

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

J. Powells and L. Pope

NSW Department of Primary Industries, Cooma, NSW 2630.

## 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 trials have been established on basalt and granite soils near Cooma. These trials 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 present on the site.

## Methods

The experimental site is located approximately 5 km south of Berridale on the property 'Oakvale'. Pasture at the site is dominated by *Austrostipa* spp. and *Austrodanthonia* spp. Treatments are:

- nil (control)
- low (125 kg/ha superphosphate)
- high (250 kg/ha superphosphate)

All treatments are applied annually. The site has nine, 5 ha paddocks (three treatments by three replicates). The replicates are blocked to allow for topographical differences. There is also a meteorological station, sheep yards and adjoining laneways.

Subterranean clover seed was applied to all the fertiliser treatment paddocks at the rates of 2 kg/ha Mount Barker, 4 kg/ha Seaton Park LF and 4 kg/ha Goulburn. Initial treatments were applied in late March 2005. Paddocks are set stocked with wethers at 2.4 sheep/hectare based on prior paddock history.

Botanical composition is measured using the BOTANAL technique (t'Mannetje and Haydock 1963) seven times a year at six week intervals in spring, summer and autumn and eight weeks during winter. Measurements are made of the pasture composition, herbage mass (kg DM/ha), green and dead feed on offer (kg DM/ha) and ground cover (Tothill *et al.* 1992). Three observers walking independent random paths perform 50 assessments/ person/ paddock. Forage quality of a random toe point sample from each paddock is measured following each BOTANAL using FeedTest™.

The frequency of each species present is measured annually in mid to late spring. Working in pairs, four observers identify all plant species in 80 random quadrats per paddock. This data is then compared to previous years to assess temporal and treatment effects. Phenological development is also monitored for the principal pasture species and nominated weed species. Monitoring techniques follow procedures recommended by Sanford *et al.* (1998).

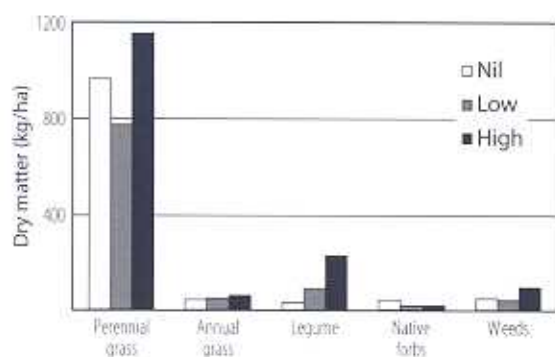
Sheep liveweights and fat scores are recorded after each pasture recording. Wool dyebands are inserted into the mid-side of each sheep every three months after shearing to allow for monitoring of wool growth. These are removed pre-shearing for analysis.

## Results and discussion

No significant treatment related results in relation to weed invasion and control can be drawn from this experiment as yet (Figure 1). The experiment is aiming to promote pasture production and maintain ground cover through stocking rates and fertiliser treatments. However should any treatment be showing to have an adverse effect on weed presence by changing the pasture composition or lowering ground cover, the treatment will be reassessed.

Future information gathered from BOTANAL, frequency and phenology pasture recordings and livestock production data will be analysed and collated to produce a best practice management guide for native pastures on granite soils on the Monaro.

Based on current animal performance trends, stocking rates will be increased to 3.2, 2.8 and



**Figure 1** Availability of various pasture components (kg DM/ha) at 'Oakvale', Berridale under three fertiliser treatments in November 2005.

decreased to 2.0 sheep/ha on the high, low and nil paddocks respectively. The data is beginning to show increasing liveweight and fat score on fertilised paddocks, this information, with BOTANAL results form the basis for determining the adjusted the stocking rates.

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