

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

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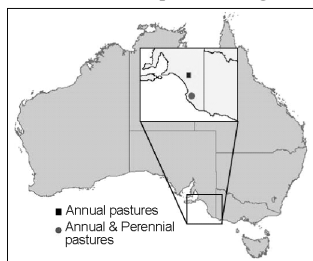
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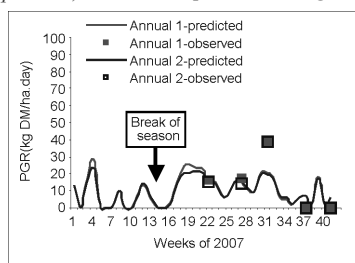
**Introduction** Pastures from Space™ provides a commercial service delivering weekly satellite-derived pasture growth rate (PGR, kg dry matter/hectare.day) data at a paddock scale to farmers across southern Australia. PGR has a number of on-farm applications, including aiding decisions on grazing management, 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.

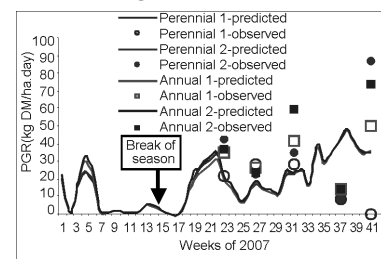
**Results and discussion** Satellite-predicted PGR's for annual pastures (predominantly medic and annual grasses) at the Karoonda site generally relate Karoonda site generally related well to the paddock values (Figure 2). In contrast, the satellite-predicted PGR's at the Lucindale site, 150km north 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.

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### References

Gherardi, S.G., Anderton, L., Sneddon, J., Oldham, C. & G. Mata (2005). Pastures from Space-Application of satellite-derived pasture predictions improve the profitability of Australian producers. In: *Proceedings of the XXth International Grassland Congress* (Grassland: a global resource), Dublin, Ireland. p. 859.