Increasing pasture and wool production from native pastures

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Many farms on the New South Wales tablelands have native pasture areas that may be under-utilised. Rather than replacing these pastures with sown species, there may be other ways of increasing productivity. To investigate this, an experiment was commenced in 1998 on an area of wallaby grass (*Austrodanthonia* spp.), which also had introduced annual grasses and legumes present. Treatments were rates of superphosphate fertiliser (0, 62.5, 125, and 250 kg/ha) or fertiliser plus lime (250+Lime). Stocking rates were allowed to increase according to increased pasture production in all treatments. Soils, pastures, and animals were monitored over 4 years; and estimates were made of nitrogen (N) fixation in each of the treatments (Bolger and Garden, 2002). Our aim was to determine whether productivity could be increased by these treatments while retaining desirable native perennial grasses.

Results

Results for soils, pastures, and animal production are shown in Table 1. Soil phosphorus (P) increased at the higher superphosphate rates, and the higher legume content (Bolger *et al.*, 2002) and consequent higher N fixation resulted in higher annual dry matter (DM) production. These increases in production allowed higher stocking rates and wool production (Table 1). Applying lime gave further increases in stocking rate of 6% and in wool production of 16%, although increases were not evident until 3 years after liming.

Discussion

Results showed that applying superphosphate to this native grassland (in the presence of a legume) allowed markedly increased production, with increases in stocking rate of 85% and in wool production of 70%. However, one of the consequences of applying fertiliser to native pastures is the possibility of undesirable changes in botanical composition, with increases in annual grasses and a reduction in native perennial grasses. There is strong evidence that such changes did occur at this site (Bolger *et al.*, 2002). In contrast to the exotic annual grasses, native grasses have evolved in soils low in N and P and are therefore at a competitive disadvantage when soil fertility is increased (Bolger and Garden, 2002). In these situations, careful grazing management is required to ensure that annual species do not dominate, causing a decline in the native perennial grasses.

References

Bolger, T. P., Garden, D. L., and Reid, B. M. 2002. Botanical changes in a grazed native grassland with 'sub and super'. *Proc. 17th Annual Conference Grasslands Society of NSW* 47.

Bolger, T. P., and Garden, D. L. (2002) Soil fertility, vegetation dynamics and ecosystem sustainability in Australian temperate grasslands. In *Soil science: confronting new realities in the 21st century*. Transactions of the 17th World Congress of Soil Science, Bangkok, Thailand. International Union of Soil Sciences. CD-ROM available online at http://sfst.org/17WCSS_CD/pages/MainIndex.htm.

Table 1. Average soil P, annual N fixation, dry matter production, stocking rate, and wool production for unfertilised and fertilised native pasture, 1998 to 2002, Yass, NSW.

Treatment	Soil P (2002) (mg/kg)	N fixation (kg/ha)	Annual DM production (kg/ha)	Stocking rate (wethers/ha)	Wool production (kg/ha)
Nil	7	6	4230	7.3	29.5
P62.5	9	18	4915	8.7	30.9
P125	11	40	5930	11.5	45.6
P250	14	56	7085	13.6	50.3
P250+Lime	15	62	7890	14.5	58.7