Changes in perennial pasture composition under organic management in northeast Victoria

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Introduction

It is recognised that perennial pastures are essential for the long-term sustainable management of soil acidity and contribute to better water management in many areas of northeast Victoria. Phalaris (*Phalaris aquatica*) is a perennial grass species that is grown for its winter feed productivity in grazing systems but can also be grown in rotation with cereal crops to improve acidity and salinity management during the pasture phase. Annual weed management in phalaris pasture is typically achieved with the use of herbicides, but these are prohibited inputs under organic management. Certified organic producers need to manage competition from annual species within their perennial pastures, especially ryegrass, as this species is a major competitor in cereal crops. In this paper, we report on the changes in perennial pasture composition after 2 years of grazing and mowing to reduce the incidence of annual ryegrass in an established phalaris pasture.

Materials and methods

The experiment is located at Rutherglen Research Institute (RRI) Organic Site and consists of chromosol and dermosol soils (pH $CaCl_2$ of 4.9, organic matter 3.0%, and available P Olsen of 16 ppm). Established (sown 1998) perennial pasture consisting of phalaris (Holdfast), tall fescue (Dovey), and subterranean clover (Trikkala, Goulburn, Leura) was topdressed with lime in 2001 (2 t/ha) and 2002 (1.1 t/ha) and replicated three times, with each plot being 0.4 ha. In 2001, grazing by first-cross ewes occurred rotationally through three plots, with an average stocking rate of 6.4 DSE/ha from January to July and 2.8 DSE/ha from July to December. In 2002, grazing by first-cross ewes and lambs was at an average stocking rate of 8.1 DSE/ha from January to September, 17 DSE/ha in October and November, and 3.6 DSE/ha in December. All plots were mown to reduce annual ryegrass seed set on 15 October 2001, 6 November 2001, and 25 September 2002. Pasture composition was assessed using the Botanal method ('t Mannetje and Haydock, 1963), and growing season rainfall (April to November) in 2001 was 318 mm (total 446 mm) and in 2002 was 199 mm (total 340 mm).

Results

Our results suggest that phalaris can survive when mowing to reduce annual ryegrass is practised. A combination of mowing and grazing has reduced the dry matter composition of annual ryegrass from 20% to less than 5%, which is beneficial if producers are in a cropping rotation (Table 1). Phalaris composition in spring has increased from 0.2% to 6.1%, but tall fescue composition has decreased from 4% to 0.1%. The environment at RRI is considered marginal for tall fescue, which generally prefers > 600-mm annual rainfall and heavier textured soils. When only one annual grass is targeted for seed reduction activity, other annual grasses can increase in the pasture (Table 1), and this may have implications for disease management in following crops.

Table 1. Pasture composition (%) changes (dry matter) from December 2000 to October 2002.

Species/date	December 2000	November 2001	October 2002
Sub clover	41.0	78.0	53.2
Annual ryegrass	20.0	5.4	2.0
Phalaris	0.2	2.0	6.1
Fescue	4.0	2.4	0.1
Flatweed	13.0	5.1	10.7
Other annual grasses	21.8	7.1	27.9

Conclusions

We conclude that organic producers using perennial grass pastures in rotation with cereal crops need to manage annual ryegrass with a combination of grazing and mowing. Our results indicate that phalaris dry matter composition may not decline with these management strategies, but further research is required to validate these results.