THESES SUMMARIES

REPRODUCTIVE PERFORMANCE OF BEEF CATTLE IN THE NORTHERN TERRITORY

L.G. Andrews

Department of Tropical Veterinary Medicine, James Cook University, Townsville, Queensland. 1976. pp. 375. Awarded M.Sc.

Reproductive wastage is a serious economic problem in the northern area of the Northern Territory. The reproductive efficiency of beef cattle (26,000) was studied over a three year period on a number of commercial beef producing properties in tropical Northern Territory. This area encompassed a range of environments, varying from northern high rainfall areas (Darwin and Gulf) to the southern semi-arid rangelands (Barkly Tablelands and Victoria River District).

In all districts conception patterns followed the rainfall pattern with a lag of approximately one month. In the semi-arid rangeland peak conception occurred during April-May, with some conception occurring into the dry season, apparently because of the persistence of the better quality forage. Conception rates were depressed in the southern regions due to high ambient temperature.

Intervals between calving were subject to wide variation. Calf survival on these semi-arid rangelands generally ranged from 80-85% in brucellosis free herds. Survival showed no relationship to season or time of calving.

Pregnancy rates were positively correlated with effective rainfall one month previously and negatively correlated with ambient temperature in excess of 36°C.

Physiological factors such as lactation-status and body condition also affected pregnancy rate. Lactation has a strongly negative effect on conception and body condition, while body conditions also influenced conception rate. Older cows or younger heifers were most affected.

The management recommendations arising from this study mostly reinforce existing strategies. The importance of nutritional management of the breeding herd in conjunction with seasonal influence is emphasised. Weaning is recommended, being important for nutritional management, disease control and cattle handling.

On a long term basis management should be aimed at vaccination, testing and handling of weaners to create separate disease-free herds. Maintenance of separate disease-free herds allows culling and facilitates disease eradication.

* This is not the author's summary. The reader is referred to the original for a more complete resume.

EFFECT OF SHEEP GRAZING *ASTREBLA* GRASSLAND IN CENTRAL WESTERN QUEENSLAND

D.M. Orr

Department of Agriculture, University of Queensland, St. Lucia, Queensland. 1979. pp. 118. Awarded M.Agr.Sc.

This thesis examines the effects of grazing pressure on plant responses in *Astrebla* grassland and the plant responses to rainfall at sites of different grazing pressure.

Three commercially grazed paddocks in *Astrebla* grassland near Blackall, central-western Queensland were selected for study on the basis of a history of light, medium or heavy grazing pressure. Summer rainfall at each property prior to and during this experiment was quantified using a simple water balance model.

Increased grazing pressure reduced the projected foliage cover of *Astrebla* spp., the basal area of which was similar under light and medium grazing pressure and was reduced under heavy grazing pressure. Differences in the density and size of *Astrebla* spp. tussocks were apparent under the three grazing pressures. Other perennial grasses, notably *Aristida latifolia* and *A. leptopoda* were more frequent under light than medium grazing pressure. Numerical classification of the sampling sites, which were arranged on a regular grid, allowed the grazing pattern to be established. Heavy utilization was shown to be associated with wind direction, shade availability and watering facilities. One sampling site from each of the three utilization zones, in each of the three paddocks, was selected to determine the response to rainfall.

At these sites the pastures' response to a summer rainfall season was measured. The inter-relationship between forage use, plant and soil variates was examined using regression analysis. The above average summer rainfall resulted in significant increases in basal area and projected foliage cover of *Astrebla* spp. Light forage use prior to this rain resulted in substantially lower yields of annual grasses and forb species and higher *Astrebla* spp. yields than where forage use had been heavier. The predominant species under heavy forage use, *Amaranthus mitchelli* and *Tribulus terrestris,* were relatively undesirable whereas under light forage use desirable species, for example *Rhynchosia minima,* were common. Soil surface condition appeared independent of the level of forage use.

It was concluded that stocking rates that are commensurate with proper grazing use were determined largely by seasonal rainfall. It is suggested that an intermediate stocking rate which promotes a forb component in the pasture and maintains reserve forage for drought periods is optimal for animal production.