



Joe Muscat in Brazil examining the Agmusa system

CASE STUDY

BACKGROUND

This trial aims to evaluate how the Brazilian farming system Agmusa, performs in the Mackay region. The Agmusa farming system has reported impressive soil health benefits, which has led to crop yield increases of 10 to 15%. The system involves the integration of subsurface placement of composted organic material and mill mud/ash, the use of fallow break crops, and producing one's own local tissue culture sugarcane plants.

The trial was started in 2015. Control treatments (Treatment 1) have had mill mud band applied at 50 t/ha and mill ash banded at 50t/ha and incorporated by cultivation. The Agmusa treatment (Treatment 2) consisted of furrow opening and band placement of 15t/ha of compost in the furrow, covered with soil. Compost was sourced from a vegetable grower in the Bowen district.

In 2015, after the previous cane crop was ploughed out, mungbeans were planted, harvested and then an A6785 soybean crop was planted, which was then harvested in May 2016.

In mid-June 2016, plant cane (variety KQ228) from the plant source planted the previous year was planted. The plant cane crop was then harvested at the end of August 2017.

Soil samples and cores have been taken throughout the trial duration to evaluate any changes and to monitor soil biota levels.

Farmacist will continue to collect data on this site to evaluate the trial over a longer term.



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FOCUS ON



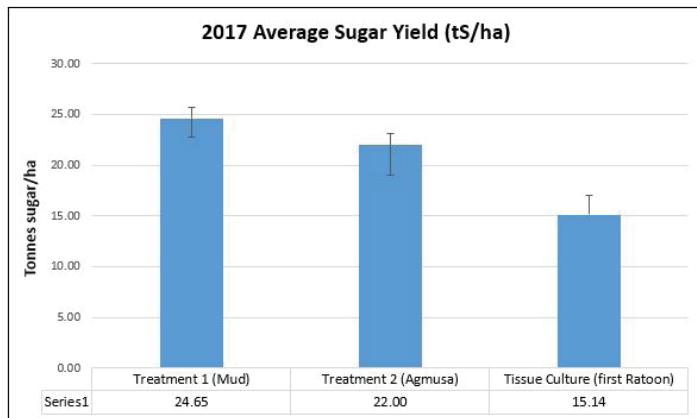
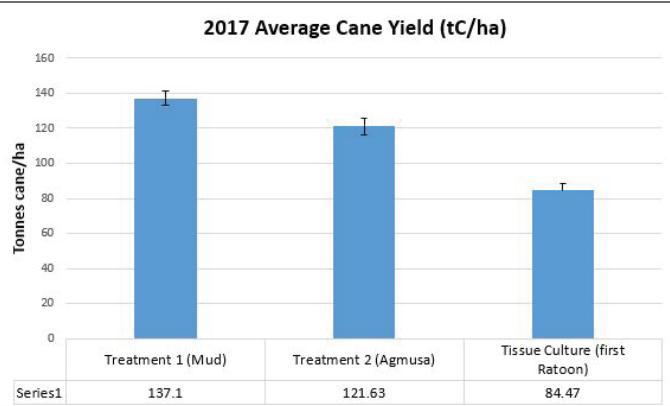
- ▶ Increases in soil health and yields
- ▶ Creating a sustainable holistic system

KEY POINTS



- ▶ There has been no obvious soil and crop benefits from the Agmusa management system so far. Only short term results have been collected, there still could be a soil and yield benefit in subsequent years.
- ▶ It is important to note that a 15t/ha compost application is hard to compare against a 100t/ha mill mud and mill ash combination. Compost was expensive, hence why only 15t/ha was put on.





Joe has been pushing sustainable farming innovation in the Mackay-Whitsunday region for a long time. Joe farms sugarcane with a rotational fibre crop in Oakenden on their 130ha property.

In 2013 when Joe did his Nuffield scholarship, he went to various countries to study different agriculture systems. During his time in Brazil, he found a unique agriculture practice called the Agmusa planting system, and local farmers were increasing cane production up to 15%. They had been working with it for 10 years in Brazil, and had been getting amazing results. When Joe returned to Australia, he looked to Sugar Research Australia for their thoughts and found they had never heard about Agmusa. So he pioneered the system here in Australia with the help of Farmacist and Reef Catchments.

“The best results so far have been on the tradition sustainable farming that we have been practicing for years on our farm.”

- Joe Muscat, sugarcane grower

Trial Design

| | |
|---|------|
| Block 6-3 | |
| Winch Path | |
| Trial Guard - 1 row | 0.06 |
| Rep 3 Treatment 2 - 7 rows | 0.47 |
| Rep 3 Tissue Culture, plant source - 2 rows | 0.19 |
| Rep 3 Treatment 1 - 9 rows | 0.54 |
| Rep 2 Treatment 1 - 9 rows | 0.58 |
| Rep 2 Tissue Culture, plant source - 2 rows | 0.14 |
| Rep 2 Treatment 2 - 6 rows | 0.4 |
| Rep 1 Treatment 2 - 5 rows | 0.32 |
| Rep 1 Tissue Culture, plant source - 2 rows | 0.14 |
| Rep 1 Treatment 1 - 9 rows | 0.58 |
| Winch Path | |
| Block 6-1 | |

OUTCOMES TO DATE

The 2017 average cane yield showed that Treatment 1 which used mill mud, produced the highest average cane yield of 137.1 tC/ha. Treatment 2 using the Agmusa planting system gave an average cane yield of 121.63 tC/ha, and tissue culture (first ratoon) produced 84.47 tC/ha.

The average sugar yield of 2017 showed that Treatment 1 using mill mud produced the highest average yield at 24.65 tS/ha. Treatment 2 using the Agmusa system gave an average sugar yield of 22 tS/ha, and the tissue culture (first ratoon) gave an average yield of 15.14 tS/ha. But the Ferdinands are not done yet. Earlier in 2016, Joe decided to cease the application of all synthetic fertilisers with the intention to transition to bio-liquid fertilisers.

Joe believes that the tissue culture he got through SRA was poor quality, and may have affected the results. He feels that the one eyed sets (cane storks germinating from the node), would have yielded better results, but were not readily available. Both are pure line but one (tissue culture) is lab grown while the other (one eyed sets) is started in a greenhouse and then hardened in the field. The one eyed sets are a little more robust, and that might have helped get better results.



REEF CATCHMENTS (MACKAY WHITSUNDAY ISAAC) LIMITED

PH (07) 4968 4200
E info@reefcatchments.com
w www.reefcatchments.com

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