

GRAZE ON - A PASTURE BUDGETING STRATEGY FOR NATIVE GRASSLANDS

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ABSTRACT

GrazeOn uses a feed budgeting approach to estimate the capability of mitchell grasslands to run animals for defined but usually short (0-2 years) periods of time. *GrazeOn* is produced in software and printed format. Embedded in the calculations are a suite of applications designed to ensure that the recommendations produced by *GrazeOn* are sustainable. For example, the pasture monitoring program is designed so that pasture condition be controlled, grazing pressure is estimated using numbers of domestic and non-domestic animals, spatial aspects of grazing behaviour are used to estimate utilization of paddocks by grazing animals and animal intake is adjusted by differences in physiological state, animal size and the greenness of pasture. Furthermore, *GrazeOn* has the scope to allow users to be progressive and champion the use of technology such as climate/pasture growth forecasting and incorporate the outcomes into feed budgeting. This approach opens windows of opportunity in the areas of drought preparedness and risk reduction.

KEYWORDS

Tactical grazing management, sheep, cattle, kangaroos, mitchell grasslands, pasture budgeting, decision support, grazing capacity

INTRODUCTION

Overstocking of mitchell grasslands (32.8 mha, 19% of Queensland) has led to vast areas (43%; Tothill and Gillies, 1992) being invaded by woody weeds and/or unpalatable pasture species. Set stocking of properties is the management principle commonly adopted which has clearly contributed to land degradation, loss of desirable species and reduced animal productivity. The high variability of mean annual rainfall (CV = 49%) predisposes the region to extreme interseasonal changes in forage production, a good example of a system most likely to be sustainable under tactical or adaptive stocking regimes.

GrazeOn is a grazing management strategy which determines, at the end of each growing season, a grazing capacity which is based on a number of factors including the biomass of pasture. *GrazeOn* uses pasture biomass to calculate grazing capacity (hd/ha) but makes adjustments according to the quantity of pasture which is available to domestic stock. Furthermore, the *GrazeOn* model adjusts the grazing pressure by taking into account the condition of pasture, selection preference of stock for different pasture species, consumption of pasture by non-domestic stock, spatial distribution of grazing pressure and interseasonal forecasting of pasture growth.

MATERIALS AND METHODS

The *GrazeOn* assessment of grazing capacity takes into consideration a whole range of factors (that are largely measured objectively) which make an important contribution to the capability of the resource to run domestic livestock without causing permanent degradation. These factors include:

- adjusting carrying capacity according to the objective measurement of pasture condition
- a mechanism to adjust carrying capacity according to the area of paddocks which are under or over-utilized by grazing
- incorporating the use of climate and pasture growth forecasting
- assessing the extent of non-domestic grazing pressure and adjusting carrying capacity accordingly

- making allowance for the difference in palatability of pasture species, the changes that occur through-out the year and the selection preference for these species by animals
- considering the lesser pasture constituents, which at times make up the highest proportion in the diet and make a significant contribution to animal productivity
- adjustments relative to the quantities of pasture livestock eat in relation to physiological state, size and pasture greenness
- and a mechanism to budget for pasture for more than 1 year, which as a safety factor to allow for future drought and hence reduce risk.

Description of product. *GrazeOn* is produced in software and printed format. It allows pastoralists to estimate the capability of their pastures to run animals for periods up to 2 years, but more commonly from the end of each growing season for 12 months. The user is required to provide details on

- paddock size and the proportion not utilized by domestic animals
- the estimated population of kangaroos on the property pasture biomass which is assessed by comparing photo standards with biomass in the paddocks
- pasture condition which is assessed by measuring the frequency of mitchell grass at permanent
- the grazing time in which all available pasture either disappears or is consumed by animals.

GrazeOn then calculates the number and stocking rate for each class of animal.

In order to mix animal type and class together in the same paddock *GrazeOn* uses the concept of a pasture Utilization Index. The user enters the number of animals of the type that will run in that paddock until the Utilization Index equals zero (forage demand equals forage supply).

GrazeOn then identifies the extent to which that paddock is under or overstocked by comparing the *GrazeOn* estimate to the number of animals presently in the paddock, which is entered by the user.

The process is completed for each paddock on the property and once completed *GrazeOn* then makes a stocking recommendation for each paddock and the property as a whole.

RESULTS AND DISCUSSION

Benefits to industry. *GrazeOn* is produced in software and printed format. Users without computers are guided through a series of calculations which estimate the grazing capacity of a paddock.. The package is applicable to some 500 pastoralists on the mitchell grasslands, an area occupying nearly 20% of Queensland and running some 6M adult Merino sheep. As a result of implementing *GrazeOn* it is likely that during dry seasons or when pasture condition is poor the mitchell grasslands will have lower domestic animal numbers producing higher per head productivity and production (\$3.9M). Alternatively during good seasons or when pastures are in good condition animal numbers are likely to be higher resulting in higher production (\$6.2M). Furthermore, *GrazeOn* should enable pastoralists to restore pasture condition and maintain it in good condition. This would reduce the need to supplement animals and

therefore reduce the cost of maintaining animal production during nutritional droughts (\$5.8M). Pasture in good condition also reduces the extent to which destocking is necessary during drought which reduces the cost of restocking post-drought (\$4.8M). At the property level *GrazeOn* provides the potential to increase income, particularly during good seasons.

Application and evaluation. *GrazeOn* has been developed for the mitchell grasslands although the principles from which it is based are applicable to most grassland systems. It is a tactical management tool developed for a climate with highly variable rainfall with defined, but usually short, periods of pasture growth. Therefore, it has the potential to be developed for grasslands worldwide. Evaluation of *GrazeOn* among pastoralists indicates that it is both practical and progressive and addresses some important issues in the mitchell grasslands. These issues include monitoring of pastures, total grazing pressure, preparing for drought, feed budgeting and the maintenance of useful records.

References

Tothill, J.C. and C. Gillies (1992). The pasture lands of northern Australia, their condition, productivity and sustainability. Tropical Grasslands Society Inc, Brisbane.