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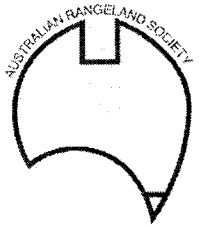

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MONITORING PASTURE CONDITION TRENDS FOR SUSTAINED PRODUCTION

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ABSTRACT

One aspect of monitoring grazing systems is the condition of the natural resource. Photos show broad changes such as the reduction of rubber vine (Cryptostegia grandiflorum) *by fire. Estimates of species composition on north-east Queensland* Aristida/Bothriochloa, *spinifex* (Triodia *spp.) and black speargrass* (Heteropogon contortus) *community sites in 1992 and 1995 show more subtle changes often missed by photos. All except the speargrass site had reductions in decreaser perennial grasses. The intermediate perennial grass increased only on the spinifex site, while increaser perennial grasses increased on all sites. The two monitoring methods are contrasted. Interpretation and use of this information in management is discussed.*

INTRODUCTION

The sustainable management of grazing lands requires the consideration of an array of factors. These include aspects of the natural resource and the grazing animal, as well as business and personal considerations. Methods of monitoring performance will vary depending on the expertise of people and the requirements of the management system. This paper presents methods used, and data collected, to monitor the condition and trend of pastures (native and introduced) in the semi-arid rangelands of north-east Queensland. The potential use of the information collected to enhance the management of the land resource is also discussed.

METHODS

During November 1994, a paddock burn was conducted for the purpose of controlling the spread of rubber vine (*Cryptostegia grandiflorum*) in a buffel grass (*Cenchrus ciliaris*) pasture near Charters Towers, Queensland. Photo points, consisting of two marked steel posts 15 metres apart, were established. Slide photos (64 ASA) were taken (from eye height looking from one post to the other) before, immediately after and six months after the burn. Separate from this paddock burn, three 4 ha monitoring sites had been established (as part of the Queensland grazing lands monitoring project QGRAZE) on typically grazed *Aristida/Bothriochloa*, spinifex (*Triodia* spp.) and black speargrass (*Heteropogon contortus*) pasture communities (according to Weston *et al.* 1981) in the semi-arid Eucalypt woodlands of north-east Queensland. Data were collected from these three sites during April - June 1992 and 1995. These data included species composition, presence or absence of rooted species (relative frequency) in 100 quadrats ($0.25m^2$) placed at regular intervals along each of five 100 metre transects, and photos (facing south from points marking the centre of these transects).

RESULTS AND DISCUSSION

Photos are a cheap and easy way to keep a record of broad trends in pasture condition. By comparing photos taken before and after the paddock burn, it was indicated that a significant reduction in rubber vine density had occurred. From photos 6 months post burn, the buffel grass pasture appeared to have recovered with minimal regeneration of rubber vine. Continuing to take photos from these set points over coming seasons will build a record of re-emergence (if any) of rubber vine. These will be valuable benchmarks for future generations.

Photos are not ideal for showing small changes in species composition that may indicate shifts in condition. On the separate monitoring sites, photos show a large bulk of grass at the *Aristida/ Bothriochloa* site in 1995 compared with low bulk in 1992, but the 1995 composition is largely

undesirable increaser species (increase under grazing - *Aristida* spp. at all sites) while in 1992 it is largely desirable decreaser perennials (decrease under grazing - *Bothriochloa* spp. on this site) (Table 1). At the spinifex site, where pasture bulk was less, photos do show a reduction in the decreaser perennial (spinifex at this site), with more bare ground in the 1995 photo.

From a management viewpoint, knowledge of recent grazing and rainfall history is required before interpreting composition data. Changes in species composition (relative frequency) have occurred between 1992 and 1995 on the separate monitoring sites (Table 1) during a period when this region had well below average rainfall (around 50% of the long-term average). Under the given conditions, grazing management appears to have been adequate on the speargrass site to maintain speargrass (the decreaser species in this community). The loss of decreaser species in the spinifex and *Aristida/ Bothriochloa* communities indicates adjustments in grazing strategies may be required if maintenance of these species is desired. On all sites, the influx of undesirable increaser species may require management intervention in the future.

Knowledge of the species involved is also useful in interpreting the processes occurring. The intermediate species (increaser or decreaser depending on grazing intensity and duration - golden beard grass, *Chrysopogon fallax*, on all sites) is increasing only on the spinifex site. In this community, spinifex propagates mainly by above-ground stolons and is thus susceptible to increased stock pressure, while golden beard grass produces below-ground rhizomes and can therefore better resist increased stock pressure and occupy space left by spinifex.

Throughout Australia, rangeland condition assessment is being promoted by land administrators. In Queensland, the State Department of Primary Industries is promoting grazier-based assessment through the GRASS Check project. The GRASS Check manual (Forge 1994) presents methods similar to those in this paper and discusses the integration of information collected into management.

Table 1. Percent relative frequency of increaser, intermediate and decreaser species in 1992 and 1995 at single *Aristida/Bothriochloa*, spinifex and speargrass community sites.

Community	*Aristida/Bothriochloa*		Spinifex		Speargrass	
Year	1992	1995	1992	1995	1992	1995
Increaser	24	72	27	42	5	23
Intermediate	80	81	17	36	66	69
Decreaser	59	35	88	53	73	83

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