

Pasture production, animal performance and weed population changes under three fertiliser treatments on basalt derived soil on the Monaro.

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Introduction

Native pastures dominate the Monaro region. The continued healthy functioning of these grasslands is vital from environmental, economic and social perspectives. They also play an essential role in resisting the invasion of perennial grass weeds. The Monaro Grassland Research and Demonstration Project is investigating a variety of management regimes to increase land productivity whilst retaining or enhancing the natural resources of the Monaro.

Two 45 hectare grazing experiments have been established on basalt and granite soils near Cooma. These experiments investigate management strategies to increase native pasture productivity without compromising the unique biodiversity found in these grasslands. Pastures under each management strategy are monitored for pasture composition change, especially for weeds. The aim is to increase the presence of legume species (spread with fertiliser) and overall pasture production. Serrated tussock (*Nassella trichotoma*) and African lovegrass (*Eragrostis curvula*) are also present on the sites.

Methods

The basalt soil at 'Idaho', Bungarby (40 km south of Cooma) supports a pasture highly dominated by poa tussock (*Poa sieberiana*). The site has nine, 5 ha paddocks blocked in sets of three replicates to allow for topographical differences. There is also a meteorological station, sheep yards and adjoining laneways.

Fertiliser treatments are:

- nil (control);
- low (125 kg/ha gypsum); and
- high (125 kg/ha gypsum plus 125 kg/ha superphosphate).

All treatments are applied annually. Paddocks were set stocked with initial stocking rates based on prior paddock history of 3 sheep/ha.

For further methods see Powells and Pope in this proceedings.

Results and discussion

Legume production has increased considerably in treated paddocks since mid-2005 (Figure 1).

The increase in legume production is similar to findings in other experiments including those of Garden *et al.* (2003) and SuperSense experiments at Oberon and Mumble. As a result of increased legume production in the paddocks receiving fertiliser, livestock production (liveweight and fat depth) have increased compared to the nil treatment (Figure 2). Stocking rates have been increased to 4.2, 3.8 and 3.4 sheep/ha on the high, low and nil treatments respectively. Treatment trends began showing in early spring 2005 for both liveweight and fat score on treatment paddocks, this information forms the basis for adjusting the stocking rates post shearing in October 2005.

In native pastures treated with fertilisers, pasture composition often moves towards more annual species. This trend has not yet been observed in this experiment but may develop over time. Data not presented here shows a small reduction in total plant species (recorded at greater than 1% presence across the site) from 76 in 2004 to 63 species in 2006. The greater number of species seen in 2004 may be due to the absence of grazing for eight months prior to the commencement of the trial in late 2004.

Whilst serrated tussock is present on the property, no increase in population has been recorded under any fertiliser treatment. This is not surprising given

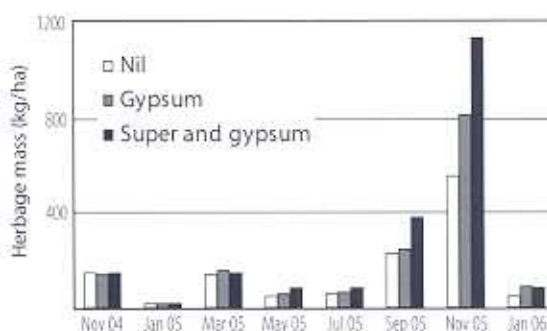


Figure 1 Legume production (kg/ha) under three fertiliser treatments at Idaho, Bungarby NSW. (Note fertiliser and legume seed was broadcast in March 2005).

the high perennial grass content (*P. sieberiana*, averaging 3679.9 kg/ha year round) and ground cover (yearly average 84%) across all treatments since recording began. This is similar to the findings of Badgery (2004) where high levels of ground cover were found to minimise serrated tussock invasion.

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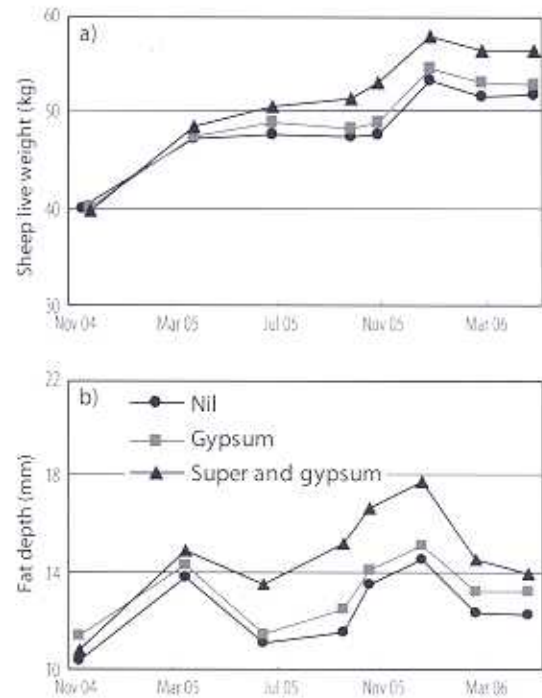


Figure 2 Sheep live weight (a) and fat depth (b) grazing pastures with nil, low and high fertiliser additions at 'Idaho', Bungarby NSW from November 2004 to April 2006. (Note that fertiliser and legume seed was applied in March 2005).