



Case Study

EM Mapping to Target Soil Constraints and Reduction of N Fertiliser Application on Late Ratoons



LANDHOLDER	CSLH010024
LOCATION	Coolbie-Rollingstone
CATCHMENT	Lower Herbert
RAINFALL	2022 - 2121mm 2023 - 1539mm
PROPERTY SIZE	49ha
ON-GROUND PROVIDER	HCPSL

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.



Great Barrier Reef Foundation



●●●● Goal

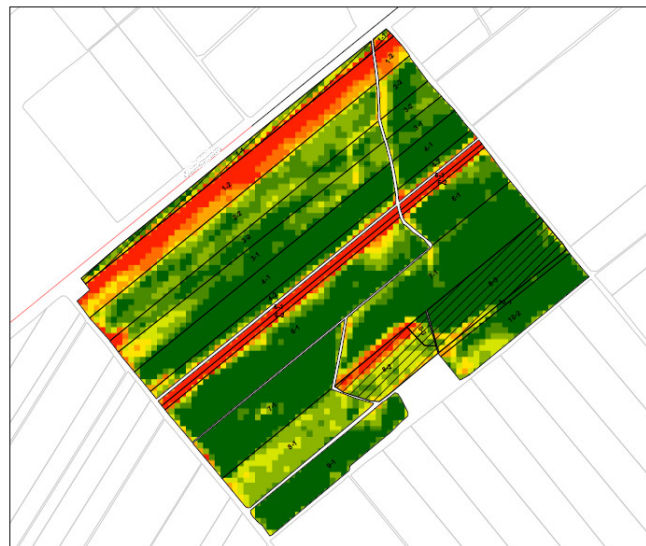
- To EM map the farm and better understand and address soil constraints with zonal applications of amendments.
- To review and update the farm nutrient management plan, considering how reductions in fertiliser application rates might be possible for simultaneously maintaining yields and reducing costs.

●●●● Overview

- Electromagnetic induction (EM) mapping is a form of precision agriculture that uses a sensor to measure electrical conductivity at various depths. Measures of electrical conductivity reflect physical and chemical soil properties such as salinity, moisture, organic matter, and clay content. Once collected this data can be used to spatially define different soil zones within a paddock requiring various applications of ameliorants. Applying ammendments zonally reduces in-field yield variation, improve nutrient use efficiency across the block and reducing the costs and run-off associated with previous inefficiencies.



A long term fallow paddock before soil testing for amelioration and fert recommendations



NDVI showing variable plant health across farm blocks

●●●● Action

- This grower was aware of a number of sodic patches across his farm that were limiting nutrient availability and productivity. EM mapping of the farm presents an opportunity to determine the true extend of the sodic soils and identify zones for amelioration and long term management. EM mapping will be undertaken throughout the season as blocks are cut.
- The grower will also receive a full nutrient management plan for their farm which takes into account soil test results, productivity data, and grower knowledge and management approaches to determine nutrient rate requirements across differing management zones, allowing the grower to be more targeted in their applications.

●●●● Outcome

- Poor weather conditions prevented EM mapping of key blocks in late 2023. As an alternative NDVI maps were used to soil test blocks with constraints. The grower intends to keep using EM mapping in future to target soil constraints.
- The grower received their Nutrient Management Plan which incorporated grower considerations including adjusting fertiliser in the later ratoons to reduce costs and manage yield potential. Based on this plan the grower reduced their N rate by 25kg/ha in their late ratoons. In reviewing their plan over the project, the grower realised they need to constantly refine their approach to ameliorating blocks and their rates. They are also considering incorporating legumes into their fallow to improve their soil health.

