MASTER — Pasture responses to lime

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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).

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.

Acknowledgments
• The project is currently funded by NSW DPI with financial support from Australian Wool Innovation Limited (1991–97, 2003–07).
• The project was funded by Grain Research & Development Corporation (1997–2002); Acid Soil Action (1997–2003); Meat & Livestock Australia (1994–97); Land & Water Australia (1994–97).
• Commercial sponsors: Incitec-Pivot Pty Ltd (Fertilisers) and Omya Australia Pty Ltd (Lime) since 1992.

Further information
• Primefact 31, MASTER — Experimental design
• Primefact 32, MASTER — Soil acidity and lime responses
• Primefact 33, MASTER — Crop responses to lime

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

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Published by NSW Department of Primary Industries
© State of New South Wales 2006
ISSN 1832-6668
Job number 6053
Updates of this Primefact are available at www.dpi.nsw.gov.au/primefacts

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