



Case Study

Introducing a Rotational Cropping System to Improve Soil Health and Improve Nitrogen Use Efficiency (NUE)



LANDHOLDER	Zac Woolston
LOCATION	Eton
CATCHMENT	Sandy Creek
RAINFALL	1500mm
PROPERTY SIZE	89ha
ON-GROUND PROVIDER	Farmacist Pty Ltd Author: Nick Hill

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 Zac Woolston's 2019/2020 season corn



Fig.2 Zac inspecting his 2020 soybean crop.



Great Barrier
Reef Foundation



●●●● Goal

To improve farm soil health and NUE, resulting in increased productivity and profit, by introducing an extended fallow cropping rotation to the farming system.

●●●● Overview

Trials conducted by the industry's Sugar Yield Decline Joint Venture demonstrated the benefit of extended fallow cropping within the sugarcane farming system. Rotational cropping increases NUE, improves soil health, diversifies the business income and increases cane production, especially the following plant cane and early ratoons.

A number of crop types are considered valuable to this approach: legumes (ie. cowpea, mungbean, sunn hemp, soybean), grain crops (ie. sorghum, maize) and fibre crops.

Zac aimed to diversify, improve soil health and incorporate legumes for N contributions to the system.



Fig.4 Farmacist agronomist, Nick Hill, with Zac in a 2020 soybean crop.



Fig.3 One of Zac's many soybean crops

●●●● Action

In consultation with Farmacist, Zac wanted investigated his options to break his sugarcane monoculture by introducing a four crop, 18 month rotation following the sugarcane (corn>soybean>corn>soybean).

The selection of corn and soybean has enabled him to tactically select the seasonally appropriate crop following the end of the cane cycle, providing options for the end product. He can now harvest for grain or silage whilst reducing N inputs during the rotation and plant cane phases. He has also improved his business gross margins.

The rate of N application reduction is dependent upon the biomass of the soybean crop and grain yield. Farmacist supports Zac in the decision making process by determining N recommendations based upon this and other parameters such as block history, soils testing results and local knowledge and expertise.

●●●● Outcome

Zac says, "Moving to an extended fallow has improved our bottom line. Soybean has enabled us to reduce our Nitrogen inputs and made the soil more healthy and friable, improving the ability of the next crop to use fertiliser and water inputs more effectively. It's also reduced pachymetra and nematode counts which is good for the cane. Cropping both soybean and corn allows us to extend the fallow period whilst providing an income with the next cane crop better than ever".

Extended fallow cropping is now an integral aspect of Zac's farming system and he is into the second rotation. Armed with the practical experience plus the economic and soil health benefit results, Zac has extended this fallow practice to the whole farm.

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