Catalyst Project Report Final report

Sub-surface liquid versus surface applied liquid fertilisers

Grower Information	
Grower Name:	Joe Deguara
Entity Name:	J & A Deguara
Trial Farm No/Name:	MKY-3128A
Mill Area:	Mackay Sugar
Total Farm Area ha:	84
No. Years Farming:	10 – 3rd generation
Trial Subdistrict:	Sandy Creek
Area under Cane ha:	170 ha

Background Information

Aim: To compare the application of liquid fertilisers sub-surface against sub-surface application of liquid fertilisers at lower rates

Background: (Rationale for why this might work)

There is always a risk that fertilisers applied onto the top of the soil are subjected to greater loss pathways than fertilisers applied sub-surface. Liquid fertiliser supplied as Dunder is traditionally applied onto the surface of the soil with irrigation used to incorporate the fertiliser into the soil.

The grower wants to apply liquid fertiliser into the sub-surface of the soil at an approximate depth of 100mm. The rationale for this practice change is that nutrients will be more readily available to the plant and will also reduce the risk of being lost either by volatilisation or washed out of the paddock from heavy rainfall events or irrigation.

Potential Water Quality Benefit:

Reduced loss off farm

Expected Outcome of Trial:

The plant will access the nutrients at a faster rate improving Nitrogen Use Efficiency and reducing the risk of nutrient loss.

Service provider contact: Farmacist

Where did this idea come from: Grower/Farmacist

Plan - Project Activities	Date: (mth/year to be undertaken)	Activities :(breakdown of each activity for each stage)
Stage 1	**October 2016**	2016 cane crop harvested
Stage 2	**October 2016**	Nutrients applied as per trial design
Stage 3	**September 2017**	Harvest trial

Project Trial site details

Trial Crop:	Q240
Variety: **Rat/Plt:**	2017 Class = 3R
Trial Block No/Name:	3-1
Trial Block Size Ha:	13.5
Trial Block Position (GPS):	148.944060/-21.205897
Soil Type:	Kinchant - Soloth

Block History, Trial Design:

Figure 1 shows the trial design for treatments applied for this site. Liquid fertiliser was applied at rates of 3.1 and 3.5 m^3 per hectare. Table 1 indicates the rate of fertiliser applied and the calculated nutrient applications.

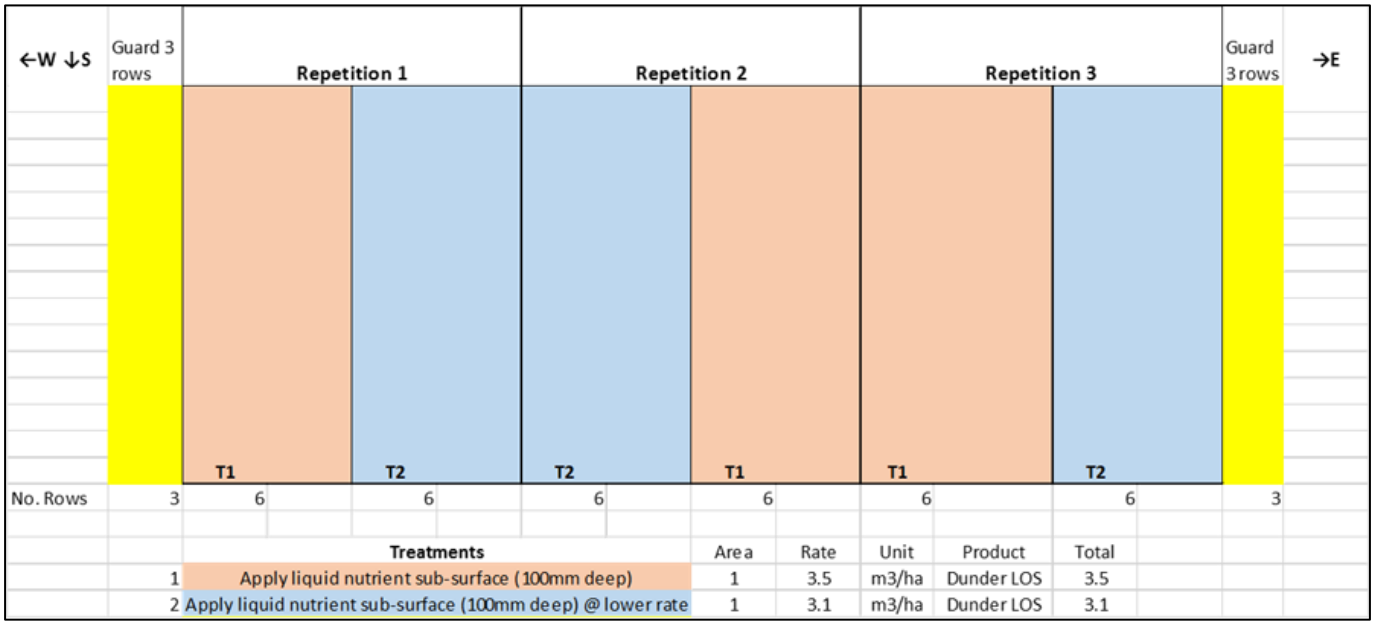

Figure 1 - trial design 2016 application for 2017 harvest

Table 1 - application rates and nutrients applied

Treatment	Product	Rate	N	P	K	S
T1	Dunder LOS	**3.5**	**175**	**0**	**100**	**17**
T2	Dunder LOS	**3.1**	**155**	**0**	**88**	**15**

Results:

Results from 2017 harvest indicated very little difference between treatments. Cane yields are shown in Figure 2 and sugar yields in Figure 3

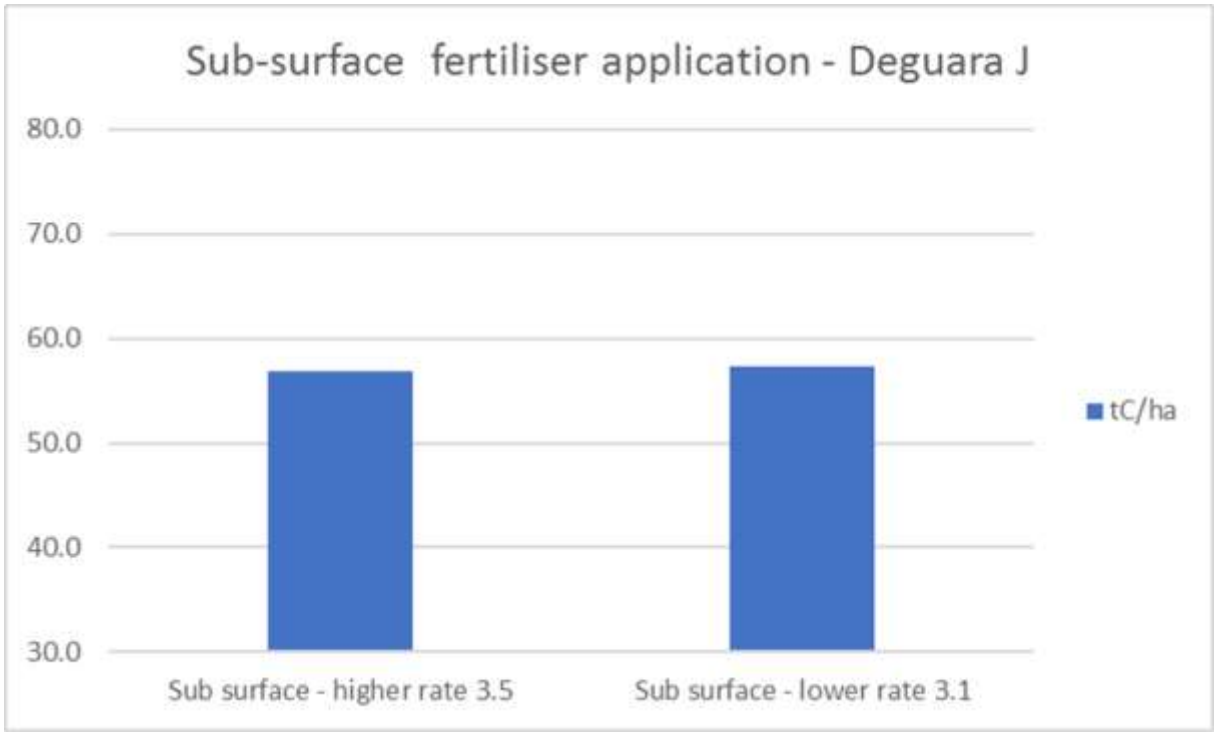

Figure 2 - cane yields 2017 harvest

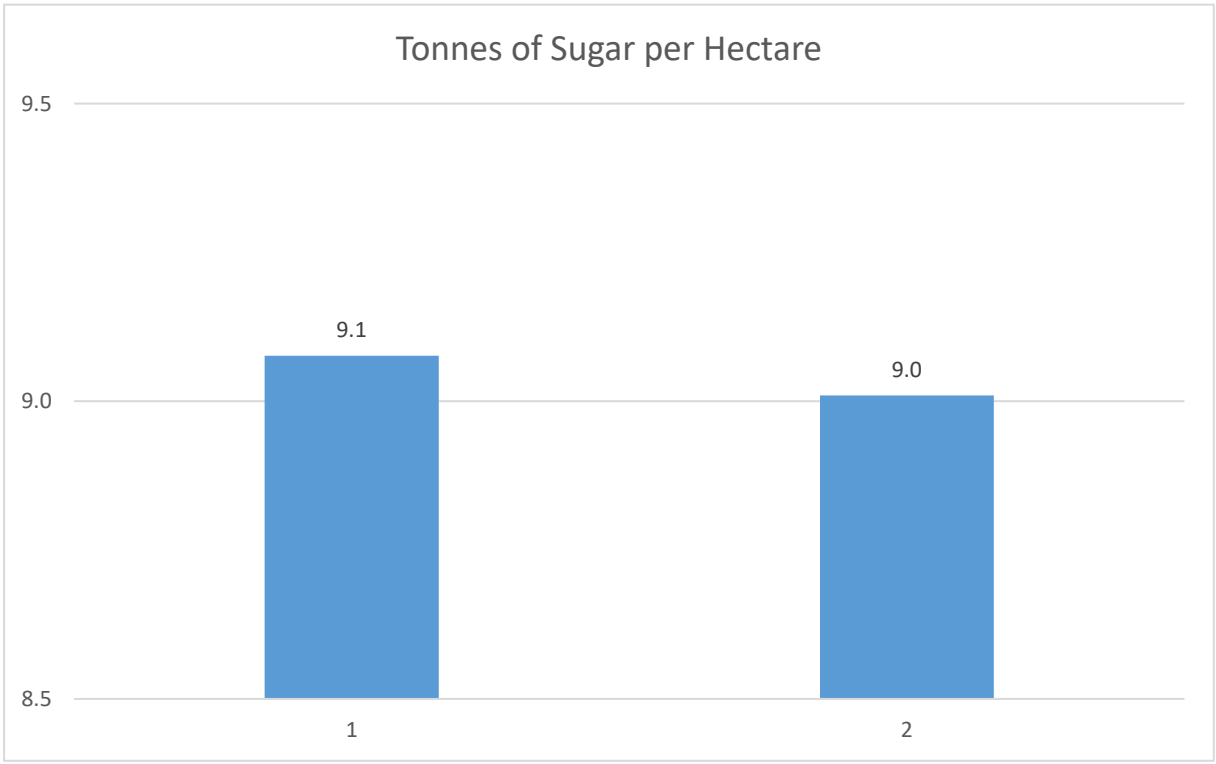

Figure 3 - sugar yields 2017 harvest

The results indicate that applying the liquid subsurface has no benefit or risk to yield, compared to applying it on the surface. Results may be influenced by seasonal conditions.

Conclusions and comments

This trial has shown very similar yields between subsurface application of dunder at different application rates. Separate trials are being undertaken to compare yields between subsurface application of dunder vs subsurface application of granular fertiliser; as well as a trial applying subsurface application of dunder vs surface application of dunder. Together these trials will provide a good indication of the potential for subsurface application and the potential to lower rates when applying subsurface. However, the trials need to be monitored over a number of years before firm conclusions can be made. Due to paddock rotations, this trial could not be reapplied in 2018.

Advantages of this Practice Change:
Subsurface application of nutrients may allow for a reduction in an application rates which would lead to improved environmental benefits

Disadvantages of this Practice Change:
Extra cost for the sub-surface application of liquid fertilisers.

Will you be using this practice in the future:
This trial needs to be measured over a number of years before making final conclusions. Results from similar trials will influence the final decision.

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

Project is complete