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# USING GOATS TO REDUCE HOPBUSH (*DODONEA viscosa* var. *attenuata*) DENSITY.

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## ABSTRACT

Up to 90 % mortality in hopbush, (*Dodonea viscosa*) was achieved by stocking 1 goat/ha for three years. The mortality rate was lower in shrubs that had been only partially defoliated (35 %) or completely defoliated for only short periods (65 %).

## INTRODUCTION

Woody weeds affect over 20 million hectares of the semi-arid rangelands of western New South Wales (SCS 1989). Dependent on their density, woody weeds suppress pasture production, decrease animal production and reduce land values. Low land values dictate that woody weed control must be low cost and beneficial in the long term. Chemical and mechanical control of woody weeds is expensive and can often require a follow-up treatment. Controlled burns are accepted to be the most cost-effective technique to manage woody weeds (Burgess 1988), however, insufficient fuel often makes this control option impossible.

Goats have been shown to control some woody weeds (Davies & Mitchell 1984, Green 1983, Harland 1988) in including *Dodonea viscosa* (Muir 1991). When pasture biomass is low, goats can be a useful management tool as browsing pressure on woody weeds will be greatest (Muir 1991). The influence of different goat grazing treatments on both hopbush density and pasture biomass is examined in this paper.

## METHODS

The 800ha experimental site was located on the sandy red earths 130km NW of Cobar, NSW. Woody weed infestation was moderate to severe, the dominant species being hopbush. Except for 1988, the annual rainfall was well below the long term average (350 mm), 1991 receiving less than one third of this amount.

Sixteen 50 ha paddocks were constructed allowing replication of five stocking treatments using either goats or sheep. The results of only the goat stocking treatments (Table 1.), are discussed here.

Shrub density and biomass measurements were taken every six months using six fixed transects of varying length, each containing 25 shrubs. Pasture biomass was estimated every three months using a double rank sampling technique (Haydock and Shaw 1975).

Table 1. Summary of stocking treatments.

STRATEGY	GRAZING REGIME
High goats (short duration)	0.4 goat/ha June 88 - Dec 89 4 goat/ha Jan 90 - Nov 90 1 goat/ha April 91 - June 91
Medium goats (long duration)	1 goat/ha June 88 - Mar 91
Low goats (long duration)	0.7 goat/ha June 88 - June 91

## RESULTS AND DISCUSSION

Goats can be used to reduce hopbush density. They significantly reduce hopbush density when stocked for three years at 1 goat/ha (Fig.1b.). Under the heavy goat stocking (short duration) treatment some of the heavily defoliated shrubs resprouted when goats were removed, suggesting that the duration of grazing was not sufficient to achieve shrub mortality.

Visibility across paddocks in both the heavy and medium goat treatments was greatly improved. As goats open shrub canopy, an opportunity exists to encourage pasture growth and incorporate other control options such as fire in a woody weed management programme.

Pasture levels were dramatically reduced on all goat stocking treatments (Fig. 1a, 2a, 3a), the rate of decrease being greatest in the heavy goat stocking treatment. Associated with the rapid decrease in pasture biomass under this treatment, was a decline in soil surface structure (Greene pers. comm), suggesting this treatment may have detrimental effects on soil infiltration characteristics. The low pasture biomass levels would have been exaggerated by the extremely low rainfall experienced from 1989 to 1992. Under such climatic conditions, a spelling period would be required to enable pasture biomass to increase to levels that allowed restocking or a follow-up management burn.

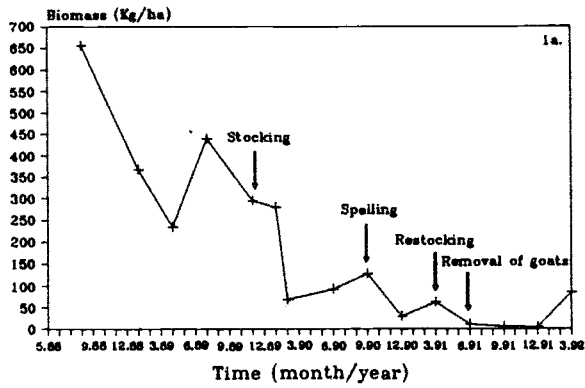
The potential of goats for woody weed control will depend on the longer term response of both the hopbush and that of the pasture. Future studies will identify the effects of time and frequency of defoliation of hopbush allowing a more effective timing of goat stocking.

## ACKNOWLEDGMENTS

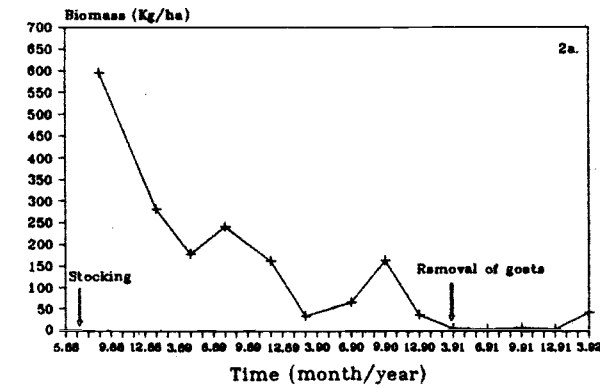
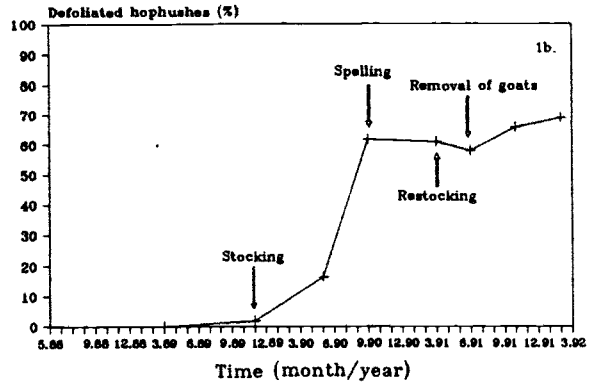
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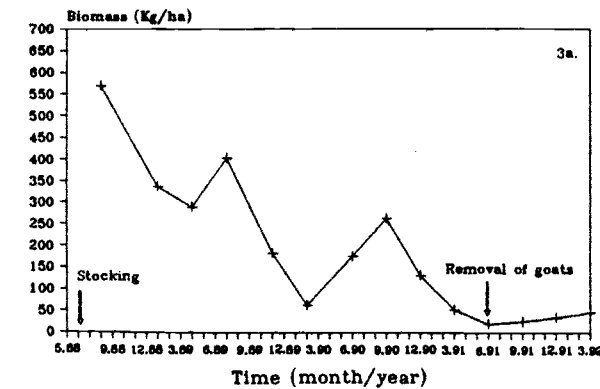
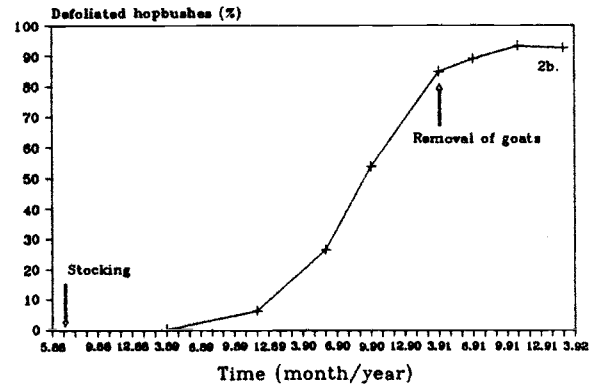
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High goats (short duration)



Medium goats (long duration)



Low goats (long duration)

