



# Case Study

## Irrigation Efficiency with G-Dot Scheduling and Timed Actuators



<b>LANDHOLDER</b>	PCCCF2023BAV49
<b>LOCATION</b>	Burdekin
<b>CATCHMENT</b>	Lower Burdekin
<b>RAINFALL</b>	868.2 mm/year
<b>PROPERTY SIZE</b>	520.2 ha
<b>ON-GROUND PROVIDER</b>	Farmacist-Burdekin

**Project Catalyst** is a grower led, sugar cane innovation and adoption project that explores, develops and validates farm management practice change to improve the enduring water quality of the Great Barrier Reef.

**BROADER ADOPTION VALIDATION & GROWER SUPPORT**

Founded in 2009, the project operates in the Mackay Whitsunday, Burdekin and Wet Tropic regions to deliver valued practice change outcomes and develop methods for industry adoption. Under the Broader Adoption and Grower Support program, professional on-ground service providers assist selected growers to adopt and validate appropriate change practices. Service providers continue to monitor implementation benefits and derived environmental performance improvements. Through targeted extension activities, the program seeks to accelerate the uptake and broader adoption of improved farming practices at local, regional and industry levels.



G-dot (soil moisture monitoring tool)



The Grower with the timed-actuator equipment



Great Barrier Reef Foundation

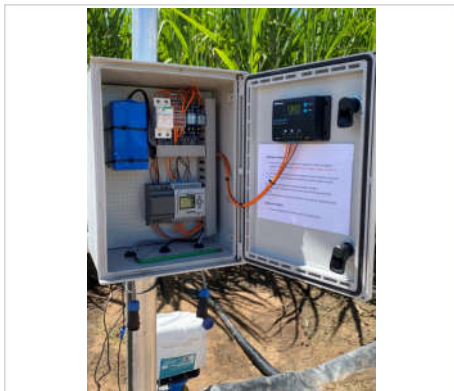


●●●● Goal

The goal was to optimise the use of nitrogen and reduce run-off risk through agricultural-technologies in automation and irrigation scheduling. Furthermore, the implementation of strategic fertiliser planning to avoid excess nitrogen application.

●●●● Overview

A timed actuator is a device that switches an irrigation set from one side of a T-piece to the other after a specified time period. By implementing a timed actuator, irrigation sets can be scheduled precisely without increasing stress on the irrigators workload. This may include applying shorter hours per set which can be difficult to do consistently due to labour constraints. GDots are simple irrigation scheduling tools that can help the grower apply irrigations according to crop requirement rather than a set schedule. The Grower will also receive a strategic nutrient plan provided to them to manage the risk of excess nitrogen and phosphorus application while still maintaining or even increasing production.



Inside of the electronics box, showing how to set the timers.



Timed-actuator and and G-dot sensor

●●●● Action

Measurements were made to provide a baseline for their existing irrigation practice. The assessed block was proven to be overwatered. Common practice for this block which had be demostarted in the initial baseline; was long set durrations due to labor constraints. The installation of a timed-actuator will reduce hours of irrigation.

Benchmarking suggest both over and under irrigation are accruing across the 14 day schedule, indicating water stress and potentially resulting reduced productivity.

Additionally a G-dot was installed in the set to monitor the soil's moisture levels throughout the season. This was ultimatley aimed at irrigation schedduling- in hope for adjusting the timing of application as required.

Nutrient managemnt plans were also issued to the farming enterprise. AN N&P budget was created to optimise nitrogen-use-efficiency, accounting for soil types, high NUE varieties, and watering capabilities.

●●●● Outcome

Runoff was reduced by automating an outlet and time savings has been a noticeable positive outcome. Additionally, a secondary baseline showed an improvement with irrigations applied.

Further improvements will include installing end of row sensors to refine each irrigation even further. This will provide exact readings and with new automation tech, this can trigger switching of sets through sensor feedback technology.

Further investigation with this grower to automate more sets is underway following the positive results of the project. The grower still faces significant labor constraints, however, expansion across the entire farming enterprise has significant potential of water savings and optimising NUE.

On this farm, N application rates were reduced by 40kg/ha for planting following a good legume fallow and by 20kg/ha on older ratoon crops without yield penalties.