SISCOweb – Real Time Evaluation and Control of Furrow Irrigation

UNIVERSITY OF SOUTHERN QUEENSLAND

Centre for Agricultural Engineering

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Department of Agriculture, Water and the Environment

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CRDC COTTON RESEARCH AND DEVELOPMENT CORPORATION

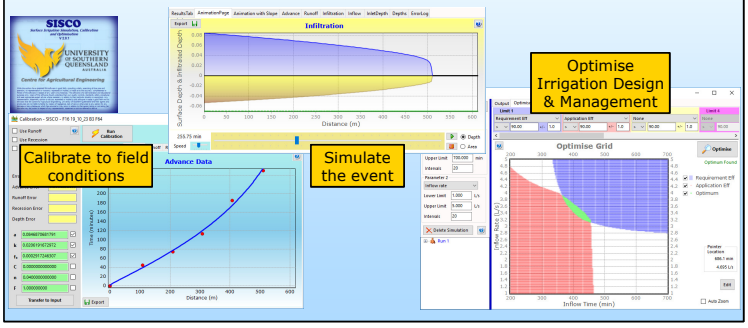
Sugar Research Australia

Background

Furrow irrigation is used extensively across the Australian cotton and sugar industries. The efficiency of furrow and other forms of surface irrigation can vary widely resulting in high levels of water wasteage if they are not well designed and managed. In the early 2000's USQ developed the IrriMATE™ system of measurement and evaluation which has been adopted across Australia and used internationally. The problem is that data collection and analysis are labour intensive and evaluations only occur after the event is finished so it is too late for the farmer to implement the recommendations.

SISCO

Surface **I**rrigation **S**imulation, **C**alibration and **O**ptimisation is a desktop PC based modelling tool used to evaluate performance of surface irrigation systems. SISCO can be used to optimise irrigation management and increase water use efficiency.



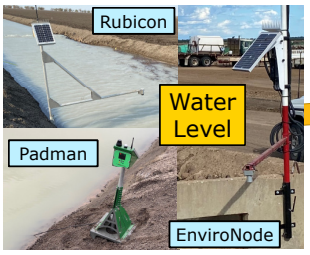
What has changed

- **Automation**– Commercial systems are available to control irrigation systems however most are simple "turn off now" sensors and do not monitor or respond to what is happening in the field.
- **Sensing and Telemetry** – We can now measure the soil & water and access this data quickly.
- **Cloud Computing** – Data can be analysed quickly and cheaply.
- **Drivers for efficiency** – Farmers are more aware of the benefits of using water more effectively.

SISCOweb – SISCO in the Cloud

SISCOweb initiates as soon as data is received from the field. It cleanses the data, calibrates itself to field conditions and identifies steps growers can take to achieve a "good" irrigation all within a matter of seconds. This occurs in a live fashion and is repeated if further data is available.

The system is useful for (A) manually operated irrigation systems, (B) automated irrigation and (C) service providers.



Inflow Rates

Water Advance

Water Advance Sensors

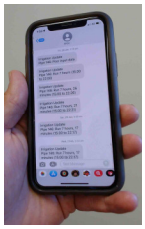
SISCOweb SERVER

Measurements

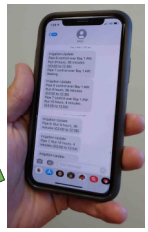
Irrigation Metrics

User C:
Service Provider
Agronomists, Irrigation scheme operators, Automation providers

User A:
SMS to farmer
Optimal shutoff time



User B:
SMS with response
Asks farmer to accept/decline new shut off time



Automation system
Pumps, valves and gates scheduled

SISCOweb & automated system control tested in 2021-2022 season on a commercial cotton field.

Benefits

- Labour reduction – Fewer visits to the field to check the irrigation
- Water efficiency – reducing water waste and improving productivity
- Transforms dumb automation systems into a smart adaptive automation systems
- Simplifies the complex task of collecting and analysing data
- Records useful metrics for the farmer to use at a later date.

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