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REHABILITATION RESEARCH - BACK O' BOURKE

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ABSTRACT

Soil degradation, perennial pasture decline and inedible shrub encroachment are common forms of land degradation north west of Bourke NSW.

An experiment to investigate the merits of various land rehabilitation treatments was commenced in April 1991. Treatments involve combinations of bladeploughing, destocking and the sowing of *Cenchrus* spp..

Rainfall has been very limited. However, early results suggest that bladeploughing, as a one off treatment, is unlikely to bring about long term improvement in land condition. The treatment yielding best pasture biomass after eleven months combines bladeploughing with concurrent sowing of *Cenchrus* and subsequent total destocking.

OBJECTIVES

1. To test the merits of alternative rehabilitation treatments in sandplain country which is presently subject to dense native shrub encroachment, depleted pasture and degraded soil condition.
2. To investigate the nature of any relationships which might exist between vegetation and soil surface characteristics.
3. To select the best rehabilitation option from the treatment combinations. More definitive management recommendations are the goal for the future.

METHOD

1. Vegetation and soil surface condition variables were measured on three replicate sites within a grazing paddock on "Bloodwood" station in April 1991.
2. Six rehabilitation treatments per replicate were installed immediately afterwards. Treatments include bladeploughing, exclusion of all larger herbivores and seeding with *Cenchrus* spp. in a factorial block arrangement.
3. Rainfall, and vegetation and soil surface condition variables will be monitored until the re-establishment of perennial pasture and improvement in soil condition within one treatment has progressed to the stage where it is judged safe to re-introduce controlled grazing.

The treatment which allows re-stocking in the shortest time will be considered the preferred method of rehabilitation.

RESULTS

1. Rainfall. The three sites received a mean total rainfall of 144 mm between April '91 and March '92. Of this total, 97% fell between December '91 and February '92.
2. Pasture Biomass Response. Pasture biomass was measured within the six treatments in April '91 and again, in March '92. Data were pooled from all replicates and the mean calculated.

Before treatment, the difference in mean pasture biomass between treatment areas was insignificant.

Eleven months after treatment, treatments involving bladeploughing and destocking contained significantly greater pasture biomass than the other four treatments.

The treatment which combined bladeploughing, destocking and seeding with *Cenchrus* yielded the best mean pasture biomass of all treatments and was significantly better than the treatment which was only bladeploughed and destocked.

CONCLUSIONS

Numerous ecological variables are being measured but it is too early to present data from them yet. Shrub mortality and soil surface condition change must be monitored for a longer period if any meaning is to be attached to data collected. Further, the pasture biomass results presented are a temporary response to a short period of low level rainfall at a time of high evaporation. The March '92 results may change significantly in the long term. Neither do the biomass data indicate present species composition of pasture (ie, quality and stability) which could fluctuate dramatically from season to season, and also follow a longer term trend as the effect of respective treatments progresses.

Nevertheless we may safely make the following conclusions now.

- * A significant increase in pasture biomass has been achieved in bladeploughed and destocked treatments after only 144 mm rain. This suggests that rehabilitation in the subject country is possible irrespective of the seasons immediately following treatment.
- * Since pasture growth is pivotal to the rehabilitation of the system as a whole, the probability of successful rehabilitation is reasonably high in bladeploughed-then-destocked treatments.
- * Conversely, all three treatments which are subject to the prevailing grazing regime show insignificant improvement in pasture biomass and therefore stand less chance of rehabilitation in future.

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