

GPS livestock tracking: a pasture utilisation monitor for the grazing industry

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Abstract: *This study reveals the potential for GPS tracking in the grazing industry. By monitoring the locations and movement of livestock, times of peak grazing activity can be identified and these can in turn produce maps of preferred grazing areas. Eventually these data may be used to produce maps of pasture utilisation and provide site specific fertiliser recommendations for the grazing industry.*

Keywords: *GPS livestock tracking, precision pastures, site specific management, pasture utilisation*

Introduction

Yield monitors linked with GPS have revolutionised the grains industry and been one of the key drivers behind the adoption of site specific land management. We suggest that GPS tracking of livestock can provide graziers with data which, when fully developed, may enable them to understand spatial variability in pasture utilisation by their livestock and potentially implement site specific management to account for nutrient removal and redistribution. This paper reports on an initial trial established to examine the potential of a GPS tracking system developed at the University of New England for determining the spatial variability in resource utilisation of pastures.

Methods

The trial site was located at 'Newstead', a property 40 km east of Inverell on the Northern Tablelands of New South Wales. The paddock consisted of gently undulating hills predominantly sown to tall fescue (*Festuca arundinacea* var Fletcher) with several gullies and isolated timbered areas dominated by native grass species. GPS tracking collars (UNTracker) were deployed on six steers in a herd of 220 for a period of 10 days during February and March of 2008. The location of the six animals was logged every five minutes. The positional data collected was analysed in ARC GIS (ESRI, California) to produce diurnal activity

graphs to identify the times of peak grazing, and then mapped as a livestock hours index (hours of grazing/animal unit/hectare/day) on a fifty metre grid.

Results and Discussion

The diurnal activity of the selected steers was found to be similar to that in many other studies (Trotter & Lamb 2008, Tompkins *et al.* 2006) with activity peaking at >250 metres per hour at two distinct times, one from 5 to 7 am the other from 1 pm to 6 pm. Observational studies have reported these times to correlate with peak grazing activity (Roath & Krueger 1982) and therefore it is likely that these periods of activity also represent the peak time of grazing activity for the steers. By distinguishing the locations at which the steers were logged during the peak grazing times a map revealing the preferred grazing areas can be developed (Figure 1).

This map reveals the preference for the steers to graze gully areas, avoiding the higher elevations in the north-eastern and north-western areas of the paddock. This most likely reflects the green feed found in the gullies during the dry seasonal conditions experienced at the time of this trial. We believe that by correlating these data with spatial variability in pasture biomass, soil nutrient analysis and an understanding of the nutrient redistribution by livestock it may be possible for site specific recommendations

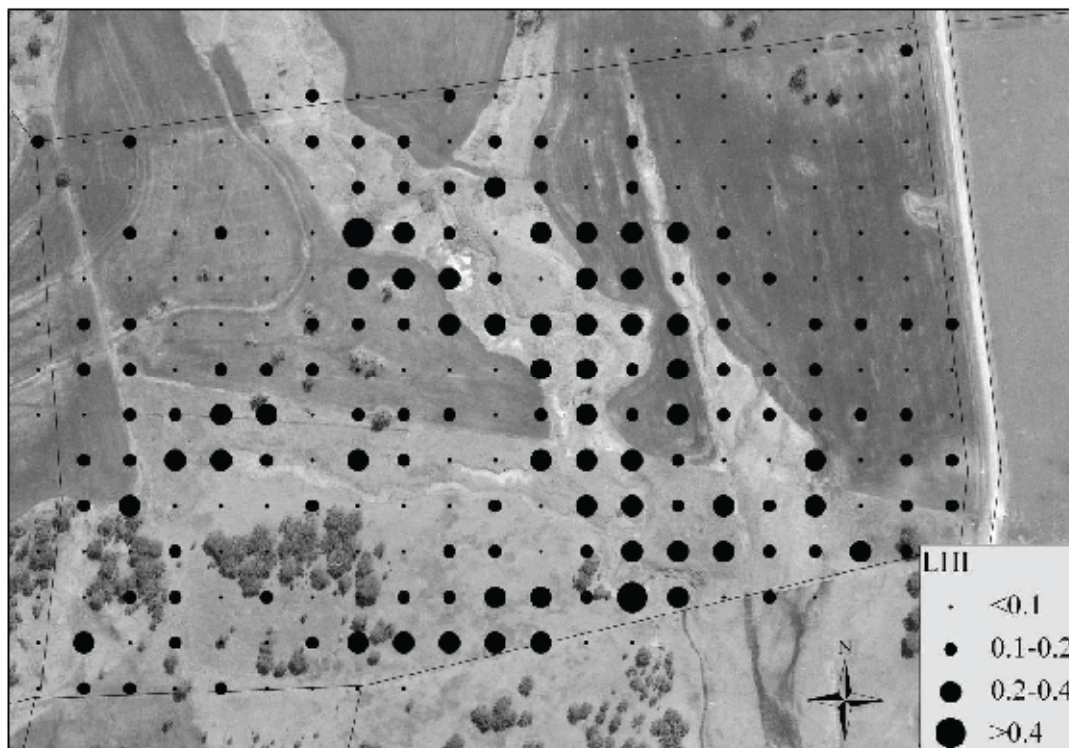


Figure 1. Spatial variation in paddock used by steers during peak grazing times (5 am-7 am and 1 pm-6 pm) expressed as a Livestock Hours Index on a 50 metre grid.

for fertilisers and targeted fencing strategies to be developed for the grazing industry leading to increase pasture production and utilisation.

Conclusions

GPS tracking devices can be successfully deployed to identify and quantify the spatial grazing patterns of livestock and there is potential for the development of site specific management strategies using this information. Further research is required to quantify the correlations of movement data with grazing activity and spatial variation in nutrient redistribution, pasture biomass and pasture quality.

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