

Project Catalyst Report

Enhanced Efficiency Fertiliser Trial

Grower Information

Grower Name:	Glen Fasano
Entity Name:	C Fasano & Co
Trial Farm No/Name:	Farm 5919 Block 1.1
Mill Area:	Mossman
Total Farm Area ha:	502.1
No. Years Farming:	25+
Trial Subdistrict:	Miallo
Area under Cane ha:	314.82

Trial Status

Continuing

Background Information

Aim:

The aim is to compare four products; Control Release, Entec, Entrench and the standard practice fertiliser 140S. This trial is continuing on from the previous Oak Beach (Mowbray) site Farm 5233 – moved to this new location due to difficulty in gaining data (Cane sample had to go from road to aril and mix-ups occurred). Entec is a nitrification inhibitor, meaning that it holds the nitrogen in the ammonium form for longer – subsequently the nitrogen is subject to less loss pathways.

Control Release fertilisers use a sulphur and polymer coating on the urea granule, 25%, 50% or 75% blends can be ordered. In this trial 25% of the urea was coated.

Entrench is a liquid applied onto urea as it is being applied subsurface - it is a nitrification stabiliser, meaning that it holds the nitrogen in the ammonium form for longer – subsequently the nitrogen is subject to less loss pathways. Comparing these will help to gain a better understanding of how Entrench, the control release (25% coated) and Entec will perform in the wet tropics region of Mossman. All four products will be applied at two rates, a high rate and a low rate and each treatment will be replicated three times.

Background: (Rationale for why this might work)

In the Wet Tropics given the amount of heavy rainfall we receive much of the applied nitrogen is lost through pathways such as denitrification and leeching. It is important to reduce the amount of nitrogen lost in this crucial period after the crop is fertilised. There have been trials conducted in other regions on these fertiliser products so we would like to see how they perform first hand.

Potential Water Quality Benefit:

The water quality benefit from these trials will be reduced nitrogen runoff due to the increased nitrogen use efficiency. If the trials support the hypothesis of less nitrogen loss and higher yields then there will be increased uptake of these products and in turn the water quality coming off farms will be improved.

Expected Outcome of Trial:

Due to the weather we have had since the trials have been put out (late 2014 – early 2015), we predict that we will not see much difference between the treatments. There has been minimal large rainfall events after application in 2014 meaning that large nitrogen losses should not have occurred in the period of this trial.

Service provider contact:

Mossman Ag Services

Where did this idea come from:

Mossman Ag Services Agronomy Staff

**Plan -
Project
Activities**

Date : (mth/year to be undertaken)

Activities :(breakdown of each activity for each stage)

Stage 1	June 2014	Plan out trial, rates of fertiliser to be used. Confirm site is appropriate. Install field equipment (equipment purchases to align with project application). Seek agronomic advice for trial design. Develop workplan for trials. Soil and product testing (if applicable). Set up trial sites.
Stage 2	July 2014	Set out trial with grower, apply treatments.
Stage 3	September 2014	Ongoing management of trial site: Monitor trials and keep accurate records of trial results, field operations, chemical and fertiliser inputs, crop yield and quality (as relevant to project), and provide to Terrain. Monitor trial. Facilitate site access for Terrain NRM staff to observe trial results.
Stage 4	July 2015	Harvest Trial, keeping records of strips cut, bin numbers in order to get bin weights and CCS samples from the mill. Site Access. Progress report.
Stage 5	October 2015	Retreat trial as per previous treatments on a new trial site due to difficulties in harvest/bin transport.
Stage 6	August 2016	Harvest Trial, keeping records of strips cut, bin numbers in order to get bin weights and CCS samples from the mill. Site Access. Progress report.
Stage 7	September 2016	Retreat trial as per previous treatments.
Stage 8	October 2017	Harvest Trial, keeping records of strips cut, bin numbers in order to get bin weights and CCS samples from the mill. Site Access. Progress report.
Stage 9	November 2017	Retreat trial as per previous treatments.
Stage 8	October 2018	Harvest Trial, keeping records of strips cut, bin numbers in order to get bin weights and CCS samples from the mill. Site Access. Progress report.
Stage 9	November 2018	Retreat trial as per previous treatments.
Stage 10	October 2019.	Harvest Trial, keeping records of strips cut, bin numbers in order to get bin weights and CCS samples from the mill. Site Access. Progress report.

Project Trial site details

Trial Crop:	Sugarcane
Variety: Rat/Plt:	Q208 2 nd ratoon when first applied
Trial Block No/Name:	1.1
Trial Block Size Ha:	6.04
Trial Block Position (GPS):	-16.430377, 145.394711
Soil Type:	Newell

Block History, Trial Design:

^Golf Club	Product	N rate (kg/ha)	Rows
REP ONE	entrench	150	6
	entec	150	6
	CR	130	6
	140S	130	6
	CR	150	6
	entrench	130	6
	140S	150	6
	entec	130	6
REP TWO	CR	150	6
	entec	150	6
	entrench	130	6
	140S	130	6
	CR	130	6
	entec	130	6
	entrench	150	6
	140S	150	6
REP THREE	140S	150	6
	entrench	150	6
	CR	130	6
	entec	150	6
	entrench	130	6
	CR	150	6
	140S	130	6
	entec	130	6
	8 Rows this side not treated		144

Treatments:

Control/Standard Practice: (T1) 140S

High rate:

645kg/ha of 140S:

N: 150kg/ha P: 13kg/ha K: 113kg/ha S: 25kg/ha

Low Rate:

540kg/ha of 140S: N: 125kg/ha

P: 11kg/ha K: 95kg/ha S: 21kg/ha

(T2) Entec 140S

High rate:

645kg/ha of 140S: N: 150kg/ha

P: 13kg/ha K: 113kg/ha S: 25kg/ha

Low Rate:

540kg/ha of 140S: N: 125kg/ha

P: 11kg/ha K: 95kg/ha S: 21kg/ha

(T3) CR 140S 25% Coated

High rate:

645kg/ha of 140S: N: 150kg/ha

P: 13kg/ha

K: 113kg/ha

S: 25kg/ha

Low Rate:

540kg/ha of 140S: N: 125kg/ha

P: 11kg/ha K: 95kg/ha S: 21kg/ha

(T4) Entrench @ 2.5L/ha + 140S

High rate:

645kg/ha of 140S: N: 150kg/ha

P: 13kg/ha K: 113kg/ha S: 25kg/ha

Low Rate:

540kg/ha of 140S: N: 125kg/ha

P: 11kg/ha K: 95kg/ha S: 21kg/ha

Results:

Table 1. 2015 results Fasano

Product	Rate N kg/ha	T/ha
140 S	150	104.1
140 S	130	102.4
Controlled Release 140S (25% Coated)	150	96.9
Controlled Release 140S (25% Coated)	130	102.9
Entec	150	97.9
Entec	130	94.9

Table 2. 2016 Results Fasano

Product	N rate kg/ha	t/ha	ts/ha
140S	150	124.9	13.7
140S	130	118.3	13.4
Controlled Release 140S (25% Coated)	150	115.7	13.3
Controlled Release 140S (25% Coated)	130	116.4	13.4
Entec	150	118.5	13.4
Entec	130	118.7	13.1
Entrench	150	119.0	13.5
Entrench	130	120.4	13.1

Table 3. 2017 Results Fasano

Product	N rate kg/ha	t/ha	ts/ha
140S	150	108.0	14.3
140S	130	106.7	14.4
Controlled Release 140S (25% Coated)	150	109.2	14.7
Controlled Release 140S (25% Coated)	130	109.8	15.0
Entec	150	105.7	14.2
Entec	130	107.8	14.2
Entrench	150	108.8	14.5
Entrench	130	101.8	13.7

Table 4. 2018 Results Fasano

Product	N rate kg/ha	t/ha	ts/ha
140S	150	106.7	14.8
140S	130	99.6	14.3
140S – should have been Controlled Release 140S (25% Coated)	150	103.2	15
140S – should have been Controlled Release 140S (25% Coated)	130	101.1	14.4
Entec	150	97.3	14
Entec	130	99.3	13.9
Entrench	150	102.2	14.1
Entrench	130	97.6	14.1

Conclusions and comments

In 2015 no CCS data was obtained from the mill, the results show little difference between the three treatments and two rates – although the standard fertiliser 140S had slightly higher yields. The dry weather may have also meant that the nitrogen was not lost in any heavy rainfall events.

In 2015 the trial site was moved to Newell Beach and an extra product, Entrench, was added to the trial. In 2016 this trial was harvested in August with results successfully obtained from the mill data with separate bin weights and CCS samples being taken from each treatment. The table above shows that there are no differences in the tonnes of sugar per hectare produced between treatments. We have retreated this site in 2016 and will harvest in 2017 to continue adding to the results. This will allow us to gather more data over different growing conditions.

The enhanced efficiency fertiliser trial ON Fasano's farm was harvested on the 15th, 16th and 19th of August 2016. The results were obtained from the mill data with separate bin weights and CCS samples being taken from each treatment.

The table above shows that there are no differences in the tonnes of sugar per hectare produced. The results for 2018 continue to show a similar trend, the trial has been retreated this year although no Control Release fertiliser was available so this was not included in the retreatment. We will continue this trial to gather more data over different growing conditions.

Advantages of this Practice Change:

The advantages of this practice change would be potentially higher yields and better CCS as well as environmental benefits.

Disadvantages of this Practice Change:

Cost more to apply and as seen in this trial won't produce results in every year – dependent on weather events.

Will you be using this practice in the future:

Continue to trial product and possibly use more of these products in the future.

% of farm you would be confident to use this practice :

Only as small trial plots.