

MEET YOUR COTTON RESEARCHER

Gerardo Andres Torres Casierra, PhD. Student
Deakin University

PROFILE

MAY 2024

RESEARCH AREA

Water & Nitrogen Use Efficiency

CRDC Research Project
Operating bankless channel irrigation systems for water and nitrogen use efficiency in cotton production

WHAT'S YOUR BACKGROUND?

I was working in the sugar cane Industry in Colombia for the last six years as irrigation engineer, in a private Mill company. There, I mainly participated in project management of drip and pivot irrigation systems. I was able to supervise the installation of seven pivot machines to water near 750 ha of sugar cane.

Also, I managed the field operations of those two systems, irrigation scheduling and fertilization. For the first one I used tension sensors and water balance to set the amount of water to be applied to the crop for coming irrigations events. For the second one, I used sugar cane nutrient uptake graphs of Nitrogen, Potassium and Phosphorus to recommend the dose to be applied to the crop according to its stage of growth. Nutrition was applied throughout these irrigation systems over the crop growing season. In addition, I assessed uniformity and water use efficiency of those systems by doing field measurements according to the standards.



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HOW DID YOU END UP IN COTTON RESEARCH?

I always was interested in undertaking a PhD and I wanted to explore more about flooding irrigation in dry environments. I started to search different universities in Australia and I found published some of the projects developed by Professor John Hornbuckle at Deakin University. Coincidentally there was a project on cotton regarding the water and nitrogen use efficiency in Bankless Channels systems lead by Professor Wendy Quayle and I just applied for the scholarship which I was granted.

WHAT EXCITES YOU ABOUT THE COTTON INDUSTRY?

The cotton industry has many challenges and one of them is to improve water use efficiency. The shortage of labour and restrictions on water available for watering are two issues that need to be solved from research point of view to support the industry as well as the cotton growers. Implementing more efficient irrigation systems, as bankless channel, and prove in the field their benefits truly excite me as well as assessing nitrogen use when applied to the crop.

WHAT DOES YOUR CURRENT PROJECT WORK INVOLVE AND WHAT WILL BE THE OUTCOMES?

My PhD project is investigating the interaction between bankless channel irrigation and nitrogen management for better information on water and nitrogen use efficiency factors in these relatively new and increasingly commercially implemented systems. Using technology as much as possible, I am aiming to make precise measurements of water and nitrogen balance (application, evapotranspiration, run-off and deep drainage) in different bankless channel layout designs and relate to two different nitrogen application systems (water run vs broadcast).

To achieve these objectives, I am considering the whole crop system: water, soil and plant. The expected outcome will be to deliver to the cotton industry detail of water and nitrogen use efficiency for bankless channel systems with contrasting design and nitrogen application methods. The information may assist in improved water and nitrogen management in automated system. It may also be used more generally to better understand any differences in the use of water and nitrogen inputs in bankless channel systems compared with conventional syphon irrigated systems for sustainability measures.

For further information:

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