

Optimising cropping management in Dairy Systems using improved data collection

Update: Soil Moisture Monitoring in the Southern Riverina

March 2019

Farmers are thirsty for reliable and relevant information. As the dairy industry has experienced significant challenges in recent years such as high water prices, milk production and low prices, it is clear that farmers are keen to optimise efficiencies. Well-informed irrigation scheduling, understanding efficiencies of irrigation management across different soil types and impacts on production are key drivers of success and essential information for farmer's to make decisions during the growing seasons.

The integration of soil monitoring systems and decision support tools to optimise cropping management in everyday dairy production system is yet to be fully exploited, including their ability to help schedule irrigations to minimise plant stress and the economic losses. To fully understand and appreciate the use of soil moisture technology to help drive on farm decisions, a collaborative project focusing on this technology with Murray Local Land Services and Murray Dairy is currently underway. Three soil moisture probes have been installed across three separate sites, each operating under different management within the Riverina region.

The project will explore the ability of each probe to collect data and show advancement of water through the soil profile to assist in demonstrating the impact of soil constraints on production, as well as how soil moisture monitoring can assist the efficiency of irrigation management across different soil and plant types. The C capacitance probe will be compared with irrometer, tensiometers and watermark sensors (electrical resistance granular matrix sensor), used to measure soil water tension and soil water status. This will help understand the advantages and disadvantages of using each technology and their ability to measure soil moisture increments (usually 10cm) down the soil profile to depth of 0.8 cm to 1.2cm, for local soil conditions. Although many advantages exists with such technology, moisture monitoring should not replace the farmer's intuitive estimates of when to water, rather encourage verifying soil moisture data with field inspections to increase confidence in the technology.

To help make sound management decisions, it is important to understand the soil, water and plant interactions. A series of extension events will be held over the coming months to demonstrate ways farmers can recognise and understand the relationships between soil, water and plant interactions. Topics to be covered will include soil constraints and the impact on crop growth and irrigation management, the importance of moisture monitoring and movement of water through the soil profile and irrigation scheduling for optimal management. Extension activities will also provide opportunities to visually understand the soil profile. Soil pits, in conjunction with soil tests and soil moisture data, will enable farmers to see what goes on beneath the surface and provide the basis for discussion around management options, in particular highlighting soil moisture content over time at different depths in the soil profile.

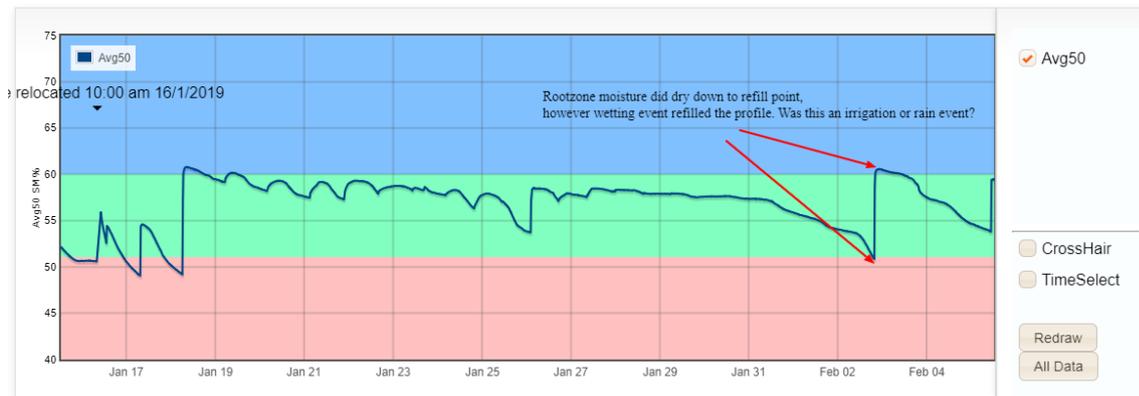


C capacitance - soil moisture probes installed in the Riverina region.

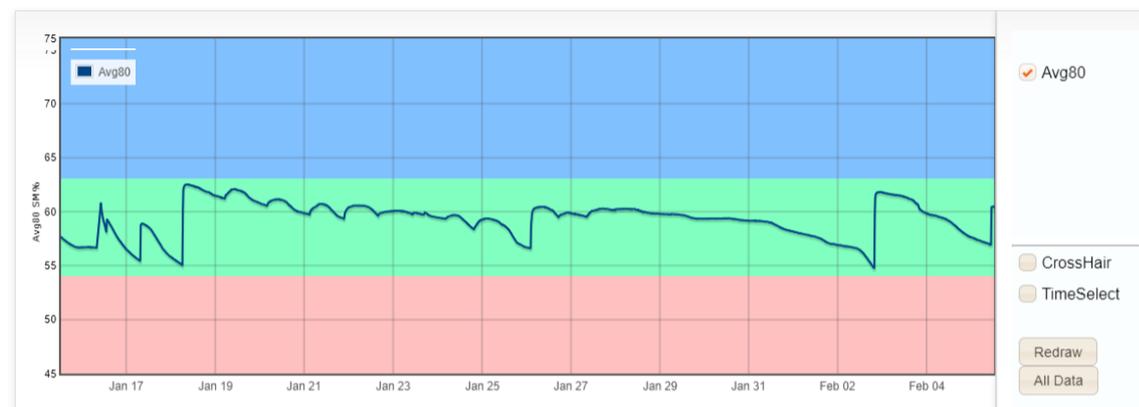
Example of C capacitance Soil Moisture Probe data – separate level and root zone moisture



Average soil moisture 0 - 50 cm



Average soil moisture 0 - 80 cm



Soil moisture