

The effect of goats on serrated tussock (*Nassella trichotoma*)

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SUMMARY

The effect of goats on a serrated tussock-improved pasture association was examined at Mt. David, New South Wales from 1975 to 1977.

Goats grazed serrated tussock (*Nassella trichotoma*) reducing its height from 40 cm at the beginning of the experiment to 15 cm in winters 1976 and 1977. In spring 1976 and 1977 regrowth occurred from the crowns increasing the height of tussocks to 25 cm. Goats had little effect on the number of tussocks present. Grazing reduced tussock seedhead production by 80%.

Goats substantially reduced the percentage ground cover of serrated tussock without harming the improved species or producing large areas of bare ground. The goats increased their liveweight and maintained good health. A further experiment is now under way comparing the long term effects on sheep, goats and sheep plus goats on a serrated tussock-improved pasture association.

INTRODUCTION

Serrated tussock (*Nassella trichotoma*) is a serious weed in the central and southern tablelands of New South Wales because it is unpalatable to sheep and cattle (Campbell and Barkus, 1961, 1965), infests large areas (680,000 ha, Campbell, 1978) and greatly reduces carrying capacity (Campbell, 1974). It is low in crude protein and very high in fibre (neutral detergent) (Campbell and Irvine, 1966).

Attempts to force sheep (Campbell and Barkus, 1965; Campbell and Irvine, 1966) and cattle (Milne, 1954) to utilize serrated tussock failed because the liveweight of sheep fell markedly (some sheep died) and that of cattle remained stationary. However, because goats eat more fibrous plant material than sheep (Wilson et al, 1975) it is possible that they could utilize serrated tussock without detriment to themselves. In fact Holst (unpublished data) observed that goats included serrated tussock in their diet whilst ignoring succulent clovers. This could mean that in a favourable spring the ungrazed clover could smother the grazed serrated tussock and thus assist in its control. To test this hypothesis a simple trial was set down at Mt. David in the central tablelands of N.S.W.

MATERIALS AND METHODS

A 2.8 ha paddock with a mixture of serrated tussock and improved pasture was selected and stocked with 40 wether goats and 2 beasts in October, 1975. Goat liveweights were recorded at bi-monthly intervals at which time anthelmintics were administered

and general health noted. Liveweights and apparent availability of forage influenced some stock movements. These consisted of the removal of the cattle in July, 1976 and their reintroduction in December 1977; and a reduction of 10 goats in February 1977. The trial is currently stocked with 30 goats and two beasts.

Thirteen permanent quadrats (25 m²) were pegged and observations made on the number and height of serrated tussock plants, the botanical composition of the pasture and the seed-head production of serrated tussock. Photographs were taken of each quadrat at six monthly intervals.

RESULTS

The goats began grazing serrated tussock once they had reduced the amount of the more palatable plants in the paddock (e.g. sweet briar (*Rosa rubiginosa*), blackberry (*Rubus fruticosus*)). The mean height of tussock plants on the quadrats was reduced from 40 cm before the goats were admitted to 15 cm by September, 1976. This represented the minimum height of the tussocks because goats exerted maximum grazing pressure on the tussocks in winter. The lower 15 cm of leaf tissue which remained after grazing died and new leaves grew from the base of the tussock. Thus in late spring 1976 the height of the tussock increased to 21 cm. In winter and spring 1977 the height of the tussocks was similar to that in the corresponding period in 1976.

The goats had little effect on the number of tussocks. On only two quadrats was there a substantial reduction in tussock numbers and this was due to their close proximity to the camp site of the goats.

The goats reduced the amount of serrated tussock seed-head produced in summer 1976 by 80% when compared to the adjoining paddock grazed by sheep at a similar stocking rate. Indications are that a similar reduction in seed-head production will be effected in summer 1977.

The goats reduced the percentage ground cover of serrated tussock without harming the improved species nor producing large areas of bare ground (Table 1).

The goats grazed the improved species as well as the tussock throughout the year. Unfortunately both the 1976 and 1977 spring periods were unfavourable for pasture growth and thus it has not been possible to observe whether goats shun succulent clover growth and whether the clover growth is sufficient to smother serrated tussock plants.

Goats were able to utilize serrated tussock and the associated pasture without serious loss of liveweight (Fig. 1). There was a decrease in liveweight in winter but a rapid recovery in spring. Goat health was excellent throughout the trial.

DISCUSSION

The results of this trial have shown that goats will graze serrated tussock and substantially reduce its height and seed

Table 1. Changes in botanical composition of permanent quadrats with time

Date	Serrated tussock	Improved species	Miscellaneous species	Bare ground	Litter
	% ground cover				
October, 1975	18	52	29	1	0
March, 1976	17	48	29	1	0
September, 1976	12	43	28	7	10
November, 1977	10	42	40	7	1

production without having deleterious effects on the associated improved species. Goat health and liveweight did not suffer due to the inclusion of serrated tussock in their diet. This is in marked contrast to the deleterious effect of a serrated tussock-improved pasture association on the liveweight and health of sheep (Campbell and Irvine, 1966).

These preliminary observations suggest that goats may have a role in serrated tussock control by placing it at a competitive disadvantage in an established pasture, because, when serrated tussock is prevented from seeding in a strong improved pasture it no longer constitutes a weed menace. This latter proposition is being tested in an experiment comparing the effects of goats, sheep, and goats plus sheep on a serrated tussock-improved pasture association on a non-arable site. Further, since it is important to know how much of the improved pasture species are actually eaten by the goats, an additional group of oesophageal fistulated goats is being used to study the composition of their diets.

Observations made in this trial showed that goats preferentially grazed *Poa* tussock (*Poa labillardieri*) and almost eliminated it from the pasture. As a result a simple trial was initiated in the southern tablelands to test the effect of goats on moderate to dense infestations of *Poa* tussock.

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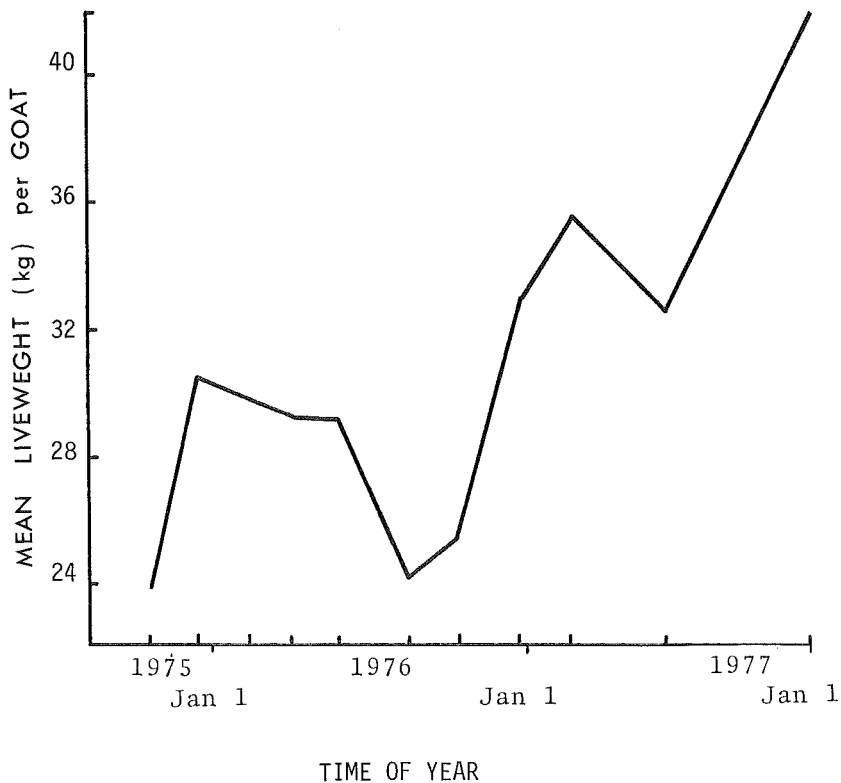


Fig. 1. Liveweights of goats