

APPLICATION ABSTRACTS

Evaluation of methods of assessing vegetation change in the semi-arid rangelands of southern Australia

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This paper evaluates a number of methods that may be used in pastoral areas for measuring long-term changes in shrubs, herbage and the soil surface. The evaluation included measurements of the variability of each method with different observers and in different seasons, the time required for measurement and their value in providing information that is useful to government agencies and pastoralists.

It was concluded that changes in unpalatable shrubs in the semi-arid woodlands should be measured by canopy cover along a transect of 1,000 step-points. Changes in saltbush and bluebush should be measured by counting shrub clumps along belt transects of 1.25-2.0m width. Soil degradation may be assessed by the area of degraded (scalded) soil along those transects, provided the soil is one that has a sharp contrast in texture between subsoil and surface. Measurement transects should also be photographed as an aid to the interpretation of long-term change.

The development of a system for monitoring trend in range condition in the arid shrublands of Western Australia.

A.McR. Holm, D.G. Burnside and A.A. Mitchell.

Leaseholders and administrators of leasehold land have a responsibility to ensure that pastoral lands can continue to be used profitably by succeeding generations. To do this it is essential that soil stability is maintained. In arid shrublands, this means maintaining the natural balance of both edible and less edible shrub species.

The Western Australian Rangeland Monitoring System — WARMS — has been designed to assist both pastoralists and administrators in achieving these objectives. A series of fixed range monitoring sites is established throughout the pastoral lease. At each site a photograph is taken and the plants within a fixed area are identified and marked on an overlay. The numbers and sizes of perennial plants are recorded within fixed belt transects and assessments are made of soil stability.

This information is summarised and made available to the leaseholder in a Monitoring File. He is encouraged to visit the sites regularly and adjust his grazing practices according to his observations at the site compared to the record in the Monitoring File. The cumulative effect of these seasonal stocking decisions is assessed by inspections every four or five years by experienced rangeland officers.

Analysis of historical records of a grazing property in south-western Queensland.

1. Aspects of the patterns of development and productivity

R.E. Oxley

This article uses historical records of a sheep-grazing property in south-western Queensland to examine the development of station improvements since the early 1860s. It also analyses pasture and edible shrub production, annual sheep losses, average fleece weights and lamb-marking percentages.

The first signs of permanent and widespread deterioration in the pastures and amount of edible shrubs showed soon after the turn of the century, and when station improvements led to all the property becoming available for grazing.

The amount of summer rainfall was important in governing the numbers of sheep that could be carried over the following winter, annual sheep losses and average fleece weights. High lamb-marking percentages were dependent on high rainfall in the preceding 18 months.

Analysis of historical records of a grazing property in south-western Queensland.

2. Vegetation Changes

R.E. Oxley

This article combines data from historical records, recently published maps and a field survey to document changes in the vegetation of a pastoral area in south-western Queensland.

Fires, ringbarking, clearing and grazing by rabbits and sheep have been an integral part of management. Examples of how these have affected the vegetation are given.

Attempts at reducing the number of trees to aid pasture growth have met with varied success. No success has been achieved in permanently reducing trees in brigalow country. The distribution of the major tree species has not changed since the turn of the century. The largest differences between then and now have been changes in density. Woody weeds, especially sandalwood, have increased in areas where clearing has involved soil disturbance. The extent of perennial saltbush has been greatly reduced.

A survey of bladder saltbush (*Atriplex vesicaria* Heward ex Benth) dieback on the Riverine Plain of south-eastern Australia from the late 1970s to 1983.

D.K. Clift, W.S. Semple and J.C. Prior

From 1977 to 1983, widespread dieback affected stands of bladder saltbush on the northern Riverine Plain of south-eastern Australia. Many graziers viewed this with great concern because they valued the drought forage provided by bladder saltbush. A survey was carried out during 1983 to determine the extent and characteristics of dieback.

It was found that:

- dieback had occurred previously, though it was often more localised than during 1977-83,
- the pattern and progress of dieback was variable,
- in a number of cases saltbush had not died but had merely defoliated,
- the area of leafy bush had declined by 53 per cent, from 1.1 to 0.5 million hectares, by spring 1983.

No cause of the dieback was established; however, a number of possible causes are discussed.

The effect of soil pitting on establishment and growth of annual *Medicago* spp. on degraded rangeland in Western Australia

G.A. Gintzburger

Regeneration and revegetation of degraded pastoral zones is a matter of great concern, not only in Australia but also in the Middle East and North Africa.

Of the techniques available to revegetate degraded and barren Mediterranean arid rangeland, soil pitting is one of the simplest to operate.

This article aims at answering questions related to the pitting techniques. Why not use conventional and available farming seeding machinery instead of specialised rangeland water harvesting equipment? How efficient is soil pitting, compared to a conventional seeding technique, in arid zones where water available for plant establishment is limited?

The post-fire regeneration responses of *Triodia wiseana* and *T. basedowii*.

N.E. Casson and J.E.D. Fox

After fire in areas of the southern Pilbara region of Western Australia, one "hard" spinifex species, *Triodia wiseana*, is able to sprout, whereas *T. basedowii* re-establishes from seed. This phenomenon is discussed in relation to the management of "hard" spinifex species as fuels.