

MEET YOUR COTTON RESEARCHER

Associate Professor Wendy Quayle, Deakin University

PROFILE

APRIL 2024

RESEARCH AREA

Soils, Nutrition & Irrigation

CRDC Research Project
Optimising irrigation performance in bankless channel cotton layouts to improve water management and nitrogen use efficiency

WHAT'S YOUR BACKGROUND?

I am youngest of 6 children, originally from a farming background in Northern England, UK. I completed a PhD at the University of Newcastle Upon Tyne that investigated the measurement and transformation of organic nitrogen compounds in freshwater aquatic environments. In 2001, following a post doc at the British Antarctic Survey, Cambridge, CSIRO brought me to Griffith, NSW working with the rice industry to determine the fate, degradation, risk assessment of herbicides in soils and floodwaters.



HOW DID YOU END UP IN COTTON RESEARCH?

With the increase in cotton production in southern NSW, around 2014, while at CSIRO Griffith I interacted with CRDC, Federal government and other stakeholders to develop research projects that better define the benefit of animal manure applications for cotton production and the potential to offset N and P mineral fertilisers.



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WHAT EXCITES YOU ABOUT WORKING IN THE COTTON INDUSTRY?

It is a successful and vibrant industry that is progressive in its approach to linking fundamental and applied research allowing opportunity to make a difference at the on-farm level as well as having significant global market exposure. I enjoy undertaking research on commercial farms to try to understand how my research might provide solutions for farmers to improve productivity and environmental sustainability.

EXPLAIN YOUR CURRENT RESEARCH AND HOW IT WILL BENEFIT GROWERS?

My current project, 'Optimising irrigation performance in bankless channel cotton layouts to improve water management and NUE' involves the integrated characterisation of water and nitrogen dynamics in bankless channel cotton systems to inform best practise when using newer irrigation and sensing technologies. It will demonstrate and inform on the movement of water and nitrogen in bankless channel systems according to design, farm irrigation infrastructure, nitrogen application methods and soil characteristics.

HOW WILL IT BENEFIT THE INDUSTRY?

Through further definition of water and nitrogen use efficiency in modern irrigation systems and nitrogen fertilizer methods and products.

WHAT ARE YOUR KEY FINDINGS TO DATE?

Findings are still at the initial stage but recent findings include:

- Careful measurement has indicated irrigation application has been identified as being as high as 0.69 ML/ha for a single irrigation with high irrigation performance - only 11% of total application may occur as run off in tightly run systems and this is typically deposited into recycle systems.
- N soil uniformity seems to occur when urea is broadcast but differences have been observed with water run urea with higher concentrations towards the bankless channel end in a reverse grade system. Although, further data is needed to corroborate this.
- There is evidence of nitrogen leaching below 60 cm in the soil profile of a southern transitional red brown earth. The quantum of this is yet to be determined.

For further information:

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