



SRA eNewsletter 7th December 2018

Legume agronomy 101

Healthy soils are the foundation for growing a good crop of sugarcane. Soil biology is a pillar to productive healthy soils and can range from invisible bacteria to earthworms you can see. Soil microbes are responsible for converting organic material such as mill mud, cane trash and fallow crop residues or green manure into nutrients that are then available to the crop.

On 22 and 23 November, members of the Soil Health team hosted five Legume Agronomy 101 information sessions throughout the Herbert region. University of Queensland Soil Microbiologist, Dr Richard Brackin and SRA Senior Researcher, Davey Olsen discussed legumes, soil health and the impact of legumes on soil biology. The sessions were well attended with over 55 turning out to hear from our presenters.

Richard Hobbs and Lawrence Di Bella from Herbert Cane Productivity Services Limited (HCPSSL) elaborated on the what, when and how of planting legumes in the Herbert. They also brought along HCPSSL's bean planter that is available for growers to assist with planting a legume crop.

The team discussed how a legume fallow resulted in increased labile carbon, microbial biomass, fungal biomass and microbial enzyme activity which are all important for soil health. The boost in soil biology after a legume rotation is likely to be short lived (3-5 months) however it occurs during the crucial window of initial cane establishment and will reduce pathogen populations in the soil.

The SRA funded project called *Measuring soil health, setting benchmarks and driving practice change in the sugar industry* has three demonstration sites and 11 paired farms (22 sites) in the Herbert which were established in 2017 and 2018. The initial findings about the impact of fallow management on soil biology are that it is important and that the input of carbon matter results in huge improvements to the soil biology. Mixed species fallow seem to provide a longer benefit than a single species break crop. Wide row spacing also results in deeper rooting depth and so more roots per plant.

Four information sheets have been developed for these events and are available [here](#).

The SRA Soil Health Project of the Herbert and Burdekin regions is kindly supported by HCPSSL, Burdekin Productivity Services, Queensland Department of Agriculture and Fisheries, Wilmar, The University of Queensland and University of Southern Queensland.

Milling Matters Summer 2018

You can read the latest in milling research from SRA in our bi-annual magazine, Milling Matters, online. The magazine focus on research, development and adoption activities within Key Focus Area five (milling efficiency and technology) and Key Focus Area 6 (product diversification and value addition) within SRA's five year strategic plan.

Update on NESP Project: Improving water quality for the GBR by better managing irrigation in the sugarcane farming system

Saving sugarcane farmers time, reducing their energy and water costs, while improving the water quality leaving their farms is motivating a team of Burdekin farmers, researchers from James Cook University, a local agricultural consultant and the Burdekin Productivity Services (BPS) to develop and build smart technology.

Members of BPS have access to a web-based sugarcane crop model – called IrrigWeb – which links to meteorological data to allow improved irrigation scheduling by predicting crop water use.

The tool has proven valuable in assisting farmers in timing their irrigation events to maximise application efficiency and productivity. However, at present, IrrigWeb requires all irrigation information and rainfall events to be entered manually by the farmer. Although still of value, this can be time consuming and has been one of the highlighted barriers to adoption of the modelling software. It had some farmers asking – is there a way to automatically upload their irrigation records into IrrigWeb to make the process simpler and easier?

The smart solution

The NESP (National Environmental Science Programme) Tropical Water Quality Hub project focuses on improving irrigation management by aiding integration of irrigation automation software used by some farmers and IrrigWeb to provide a smarter irrigation solution and using the 'Internet of Things (IoT).

This systemic approach allows the ability for the two platforms to communicate and share data in real time.

The project team has already trialled and successfully connected Burdekin sugarcane farmer Aaron Linton's automated irrigation system to IrrigWeb.

Aaron uses the WiSA automation system to control and monitor his furrow and sub-surface drip irrigation. Irrigation records from Aaron's farm are now automatically populating data sets in IrrigWeb required to schedule irrigations. That is, the date and the volume of water applied is remotely uploaded, making data transfer more efficient. To date the Uplink program (WiSA to IrrigWeb) has been running smoothly on Aaron's farm for more than 12 months, since August 2017.

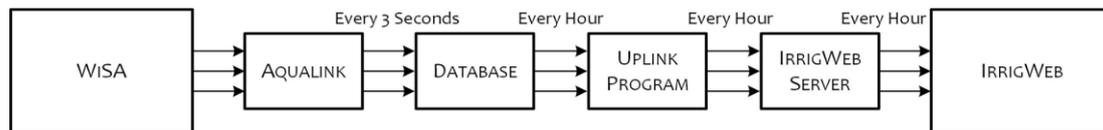
During this 14-month period, 1153 irrigation events and 119 rainfall events for his 15 paddocks were recorded by the automated system.

To put the benefits into context, if we assume it takes Aaron an average three minutes to manually enter each record, 64 hours have been saved with the help of the Uplink program $[(1153+119) \times 3 = 3816 \text{ minutes} = 64 \text{ hours}]$. Another benefit is that Aaron can now monitor and record the exact

amounts being applied to each paddock and further improve his irrigation management when required.

How does it work?

Time-stamped irrigation and rainfall data are extracted from the WiSA irrigation automation system through Aqualink (software) and stores that information into a database every hour. The program then calculates the amount of irrigation water applied. These data are merged and uploaded into the IrrigWeb's server every hour.



The next stage:

In the next stage, the IrrigWeb-generated irrigation schedule will be linked to the WiSA automation software. This new program, called Downlink, moves information from IrrigWeb to WiSA. The IrrigWeb generated irrigation schedules will then automatically apply the schedule to the WiSA system.

SRA's Regional Coordinator, Anthony Curro, collaborates with AgriTech and JCU on the NESP Project "Improving water quality for the GBR by better managing irrigation in the sugarcane farming system".

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