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# GRAZING EFFECTS ON A POST FIRE REGENERATING MALLEE COMMUNITY, SOUTH WESTERN NEW SOUTH WALES.

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## INTRODUCTION

Within semi-arid rangelands, herbivores including sheep, goats, rabbits and kangaroos, may impose significant post-fire selection pressures by grazing whatever herbage and desirable woody regeneration occurs after fire (Noble *et al.* 1986). This reduces the competitive effects of palatable flora, particularly grasses and herbs, and leads to a dominance of unpalatable shrubs or woody weeds (Harrington *et al.* 1984). The fire regime is altered as the fuel for fires (grasses and herbs) is consumed, and the remaining unpalatable shrubs increase their tolerance to fire as they age (Noble *et al.* 1986). The interaction between grazing and fire can severely alter natural vegetation communities in semi arid rangelands, having significant implications for pastoralism and conservation. The effect of grazing in Mallee *Triodia* vegetation was investigated on Nanya station NSW, by measuring exclusion and control plots three months and nine months post-fire.

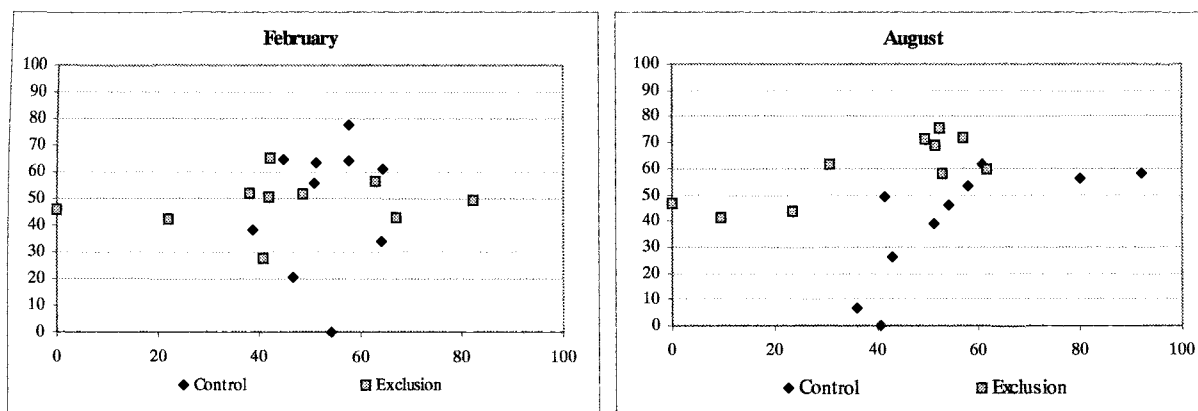
## METHOD

Nanya station is situated within Scotia country of far western NSW, 150 km north west of Wentworth. In September 1997, a 50 x 50 m exclusion plot, designed to exclude all mammalian herbivores, was erected in an area of Mallee *Triodia* that burned in December 1996. A control was also established adjacent to the exclusion with a 5 m buffer separating the two plots. Ten random quadrats (5.5 x 5.5 m) were sampled within each plot, initially in February 1998 and again in August 1998. All vascular plants occurring within a quadrat were recorded to give an account of species richness and diversity. Direct comparisons of plot data pooled into family groups were also made. The degree of similarity between the exclusion and control over time was investigated using the Bray Curtis (1957) method of polar ordination.

## RESULTS

Forty species from 17 plant families were recorded in the exclusion, and 35 species from 18 families in the control plot. The most abundant species was *Beyeria opaca* in the exclusion and *Eremophila glabra* in the control plot. Species numbers were grouped into families and interpreted as the percentage of the entire family represented in either the exclusion or control plots. Families recorded in greater proportions within the exclusion plots included Asteraceae (78%), Boraginaceae (73%), Haloragaceae (87%), Poaceae (66%) and Polygonaceae (83%). There were greater percentages of shrubs from the Caesalpinaceae and Myoporaceae within control plots. Families that decreased or increased over time did so within both plots i.e. Euphorbiaceae, Haloragaceae, Solanaceae and Amaranthaceae increased, Boraginaceae, Caesalpinaceae, Myoporaceae, Poaceae and Asteraceae decreased. Poaceae was represented by 7428 individual plants of three species, of these 33% were recorded in the control, with many severely grazed. Likewise, only 20% of *Muehlenbeckia diclina* var. *diclina* was found in the control.

The ordination graphs in Fig. 1 show two groupings of six control and five exclusion quadrats in February, and four control and six exclusion quadrats in the August data. The spread between quadrats in each plot in both data sets is somewhat large, though general groupings are distinct. Grouping of quadrats from the August ordination plot is less distinct.



**Figure 1.** The percent dissimilarity of each quadrat is shown above for the February and August plots.

## DISCUSSION

Selective grazing of post-fire regeneration was evident within the control plot. As annual and ephemeral ground layer species are grazed, they are replaced with unpalatable shrub species (Wilson & Harrington 1984). Greater numbers of Caesalpinaeae and Myoporaceae within the shrub layer, and Solanaceae within the shrub and ground layer, were recorded in the control plot. The lack of competition for water and nutrients from palatable species may have allowed these species to prosper. The higher density of *Haloragis odontocarpa* (Haloragaceae) within the exclusion reflects the high palatability of the species as reported by Noble (1989). Similarly a degree of palatability was evident for Poaceae, Asteraceae, Boraginaceae and Polygonaceae. The same temporal trends (eg. an increase in herbs and grasses) were evident within both plots. Noble (1989) found that there was a relatively short-term contribution to total cover by herbs and grasses following fire. Many short-lived ground layer species are adapted to exploit soil moisture and rapidly complete their life cycle, before shrub seedlings establish once again (Harrington *et al.* 1984). As unpalatable species thrive due to grazing of palatable species, the useful grazing life of post fire rangelands diminishes and the time between fire increases.

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