

The benefits of a **CENTRAL REGION SOYBEAN FALLOW CROP - A CASE STUDY**



Growing area:
North Eton

Paddock size:
5.8 ha

Soybean variety:
Kuranda

Planting rate:
60 kg/ha

Plant date:
1 January 2020

Planting style:
**3 rows on 2 m beds,
0.5 m plant spacings**

Growers:
**Sam, Gerry and Joe
Deguara (pictured above)**

In the Central region, summer legume fallow crops are an excellent fit for the climate and sugarcane farming system.

Soybeans handle wet season conditions well and can be planted in the traditional fallow period. They offer a multitude of benefits for soil health as well as an additional income stream for sugarcane farming businesses, especially at current market prices.

The Deguara family have been growing soybeans for the last 15 years as a part of their regular farming practice. In the 2019/20 season, one of their sugarcane blocks was involved in the Soil Health Project - Central. The project conducted a range of soil, sugarcane biomass and root system comparative testings between sites that have a long-term history of different management practices (>10 years). These were referred to as *paired sites*. The measurements taken aimed to determine how different practices may influence soil health. Two sites with very different management practices were sampled on the Deguara's property.

Results from the project demonstrated that soil health indicators were more optimal in the farming system that reduced tillage, controlled traffic, applied regular soil ameliorants (e.g., lime and mill mud) and, most importantly, broke the sugarcane monoculture with legume crops such as soybean, mungbeans and chickpeas. These are all practices the Deguara family have adopted into their farming system.

THE BENEFITS OF LEGUME CROPPING

- Legumes fix nitrogen through a symbiotic relationship with the soil bacteria rhizobia, providing plant available nitrogen to the following crop.
- In the wet season a legume crop (or any cover crop) decreases the damage fast moving rainfall has on topsoil, reducing soil erosion.
- Legumes improve soil structure and soil organic matter and host a diverse range of beneficial soil microbes, which assists in decreasing sugarcane root feeding pests.
- The herbicides available for use in soybean crops provide an opportunity to also combat difficult weeds such as guinea grass and nut grass.
- They can be a cash crop that provides financial benefits at the time of harvest and the ability to reduce fertiliser applications on plant cane.
- Legume crops can be harvested or green manured to provide great soil health benefits.



The Deguara family harvest soybean for grain and then reduce the following plant cane nitrogen fertiliser application rate. In the 2020/21 season plant cane, nitrogen rates were reduced by 60 kg/ha which equates to approximately \$100/ha saving. The Deguara family has been reducing nitrogen rates after soybean for many years without experiencing yield loss. Generally, they experience a yield increase after soybean compared to bare fallow blocks.

SUCCESSFUL SOYBEAN CROPPING

According to the family, the key to growing successful soybean crops are:

- Planting at the right time, with the right variety.
- Ensuring weeds are controlled and pest are managed throughout the season, with twice weekly insect checks from podding to pod fill.
- If unsure about what to do, get the appropriate professional help.
- Good agronomy for the crop - ensure soil pH levels are suitable and that the crop is watered at the correct time.
- Planting into beds results in close soil contact with the seed.

CROP ECONOMICS

After eliminating variable costs, the approximate gross margin per hectare for the soybean crop of the 20/21 season was \$2669 (Table 1). In combination with the \$100/ha saving on plant cane nitrogen fertiliser costs, and the soil health benefits, legume crops are an attractive addition to the farming system.

USEFUL RESOURCES

- The impact of fallow management on soil biology (PDF)
- Legumes pros and cons (PDF)
- Planning for legumes (video)

Table 1 Gross margin analysis of the Deguara's 2020/2021 season soybean crop.

Yield (t/ha)	4
Price received (\$/t)	920
On farm revenue (\$/ha)	3680
Freight of harvested grain (\$/ha)	300
Seed cost (\$/ha)	132
Planting cost (\$/ha)	50
Irrigation - flood (\$/ha)	100
Crop nutrition (\$/ha)	75
Weed and pest control (\$/ha)	175
Pre harvest spray (\$/ha)	34
Harvesting costs (\$/ha)	145
Total variable costs (\$/ha)	1011
Gross margin (\$/ha)	2669



MORE INFORMATION

Zoe Eagger **Farmacist Ltd** zoe@farmacist.com.au

The Soil Health Project - Central is supported by the Department of Agriculture, Water and the Environment through funding from Australian Government's National Landcare Program, SRA and project partners.

