

MASTER — Pasture responses to lime

Dr Guangdi Li

Senior Research Scientist, Systems
Research, Wagga Wagga

Dr Mark Conyers

Senior Research Scientist, Resources
Research, Wagga Wagga

Summary

This Primefact reports pasture responses to lime application. Lime increased pasture yield and improved the pasture quality. Lime increased the proportion of desirable species, and decreased the proportion of undesirable species.

Trends in botanical composition

- Pasture botanical composition changed dramatically 3–4 years after liming.
- Lime increased the proportion of the desirable species such as phalaris and subterranean clover (Fig. 1).
- Lime decreased the proportion of undesirable species such as silvergrass (*Vulpia* spp.) in both perennial and annual pastures (Fig. 1).
- Barley grass (acid-sensitive weeds) gradually invaded both limed annual and perennial pastures since 1997 as soil acidity has been gradually ameliorated (Fig. 2).

Pasture yield responses to lime

- An increase in pasture yield due to lime was observed in the first year of liming when lime was incorporated.
- However, lime responses would be delayed if lime was top-dressed.
- Averaged across years, lime increased pasture yield by 25% on perennial pastures (660 kg/ha) and 16% on annual pastures (500 kg/ha).



Limed pastures

Unlimed pastures

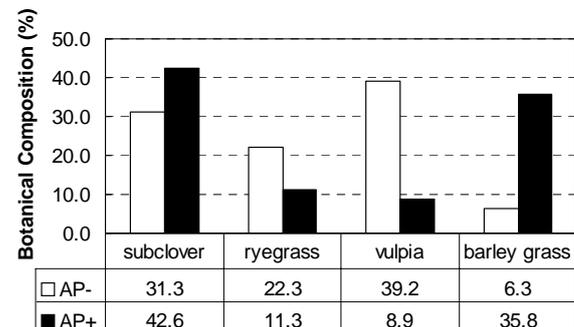
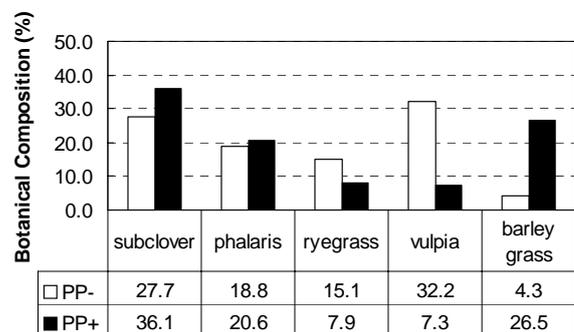


Fig. 1. Botanical composition of major species in perennial (top figure) and annual pastures (bottom figure) with (+) and without lime (-) during spring 2001–03.

- Both perennial and annual pastures had the greatest responses to lime (15%–22%) in spring. However, there were no responses to lime on either perennial or annual pastures in autumn.
- In winter, lime responses occurred on perennial pastures (18%), but not on annual pastures.

Recommendations

- Lime should be incorporated where applicable. Top-dressing lime is acceptable, but would result in a longer response time.
- The optimum lime rate to achieve the maximum responses is to maintain pH_{Ca} 5.5 at top 10 cm.
- Liming perennial pastures will be more beneficial for pasture composition than liming annual pastures.

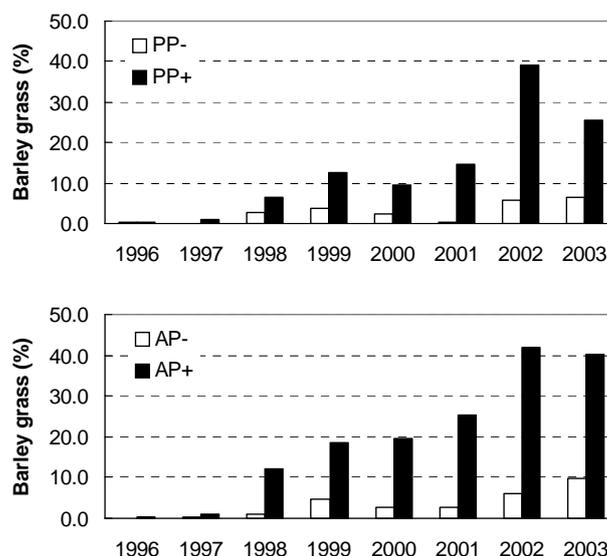


Fig. 2. Barley grass trends in perennial (top figure) and annual pastures (bottom figure) from 1996 to 2003.

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Further information

- Li, GD, Helyar, KR, Evans, CM, Wilson, MC, Castleman, LJC, Fisher, RP, Cullis, BR, Conyers, MK 2003, 'Effects of lime on the botanical composition of pasture over 9 years in a field experiment on the southwestern slopes of New South Wales', Australian Journal of Experimental Agriculture 43, 61–9.
- [Primefact 31, MASTER — Experimental design](#)
- [Primefact 32, MASTER — Soil acidity and lime responses](#)
- [Primefact 33, MASTER — Crop responses to lime](#)

- [Primefact 35, MASTER — Sheep responses to limed pastures](#)
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