Can Pastures from Space™ Accurately Predict Pasture Growth Rate in Eastern Australia?

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The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

Can pastures from Space™ accurately predict pasture growth rate in eastern Australia ?

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Key words : Pastures from Space™ , satellite , pasture growth rate

Introduction Pastures from Space™ provides a commercial service delivering weekly satellite-derived pasture growth rate (PGR , kg dry matter/hectare .day) data at a paddock scale to farmers across southern Australia . PGR has a number of on-farm applications , including aiding decisions on grazing management , feed budgeting and tactical application of fertiliser , benchmarking pasture performance and strategic farm planning . The service , developed and commercialised in Western Australia for annual-based pastures , has been taken up by farmers in that state who have since demonstrated increases in productivity and profitability for their grazing enterprises (Gherardi *et al* ., 2005) . There has also been keen interest in the technology in eastern Australia , however uptake has been limited due to the PGR predictions not having been validated for these regions . This project was therefore testing the accuracy of the satellite-derived PGR for South Australian soil and pasture conditions as the initial steps in validating the technology for eastern Australia .

Materials and methods Pastures from Space™ PGR is calculated from satellite-derived normalised difference vegetation index (NDVI) to derive the fraction of absorbed photosynthetic active radiation , intersected with climate (rainfall and solar radiation) , temperature index and soil (water holding capacity) data . Thirty-three paddocks across 13 farms , spread from Karoonda to Mt Gambier in the South East of South Australia were selected as validation sites to provide a range of soil types (clay , loam , sand) and predominant pasture types (annual vs perennial pastures) , however data from only 2 farms (Figure 1) are presented . From the break of the season in April 2007 , feed on offer (kg dry matter .ha) was measured by calibrated visual assessment at monthly intervals at up to seven 1m x 1m exclusion cages geo-located across each paddock and used to calculate PGR for each cage site and provide a paddock average PGR . Satellite-derived PGR's were predicted for each paddock and compared to the paddock-measured values .

Results and discussion Satellite-predicted PGR's for annual pastures (predominantly medic and annual grasses) at the Karoonda site generally relahe Karoonda site generally related well to the paddock values (Figure 2) . In contrast , the satellite-predicted PGR's at the Lucindale site , 150km north of Mt Gambier (Figure 3) , generally underestimated PGR relative to the paddock values , with the perennial grass (*Phalaris aquatica)*-dominant pasture being underestimated to a greater extent .

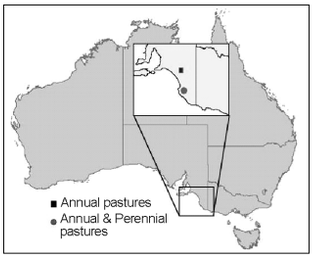

Figure 1 *Location of 2 of the test properties in the south east of South Australia (Karoonda and Lucindale) .*

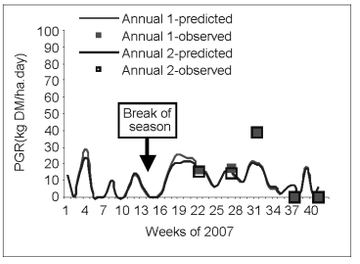

Figure 2 *Observed and model predicted PGR (uncorrected for soil type) for annual pastures at Karoonda .*

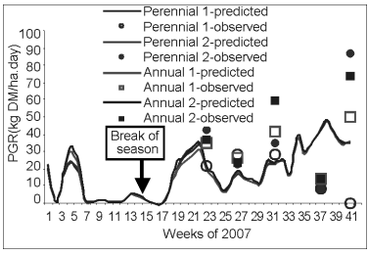

Figure 3 *Observed and model predicted PGR (uncorrected for soil type) for annual and perennial pastures at Lucindale .*

Conclusions Based on this limited dataset , there was a stronger relationship between satellite-predicted and paddock-measured PGR values for annual compared to perennial pastures . The relative contribution of pasture species and/or soil type to the poorer relationship for perennials is not currently known , however the importance of these factors will be clarified as further data is collected and analysed from this project . Appropriate modifications to the PGR model will be undertaken if required to accommodate the different pasture species , soil types and climatic characteristics encountered in south eastern South Australia , resulting in a more robust PGR model for eastern Australia .

Acknowledgement Funding for this work was provided by Australian Wool Innovation Limited and Meat & Livestock Australia .

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