



Irrigating from space

- satellite and SMS irrigation scheduling service

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IN A NUTSHELL

- A state of the art system using the latest in satellite and SMS technology is being used to provide irrigators with 'simple to understand' irrigation scheduling information
- Satellite images are used to measure crop growth and a subsequent crop coefficient, which can then be used with data from on-ground weather stations to determine the crop's water needs
- This information is distilled into simple to understand SMS text messages that are sent to irrigators on their mobile phones indicating how long they should run their drip system for to replace lost water

Increasing water shortages and low allocations have seen some dramatic changes in the way irrigation water is managed throughout Australia in the last five years.

Increasing water use efficiency through improving the timing and application of irrigations can potentially save large amounts of water. However, recent ABS statistics show that currently only 20% of irrigators use some form of quantifiable approach (ie soil moisture monitoring, weather based scheduling) for deciding when and how much water they apply.

Some of the reasons for such low uptake relate to the cost of some approaches, either in time or money, or the complexity of using the approach. As part of a CRC for Irrigation Futures project an irrigation scheduling system is being developed that delivers low cost, site specific irrigation scheduling information direct to irrigators in a format they can understand and make a decision on.

Trials were undertaken with wine grape drip irrigators in the MIA during the 2007–08 irrigation season and response from users was very positive.

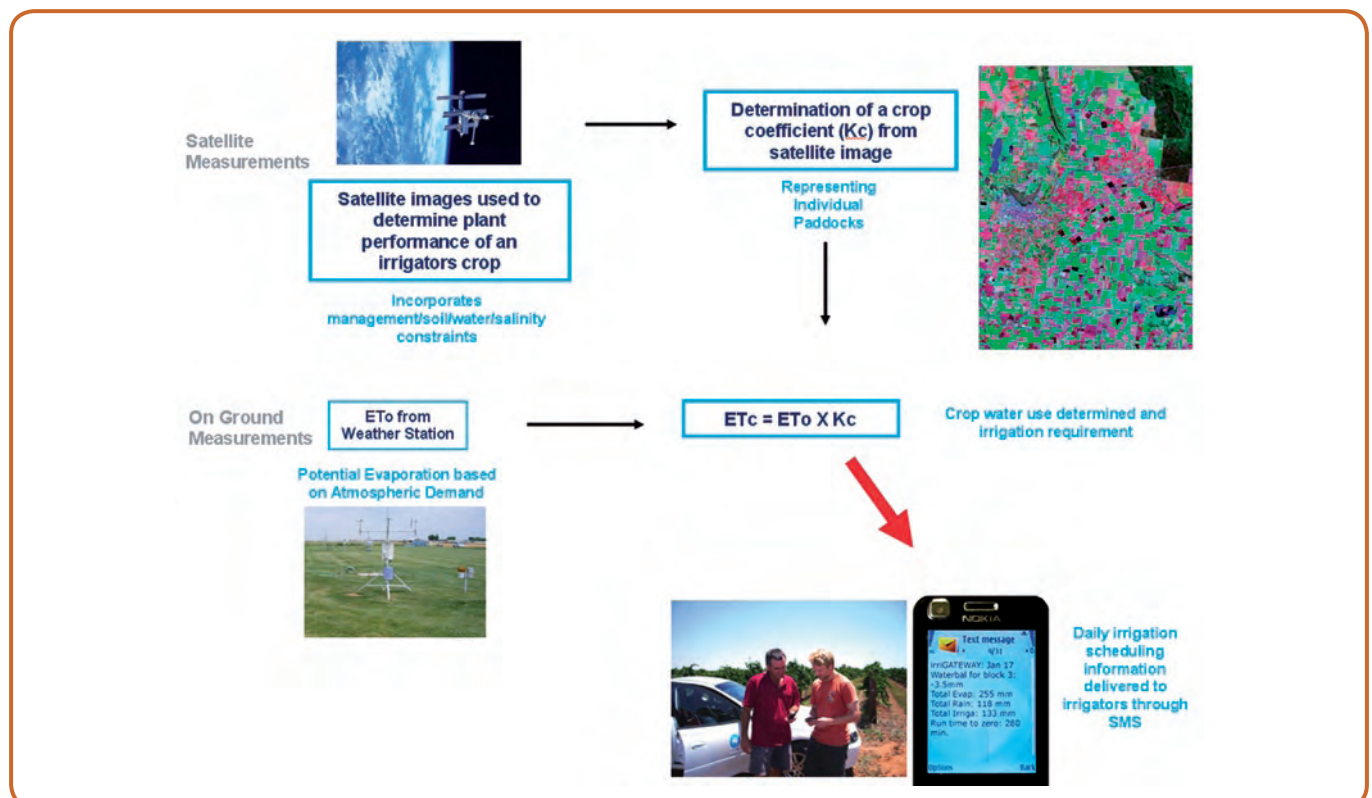


Figure 1. Processes and flow of information in the Satellite and SMS Irrigation Scheduling Service



How it works

Satellite images are used to determine crop coefficients for an individual crop. Satellite images are collected across Australia every 14–20 days. From these images plant canopy size can be determined, which can be used to derive a specific crop coefficient for the crop. This information is then combined with data from on-ground weather stations (such as the CSIRO Hanwood weather station) to determine crop water use.

The on-ground weather stations measure sunlight hours and intensity, cloud cover, rainfall and wind which are all used to calculate a potential water loss in the past 24 hours. This information when combined with the satellite-determined crop coefficient for your crop allows an actual water use figure to be calculated. At the start of the season the drip or sprinkler application rates of an irrigation system are measured and this information is stored on a central computer by the system. Computer technology analyses all this data and sends a short message about irrigation for the crop to a mobile phone. The message contains rainfall and irrigation water use applied so far throughout the season for the crop and also a pump or dripper run time to bring the system back to a refill point. So on a daily basis an irrigator receives a simple SMS text message that gives suggested pump run times, on which they can easily make an irrigation decision (Figure 1).

Try a demonstration now!

A demonstration SMS can be sent directly to your mobile simply by following the instructions in Figure 2. The system will send you back an SMS message containing an example message with irrigation scheduling information for grapevines to demonstrate the information provided and format.


Future plans

So far the system has been trialled over the last irrigation season with 30 wine grape growers using drip irrigation in the MIA. Responses from users have been positive. The system will undergo further trials and refinement with grape growers during the 2008–09 irrigation season and the researchers are actively looking for future opportunities to extend the work into other crops. The system and approach is easily adaptable to any drip or sprinkler irrigated crop which has a controlled application of irrigation water.



Figure 2. Send a text message 'demo run times' to 0416 905 013 to receive a demonstration SMS provided by the service

The addition of 7-day weather forecasts is also being investigated to extend the utility of the service and also incorporating water ordering functionality into the service.

Any horticultural irrigators interested in being involved in next year's trials should contact the authors. 

Acknowledgements

The authors would like to acknowledge the funding provided through the Grape and Wine Research and Development Corporation's (GWRDC) 'Soil and Water Initiative' program and the CRC for Irrigation Futures' 'Toolkits for Improved Profitability and Longevity' project for this work to be undertaken.

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