



Case Study

Mixed Legume Fallow and EM Mapping to Target Soil Constraints



LANDHOLDER	CSLH010019
LOCATION	Lannercost Extension
CATCHMENT	Lower Herbert
RAINFALL	2022 - 1170mm 2023 - 1634mm
PROPERTY SIZE	65ha
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

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



Low rates of banded mill mud

●●●● 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 for zonal application of ammendments.
- In addition to improving diversity of ground cover species, mixed legumes fallows offer an effective way to rapidly improve organic matter, capturing soil carbon, and suppressing weed growth.



Marking out comparison strips for reduced rates after banded mud

●●●● Action

- EM mapping is planned for several key blocks with strategic soil testing to identified management zones for managing constraints.
- Two contiguous trial blocks set to be ploughed out have been selected for the mixed legumes. This farm has poor draining clays which will benefit from the legumes. Once the blocks are cut they will be soil tested, pre-mounded and limed if necessary.
- In late 2022 the grower communicated their intention to apply mill by-products as a soil conditioner and organic nutrient supply. Working with their advisor the grower decided to develop demonstrations strips with low rates of banded mud and subsequent varying fertiliser rates to suitable approach that found a balance between the cost and benefits for the different applications in meeting the soil and crop nutrient requirements. These comparison strips will be used to monitor the progress of the crop and determine potential future approaches to mill by-product and inorganic nutrient applications.

●●●● Outcome

- Variable rainfall after the ploughout blocks intended for legumes were cut meant the grower was unable to plant mixed species across their ploughout in the 2023-24 season. The grower was prepared with seed and so intends to plant legumes in the coming season, potentially even without tillage to reduce the number of passes.
- On-ground service providers monitored the mud and reduced rate strip demonstration trial over 22-2023. In discussions the grower has mentioned seeing the benefit of low rates of mill mud.
- As part of their 2022 NMP and as recommended by their advisor, the grower made N application reductions in their late cut ratoons by 10kg N/ha. The grower maintained this approach with management zones in 2023 following discussions with their advisor and they intend to include this zone in future NMPs where appropriate.

