
Envirowet 50	Paraquat 360	85.00	(68.9, 101.1)
None	Paraquat 360	77.50	(61.4, 93.6)
Envirowet 50	Glyphosate 450	50.00	(33.9, 66.1)
Axiwetta	Glyphosate 450	47.50	(31.4, 63.6)
None	Glyphosate 450	42.50	(26.4, 58.6)
LI700	Glyphosate 450	40.00	(23.9, 56.1)
Envirowet 25	Glyphosate 450	40.00	(23.9, 56.1)
Envirowet 100	Glyphosate 450	37.50	(21.4, 53.6)

Table A115. The marginal treatment means and its 95% confidence interval for CONTRO, Pisum sativum, at 8 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 360	93.75	(87.5, 100.0)
Envirowet 100	Paraquat 360	92.50	(86.2, 98.8)
Envirowet 50	Paraquat 360	92.50	(86.2, 98.8)
Axiwetta	Paraquat 360	91.25	(85.0, 97.5)
Envirowet 25	Paraquat 360	88.75	(82.5, 95.0)
None	Paraquat 360	86.25	(80.0, 92.5)
None	Glyphosate 450	13.75	(7.5, 20.0)
LI700	Glyphosate 450	10.00	(3.7, 16.3)
Envirowet 100	Glyphosate 450	8.75	(2.5, 15.0)
Envirowet 50	Glyphosate 450	8.75	(2.5, 15.0)
Axiwetta	Glyphosate 450	8.75	(2.5, 15.0)
Envirowet 25	Glyphosate 450	8.75	(2.5, 15.0)

Table A116. The marginal treatment means and its 95% confidence interval for CONTRO, Pisum sativum, at 17 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 360	100.00	(90.7, 109.3)
Envirowet 100	Paraquat 360	100.00	(90.7, 109.3)
Envirowet 25	Paraquat 360	98.75	(89.5, 108.0)
Envirowet 50	Paraquat 360	98.75	(89.5, 108.0)
LI700	Paraquat 360	97.50	(88.2, 106.8)
Envirowet 50	Glyphosate 450	92.50	(83.2, 101.8)
Axiwetta	Glyphosate 450	87.50	(78.2, 96.8)
None	Paraquat 360	86.25	(77.0, 95.5)
Envirowet 100	Glyphosate 450	85.00	(75.7, 94.3)
Envirowet 25	Glyphosate 450	85.00	(75.7, 94.3)
LI700	Glyphosate 450	85.00	(75.7, 94.3)
None	Glyphosate 450	83.75	(74.5, 93.0)

Table A117. The marginal treatment means and its 95% confidence interval for CONTRO, Silybum marianum, at 8 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 25	Paraquat 360	100.00	(92.0, 108.0)
Envirowet 50	Paraquat 360	100.00	(92.0, 108.0)
LI700	Paraquat 360	100.00	(92.0, 108.0)
None	Paraquat 360	100.00	(92.0, 108.0)
Axiwetta	Paraquat 360	98.75	(90.8, 106.7)
Envirowet 100	Paraquat 360	98.75	(90.8, 106.7)
LI700	Glyphosate 450	27.50	(19.5, 35.5)
None	Glyphosate 450	15.00	(7.0, 23.0)
Envirowet 100	Glyphosate 450	10.00	(2.0, 18.0)
Envirowet 50	Glyphosate 450	7.50	(-0.5, 15.5)
Axiwetta	Glyphosate 450	7.50	(-0.5, 15.5)
Envirowet 25	Glyphosate 450	5.00	(-3.0, 13.0)

Table A118. The marginal treatment means and its 95% confidence interval for CONTRO, Silybum marianum, at 17 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 360	100.0	(91.1, 108.9)
Envirowet 100	Paraquat 360	100.0	(91.1, 108.9)
Envirowet 25	Paraquat 360	100.0	(91.1, 108.9)
Envirowet 50	Paraquat 360	100.0	(91.1, 108.9)
LI700	Paraquat 360	100.0	(91.1, 108.9)
None	Paraquat 360	97.5	(88.6, 106.4)
Envirowet 100	Glyphosate 450	65.0	(56.1, 73.9)
Envirowet 25	Glyphosate 450	52.5	(43.6, 61.4)
Envirowet 50	Glyphosate 450	47.5	(38.6, 56.4)
LI700	Glyphosate 450	47.5	(38.6, 56.4)
Axiwetta	Glyphosate 450	45.0	(36.1, 53.9)
None	Glyphosate 450	42.5	(33.6, 51.4)

Table A119. The marginal treatment means and its 95% confidence interval for CONTRO^T, Vicia sativa, at 8 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 50	Paraquat 360	60.00	(49.0, 71.0)
LI700	Paraquat 360	60.00	(49.0, 71.0)
None	Paraquat 360	60.00	(49.0, 71.0)
Envirowet 100	Paraquat 360	55.00	(44.0, 66.0)
Envirowet 25	Paraquat 360	52.50	(41.5, 63.5)
Axiwetta	Paraquat 360	50.00	(39.0, 61.0)
LI700	Glyphosate 450	12.50	(1.5, 23.5)
Envirowet 50	Glyphosate 450	11.25	(0.2, 22.3)
Axiwetta	Glyphosate 450	10.00	(-1.0, 21.0)
Envirowet 25	Glyphosate 450	8.75	(-2.3, 19.8)
Envirowet 100	Glyphosate 450	8.75	(-2.3, 19.8)
None	Glyphosate 450	7.50	(-3.5, 18.5)

Table A120. The marginal treatment means and its 95% confidence interval for CONTRO^T, Vicia sativa, at 17 days after application, Horsham, VIC. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 360	43.75	(27.0, 60.5)
Envirowet 100	Glyphosate 450	42.50	(25.8, 59.2)
LI700	Glyphosate 450	40.00	(23.3, 56.7)
Envirowet 25	Glyphosate 450	37.50	(20.8, 54.2)
Envirowet 100	Paraquat 360	37.50	(20.8, 54.2)
Axiwetta	Glyphosate 450	32.50	(15.8, 49.2)
Envirowet 50	Paraquat 360	32.50	(15.8, 49.2)
None	Paraquat 360	30.00	(13.3, 46.7)
Envirowet 50	Glyphosate 450	25.00	(8.3, 41.7)
Envirowet 25	Paraquat 360	25.00	(8.3, 41.7)
None	Glyphosate 450	25.00	(8.3, 41.7)
LI700	Paraquat 360	22.50	(5.8, 39.2)

Table A121. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 4 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Paraquat 250	80.0	(74.3, 85.7)
Axiwetta	Paraquat 250	77.5	(71.8, 83.2)
None	Paraquat 250	77.5	(71.8, 83.2)
Envirowet 50	Paraquat 250	72.5	(66.8, 78.2)
LI700	Paraquat 250	72.5	(66.8, 78.2)
Envirowet 25	Paraquat 250	70.0	(64.3, 75.7)
LI700	Glyphosate 450	5.0	(-0.7, 10.7)
Envirowet 25	Glyphosate 450	5.0	(-0.7, 10.7)
None	Glyphosate 450	5.0	(-0.7, 10.7)
Envirowet 100	Glyphosate 450	2.5	(-3.2, 8.2)
Axiwetta	Glyphosate 450	2.5	(-3.2, 8.2)
Envirowet 50	Glyphosate 450	2.5	(-3.2, 8.2)

Table A122. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 7 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 250	95.00	(88.7, 101.3)
LI700	Paraquat 250	95.00	(88.7, 101.3)
Envirowet 100	Paraquat 250	93.75	(87.5, 100.0)
Envirowet 25	Paraquat 250	93.75	(87.5, 100.0)
Envirowet 50	Paraquat 250	93.75	(87.5, 100.0)
None	Paraquat 250	92.50	(86.2, 98.8)
Envirowet 25	Glyphosate 450	7.50	(1.2, 13.8)
Envirowet 50	Glyphosate 450	6.25	(0.0, 12.5)
None	Glyphosate 450	6.25	(0.0, 12.5)
Envirowet 100	Glyphosate 450	3.75	(-2.5, 10.0)
Axiwetta	Glyphosate 450	3.75	(-2.5, 10.0)
LI700	Glyphosate 450	0.00	(-6.3, 6.3)

Table A123. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 13 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 250	91.25	(83.5, 99.0)
Axiwetta	Paraquat 250	90.00	(82.3, 97.7)
Envirowet 50	Paraquat 250	90.00	(82.3, 97.7)
Envirowet 25	Paraquat 250	88.75	(81.0, 96.5)
Envirowet 100	Paraquat 250	86.25	(78.5, 94.0)
None	Paraquat 250	82.50	(74.8, 90.2)
Axiwetta	Glyphosate 450	62.50	(54.8, 70.2)
Envirowet 50	Glyphosate 450	60.00	(52.3, 67.7)
Envirowet 25	Glyphosate 450	55.00	(47.3, 62.7)
Envirowet 100	Glyphosate 450	55.00	(47.3, 62.7)
LI700	Glyphosate 450	52.50	(44.8, 60.2)
None	Glyphosate 450	50.00	(42.3, 57.7)

Table A124. The marginal treatment means and its 95% confidence interval for CONTRO, Lolium rigidum, at 28 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Glyphosate 450	95.75	(93.2, 98.3)
None	Glyphosate 450	95.00	(92.4, 97.6)
Envirowet 100	Glyphosate 450	95.00	(92.4, 97.6)
Envirowet 25	Glyphosate 450	95.00	(92.4, 97.6)
Envirowet 50	Glyphosate 450	94.50	(91.9, 97.1)
LI700	Glyphosate 450	94.50	(91.9, 97.1)
Envirowet 50	Paraquat 250	92.00	(89.4, 94.6)
Envirowet 25	Paraquat 250	91.25	(88.7, 93.8)
LI700	Paraquat 250	90.00	(87.4, 92.6)
Axiwetta	Paraquat 250	88.75	(86.2, 91.3)
Envirowet 100	Paraquat 250	87.50	(84.9, 90.1)
None	Paraquat 250	82.50	(79.9, 85.1)

Table A125. The marginal treatment means and its 95% confidence interval for CONTRO, Rumex spp, at 4 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
None	Paraquat 250	90.000	(79.4, 100.6)
Axiwetta	Paraquat 250	85.000	(74.4, 95.6)
Envirowet 100	Paraquat 250	85.000	(74.4, 95.6)
LI700	Paraquat 250	83.325	(72.7, 93.9)
Envirowet 50	Paraquat 250	80.000	(69.4, 90.6)
Envirowet 25	Paraquat 250	50.000	(39.4, 60.6)
Envirowet 100	Glyphosate 450	7.500	(-3.1, 18.1)
LI700	Glyphosate 450	7.500	(-3.1, 18.1)
Envirowet 25	Glyphosate 450	5.000	(-5.6, 15.6)
None	Glyphosate 450	3.325	(-7.3, 13.9)
Envirowet 50	Glyphosate 450	0.000	(-10.6, 10.6)
Axiwetta	Glyphosate 450	0.000	(-10.6, 10.6)

Table A126. The marginal treatment means and its 95% confidence interval for CONTRO, Rumex spp, at 7 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 250	90.000	(81.5, 98.5)
Envirowet 25	Paraquat 250	90.000	(81.5, 98.5)
Envirowet 50	Paraquat 250	90.000	(81.5, 98.5)
None	Paraquat 250	87.500	(79.0, 96.0)
Envirowet 100	Paraquat 250	85.000	(76.5, 93.5)
LI700	Paraquat 250	83.325	(74.9, 91.8)
Envirowet 25	Glyphosate 450	21.250	(12.8, 29.7)
None	Glyphosate 450	16.675	(8.2, 25.1)
Envirowet 100	Glyphosate 450	16.250	(7.8, 24.7)
Envirowet 50	Glyphosate 450	13.325	(4.9, 21.8)
LI700	Glyphosate 450	11.250	(2.8, 19.7)
Axiwetta	Glyphosate 450	10.000	(1.5, 18.5)

Table A127. The marginal treatment means and its 95% confidence interval for CONTRO^T, Rumex spp, at 13 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 50	Paraquat 250	80.500	(73.9, 87.1)
Envirowet 100	Paraquat 250	75.000	(68.4, 81.6)
Axiwetta	Paraquat 250	73.450	(66.9, 80.0)
None	Paraquat 250	72.500	(65.9, 79.1)
Envirowet 25	Paraquat 250	70.250	(63.7, 76.8)
LI700	Paraquat 250	63.375	(56.8, 69.9)
Axiwetta	Glyphosate 450	20.000	(13.4, 26.6)
Envirowet 25	Glyphosate 450	20.000	(13.4, 26.6)
Envirowet 50	Glyphosate 450	13.050	(6.5, 19.6)
Envirowet 100	Glyphosate 450	12.500	(5.9, 19.1)
LI700	Glyphosate 450	11.250	(4.7, 17.8)
None	Glyphosate 450	8.300	(1.7, 14.9)

Table A128. The marginal treatment means and its 95% confidence interval for CONTRO, Rumex spp, at 28 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 25	Paraquat 250	85.000	(75.3, 94.7)
None	Paraquat 250	83.750	(74.1, 93.4)
Envirowet 100	Paraquat 250	77.500	(67.8, 87.2)
LI700	Paraquat 250	76.675	(67.0, 86.4)
Axiwetta	Paraquat 250	75.000	(65.3, 84.7)
Envirowet 50	Paraquat 250	75.000	(65.3, 84.7)
None	Glyphosate 450	73.325	(63.6, 83.0)
Axiwetta	Glyphosate 450	72.500	(62.8, 82.2)
Envirowet 100	Glyphosate 450	71.250	(61.6, 80.9)
LI700	Glyphosate 450	61.250	(51.6, 70.9)
Envirowet 25	Glyphosate 450	58.750	(49.1, 68.4)
Envirowet 50	Glyphosate 450	53.325	(43.6, 63.0)

Table A129. The marginal treatment means and its 95% confidence interval for CONTRO, Trifolium subteraneum, at 4 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Axiwetta	Paraquat 250	77.5	(71.4, 83.6)
Envirowet 100	Paraquat 250	77.5	(71.4, 83.6)
LI700	Paraquat 250	72.5	(66.4, 78.6)
None	Paraquat 250	72.5	(66.4, 78.6)
Envirowet 25	Paraquat 250	70.0	(63.9, 76.1)
Envirowet 50	Paraquat 250	70.0	(63.9, 76.1)
None	Glyphosate 450	7.5	(1.4, 13.6)
Envirowet 100	Glyphosate 450	5.0	(-1.1, 11.1)
Axiwetta	Glyphosate 450	5.0	(-1.1, 11.1)
Envirowet 25	Glyphosate 450	5.0	(-1.1, 11.1)
LI700	Glyphosate 450	2.5	(-3.6, 8.6)
Envirowet 50	Glyphosate 450	2.5	(-3.6, 8.6)

Table A130. The marginal treatment means and its 95% confidence interval for CONTRO, Trifolium subteraneum, at 7 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Paraquat 250	75.00	(65.7, 84.3)
Envirowet 50	Paraquat 250	67.50	(58.2, 76.8)
Axiwetta	Paraquat 250	65.00	(55.7, 74.3)
None	Paraquat 250	62.50	(53.2, 71.8)
LI700	Paraquat 250	57.50	(48.2, 66.8)
Envirowet 25	Paraquat 250	52.50	(43.2, 61.8)
Envirowet 100	Glyphosate 450	13.75	(4.5, 23.0)
None	Glyphosate 450	10.00	(0.7, 19.3)
Envirowet 50	Glyphosate 450	8.75	(-0.5, 18.0)
Envirowet 25	Glyphosate 450	8.75	(-0.5, 18.0)
LI700	Glyphosate 450	5.00	(-4.3, 14.3)
Axiwetta	Glyphosate 450	5.00	(-4.3, 14.3)

Table A131. The marginal treatment means and its 95% confidence interval for CONTRO, Trifolium subteraneum, at 13 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
LI700	Paraquat 250	35.00	(27.9, 42.1)
Axiwetta	Paraquat 250	32.50	(25.4, 39.6)
Envirowet 100	Paraquat 250	30.00	(22.9, 37.1)
Envirowet 50	Paraquat 250	30.00	(22.9, 37.1)
None	Paraquat 250	26.25	(19.2, 33.3)
Envirowet 25	Paraquat 250	25.00	(17.9, 32.1)
None	Glyphosate 450	23.75	(16.7, 30.8)
Axiwetta	Glyphosate 450	23.75	(16.7, 30.8)
Envirowet 25	Glyphosate 450	22.50	(15.4, 29.6)
Envirowet 50	Glyphosate 450	20.00	(12.9, 27.1)
LI700	Glyphosate 450	17.50	(10.4, 24.6)
Envirowet 100	Glyphosate 450	15.00	(7.9, 22.1)

Table A132. The marginal treatment means and its 95% confidence interval for CONTRO, Trifolium subteraneum, at 28 days after application, Young, NSW. The rows are organised by the descending order of treatment means.

Adjuvant	Herbicide	Marginal Mean	95% confidence interval
Envirowet 100	Glyphosate 450	72.50	(65.1, 79.9)
Axiwetta	Glyphosate 450	72.50	(65.1, 79.9)
Envirowet 25	Glyphosate 450	70.00	(62.6, 77.4)
LI700	Glyphosate 450	68.75	(61.3, 76.2)
None	Glyphosate 450	67.50	(60.1, 74.9)
Envirowet 50	Glyphosate 450	55.00	(47.6, 62.4)
Envirowet 100	Paraquat 250	15.00	(7.6, 22.4)
Axiwetta	Paraquat 250	12.50	(5.1, 19.9)
Envirowet 50	Paraquat 250	12.50	(5.1, 19.9)
None	Paraquat 250	12.50	(5.1, 19.9)
LI700	Paraquat 250	10.00	(2.6, 17.4)
Envirowet 25	Paraquat 250	10.00	(2.6, 17.4)

A.5. Model diagnostics

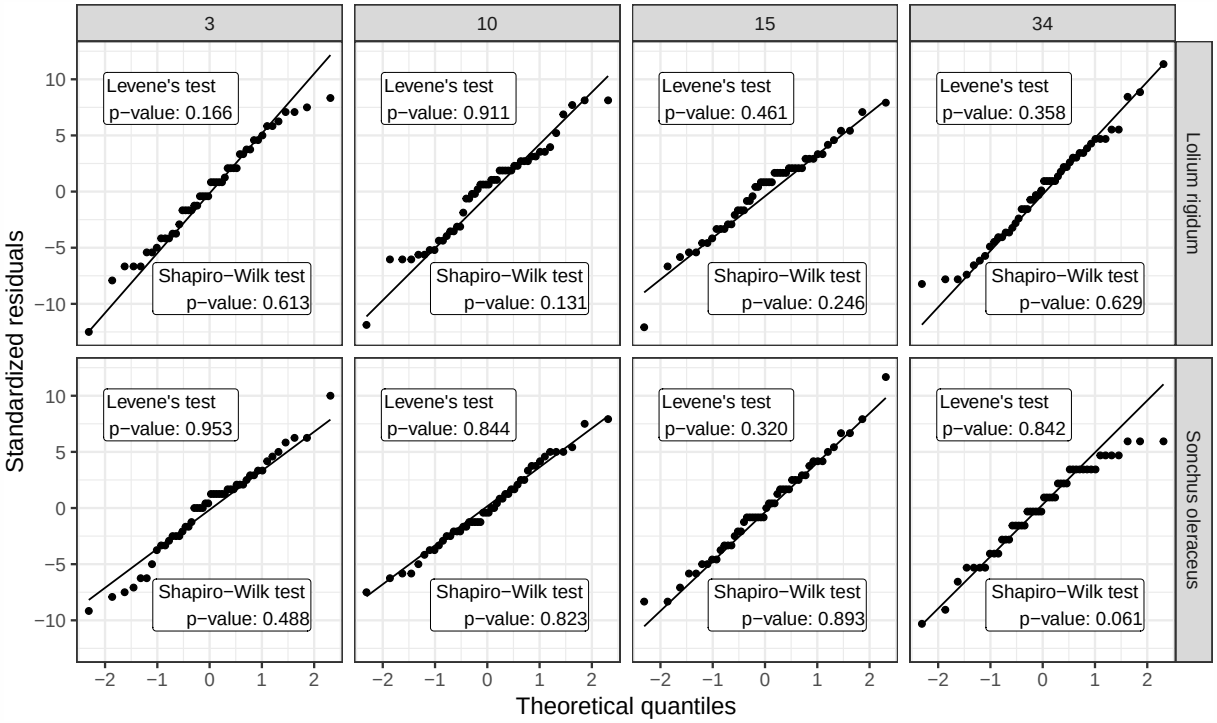

Figure A12. Quantile-quatile plots of the residuals for Bellata by pest species and days after application.

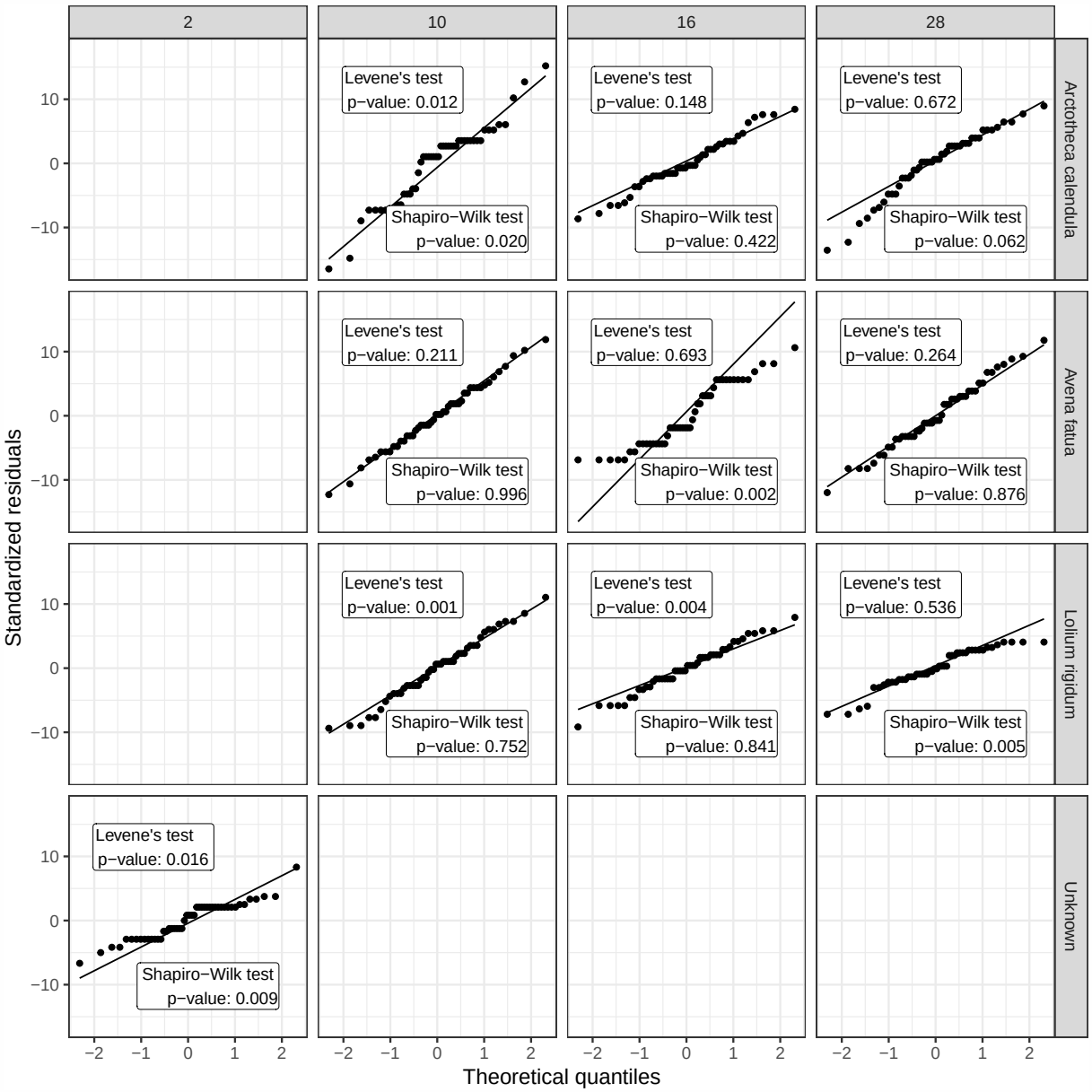

Figure A13. Quantile-quatile plots of the residuals for Beverley by pest species and days after application.

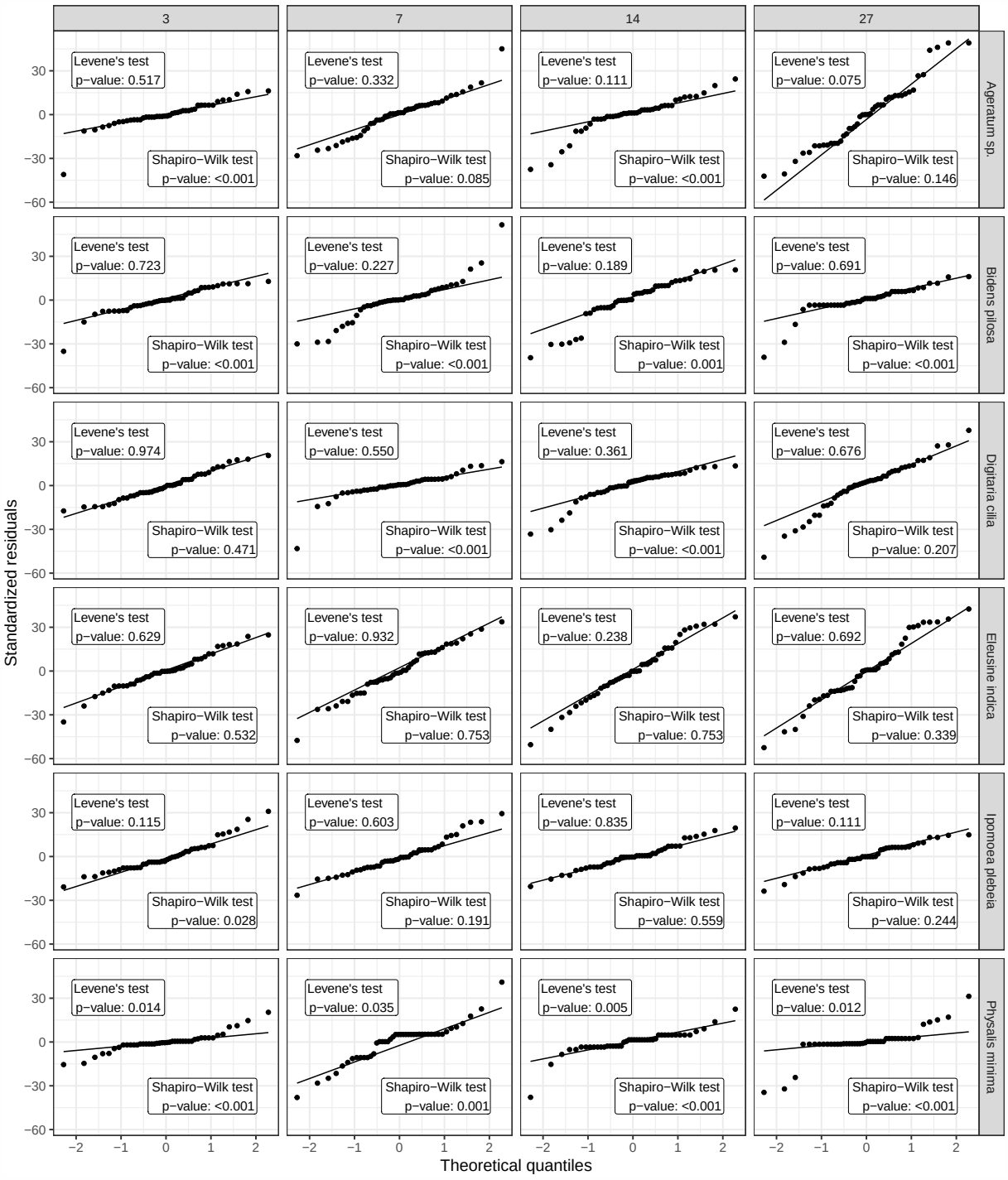

Figure A14. Quantile-quatile plots of the residuals for Bundaberg by pest species and days after application.

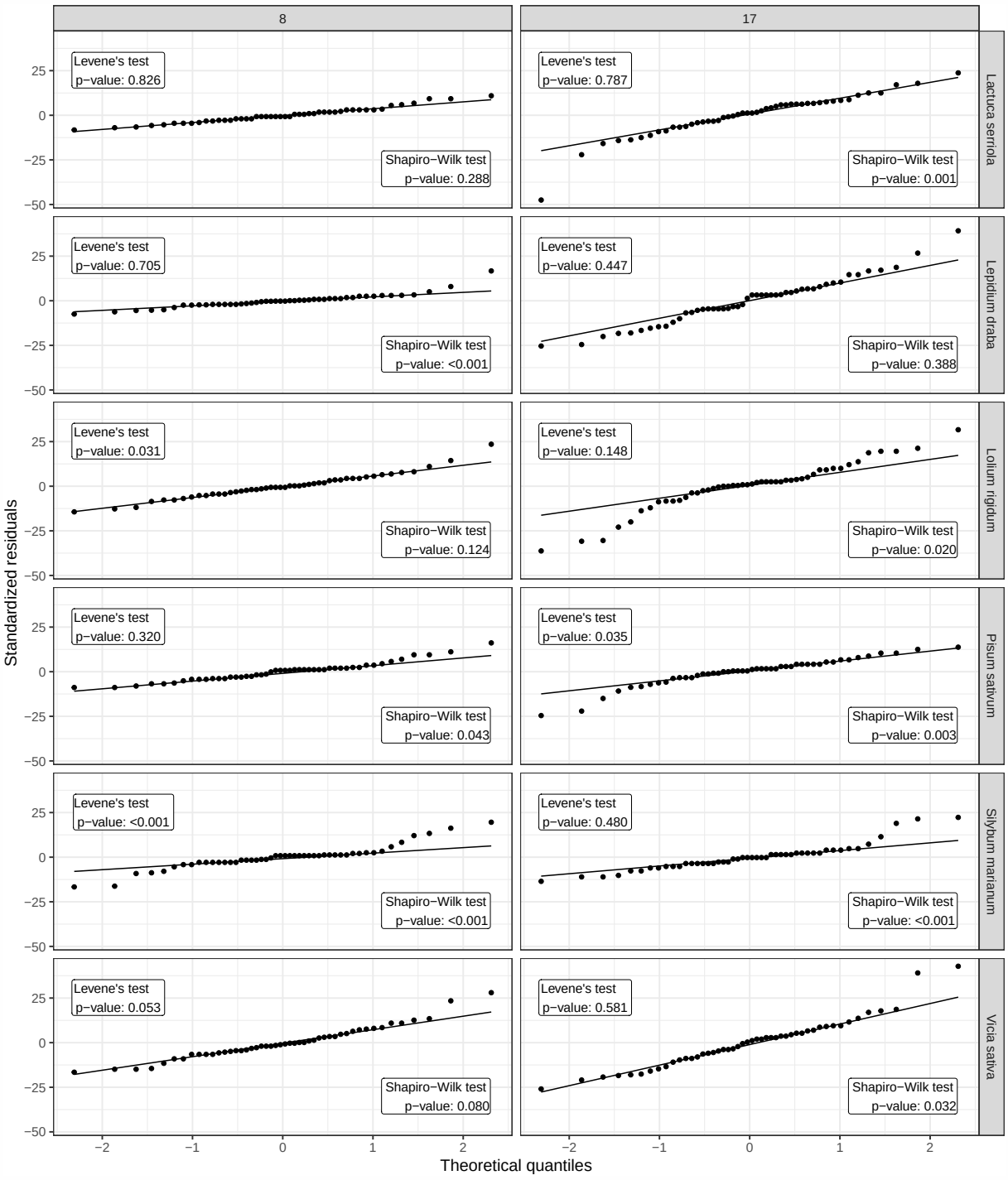

Figure A15. Quantile-quatile plots of the residuals for Horsham by pest species and days after application.

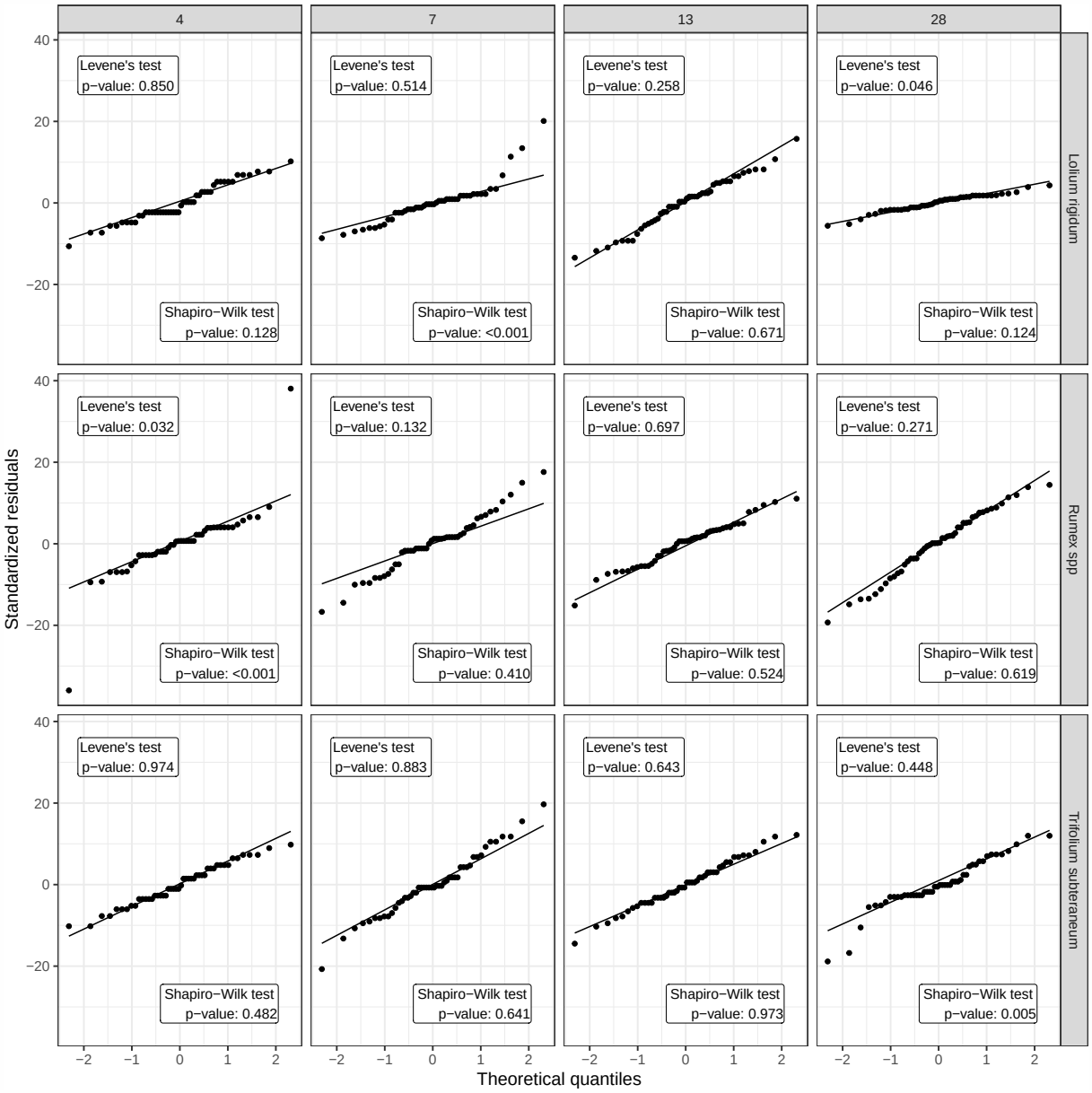

Figure A16. Quantile-quatile plots of the residuals for Young by pest species and days after application.

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