



# Case Study

## The Multiple Benefits of Fallow Crops: Ground Cover, Soil Health, Reduced Nitrogen Inputs & Income Diversification



<b>LANDHOLDER</b>	Colin Mackenzie
<b>LOCATION</b>	Calen
<b>CATCHMENT</b>	St Helens Creek
<b>RAINFALL</b>	average 1460mm/year
<b>PROPERTY SIZE</b>	113 ha
<b>ON-GROUND PROVIDER</b>	Farmacist Pty Ltd Author: Che Trendell

**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.



Fig. 1 Plant cane following a cowpea legume crop



Fig. 2 Colin was able to reduce N rates applied to his plant cane



Great Barrier  
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## ●●●● Goal

To incorporate alternate crops into the farming system to break the sugarcane mono-culture, provide a potential income stream, and investigate the potential to reduce nitrogen (N) inputs following a legume crop.

## ●●●● Overview

As demonstrated through previous industry research projects and Project Catalyst trial work, breaking the sugarcane mono-culture has shown to reduce root pathogens, reduce plant parasitic nematodes and increase soil microbial biomass.

Colin sought to incorporate legume and alternative fallow crops into his current farming system to achieve these goals as well as maintain ground cover and provide an alternate income source.

Incorporating legume crops also provides opportunity to decrease N fertiliser applications in the following plant cane crop.



Fig. 4 Harvesting the oat crop for silage



Fig.3 Soil moisture probe (GDot) in plant cane following oat crop

## ●●●● Action

Colin planted a cowpea crop during the 2019-20 summer. The crop grew with no addition of fertiliser and provided beneficial ground cover over the wet season.

After the wet season, he worked the cowpea back into the ground to increase the soil organic matter and soil microbial biomass prior to planting sugarcane.

During the winter of 2020 Colin then planted other blocks with Oats as an alternate income stream, as well as a winter crop of soybean. The oat crop was harvested and baled as silage, while the soybean was sprayed-out and worked back into the soil.

Sugarcane was planted following the oat crop. Colin has noticed that "the oats seem to have dried out the soil. I've had to irrigate the following plant cane more than usual to keep it growing".

## ●●●● Outcome

A soil sample taken following the cowpea crop was compared to a sample taken prior to the previous sugarcane crop cycle. The results indicate that the organic carbon value in the soil has increased. Colin was able to apply less N fertiliser on his plant cane crop without risk of impacting the sugarcane crops yield.

Colin is reconsidering growing winter crops. The last few years have been dry winters, and with limited irrigation, he does not want to risk impact to the following cane crop.

A decision will need to be made annually taking into consideration weather predictions, commodity prices and sugar price.

Summer legume crops will continue to be planted where possible. For more information contact Che Trendell (Farmacist) Mb. 0439 588 627.