

THE EFFECT OF GOATS IN CONTROLLING
POA LABILLARDIERI AND TREES.

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Summary. Goats were used to control Poa tussock (*Poa labillardieri*) and small unwanted trees on the southern tablelands of New South Wales from 1977 to 1983. Wether goats were set stocked at between 17.7 ha⁻¹ and 7.4 ha⁻¹ depending on the forage available. All small trees were killed and the height and ground cover of Poa tussock reduced by 89% and 66% respectively which allowed a 44% increase in the ground cover of naturalised pasture. In effect the goats converted Poa tussock from a dominant plant to a minor part (13% ground cover) of the naturalised pasture.

INTRODUCTION

Mature foliage of the native grass Poa tussock (*Poa labillardieri*) is unpalatable to sheep and cattle and low in nutritive value, but young foliage is relatively nutritious (Leigh and Holgate 1978). For sheep to control Poa tussock and obtain a diet of young foliage it is necessary to stock heavily, i.e. at 44 wethers ha⁻¹ (Anon. 1973). Because goats select a more fibrous diet than sheep and have grazed and controlled other tussock grasses unpalatable to sheep and cattle, e.g. serrated tussock (*Nassella trichotoma*, Campbell and Holst, 1978; Campbell *et al.* 1979), observations were made on the effect of goats on Poa tussock, (and associated trees).

MATERIALS AND METHODS

The site, south of Braidwood, had a soil derived from granite with a pH of 4.7 (CaCl₂) and a low phosphate rating. Superphosphate with molybdenum was applied at 125 kg ha⁻¹ in 1979, 1980 and 1981. The pasture was composed of Poa tussock (30% ground cover of the paddock), improved species (20%) and naturalised species (50%). The improved species were phalaris (*Phalaris aquatica*) and white clover (*Trifolium repens*) and the naturalised species were, mainly, ratstail fescue (*Vulpia* spp.), crowsfoot (*Erodium* spp.), annual legumes, sorrel (*Rumex acetosella*), catsear (*Hypochoeris radicata*), bracken fern (*Pteridium esculentum*), stinging nettle (*Urtica urens*) and Yorkshire fog (*Holcus lanatus*). A number of trees and shrubs were also present.

Stocking rate on the 2.8 ha paddock began at 17.7 wether goats ha⁻¹ in October, 1977, and was varied as the available forage fluctuated through October 1983 (Fig. 1). Observations on goat liveweight and health and pasture composition were made on 15 occasions over the six years. Pasture measurements (Fig. 1) were made on 10 permanent quadrats in the paddock.

RESULTS AND DISCUSSION

In the first year goats reduced the average height of Poa tussock from 82 cm to 19 cm. After that, height varied between 20 cm and 6 cm depending on stocking rate and availability of feed (Fig. 1). Height reduction was most severe in winter or during drought.

The percentage ground cover of Poa tussock was also reduced by the goats (Fig. 1). Some tussocks were killed by heavy grazing but the number of tussocks per unit area increased over time as large tussocks were split into smaller tussocks. Goats physically pulled small parts of tussocks out and generally left them on the soil surface. They also weakened tussocks by partly pulling sections out and breaking roots, but not to the same extent as with serrated tussock (Campbell *et al.* 1979).

Seed head production of *Poa tussock* was reduced by c. 80% in 1978 and between 70% and 95% in each of the following years.

The percentage ground cover of pasture increased over time (Fig. 1), probably because of the increase in light and space due to the reduction in height and ground cover of *Poa tussock*. At no stage was the pasture sufficiently vigorous to overtop the *Poa tussock* and kill it as occurred with serrated tussock (Campbell *et al.* 1979). This may have been achieved had the improved species and not the naturalised species been the competitors with *Poa tussock*; the improved species were only sown on the arable parts of the paddock where there was no *Poa tussock*.

The goats killed small trees by stripping off bark up to 2 m above the ground. Within the first year they killed 27 black wattle (*Acacia melanoxylon*), 22 narrowleaf peppermint (*Eucalyptus radiata*), and 5 roughbark ribbon gum (*E. viminalis*). A further 13 ribbon gums were killed during the trial period, which constituted the remainder of the small trees in the paddock. These trees ranged in height from 1 m to 6 m and in trunk diameter from 2 cm to 15 cm. Large trees were wrapped with wire to protect them. Although the goats killed a hawthorn bush (*Crataegus* spp.), two tea trees (*Melaleuca* spp.) and a large American Aloe (*Agave americana*) they had no effect on bracken fern or on stinging nettle.

The goats maintained weight and good health during the trial; the only serious problem being an infestation of liver fluke that was controlled by drenching.

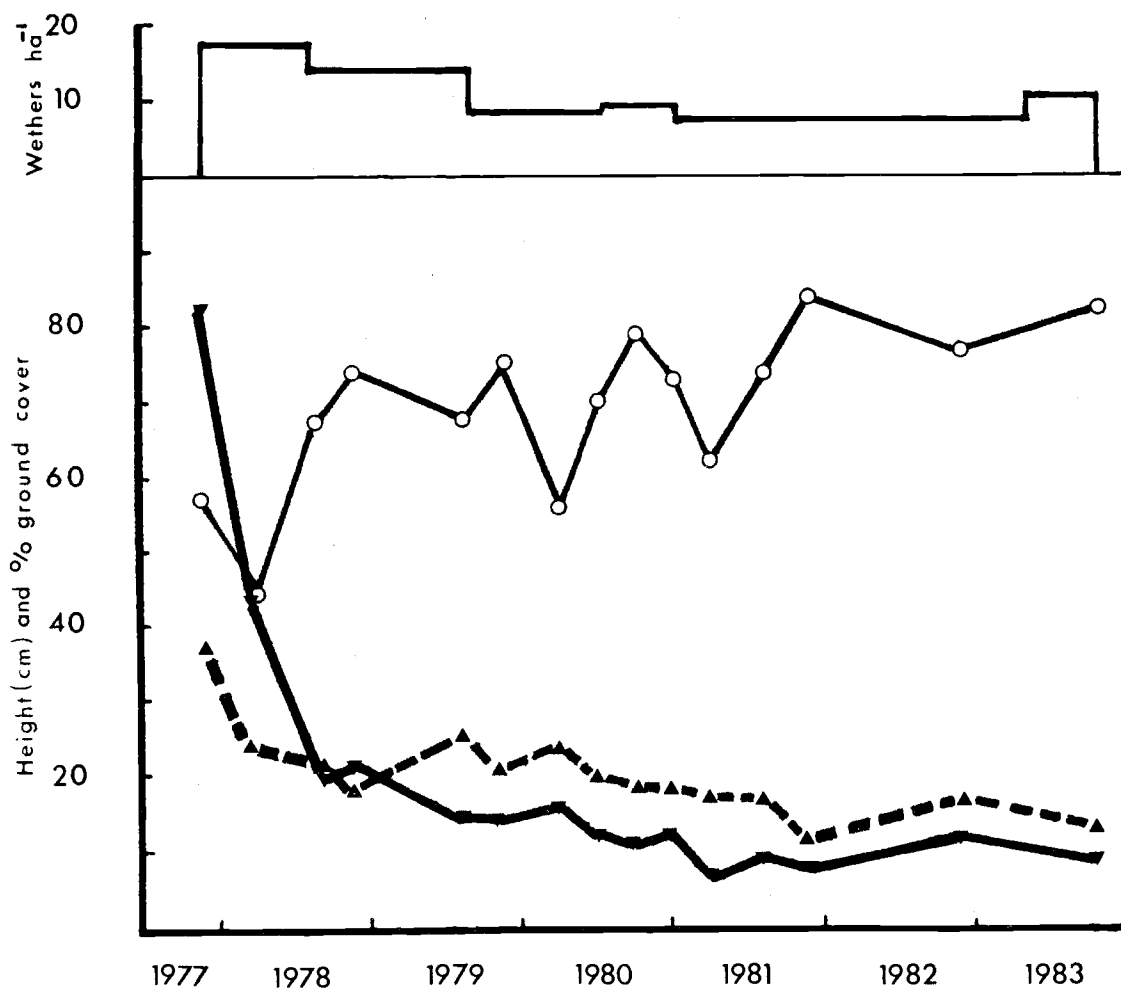


Figure 1. Effect of goats on height (cm) of *P. labillardieri* (—○—○—), and percentage ground cover of pasture (—○—○—) and *P. labillardieri* (—▲—▲—), from 1977 to 1983. Stocking rate (wethers ha⁻¹) is presented above.

LITERATURE CITED

- Anon. (1973) Rural Res. 79: 30-32.
- Campbell, M.H. and Holst, P.J. (1978). Proc. 1st Conf. Council. Aust. Weed Sci. Soc. Melbourne, 1978.
- Campbell, M.H., Holst, P.J., Auld, B.A. and Medd, R.W. (1979). Proc. 7th Asian-Pacific Weed Sci. Soc. Conf. Sydney, 1979.
- Leigh, J.H. and Holgate, M.D. (1978). Aust. J. Exp. Agric. Anim. Husb. 18: 381-390.