

APPLICATION ABSTRACTS

Factors contributing to differences in forage yield in the semi-arid woodlands

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This paper reports on a study into the vegetation and soil factors contributing to differences in productivity between sites in the semi-arid woodlands. The measurements were made in the vicinity of Cobar, N.S.W. Average forage yield varied from 240 to 40 kg per hectare. A major proportion of these differences was attributed to total tree and shrub cover, total nitrogen content of the soil and organic carbon in the soil. All species of trees and shrubs (including edible species) contributed equally. Differences in soil nitrogen are considered to be a reflection of surface erosion, but direct estimation of surface erosion is inaccurate. The composition of the herbage layer (grass and copperburrs) differed between enclosed and grazed sites but was not a useful factor in determining forage yield.

We conclude that monitoring of land condition in the semi-arid woodlands should employ total tree and shrub cover and an improved measure of soil surface erosion.

Soil and plant relationships with cattle production on a property scale in the monsoonal tallgrass tropics

T.H. McCosker, P.K. O'Rourke, A.R. Eggington and F.W. Doyle

Cattle production was monitored in ten paddocks on Mount Bunday Station in the Darwin district of the Northern Territory. Land unit composition of each paddock was assessed. Species yield and composition of the major soil types was estimated in 1983 and 1984. Numerical classification and correlation techniques were used to investigate and define soil, plant and animal relationships.

Lactating heifers were most sensitive to yield of individual species and their pregnancy rate was positively related to dry matter yield of *Themeda triandra*, *Sorghum plumosum*, *Eriachne burkittii* and *Eragrostis* spp. and negatively related to that of *Alloteropsis* spp., *Pseudopogonatherum contortum* and *Heteropogon triticeus*. Pregnancy rates of both lactating cows and lactating heifers increased with the proportion of lowland soil types in a paddock and decreased as the proportion of hills increased. The main grazing sites were over-grazed within four years, indicating that this country could not sustain a continuous stocking rate of one breeder to 14ha when mineral supplements were provided.

Effect of short- and long-acting growth promotants on grazing beef cattle in south-west Queensland

M.R. Clarke and J.R. Wythes

Growth promotants can improve the productivity of cattle in the rangelands. They act to increase liveweight gains and carcass weights by increasing greatly the efficiency of converting feed to muscle protein. In the Mitchell grasslands of south-west Queensland, implantation of one, two and three year old steers with Ralgro (a short-acting promotant) increased final liveweight by 2.9%, 3.9% and 2.0%, respectively. In the Channel country, implantation with Compudose (a long-acting promotant) increased final liveweight by 5.3% and carcass weight by 4.6%. There was no effect on fat depth or dressing percentage. No physical abnormalities due to implantation were detected.

In the Mitchell grasslands, the choice of growth promotant should match the expected finishing period prior to slaughter. In the Channel country, we advise that steers be implanted with a long-acting growth promotant before being released for finishing. Whenever possible, implantation should coincide with routine handling procedures to minimize costs.

Photographic standards for estimating comparative yields in arid rangelands

M.H. Friedel and G.N. Bastin

The estimation of pasture yield is important for range managers who want to know, for instance, how much forage they have left after livestock have been grazing, what fuel loads there are, or what response there has been to rainfall. In arid rangelands, yield is not easy to estimate with any reliability because the vegetation is very patchily distributed and different operators use estimation techniques in different ways. Without proven techniques, differences in yield from one place or occasion to the next may simply be due to variation in the way a technique is used.

In the past, we have tested a wide variety of methods for estimating both yield and species composition of pastures, and have recommended one which is quadrat-based, for composition. The comparative yield technique, for pasture yield, is complementary to it but produces highly variable results and is very slow. Our study reported here has tested a variation of the comparative yield procedure. We used photographs of quadrats containing known weights of pasture to rate our sampling quadrats. Different operators obtained reasonably consistent estimates of yield in a relatively short time with the technique.

A program is available that enables operators to collect and analyse data with a hand-held computer at field sites, using the recommended techniques for pasture yield and composition.

Sheep productivity in an *Astrelba* grassland of south-west Queensland

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Reduced sheep productivity, particularly lamb marking percentages, were reported in *Astrelba* (Mitchell grass) grasslands during a series of years with above average summer rainfall. Changes in pasture composition during these years suggested that the reduction in the forb component may be associated with reduced sheep productivity. This paper reports a grazing study conducted between 1979 and 1983 in which sheep productivity was compared between two paddocks, one of which was modified in an attempt to increase forb growth.

Average annual lamb marking percentages varied from 32% to 115% even though pasture modification failed to increase forb growth. These large differences in lamb marking percentages were associated with large differences in the quality of the ewe's diet around the time of lambing. These differences were due, in turn, to large differences in rainfall around the time of lambing. The effects of variable pasture composition on sheep productivity are small relative to the effect of season.

The economics of prescribed burning for shrub control in the semi-arid woodlands of north-west New South Wales.

D.M.N. Burgess

It is important for pastoralists and agricultural advisers to understand the economics of prescribed burning for shrub management. An evaluation of the profitability of the practice is presented. According to measures of net present value, internal rate of return and payback period, burning is a feasible management technique.

There is very little quantitative information about pasture response and livestock production after fire. To compensate for this uncertainty, a sensitivity analysis is used to confirm that prescribed burning is likely to contribute to more profitable rangeland pastoralism.

This study highlights the need for further research into pasture and animal production responses in burnt rangelands.

Seasonal changes in the nutritive value of grass species in spinifex pastures of Western Australia

A. McR. Holm and R.J. Allen

Most of the grasses which establish on burnt "soft spinifex" country in the Exmouth Gulf region of Western Australia, were neither more palatable nor more nutritious than soft spinifex (*Triodia pungens*). We suggest that the manipulation of these pastures, to encourage grasses other than spinifex, by burning and deferred grazing, may not be desirable in this environment.

The importance to animal nutrition of woody herbs and forbs, which can also be promoted by burning, warrants further study.