Improving irrigation resilience by transforming water and energy management

Relevant Hub Outcome

ST2: Co-design and participatory approaches embedded in the design and delivery of Hub activities
ST5: Efficient and effective activities to support RDEA&C and uptake by end users
HS2: Transformational Agricultural Systems (Decision Making; Finance Partnerships; Adoption Pathways)
MT2: Increased adoption and commercialisation of drought resilience technologies and practices
MT3: Technologies and practices adopted are effective in improving drought resilience

Impact Statement

The TNQ Drought Hub is scaling up the successful Burdekin Irrigation Project (BIP) in trial into the Atherton Tablelands to highlight the importance of data-driven irrigation practices in the face of increasing climate variability. The integrated platform will reduce costs associated with water and energy to increase profitability.

Background

This trial is based on a highly successful program in the Burdekin sugar industry, where 7000 hectares of sugar have been transferred from manual irrigation to automated toolkit irrigation. This trial aims to transfer learnings from the Burdekin to the Atherton Tablelands to better prepare the regions industry for future drought. The trial trials climate smart Ag-Tech to improve energy and water efficiency in sugar cane and other crops by using a suite of technologies.

Operations

To date a trial site has been established and an automation plan approved by the farmer. The trial site, Dimbulah on the Atherton tablelands, is approx. 100km southwest of Cairns and 40km west of Mareeba and primarily grows sugarcane and other horticulture crops. The automation hardware, consisting of radio base station and computer, internet for remote access, field radios, actuators & brackets, and sensors have been installed. Training on the use of IrrigWeb, the Farm-in-One platform and the automation system with the farmer is on-going. This integrated toolkit is designed to increase productivity through energy and water savings on irrigation. The technologies include automation hardware, a crop modelling simulation, review of energy usage and a programming interface on a singular user platform. The platform is a local AgTech product produced by a company based on the Atherton Tablelands in Far North Queensland. The company specialises in irrigation/fertigation and automation control, monitoring, and irrigation agronomy.


LEFT: Base station and computer for the WiSA radio network and Farm in ONE platform. RIGHT: Radio field module controlling 2 valves delivering water to 2 irrigation sets.

Issues being addressed

This trial assists in establishing an irrigation baseline -most farmers lack precise information on how much water they are applying, at what cost and at what crop requirement. With this technology, these parameters are quantified and recorded so that along with yield and profitability information, farmers are supported in making data driven decisions. By reducing costs associated with water and electricity as well as labour time in manually changing irrigation profitability can be increased. The toolkit could redefine water management practices across multiple crop types, contributing to long-term drought resilience and productivity growth for agricultural communities

Impacts and benefits

The value of the integrated toolkit being trialled is that rather than offering just one technology, a suite of smart technologies is integrated into a single platform that enables the producer/grower to collect, analyse, action and report their farm data in one platform. The toolkit shows quantifiable information in saving per megalitre and enables farmers to look at what risks surround decision making in managing their farms e.g. in balancing costs in energy, water and time. The integrated nature of the toolkit has reduced adoption fatigue as instead of a series of induvial pieces of technology that need to be adopted and integrated on farm, the single platform offers multiple benefits on one platform. The benefits of this trial have also been in social well-being, by reducing the time spent a farmer can use automation rather than manually going out to turn off a pump at "family time".

Based on a previously successful trial in the Burdekin region, the project has been successful at transitioning farmers from manual irrigation to the toolkit. As a result, 7000 hectares of sugarcane cropping have been transitioned. It is expected that this trial has the capacity to create a similar legacy in the Atherton Tablelands. The previous experience in the Burdekin trial is that this technology will continue to be used even after the trial has officially ended, meaning long term benefits for farm management.

Feedback

Salvetti Farming farm manager Jason Salvetti said *"I've always been interested in technology and computers, and we started off with some basic systems like weather stations and soil moisture probes, and then the next step was to try and start some automation processes on the farm. Our home farm is about a 20-minute drive from here, and on the flood irrigation systems, we would come out here anytime between two and three times a day. The advantage of this technology is that it will basically do those trips for us, in that it will change the irrigation valving required to move to the next irrigation set by itself, without anyone having to be around to do it."*

Left: TNQ Drought Hub Director David Phelps and Farm Manager Jason Salvetti. Right: Burdekin trial site demonstration

Learnings

The difficulties associated with technology are amplified in north Queensland where challenges due to weather (such as very high frequency of rainfall) make farm access difficult. There is also low availability of skilled people such as electricians to perform initial work. This means timelines in the startup trial phase can be significantly impacted.

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