

# CASE STUDY

## PAUL VILLIS



### Who

Paul Willis, manager for Jurgens Farming

### Location

Kalamia

### Catchment

Kalamia Creek

### Rainfall

957mm

### Property size

400ha

### Landuse

Sugarcane production

### Family history

After completing a Bachelor in Applied Science in 1999, Paul worked with sweet corn in Bowen for five years before making the move to Ayr in 2005 to take on the role of manager for Jurgens Farming.

He also has his own business providing services around planting and harvesting legume rotational crops in sugarcane fallow paddocks.

### Practices

Paul manages 360ha for Jurgens as well as his own 40ha farm in Kalamia. He uses GPS guidance and follows a zonal tillage system in ratoons and formed beds in fallow blocks.

He plants a legume rotational crop which is harvested or incorporated as a green manure.

The majority of the farm is flood irrigated, with 17ha setup with trickle irrigation, and a trial system of solid state irrigation. A water recycle system captures irrigation runoff from 80ha which is then re-used on the farm.

Working with Jurgens Farming, Paul is also trialling broadcast spreading of mill mud and compost on fallow rotations to improve soil health and potentially reduce nutrient inputs.

Paul is always keen to take advantage of technology to improve his practices, using EM and yield mapping and soil testing to gather data on soil variation across the farming operation and continuing to improve the minimum tillage system.

### Chemical practices

Paul's weed management plan takes a whole-farm approach targeting specific weed zones and particular species such as guinea grass and sorghum. Rates are based on a combination of experience, label ranges and agronomist advice. He uses his high clearance tractor fitted with shielded

sprayers and interchangeable dropper configurations.

A knockdown application with shields after the second irrigation is followed by a second application using droppers before canopy closure. Paul only uses PSII herbicides in plant cane or problematic areas in ratoons and it is applied on top of the hill.

GPS guidance and flow rate monitors provide the ability to constantly monitor each chemical application. This is backed up with a full calibration annually and recalibration when required.

### Nutrient practices

Due to a substantial variance in soil types across the farms, Paul uses a block specific nutrient plan. Rates are determined based on guidance from the local agronomist, yield data, SIX EASY STEPS guidelines and soil testing during fallow rotations

Paul applies subsurface using a stool splitter.





## SHARING...

**Paul Villis showcased the solid state irrigation system when hosting the 2014 Project Catalyst Burdekin Field Tour.**

The subsurface is two blends of a single shot liquid dunder which helps to maximise the uptake of nutrient by the sugarcane.

Using GPS guidance also means he can pick up on any nutrient application issues during regular machinery calibration checks.

Paul noticed significant improvement in his nutrient practices and yield results by the second year of applying subsurface dunder.

### Motivators for change

Paul is constantly searching for new ways to farm cost-effectively with the ultimate aim of reducing the dollar per tonne ratio. He is conscious of the impact of farming practices on the environment which has motivated him to find a solution that has economic benefits as well as water quality outcomes.

Paul sees the benefit of utilising mill mud as an effective method in fallow and ratoon blocks and its potential to further reduce his crops nutrient requirements. However, banded mill mud placement is a new practice in the Burdekin region, so the ability to apply the mud strategically on top of the hill has not been available.

### Challenge

Paul recognised that compost has been used successfully to improve soil health through horticulture. "This got me thinking, could the same

improvements be made to the soil in sugarcane production?" This idea motivated him to undertake the project work and he has incorporated it into his farm management plan.

Paul recognised that, with no trials undertaken on his farm prior to implementation, the risks for the project were high with additional costs for equipment and a potential drain on time and resources.

### Project involvement

Paul contacted NQ Dry Tropics and submitted a successful Reef Water Quality Grant application to make this practice change. The purchase of compost machinery has enabled Paul to increase soil health while reducing impacts on his time and resources.

Paul is also hosting a GameChanger Mill Mud Application Trial that is one of four replicated trials designed by Farmacist that are looking at breaking down the barriers to the adoption of banded mill mud application in the Burdekin, through environmental, economic and social monitoring.

### Treatments

T1 – Control – No Mud  
T2 – Conventional @ 200 t/ha  
T3 – Conventional at 100 t/ha  
T4 – Banded at 65 t/ha

### Monitoring

The banded Mill Mud Application

Trials were designed by Farmacist to identify production and water quality differences between different mill by-products (mill mud and mill mud/ash) on different soil types, application rates and application methods.

### Expected outcomes

By identifying the most sustainable method of management for mill by-products, nitrogen and phosphorus movement off farm can be reduced while utilising this valuable resource.

### Results

Results from the 2015 harvest indicated higher productivity in all treatments where mud was applied in comparison to the control where no mud was applied.

Further economic analysis is needed to draw conclusions. All treatments have been fertilised and will be further assessed during the 2016 harvest.

### Showcasing to broader community

Paul has been an active advocate for the Burdekin sugar industry.

He has shared his work with drip irrigation, solid state irrigation and a composting system through onsite tours and presenting to industry groups.





## INNOVATION...

Contractors developed a new system for banded mill mud application.

### Who are we?

NQ Dry Tropics is an independent, not-for-profit, non-governmental organisation that supports the Burdekin Dry Tropics community to sustainably manage its land and water. As the leading Natural Resource Management body for the 146,000km<sup>2</sup> Burdekin Dry Tropics region, NQ Dry Tropics views innovation as crucial to the future of the agriculture sector.



### The Programme

NQ Dry Tropics Sustainable Agriculture programme offers information, training and support to assist agricultural producers to use best management practices for resilient landscapes and productive enterprises. Within this program, the Sugarcane Innovations Program delivers a number of projects that support innovative farmers with opportunities to trial their practice ideas with the assistance of technical experts. Delivery partners are Farmacist, the Queensland Department of Agriculture and Fisheries and the Burdekin-Bowen Integrated Floodplain Management Advisory Committee.

### The Projects

The fast-tracking adoption of 'game changing' sugarcane nutrient and pesticide management practices (GameChanger) project is funded by the Australian Government Reef Programme. GameChanger management practices focus on the use of precision agriculture technologies and advanced planning to provide opportunities for cane farming to be more economically and environmentally sustainable. GameChanger will generate the evidence for these practices to be promoted to the greater industry for wide-scale adoption and integration into the Reef Programme Water Quality Improvement Grants programme, where they will have the potential to significantly reduce agricultural runoff whilst maintaining farm productivity and profitability.

The Australian Government Reef Programme is reducing the impacts of agriculture on the Great Barrier Reef through implementation of a water quality improvement programme to achieve sustainable agricultural practices in the Burdekin Dry Tropics NRM region. The targeted extension and financial incentives programme aims to improve water quality by focusing on reducing pesticide and nutrient loss from Burdekin cane farms.

### For more information

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