

# **Australian grain farms step up... to take the next big leap Using High Resolution Satellite imagery for dryland crop production**

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**Current farming practice in Australia is gaining momentum into a new age of ‘spatial information rich agriculture’. Researchers and farmers are beginning to understand and manage the spatial variability that exists across fields and farms.**

Access to a range of spatial tools including proximal production sensors (grain yield monitors), electromagnetic induction (EM), RTK GPS, and multispectral imagery has paved the way to discover how management and environment interact to drive the modern farming system. Although many of these tools are not new, their wider application to Australian farms is; particularly the way in which the spatial data is interrogated.

High resolution multispectral imagery using airborne and space borne platforms have been used in a study commissioned by the Grains Research and Development Corporation (GRDC) as part of the strategic initiative on ‘Precision Agriculture’. In 2003, 2m pixel airborne imagery was captured on eight paddocks throughout Australia. Various vegetation indices and band combinations were used to analyse the data. Other layers of spatial information such as topography, grain yield and EM were analysed in combination with the imagery using a GIS.

The 2003 results showed that high resolution imagery has greater potential than its coarser resolution cousins (such as Landsat) to detect and begin to understand variability within crops. The 2003 aerial imagery demonstrated that crop variation in fields was as much a result of human management as other variations such as soils and topography. This implies that better farm management alone will considerably reduce paddock variability. When coarser resolutions of spatial data such as yield monitors were used, this crop variation appeared to be less obvious.

Although the benefits of the aerial imagery were apparent, concerns of timeliness, availability and cost became evident. IKONOS satellite imagery is now being examined as a more suitable form of image capture for broad acre grain farms. This paper aims to further examine the results from imagery capture (its uses and problems), how can the information be used to make better decisions, and the use of IKONOS satellite imagery as an alternative to airborne platforms for collection of high resolution imagery.

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