

# Wick wiper application in Giant Rat's Tail Grass management: Evaluating herbicide efficacy and rates

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## Background

Giant Rat's Tail Grass (GRT, *Sporobolus natalensis*) is an aggressive colonizer of disturbed areas, with infestations significantly reducing pasture productivity and animal production.

Wick wiping is an established GRT control method that applies herbicide treatment depending on a height differential; it targets taller weeds such as GRT, while avoiding shorter, desirable pasture grasses.

Currently, glyphosate and flupropanate are the only registered herbicides for GRT control, but flupropanate shortages and resistance in some populations necessitate finding alternatives.

Through a lab-based wick wiping simulation, this study sought to determine the effectiveness of different herbicide treatments on control of GRT, as well as optimal application volume.

## Materials and methods

Mature *S. natalensis* tillers, planted in November 2022, were split and replanted in 150mm pots with commercial soil in September 2024. Each pot contained 10 tillers trimmed to 30cm, simulating paddock slashing. After 4–6 weeks, plants with >10cm regrowth were ready for wick wiping. Herbicide treatments were applied along the midrib of each tiller using a pipette to ensure precision in application volume (Figures 1 & 2).

Figures 1 & 2. Herbicide application using pipette



Table 1. Trial 1 herbicide treatments

Treatment	Herbicide	Application rate (L/ha)
1	Glyphosate - Roundup Biactive (360g/L)	2
2	Glyphosate - Roundup Biactive (360g/L)	4
3	Flupropanate - Apparent Rocky (745g/L)	0.5
4	Flupropanate - Apparent Rocky (745g/L)	1
5	Glyphosate + Flupropanate	2 + 0.5
6	Glyphosate + Flupropanate	4 + 1
7	Haloxyfop - Verdict (520g/L)	0.77
8	Flazasulfuron - Katana (250g/kg)	200 (grams/ha)
9	Control	-

## Trial 2: Testing application volumes

Five application volumes of combined glyphosate and flupropanate (4L/ha + 1L/ha) and a control were tested in a randomized block design, replicated five times. Treatments aimed to represent low and high application volumes and manufacturer recommendations (Table 2).

Table 2. Trial 2 application volumes

Treatment	Herbicide	Application volume (L/ha)
1	Control	0
2	Glyphosate + Flupropanate	5
3	Glyphosate + Flupropanate	10
4	Glyphosate + Flupropanate	20
5	Glyphosate + Flupropanate	40

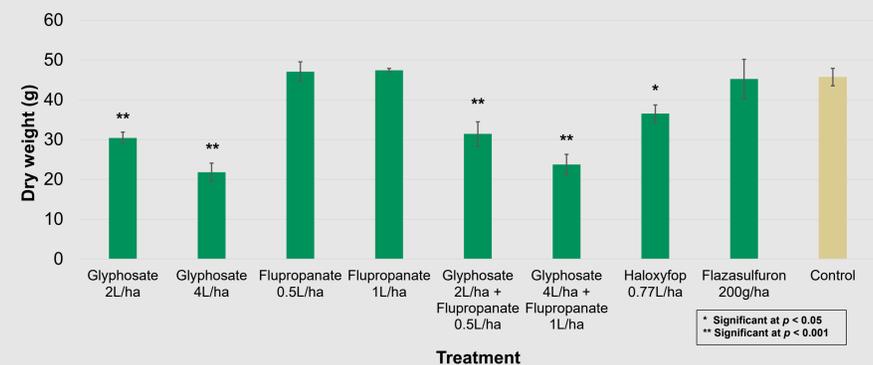
Treatment effectiveness was assessed by measuring above ground biomass (dry weight in grams) and seed head count at two- and three-months post herbicide application. Above ground plant matter was cut, bagged, oven-dried, and weighed, while seed heads were manually counted. Data were analysed using ANOVA, followed by Dunnett's test for significant effects.

## Conclusions

- Glyphosate alone, and combined glyphosate + flupropanate reduced GRT biomass and seed head count, while flupropanate alone, haloxyfop, and flazasulfuron did not.
- Haloxyfop and flazasulfuron did not rate well as effective alternate options for flupropanate.
- No recommendation for optimal application volume of combined glyphosate + flupropanate, as trial results showed limited impact.
- The study's precision application of herbicide via pipette may not generalize to real-world methods, and the short follow-up time limits assessment of longer-term effectiveness of slower-acting herbicides like flupropanate.

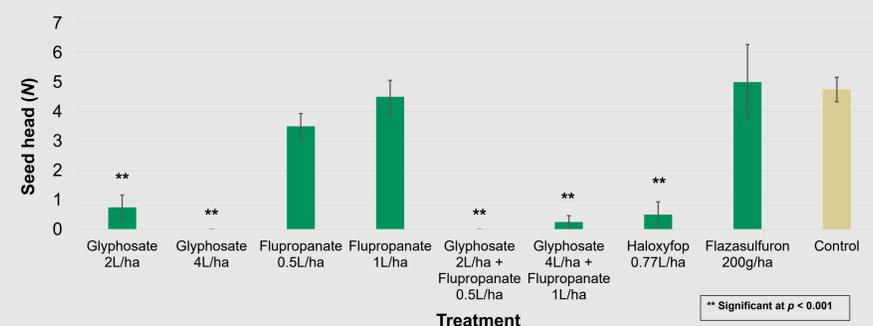
## Results – Trial 1: Testing different herbicides

Figure 3. Trial 1 average above ground biomass, showing standard error and significance levels



Both rates of glyphosate alone and the combined glyphosate + flupropanate mixtures reduced biomass compared to the control. Haloxyfop, flazasulfuron, and flupropanate alone did not affect dry weight three months post application.

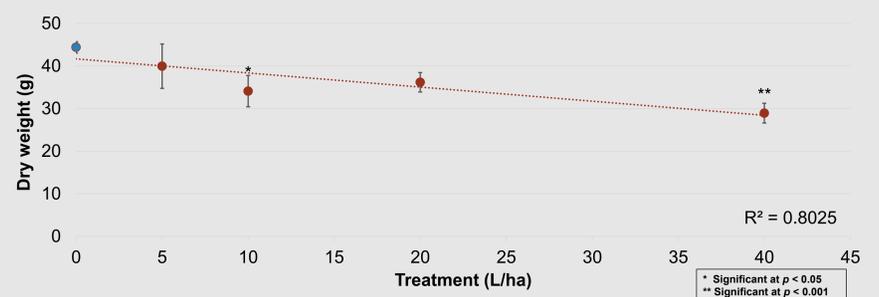
Figure 4. Trial 1 average seed head count at 2 months, showing standard error and significance levels



Two months after application, all glyphosate alone, combined glyphosate + flupropanate mixtures, and haloxyfop treatments significantly reduced seed head numbers compared to the control. However, no significant effects were observed three months post application.

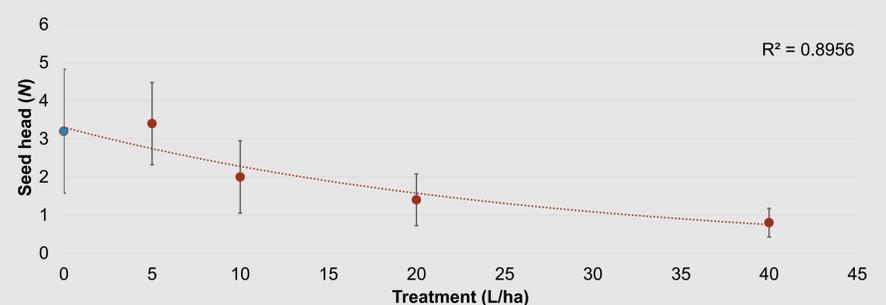
## Results – Trial 2: Testing application volumes

Figure 5. Trial 2 average above ground biomass, showing standard error and linear trendline



Biomass showed a linear decline with increasing application volume, however very little damage was observed at the highest volume.

Figure 6. Trial 2 average seed head count, showing standard error and exponential trendline



Seed head count decreased with higher application volume, but the trend lacks reliability due to high variability within treatments.