

Effects of Flupropanate on non target grassland species - field trials

Introduction

This information note provides information about the effect of flupropanate on non target native grass species across three sites on the Victorian Volcanic Plain.



The Issue

Serrated tussock commonly invades areas that contain native grassland species. Flupropanate is registered for the control of serrated tussock, yet is also known to be damaging to some native grasses.

This project aimed to assess flupropanate dose response effects on native and introduced pasture species commonly found in areas containing serrated tussock. The findings of this report can be used to aid management decisions related to flupropanate use on native grasslands.

Trial setup and treatments

Trial sites were setup at Balliang, Werribee and Oaklands Junction Victoria (Grech and McLaren, 2011). Each trial site consisted of 6 treatments (3x4m plots, table 1) replicated 4 times and assessed seasonally for 3 years prior to statistical analysis using Genstat.

The plots were sprayed using a hand held boom sprayer applying 150l/ha water using AI 110015 nozzle tips during spring 2009.

Pasture basal composition was recorded prior to spraying (day 0) and post spraying at seasonal intervals using a 100 point basal pasture comb (% Basal cover). Categories of native and introduced grasses were recorded, based on species observations at the individual sites. Species such as Spear

grass, Kangaroo grass and Onion grass were commonly observed as well as other broadleaf weed species.

Table 1: Experimental Treatments

Treatment Number	Flupropanate rate
1 Control	0.0 L/ha (0 g a.i./l)
2	0.5 L/ha (372.5 g a.i./l)
3	1.0 L/ha (745 g a.i./l)
4	1.5 L/ha (1117.5 g a.i./l)
5	2.0 L/ha (1490 g a.i./l)
6	4.0 L/ha (1490 g a.i./l)

Results

Response of Native grasses to flupropanate

- Generally native grass cover declined rapidly at flupropanate rates greater than 0.5l/ha or 1l/ha for all sites (Figure 1)
- Summer growing C4 native grasses (e.g. Kangaroo grass) tended to tolerate flupropanate rates of up to 2l/ha better than C3 Winter growing species (e.g. Spear grass)

Response of other weedy species to flupropanate

- Broadleaf weed cover was increased by the application of flupropanate up to 2l/ha at Oaklands Junction but not at Balliang.
- Herbaceous weed cover (e.g. Onion grass) was increased by applications of flupropanate up to 2l/ha at Werribee only.

Management implications

The results of the trials showed that boom spraying of flupropanate in indigenous grasslands can be very damaging to native plants.

Weed seedbank management prior to spraying is important as this will affect the recovery and competitiveness of desirable species

Considerations prior to spraying flupropanate:

- **Ensure you are using the correct flupropanate rates for your soil type**

For a given application rate, flupropanate is known to be less plant available in heavier clay soils than lighter sandier soils

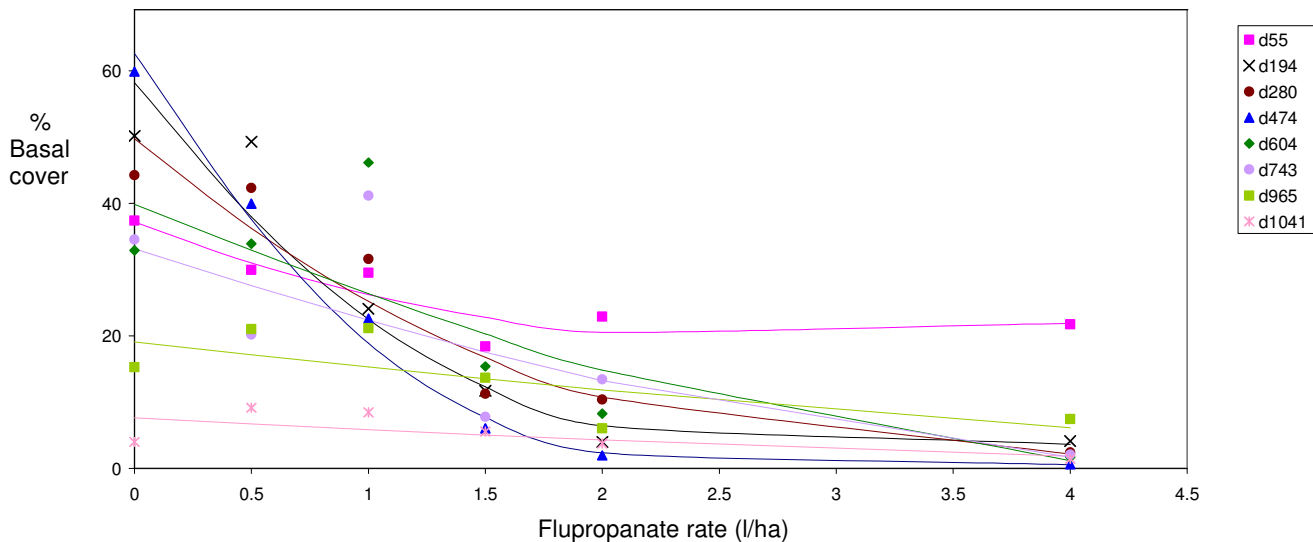


Figure 1 – Response of native grasses basal cover to various flupropanate rates at the Oaklands Junction site only (lines depict days after application) Note that flupropanate takes at least 90-180 days to affect plant survival depending on rainfall.

e.g. Spear grass could tolerate up to 0.5l/ha of flupropanate at Werribee, but not at Oaklands Junction.

- **Manage broadleaf or herbaceous weeds**

e.g. The final basal composition of Spear grass was influenced by the herb or broadleaf weed basal cover prior to spraying

- if no weed management control (i.e. Oaklands Junction and Werribee sites were weedy) then the amount of weed regrowth increased proportionally with the flupropanate rate after spraying
- if weeds are actively managed (i.e. Balliang site had few weeds) then only a small amount of broadleaf weeds regrew after spraying at all flupropanate rates. Desirable grasses (e.g. Spear grass) were able to regenerate due to the lack of competition from herb or broadleaf weeds.

Considerations after spraying flupropanate

- **Control broadleaf weeds and re-seed with desirable species**
- **Manage grassland biomass**

Native grassland species senesce and become less competitive against weeds if they are allowed to grow rank and accumulate too much dead biomass

e.g. the use of burning will reduce plant biomass and encourage regeneration of desirable native species

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Future Directions

Given the limited tools available to managing serrated tussock on a broad scale in native grasslands, more work needs to be undertaken to assess effects of spot spraying or possible use of granulated flupropanate to individual plants to reduce non target effects. The findings of this study and the tolerance of certain native grass species to low rates (0.5l/ha) of flupropanate opens up a range of management options that have previously been considered inappropriate.

Acknowledgments

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Further reading:

Grech C. J. and McLaren D. A. (2011) Flupropanate non target effects - field trial. Department of Primary Industries Victoria. Report on behalf of the Victorian Serrated Tussock Working Party, pp. 1 - 14.

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