

An assessment of parthenium weed (*Parthenium hysterophorus*) in  
grazing lands - preliminary results

I.J. Dale  
Department of Lands  
Townsville 4810, Queensland

and

C.N. Jacobsen, R.J. Tucker  
Department of Primary Industries  
Emerald 4720, Queensland

### SUMMARY

Parthenium weed (*Parthenium hysterophorus*) is a relatively recent introduction to Queensland which has become dominant over many thousands of ha of grazing land. A survey covering the properties with large areas of weed showed that the major infestations are confined to deep, grey and brown, self-mulching, cracking clay soils particularly those where brigalow (*Acacia harpophylla*) and gidyea (*Acacia cambagei*) low open forests have been cleared. Very few cases are recorded where uncleared native pastures have been invaded. In all cases of serious infestation, the invasion was associated with a grass ground cover lower than that in similar areas without parthenium weed. There appears to be an inverse relationship between the amount of grass present and the degree of parthenium weed infestation. This relationship appears to hold in both cleared and uncleared situations with native or exotic grasses.

### INTRODUCTION

Parthenium weed (*Parthenium hysterophorus*) is an annual herb (Harvey, 1976) which has invaded extensive grazing areas in central Queensland (Haseler, 1976). Gas exchange studies have indicated that its limits of distribution may be very wide in the humid and sub-humid regions of Australia (Doley, 1977). The plant has been reported from many parts of Queensland and the Queensland Government is making large sums of money available for its containment (Haseler, 1976). A preliminary study indicated that the plant is very limited in well managed, vigorous pastures (Jacobsen and McLaughlin, personal communication). Management practices aimed at keeping pastures in good condition have been outlined (Anon, 1977).

The present study was initiated to define the factors determining the distribution of parthenium weed in grazing lands. The vegetation, soil and management factors affecting the occurrence of the plant were to be used to assess the potential of various grazing lands for invasion by parthenium weed.

### MATERIALS AND METHODS

All properties with more than 200 ha of parthenium weed were considered for the study. On each property, sampling areas containing parthenium weed were selected on each land unit as identified by Gunn and Nix (1977). Where possible, another area without parthenium weed

was sampled on the same land unit on the same property. "Waste" areas (roadsides, around yards, watering points, etc.) were not considered as these small areas are subjected to repeated disturbance not experienced over the remainder of the paddock.

Within each sampling area, a transect 400 m x 20 m was established and data collected from five quadrats each 20 m square within this transect. The data included a complete list of all grass, herb, and tree species present. Direct measurement of individual plant size was obtained from basal diameter, foliage diameter and height for all grasses, and foliage diameter and height for all herbs and trees. A soil profile description was recorded at each sampling area. Climatic data and the management history of the paddock since clearing were used where possible.

Other permanently marked areas have been pegged for recording of number, size and foliage area of grass and parthenium weed under a range of management strategies.

## RESULTS AND DISCUSSION

Preliminary data evaluation only has been completed. All sites were on deep grey or brown, self mulching, cracking clay soils (mainly Ug 5.24, Ug 5.34 and Ug 5.35 according to the Northcote (1971) Factual Key). The extent of gilgai showed large variation in depth, wavelength and percentage mound.

Data from all areas, whether cleared or uncleared, with native or exotic grasses, have shown an inverse relationship between the amount of grass present and the amount of parthenium weed. The areas of uncleared native pasture where parthenium weed was recorded in appreciable quantities were all on clay soils and were associated with lower basal and foliage areas of grasses than situations without parthenium weed. Overgrazing of the pasture has been indicated in all areas where this has occurred.

In some cleared areas, perennial grasses have not established after clearing and heavy infestations of parthenium weed have developed. Where buffel grass (*Cenchrus ciliaris*) or native grasses have established successfully little parthenium weed is present. Studies over one growing season have shown an increase in numbers and size of grass plants in a mixed buffel grass, parthenium weed pasture under a range of management practices. Further data on the management of the sample areas will be collected to allow definition of the effect of management on the levels of parthenium weed. The permanent study areas will be continued to study the effect of different seasonal conditions and management practices on the balance between grass and parthenium weed.

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