



Case Study

EM Mapping to Support Implementing Precision Farm Management & Installing Irrigation Scheduling Tools



LANDHOLDER	Anonymous
LOCATION	Kalamia
CATCHMENT	Lower Burdekin
RAINFALL	984 mm
PROPERTY SIZE	182 ha
ON-GROUND PROVIDER	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.



Figure 1: EM map with G-dot location



Image 1: Aerial image of growth variability within paddock

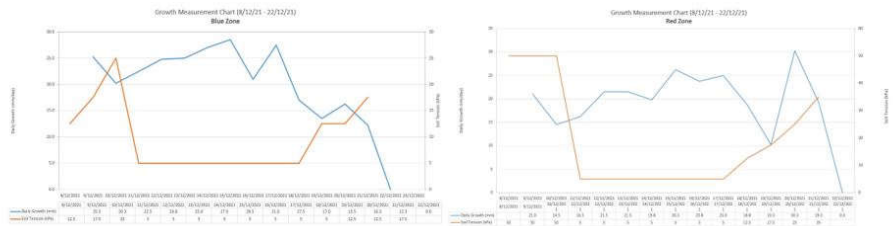


Great Barrier Reef Foundation



●●●● Goal

To use EM Mapping to develop management zones on farm that may be treated differently regarding ameliorates, fertiliser, irrigation or pesticide use.



●●●● Overview

EM Mapping is a precision mapping tool used to assess different soil conditions. Growers are able to use EM maps and the relative data to manage certain areas of their paddocks differently in regards to the application of ameliorants (lime/gypsum, mill mud/ash), fertiliser, irrigation and other inputs. When the map is ground truthed using soil samples, it can provide the grower with a better picture of what is happening in the soil profile, not just what is on the soil surface. Understanding constraints with-in field allows for more targeted applications of nutrients, pesticides and amelioration, but also aims to rectify yield variation across and with-in fields, leading to improved water quality.



Image 2: Plant cane months after mapping

Figure 1: Zonal comparison of cane crop growth (mm/day) and soil tension (kPa) measurements

●●●● Action

This farm is particularly close to a large lagoon meaning the soil is very sodic and heavy clay. This was the primary limiting factor to yield. In order to pin point the areas of sodicity and develop a targeted management platform, the fallow paddocks on this farm were mapped. The EM mapping provided a greater insight into issues that may be limiting yield. These data layers can be used to develop short and long-term effective solutions.

Following the EM Mapping, Farmacist installed a G-dot in the high and low EC zones. They then collected growth measurements of these paddocks to monitor growth rates between the zones, and assess the effect of soakage and water logging. The G-dots were placed in areas of high and low conductivity to measure the effect of these specified parameters. Growth measurements were taken over a three week period (two scheduled irrigations).

●●●● Outcome

The EM maps were a useful tool for the grower to better understand the soil types and variation within individual paddocks and across the farm. The G-dots, which were placed in two zones within each paddock, and growth measurements were recorded over three weeks. It was discovered that the heavy clay (High EC) had poor growth rates as the irrigation water was held on the paddock for a long period of time and couldn't drain away. This was seen in the G-dot readings as there was little decrease in soil moisture over the three week monitoring period. This adversely affected the cane growth in these areas. Soil samples were also taken in the vicinity of the g-dots to assess soil properties. It was determined that the sodicity was quite high in this zone. This would have also affected the cane growth. The grower is looking at variable rate gypsum application as a management strategy to improve growth rates in the high EC zone.

