

Evaluation of Itril alone and in combination with Tribunil, Bladex, Ethomate, and Baron for Weed Control Efficacy and Crop Safety in a commercial onion planting in Waiuku, New Zealand

October 2025, S. Slack & R. Cox

Summary

A field trial was conducted during winter 2025 to assess the effect of Itril and Itril tank mixed with Tribunil, Bladex, Ethomate, and Baron on weed control and crop safety. The results indicate tank mixes containing Bladex or Ethomate delivered the strongest reductions in weed populations and the highest levels of visual control, making them the most effective treatments in this study. However, these same treatments were also associated with moderate to severe crop phytotoxicity, particularly at later assessments. Baron at the higher rate was also effective but came with significant injury risk. Itril alone and Itril + Tribunil provided only partial suppression, making them less reliable options under high weed pressure.

Materials and Method

Experimental site and application details

An experimental area was established within a commercial onion planting of the cv. Pinotage in a known high pressure weed block in Waiuku. The crop was seeded on the 15th of September. The experiment was laid out in a randomised complete block design (RCBD) with four treatment replicates. A total of 9 treatments were included in the experiment (including an untreated control) (Table 1). Plots were one bed (1.72m) wide and 7m in length. Herbicide applications were made on the 1st of August and were applied using a CO₂ powered plot sprayer using 11002 AITTJ60 teejet nozzles spaced at 30cm. The sprayer was calibrated to apply a water volume equivalent to 400L/Ha. No other herbicides were made to the experimental area; all other growing practices were conducted as per the commercial crop.

Herbicide efficacy (% weed control/plot) was assessed on the 7th, 11th and 15th of August. Weed and onion counts were recorded on August 28th using a 1 m² quadrat placed within a representative area of each plot. Weed control efficiency was calculated based on the number of weeds present and was calculated using the formula below:

$$WCE(\%) = (WDc - WDt) / WDc \times 100$$

WCE = Weed control efficiency

WDc = Weed population of the untreated control

WDt = Weed population of the treated plot

Statistical analysis

Data was analysed using a 95% confidence interval. Analyses of variance (ANOVA) were computed using the statistical software ARM. Treatment means were separated using Tukeys test. As the LSD is computed using transformed data, comparisons of means should rely on the letters of separation, rather than the LSD value.

Table 1: Herbicide treatment details

Treatment	Product name	Active Ingredient
1	Untreated Check	-
2	lotril (400ml)	loxynil
3	lotril (400ml) + Tribunil (250g)	loxynil + Methabenzthiazuron
4	lotril (400ml) + Tribunil (500g)	loxynil + Methabenzthiazuron
5	lotril (400ml) + Bladex (50g)	loxynil + Cyanazine
6	lotril (400ml) + Bladex (100g)	loxynil + Cyanazine
7	lotril (400ml) + Ethomate (500ml)	loxynil + Ethofumesate
8	lotril (400ml) + Baron (50g)	loxynil + Oxyfluorfen
9	lotril (400ml) + Baron (100g)	loxynil + Cyanazine

Results and Discussion

Crop Safety (Phytotoxicity)

Crop injury was negligible in the untreated control across all assessments. At the first assessment date (7 August), injury was generally low across treatments, with most treatments producing only mild visible effects (10–25%). The exception was lotril + Baron (100 g), which showed significantly higher injury (42.5%) compared to the control. By the second assessment (11 August), differences between treatments became clearer. Both Bladex treatments and Baron at 100 g produced moderate to high levels of crop damage, with injury levels ranging from 57–70%. By the final assessment (25 August), all treatments displayed substantial injury, with mean values between 36% and 60%. The highest levels were recorded for lotril + Bladex (50 and 100 g), lotril + Ethomate (500 mL), and lotril + Baron (50 and 100 g), indicating that while these treatments were effective at controlling weeds, they were also associated with significant crop effects.

Weed Density (Plant Counts)

Weed pressure was extremely high in the untreated plots, with final counts reaching approximately 405 plants per square metre. In contrast, all treated plots showed large and statistically significant reductions in weed numbers, ranging from 10 to 54 plants per square metre depending on the treatment. The lowest densities were observed in the lotril + Bladex (50 g), lotril + Ethomate (500 mL), and lotril + Bladex (100 g) treatments, which reduced weed numbers to less than 20 plants per square metre. These results confirm the strong suppression in weeds for these tank mixes.

Percent Weed Control (Visual Ratings)

Visual assessments of weed control reflected the trends observed in the plant count data. lotril alone produced only moderate suppression (26–65%), while Tribunil treatments improved control to 45–58% but remained less effective than other mixtures. The most consistent and effective control was achieved with Bladex tank mixes, which provided 74–94% control, and the Ethomate mix, which reached ~94% control at the final assessment (25th August). Baron combinations produced moderate to good control (50–82%), with the higher rate offering greater suppression but also increased crop injury.

Table 2: The average percentage of crop damage per treatment using Iotril alone and in combination with Tribunal, Bladex, Ethomate, and Baron in a commercial onion crop in Waiuku, New Zealand.

Treatment		7 th August	11 th August	25 th August
No.	Name			
1	Untreated Check	0.0 b	0.0 d	0.0 b
2	Iotril (400ml)	17.5 ab	15.0 cd	43.8 a
3	Iotril (400ml) + Tribunal (250g)	11.3 ab	31.3 bcd	40.0 a
4	Iotril (400ml) + Tribunal (500g)	17.5 ab	40.0 abc	36.3 a
5	Iotril (400ml) + Bladex (50g)	20.0 ab	65.0 ab	53.8 a
6	Iotril (400ml) + Bladex (100g)	21.3 ab	70.0 a	60.0 a
7	Iotril (400ml) + Ethomate (500ml)	12.5 ab	28.8 bcd	57.5 a
8	Iotril (400ml) + Baron (50g)	25.0 ab	42.5 abc	55.0 a
9	Iotril (400ml) + Baron (100g)	42.5 a	57.5 ab	50.0 a
Tukey's HSD P=.05		32.94	41.80	44.98
Standard Deviation		13.70	17.39	18.72
CV		73.63	44.72	42.51
Grand Mean		18.61	38.89	44.03
Levene's F [^]		1.045	0.689	3.326*
Levene's Prob(F)		0.429	0.697	0.009*
Replicate F		0.498	0.582	0.499
Replicate Prob(F)		0.6872	0.6328	0.6865
Treatment F		2.824	7.033	3.857
Treatment Prob(F)		0.0232	0.0001	0.0048

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Due to missing data, larger Tukey's HSD values (col. 7: >=43.39 and <=51.29) are used for mean comparisons of treatment pairs with missing data. * Adjusted means

Table 3: Weed and onion counts were recorded (last assessment) on August 28th using a 1 m² quadrat placed within a representative area of each plot.

Treatment No.	Name	Weed Count: 28 th August	Onion Count: 28 th August	WCE (Total) (%)
1	Untreated Check	404.9 a	47.8 a	-
2	lotril (400ml)	16.8 b	42.0 ab	95.85
3	lotril (400ml) + Tribunil (250g)	38.5 b	37.8 ab	90.49
4	lotril (400ml) + Tribunil (500g)	54.3 b	31.8 b	86.58
5	lotril (400ml) + Bladex (50g)	10.0 b	30.3 b	97.53
6	lotril (400ml) + Bladex (100g)	18.5 b	31.0 b	95.43
7	lotril (400ml) + Ethomate (500ml)	16.0 b	40.0 ab	96.05
8	lotril (400ml) + Baron (50g)	38.8 b	36.5 ab	90.42
9	lotril (400ml) + Baron (100g)	29.0 b	36.3 ab	92.84
Tukey's HSD P=.05		43.39	14.08	
Standard Deviation		17.82	5.86	
CV		29.2	15.82 37.03	
Grand Mean		61.03	2.386*	
Levene's F [^]		0.189	0.043*	
Levene's Prob(F)		0.99	14.08	
Replicate F		1.576	3.900	
Replicate Prob(F)		0.2249	0.0211	
Treatment F		152.703	3.790	
Treatment Prob(F)		0.0001	0.0053	

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Due to missing data, larger Tukey's HSD values (col. 7: >=43.39 and <=51.29) are used for mean comparisons of treatment pairs with missing data. * Adjusted means

Table 4: The percentage of weed control achieved using Itril alone and in combination with Tribunal, Bladex, Ethomate, and Baron across all weed populations in a commercial onion crop in Waiuku, New Zealand.

Treatment		7 th August	11 th August	25 th August
No.	Name			
1	Untreated Check	2.5 b	0.0 b	0.0 b
2	Itril (400ml)	26.3 ab	51.3 a	65.0 a
3	Itril (400ml) + Tribunal (250g)	51.3 a	45.0 a	51.7 a
4	Itril (400ml) + Tribunal (500g)	30.0 ab	57.5 a	53.3 a
5	Itril (400ml) + Bladex (50g)	56.3 a	73.8 a	86.7 a
6	Itril (400ml) + Bladex (100g)	52.5 a	71.3 a	85.0 a
7	Itril (400ml) + Ethomate (500ml)	51.3 a	67.5 a	93.7 a
8	Itril (400ml) + Baron (50g)	27.5 ab	50.0 a	60.0 a
9	Itril (400ml) + Baron (100g)	23.8 ab	65.0 a	81.7 a
Tukey's HSD P=.05		34.15	31.60	59.54
Standard Deviation		14.21	13.15	20.50
CV		39.8	24.59	31.97
Grand Mean		35.69	53.47	64.11
Levene's F [^]		0.563	0.951	0.427
Levene's Prob(F)		0.799	0.493	0.889
Replicate F		0.205	2.907	0.375
Replicate Prob(F)		0.8917	0.0553	0.6934
Treatment F		6.495	11.631	5.824
Treatment Prob(F)		0.0002	0.0001	0.0014

Means followed by same letter or symbol do not significantly differ (P=.05, Tukey's HSD).

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Due to missing data, larger Tukey's HSD values (col. 7: >=43.39 and <=51.29) are used for mean comparisons of treatment pairs with missing data. * Adjusted means

Appendix

Appendix i: Weather Data

Date	Max Air Temp. (°C)	Min Air Temp. (°C)	Mean Air Temp. (°C)	Rainfall (mm)
Fri, Aug 1, 2025	15.4	2	8.7	0
Sat, Aug 2, 2025	14.6	4.2	9.4	0.9
Sun, Aug 3, 2025	15.3	4.2	9.7	0
Mon, Aug 4, 2025	12.7	6.3	9.5	0
Tue, Aug 5, 2025	14.2	8.4	11.3	0
Wed, Aug 6, 2025	13.1	8	10.5	0
Thu, Aug 7, 2025	15.9	10.8	13.4	5.3
Fri, Aug 8, 2025	15.8	8.2	12	8.3
Sat, Aug 9, 2025	14	3.1	8.5	0.4
Sun, Aug 10, 2025	12.3	1.5	6.9	0
Mon, Aug 11, 2025	15.1	3.8	9.4	0
Tue, Aug 12, 2025	15.2	3.2	9.2	0
Wed, Aug 13, 2025	16.6	3	9.8	0
Thu, Aug 14, 2025	16.7	2.7	9.7	0
Fri, Aug 15, 2025	17.8	5.4	11.6	0
Sat, Aug 16, 2025	14.2	8.1	11.2	14.3
Sun, Aug 17, 2025	17.7	7	12.3	1.1
Mon, Aug 18, 2025	15	7.5	11.3	9.8
Tue, Aug 19, 2025	12.4	3.3	7.8	10.3
Wed, Aug 20, 2025	13.6	2.5	8.1	0
Thu, Aug 21, 2025	15.6	4.8	10.2	0
Fri, Aug 22, 2025	15.8	5	10.4	0
Sat, Aug 23, 2025	14.8	5.7	10.2	0
Sun, Aug 24, 2025	16.5	8.6	12.5	4
Mon, Aug 25, 2025	18.1	9	13.6	0
Tue, Aug 26, 2025	17.8	8.5	13.2	0
Wed, Aug 27, 2025	15.6	5.6	10.6	0
Thu, Aug 28, 2025	19.1	10.8	14.9	3.6