

Temporary cropping as a means to restore native perennial grasslands in western NSW

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Abstract: *The spread of invasive native scrub (INS) is a major problem in western NSW. This project aimed to test the hypothesis that native perennial grasslands do regenerate in areas that have been cropped following removal of INS. Results indicated that ground cover, native perennial grass cover and standing dry matter were highest under light/rotationally grazed conditions. Availability of soil seed did not appear to be a limiting factor. We conclude that opportunistic cropping can be used successfully to remove INS and restore native perennial grasses.*

Introduction

INS is one of the major natural resource threats in the rangelands of NSW. Its impact on vegetation structure, pastoral productivity, land value and susceptibility of encroached landscapes to further degradation has been well documented (e.g. Noble & Walker 2006). Research over several decades has identified a range of management options that are capable of controlling INS but in most instances the cost is not justified by the economic benefit obtained (e.g. Pressland 1981).

While there is anecdotal evidence that native perennial grass species re-establish successfully in the post-cropping environment if seasonal conditions are favourable other observations indicate that former cropping paddocks may support only further stands of INS.. The aim of this study was to determine whether native perennial grassland reestablish following removal of INS on the Cobar pediplain.

Materials and Methods

Paddocks that had been cropped since 1987 were identified and thirty paddocks in the Western CMA area were selected for sampling. Paddocks were classified into four types based on cropping history and grazing management. Paddocks that were encroached with INS and had never been cleared were classified as 'INS'. Paddocks that were last cropped previously and were reinvaded by INS were classified as

'regrowth'. Paddocks that had been cropped and were set stocked when not in crop were classified as 'set stocked'. The paddocks which had been cropped and were either rotationally or lightly grazed were classified as 'light/rotationally grazed'

Grassland condition was assessed by measuring ground cover, pasture botanical composition and standing dry matter. Ground cover and pasture composition were assessed using the step point method described by Campbell & Hacker (2000) Standing dry matter was assessed using photo standards.

Results and discussion

Total ground cover was less than 30% and did not differ significantly between 'INS' 'regrowth' and 'set stocked' paddocks, but was 50% in the light/rotationally grazed paddocks ($P < 0.001$; Fig. 1). Cover of native perennial grasses was more than 20% in the light/rotationally grazed paddocks compared with less than 5% in the other types of paddocks ($P < 0.01$) and was the major factor contributing to the difference in total ground cover (Fig. 1). Good stands of native perennial grasses were recorded in paddocks that had been cleared of INS, cropped and light/rotationally grazed (Fig.2).

Standing dry matter varied from about 100 kg/ha in both 'INS' and 'regrowth' paddocks to about 300 kg/ha in 'set stocked' paddocks and 1100 kg/ha in light/rotationally grazed paddocks ($P < 0.001$).

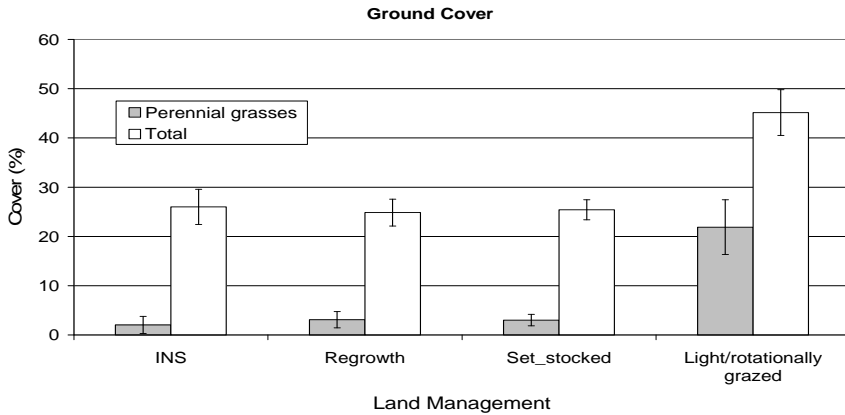


Figure 1. Total and perennial grass ground cover (%) under the different land management categories

The study showed that native perennial grasses were able to re-establish in the post-cropping period with effective grazing management. Sufficient viable seed remained in the soil for the marked response to favourable seasonal conditions. The combination of soil disturbance and the adequate spring/summer rainfall preceding the survey, probably account for the response observed.

Total ground cover was influenced by the proportion of perennial grass cover and both of these were in turn determined by the grazing management system. Ground cover is recognised as a key indicator of ‘rangeland sustainability’ and restoration of native perennial grasslands is expected to improve ecological processes resulting in more productive and resilient landscapes.

Acknowledgements

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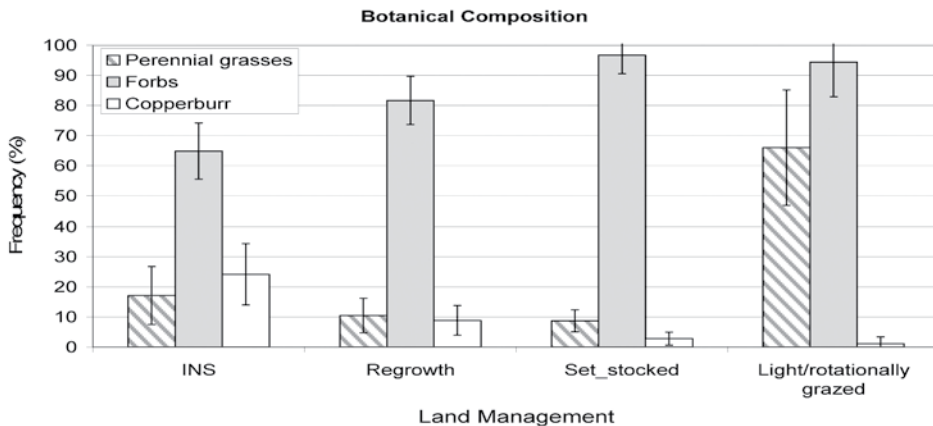


Figure 2. Frequency of the major pasture components under the different land management categories