Control of *Vulpia* spp. (silvergrass) in perennial pastures of south-western Victoria

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ABSTRACT

Two field sites were established in south-western Victoria to compare the effectiveness of different control treatments in reducing vulpia populations. Grazing management, fertiliser and winter-cleaning treatments were applied to examine their impact on vulpia dry matter production and plant densities. Key results from the first year of the project indicate that winter-cleaning is effective in controlling silvergrass, and that rotational grazing tends to reduce silvergrass dry matter.

KEY WORDS

Vulpia, silvergrass, grazing management, winter-cleaning, fertiliser.

INTRODUCTION

Vulpia spp. are annual weed grasses and are widespread in pastures throughout southern Australia. It has been estimated that vulpia causes losses of $33 m annually in the wool industry through reduced livestock carrying capacity of pastures, damage to livestock skins and pelts, and suppression of growth of other pasture species including allelopathic effects (1, 8).

Limited success in vulpia control has been achieved through spray-topping and cutting pastures for hay and silage, but the use of winter-cleaning has been more successful (5). Grazing management and fertiliser application can also be used, but vulpia still poses a significant problem. Many of these methods are short term; more emphasis needs to be placed on developing long term integrated solutions to control silvergrass. This paper reports first year results from experiments comparing the effects of combinations of treatments on vulpia populations.

METHOD

Two sites were established in spring 1999, one in the 575 mm rainfall zone (Ararat) and the other in the 625 mm rainfall zone (Vasey), in south-western Victoria on phalaris pastures, to compare fertiliser and winter-cleaning treatments. At Vasey, the experiment was established in an existing trial, comparing different grazing management systems (2). Winter-cleaning was applied in June 2000 using simazine at a rate of 1.4 l/ha, to plots in set stocked, four-paddock rotation and intensive rotation treatments. Control plots were established in each grazing treatment. The areas were grazed by spring-lambing Merino ewes at stocking rates between 11 and 15 ewes/ha, depending on the treatment (2).

The Ararat site was established in a rotationally-grazed paddock in August 1999. Simazine was applied as a winter-cleaning treatment at a rate of 1.4 l/ha in September 1999. A fertiliser treatment (lime (1.57 t/ha) + dolomite (0.48 t/ha) + single superphosphate (56 kg/ha) + potassium sulphate (120 kg/ha)) was applied in May 2000. A combined fertiliser and winter-cleaning treatment was also applied and control plots were established. At both sites, vulpia dry matter (DM) production and tiller densities were measured.

RESULTS AND DISCUSSION

At Vasey, differences in vulpia DM production between grazing treatments were not significant due to large spatial variation in vulpia distribution. However, the vulpia content was lowest in the four-paddock rotation treatment and highest in the set stocked treatment. (Table 1). In the set stocked treatment the amount of vulpia increased over the measurement period. Since set stocking decreases phalaris growth and basal cover in comparison to a pasture that is rested (7), there would be less competition against vulpia than in a rotationally grazed pasture. Perennial plants provide greater competition against vulpia than annual plants (6).

Table 1. Effect of grazing management and winter cleaning at Vasey on vulpia content of pastures (% total pasture DM).

Grazing regime	Control			Winter-cleaning
	September 1999	May 2000	September 2000	September 2000
Set stocked	6.9	16.2	16.4	0.0
Four-paddock rotation	3.1	5.7	2.9	0.0
Intensive rotation	11.0	11.2	8.5	0.0

Winter-cleaning significantly reduced vulpia in all grazing treatments (P <0.05). It remains to be seen how quickly vulpia can reinvade and how grazing management might affect the speed of re-invasion. Winter-cleaning is commonly used to control vulpia (3), but concern over the possibility of herbicide resistance means that integrated control methods may offer a more sustainable approach.

Table 2. Effect of winter-cleaning and fertiliser at Ararat on vulpia tiller density (tillers/m^2) in May 2000 and content in pastures (% total pasture DM) in September 2000.

	Control	Winter-cleaning	Fertiliser	Winter-cleaning + Fertiliser
Density (tillers/m^2)	5670	2440	5500	1970
Content (%)	12.3	1.7	11.6	0.9

At Ararat, simazine significantly decreased vulpia dry matter and tiller densities (P < 0.05, Table 2). The ability of vulpia to reinvade plots will be examined over the next two years. Research has shown that seed bank reserves can provide a major source for re-invasion if there is no other significant competition (4), therefore it is important to provide integrated control methods that are not reliant on simazine alone.

Applying fertiliser in autumn 2000 had no significant effect on vulpia dry matter production, but a longer time period may be required for a difference to develop. Higher soil fertility may help desirable pasture species such as phalaris to out-compete vulpia, although this will depend on the amount of the perennial component present (3, 4).

CONCLUSION

Initial results show that winter-cleaning will control vulpia and that rotational grazing management may also reduce the incidence of vulpia. Research over the next two years of this project will indicate which is the best combination of treatments for the Western District of Victoria.

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