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Australian Government
Department of Agriculture and Water Resources

Rural Research and Development for Profit
Keeping Australian farmers at the cutting edge

# Smarter Irrigation for Profit
# WA Demonstration Activity Summary, Summer 2017

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## Project Overview

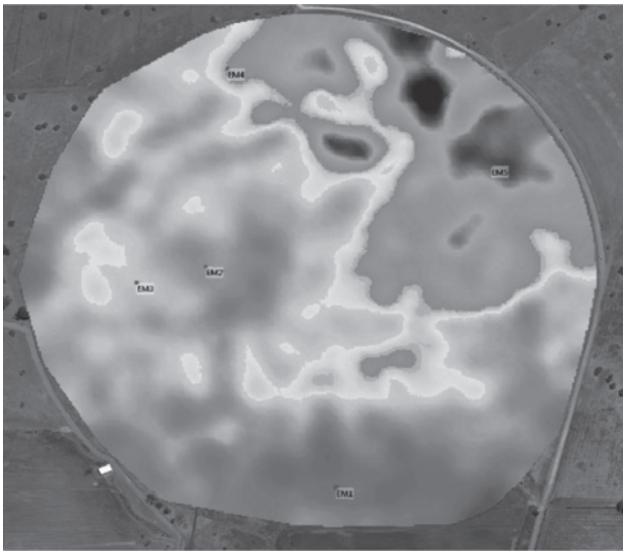
The Smarter Irrigation for Profit project is a partnership between the major irrigation industries of cotton, dairy, rice and sugar. It will target 3000 irrigators to improve their individual enterprise profit by $20,000-40,000 per annum. The project has 10 key activities, four industries, 16 R&D partners, and 19 farmer managed learning sites across five states.

The expected outcomes are:

- 10-20 percent improvement in water productivity, efficiency and farmer profitability
- Adoption of new irrigation technologies and science application by farmers and irrigation professionals to improve farm profits.
- Improved cross sector industry research collaboration with public and private sectors in four major irrigation industries providing a legacy platform for other sectors to also benefit.

## WA Demonstration Site Activities

## EM 38 & Gamma Radio-metrics Survey



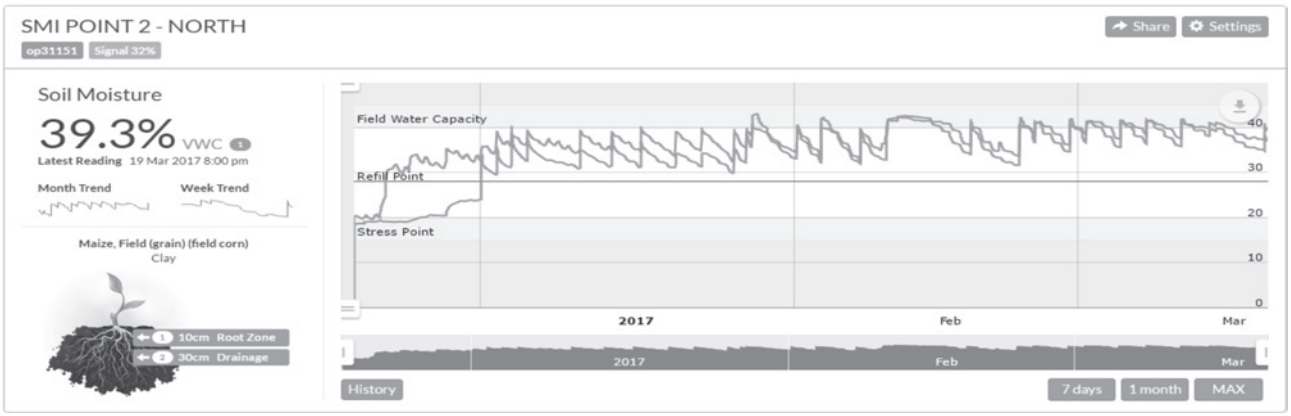
This purpose of this survey is to gain a greater understanding of soil characteristics, particularly plant available water content, and saturated hydraulic conductivity. These characteristics help to inform irrigation scheduling and application rates. A greater plant available water content indicates a potential to extend the interval between irrigation events without risk of stressing the crop, while the hydraulic conductivity informs us how much water can be applied without risk of causing runoff, which may result in surface water loss and/or erosion. Where significant differences in plant available water content are apparent, variable rate irrigation may be worth considering if the irrigation infrastructure allows.

The blue/green areas above represent areas of higher EC (up to 0.5 dS/m) while the orange / red areas indicate lower EC values (~0.1 dS/m). Soil type varies from Sandy Clay Loam at the red in the bottom of the picture, to clay loam in the blue in the top right corner.

## Moisture Sensors

There are many types of soil moisture sensors available on the market these days. "Wildeye" dual depth sensors, with telemetry so that data could be viewed online have been installed at this site. More sophisticated soil moisture sensors are available (eg capacitance probes) that can measure moisture at depths to over 1m in 10cm increments and also collect other data such as soil temperature and EC. We chose to use the Wildeye sensors as they are simple to install, lower cost to set up, are replaced with new units at the end of the battery life and offered good after sales service.

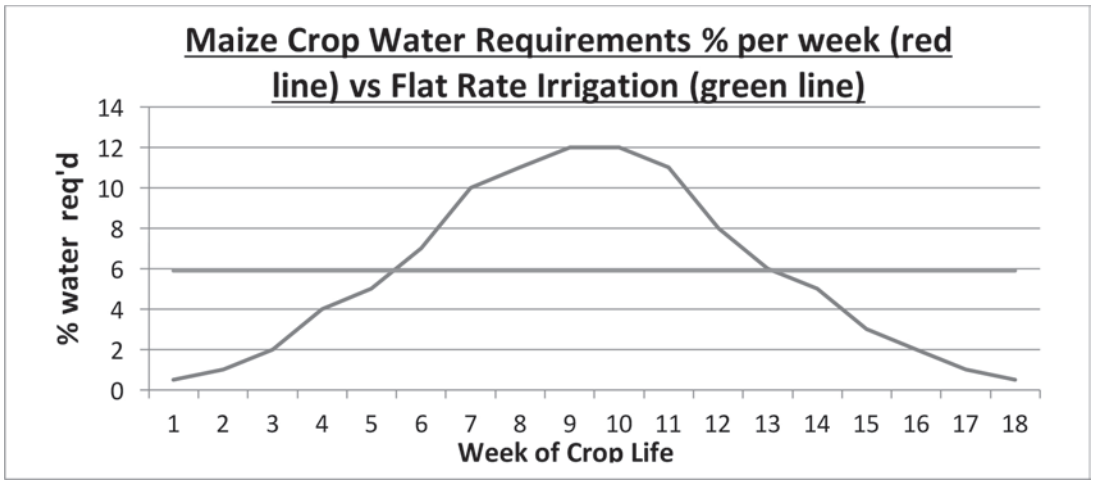
The graph below shows the soil moisture content at one of the monitoring sites. This site shows that the soil moisture content on this soil type is near field capacity (top of white shaded area) and soil moisture remains above the refill point (blue line). By utilising this information we can inform irrigation decisions, changing the irrigation interval based on soil relative soil moisture supply.




## Scheduling

Irrigation scheduling should take into account many soil, crop and environmental factors. At Giumellis' this season, irrigation applications have been adjusted to meet the Maize crops requirement, which changes throughout the season based on crop growth stage.

The graph below demonstrates the difference in irrigation required to meet the demands of the Maize crop based on age / crop stage (red line), displayed as a % of total water requirements. The green line simply shows the total crop water requirement applied as an even amount daily over the life of the crop.




Where a strategy of flat rate irrigation was a adopted, over watering of the crop would occur in weeks 1-5, and again in weeks 14-18, while the crop may be limited for moisture in weeks 6-13 which are critical in setting the crop yield potential.

For further information or project progress updates, contact:
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