

Effects of Trifluralin on Oats

Facey Group

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AIM

To compare different rates of trifluralin incorporated by seeding on oats in the Wickepin region and its effects on weed control, germination, yield and grain quality.

TRIAL DETAILS

Property:	Lansdell's: Rose Rd, Wickepin, Laneway Paddock.
Plot size & replication:	Trial length 200m x 12m, 3 Plots per treatment Plot length 65m
Soil type:	Sandy Loam
Crop Variety:	Wandering Oats
Sowing Date:	15/05/2020
Seeding Rate:	80kg/ha
Fertiliser:	100kg/ha of Cropbuilder19/MOP/FlexiN
Paddock rotation:	2017- Oats 2018- Barley 2019- Pasture 2020- Oats
Herbicides:	Pre seeding: 1.8litre/ha Glyphosate, 400grams/ha Diuron Post emergent: 50ml/ha T-Rex, 500ml/ha Brom, 50ml/ha Alpha Forte

METHODOLOGY

A farm scale demonstration trial, with each treatment strip designed to accommodate the host growers seeding, harvesting and spraying equipment. The trial was sown on the 15th of May with Wandering Oats at a rate of 80kg/ha. Six treatment plots, 12m wide by 200m long, divided into three equal quadrants were established for the trial site. Five rates of trifluralin were incorporated at seeding (1L/ha, 1.5L/ha, 2.0L/ha, 2.5L/ha and 3.0L/ha) in addition to a control with 0L/ha trifluralin. Germination counts were conducted on the 28th May 2020, with the number of oat and ryegrass plants counted as plants per metre. Plant establishment and ryegrass counts were subsequently taken on 7th July 2020 at growth stage Z24. Grain yields and grain quality results from each treatment were recorded at harvest.

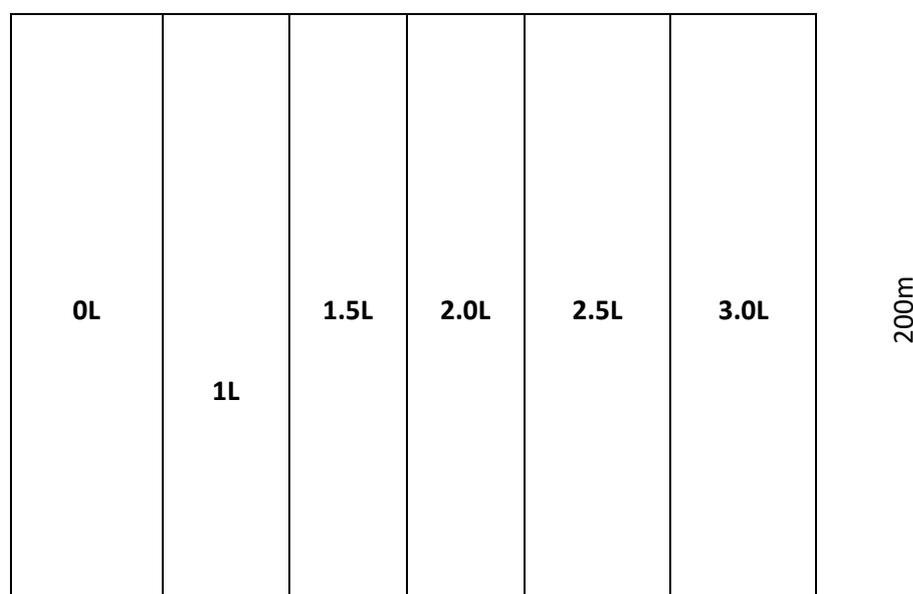


Figure 1: Trial Layout

RESULTS & DISCUSSION

Growing season rainfall was recorded at the site (*Table 1*).

Table 1: Landsdell's on-farm growing season rainfall data - 2020

May	June	July	Aug	Sept
37	31	35	38	34

Germination counts were completed 13 days post seeding across each treatment, with three counts per quadrant. The averages for each treatment were recorded (*Table 2*).

Table 2: Average number of oat and ryegrass plants 13 days post-seeding.

Treatment	Average oat plants (per m ²)	Average ryegrass plants (per m ²)
Control (0L/ha)	18.0	0
1L/ha	50.2	0
1.5L/ha	46.8	0
2L/ha	30.9	0
2.5L/ha	39.8	0
3L/ha	40.7	0

Due to low plant available moisture resulting in staggered germination, a secondary count was conducted for each treatment at oat growth stage Z23, (2/7/20). Three counts were conducted per quadrant, with the averages recorded (*Table 3*).

Table 3: Average number of oat and ryegrass plants at oat growth stage Z23.

Treatment	Average oat plants (per m ²)	Average ryegrass plants (per m ²)
Control (0L/ha)	77.1	7.8
1L/ha	76.6	0.0
1.5L/ha	64.3	217.8
2L/ha	59.3	88.9
2.5L/ha	54.0	75.6
3L/ha	41.3	106.7

A one-way ANOVA ($\alpha=0.05$) was used to assess the impact of the different rates of Trifluralin on the number of oat and ryegrass plants/m² at germination (*Table 2*) and establishment (*Table 3*). The results indicate that there was no significant effect of trifluralin rate on oat or ryegrass plant numbers at germination or establishment.

Yield data was collected for each treatment, using grower machinery and the weight captured in a weigh trailer. Grain yield was similar between treatments (*Figure 2*). Data could not be statistically analysed as there was no replications of the trial. As trifluralin rate did not impact on the number of oat or ryegrass plants, any differences in yield are likely due to factors outside of this experiment.

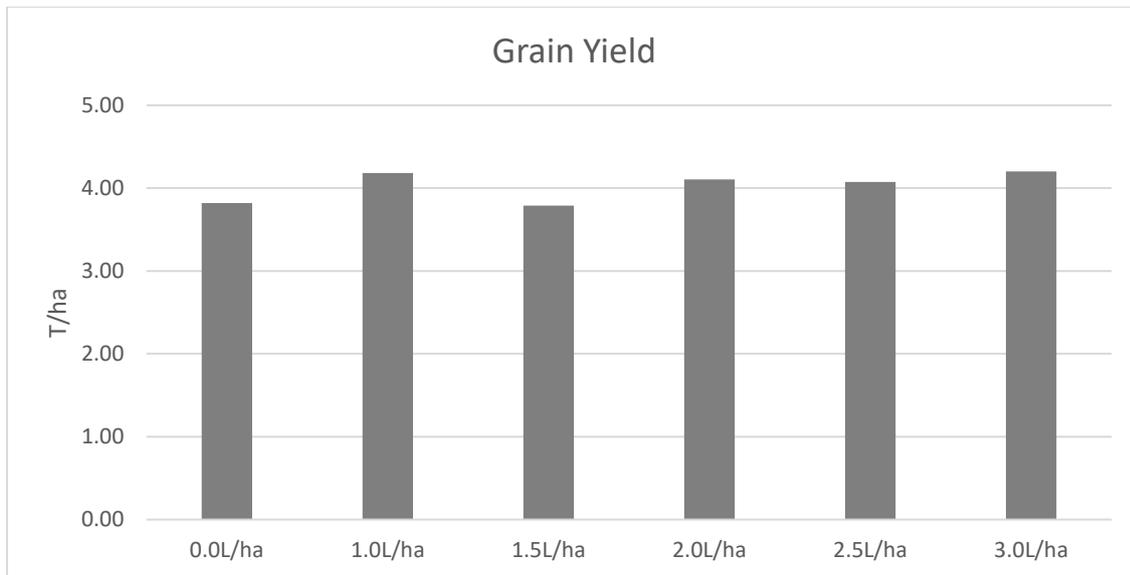


Figure 2: Grain yield of oat crops with varying rates of trifluralin application at seeding.

Despite no statistical significance, it was observed during the trial that oat plants in the control treatment (0L/ha) had increased early vigour compared to the trifluralin treatments, reaching the tillering phase of development prior to other treatments. Any difference in early development did not translate into higher grain yield however.

The 2020 trial site was located in a paddock that was utilised for pasture in 2019. In early 2020, the trial site was speed tilled, whereas in previous years the experiment was conducted under no-till management (2017-2019). An observation was made that the speed tilling encouraged ryegrass germination similar to what is visually observed in a full cut operation.

The 2020 trial reported no difference in oat and ryegrass plant numbers regardless of trifluralin treatment, which supports the findings of the previously conducted trials.

CONCLUSION

This trial has now been conducted over four seasons (2017-2020). The results from the 2020 trial support the findings of previous years, with no relationship between trifluralin application rate and oat or ryegrass plant numbers being recorded. Ryegrass counts throughout this trial have not decreased when Trifluralin rates have increased. Based on the results, increasing trifluralin rates above label recommendations has not impacted the grain yield of oat crops.

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