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# CUT SHOOTS OF WESTERN MYALL DO NOT SUBSTITUTE FOR SEEDLINGS IN SOME GRAZING REMOVAL EXPERIMENTS

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## ABSTRACT

*Sheep, rabbits and/or kangaroos could each be the cause of the hiatus in recruitment this century of western myall (Acacia papyrocarpa Benth.), a long-lived Australian arid-zone perennial tree which usually recruits about every 25 years. Research into this hiatus requires studying how seedlings are lost from the environment, but producing and field-placing seedlings is labour intensive. Question: can cut shoots (probes) from adult western myall plants be used as surrogates for seedlings? So far we have examined this for rabbits and sheep. Results indicate that while sheep show a significant preference for probes, rabbits appear not to discriminate between the two. Thus probes are not an acceptable surrogate in sheep experiments but they are in experiments with rabbits.*

## INTRODUCTION

Juvenile western myalls are rarely seen in the landscape at Middleback Station, S.A. Judged from the presumed age of the youngest cohorts of trees which are common, the absence of juveniles appears to coincide with the arrival of exotic herbivores (Lange and Purdie 1976, Lange and Graham 1983, Ireland 1992). However, about every 25 years seedlings do emerge in sufficient numbers to form the juvenile cohorts, if they were to survive. Therefore, recruitment is being suppressed, most likely by herbivores. Three major herbivores have become more abundant since European settlement:

1. Sheep, the introduced domestic herbivore, restricted by water supplies;
2. Rabbits, the introduced pest herbivore, not restricted by water supplies; and
3. Kangaroos, the native herbivore, proliferated after the introduction of stock watering supplies.

There are difficulties in studying the herbivory of seedlings. Few seedlings occur naturally in the field. Furthermore, it is logistically very difficult to propagate and artificially place in the field seedlings in large enough numbers for landscape scale experiments. Can we use seedling-sized cut shoots of adults (probes) as surrogates for seedlings?

## METHODS

We did two experiments with RABBITS with no sheep present; seedlings and probes were placed in natural rangeland vegetation around active rabbit warrens and were grazed for four days in September 1994 and six days in February 1995. There were six active warrens with four sites at each (a total of 24 sites) with ten pairs of seedlings and probes at each site. We did two experiments with SHEEP with no rabbits present; seedlings and probes were placed in a small rabbit-proof enclosure of natural rangeland vegetation where sheep were given free access to graze for three days in September 1993 and six days in February 1994. There were 24 sites spread uniformly across the enclosure with ten pairs of seedlings and probes at each site.

## RESULTS

The data were analysed as a split-plot design, both as an ANOVA, and, more correctly for these binomial data, as a Generalised Linear Model. The conclusions from both were identical. Figure 1 clearly shows that overall, probes were preferred to seedlings ( $P < 0.001$ ), sheep preferred probes over seedlings and rabbits appeared not to discriminate between the two ( $P < 0.001$ ).

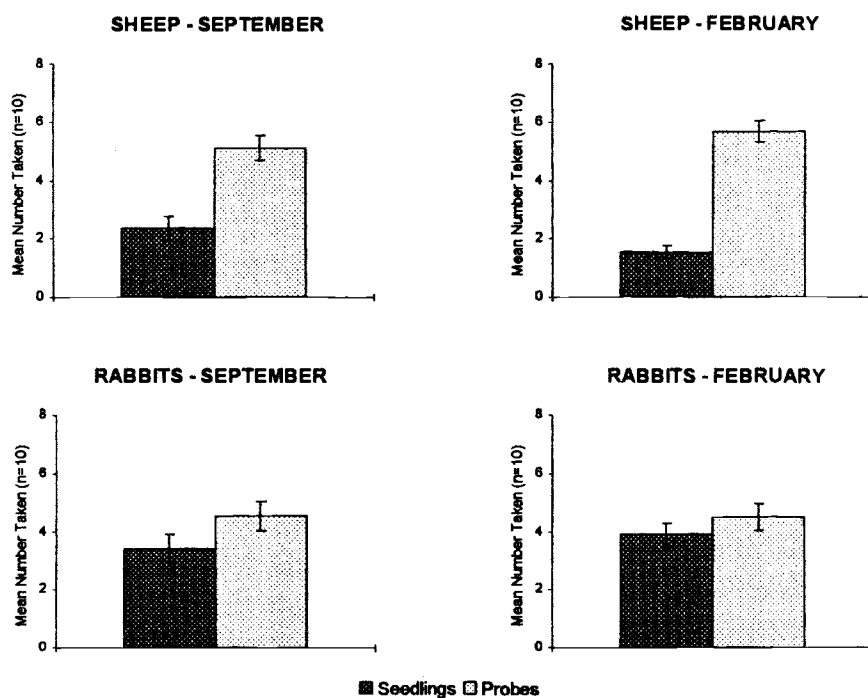


Figure 1. Mean number ( $\pm$  s.e.) of seedlings and probes taken.

## DISCUSSION

Probes cannot be used as surrogates for seedlings in sheep experiments but can be used in experiments with rabbits. An interesting finding is that sheep appear to reject seedlings compared to probes. This seems to be an example of a more general phenomenon that seedlings are less preferred compared with adult foliage. Unpublished data from the above sheep grazing experiments show that sheep appear to prefer almost any other forage on offer (e.g. saltbush, blackbush) to western myall seedlings. Furthermore, other results from a similar grazing experiment at the same location (Lange *et al.* 1992) showed that sheep also rejected seedling saltbushes compared to foliage from adult plants.

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