2024

PROJECT CATALYST

Case Study

EM Mapping for Targeted Amelioration and Legume Fallow

LANDHOLDER	CSLH010016
LOCATION	Toobana
CATCHMENT	Lower Herbert
RAINFALL	2038mm
PROPERTY SIZE	80ha
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 bene its 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.

EM sled prior to generating block map

Flying the drone to review block response to zonal amelioration

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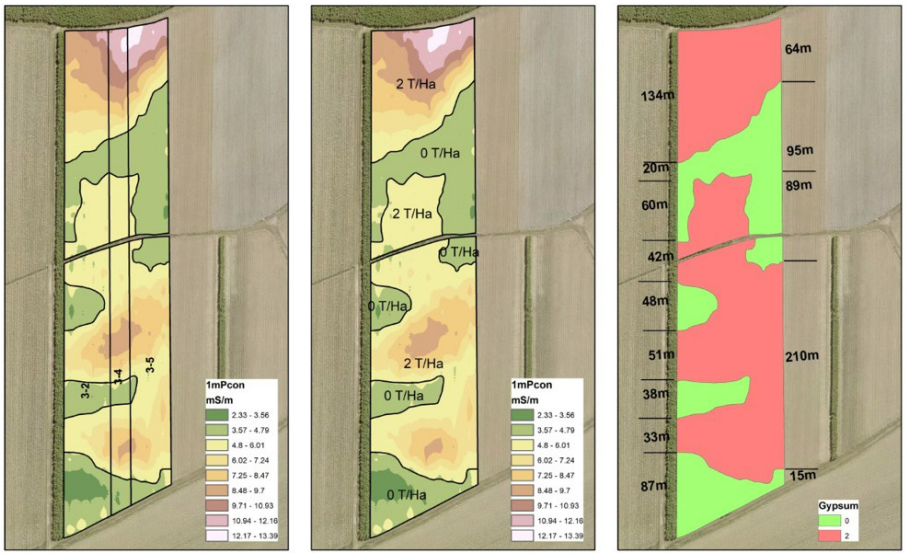
2024 EM Mapping for Targeted Amelioration and Legume Fallow

Goal

- To EM map blocks in order understand soil constraints and develop farm management zones.
- To grow legume crops on fallow blocks to alter soil structure, nutrient availability and water holding capacity for improved soil health.



Maps (left to right): EM 1mPcon readings, Gypsum applications Zones, Gypsum application rate

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.

Plant block that was EM mapped in fallow

Action

- This farm has a history of patchy sodicity across blocks. Grower knowledge of existing land formations, yield variability and crop response to environmental stressors has built a good picture of which blocks have sodicity issues. However EM mapping provides further accuracy for developing management zones in and across blocks ahead of amelioration.
- EM mapping of several key blocks with strategic soil testing identified a number of management zones where lime and gypsum could be applied at different rates across blocks to ameliorate soil constraints.
- Ameliorants were applied to the block ahead of planting.
- The grower will also receive a full nutrient management plan with recommendations for where N and P applications can be adjusted to improve nutrient use efficiency.
- They grower is planning to plant legumes in their fallow this season.
- They are also interested in exploring a microbial-based product to enhance P uptake.

Outcome

- The grower was able to apply ameliorants zonally across a number of blocks. He expressed a new understanding of addressing variable soils. The grower was happy with the savings from identifying management zones based on the EM map and not having to blanket apply ameliorants.
- Poor weather conditions meant the grower was unable to plant legumes in the 2022-23 season. They intend plant mixed legumes as cover crops in the fallow period in future.
- The grower received an NMP in 2023. In consultation with their advisor they selected key late cut blocks for which they reduced their N and P application. They intend to continue with reductions in late cut, older ratoons where possible.

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