

ENTEC fertiliser trial – economic case study, Ingham region

Grower: Anthony Marino

Anthony Marino farms 305 hectares of cane in Trebonne, Hamleigh and Helens Hill in the Herbert Valley. Anthony is conducting a replicated trial of ENTEC fertiliser, comparing the profitability of applying the grower's conventional fertiliser product with ENTEC fertiliser applied at a lower nitrogen rate. The trial has been established on a 5.7 hectare block of first ratoon cane in Hamleigh.

ENTEC fertilisers are designed to inhibit the conversion of ammonium nitrogen to nitrate for several weeks after application. In ammonium form, nitrogen is less prone to leaching and denitrification under wet conditions, leaving more nitrogen available to be taken up by the plant following a significant rain event compared to conventional fertiliser.

Key findings

- While the ENTEC product is more expensive than the standard fertiliser blend, at the rate applied in this trial, the ENTEC treatment had a lower cost compared to the standard fertiliser treatment.
- Due to the lower cost, a break-even analysis suggests that yield can decrease by up to 1.2 tonnes per hectare before the ENTEC treatment becomes less profitable than the standard treatment.
- Production results will not be available until after the 2016 harvest.

Trial description

Two treatments are being evaluated: a standard fertiliser blend at a rate of 618 kg per hectare (150 kg of nitrogen per hectare), and a reduced nitrogen blend treated with ENTEC at a rate of 494 kg per hectare (115 kg of nitrogen per hectare). Each treatment was replicated five times.

The treatments were applied on first ratoon cane with a stool splitter in late October 2015. Production results will not be available until after the 2016 harvest.

Table 1 shows the product rate and cost of each treatment, while the nutrient rates of each product are shown in table 2. The two treatments were intended to be applied at rates that would result in the same cost per hectare, however the actual application rates led to a slightly lower cost for the ENTEC

treatment (\$404 per hectare) compared to the standard treatment (\$439 per hectare).

Table 1: Trial treatments and product costs

Treatment	Product rate	Product cost (\$/t)	Product cost (\$/ha)
Standard fertiliser	618 kg/ha	\$711	\$439
ENTEC	494 kg/ha	\$817	\$404

Table 2: Treatment nutrition rates, kg/ha

	N	P	K	S
Standard	154	15	103	15
ENTEC	115	13	89	13

Methodology

This case study compares the gross margins¹ that result from applying the grower's conventional fertiliser product and rate with ENTEC fertiliser applied at a lower N rate.

The Farm Economic Analysis Tool (FEAT) was used to calculate revenues, costs and gross margins associated with both treatments. The gross margin analysis incorporates actual growing expenses related to the trial, such as fertiliser, herbicide and pesticide product costs and application expenses.

Other parameters used in the analysis include: a sugar price of \$430 per tonne;² a labour price of \$30 per hour; and a fuel price of \$1 per litre (net of the diesel rebate and GST). Fertiliser and pesticide prices were sourced from local suppliers.

Results

Table 3 shows the revenue, costs and gross margins for the Standard and ENTEC treatments assuming that both treatments attain the same cane yield and CCS. Revenue was calculated using Anthony's average first ratoon production results from 2015.

Table 3: First ratoon gross margin analysis

	Standard	ENTECH
Revenue*	\$3,387	\$3,387
Less Fertiliser†	\$462	\$426
Weed control	\$21	\$21
Harvesting costs	\$748	\$748
Gross margin	\$2,155	\$2,191

* Based on a sugar price of \$430/t

† Including application costs

The lower cost of the ENTEC treatment resulted in a higher gross margin (\$2,191 per

¹ Gross margin equals revenue minus variable costs, which include chemical, fertiliser, machinery and harvesting costs.

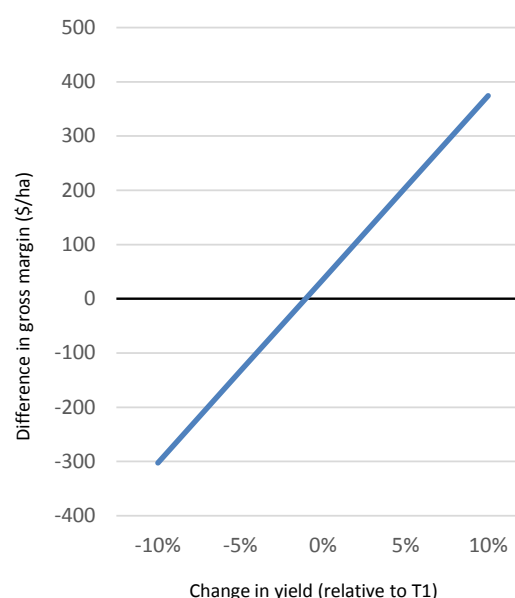
hectare) compared to the standard treatment (\$2,155 per hectare).

The higher gross margin means that the ENTEC treatment could result in a yield decrease of 1.2 tonnes per hectare before it became less profitable than the standard fertiliser treatment (assuming a constant CCS of 14.0).

Sensitivity analysis

To examine the sensitivity of the gross margins to changes in yield, figure 1 compares the difference in gross margin between the treatments at a range of ENTEC treatment yields. The chart shows, for example, that a drop in the ENTEC treatment yield of 5 tonnes per hectare compared to the standard treatment would reduce the gross margin by \$165 per hectare. Conversely, a 5 tonne per hectare increase in the ENTEC treatment yield would result in an increase in gross margin of \$219 per hectare.

Figure 1: Sensitivity of economic outcome to variations in cane yield



² \$430 per tonne is the 5 year average (2010-14) of QSL's seasonal and harvest pools.

The preceding analysis has been based on a sugar price of \$430 per tonne. However, as the price of sugar can fluctuate dramatically, examining the sensitivity of the break-even yield to changes in the price of sugar is useful.

Figure 2 builds on the previous table, showing the break-even yield for the ENTEC treatment at different sugar prices.

The chart shows that, at lower sugar prices, the ENTEC treatment can absorb a greater yield decrease before it becomes less profitable than the standard treatment. For example, at a sugar price of \$330/t, the ENTEC treatment could generate a yield 1.7 t/ha lower than the standard fertiliser treatment to produce the same gross margin, whereas the break-even yield decrease would be 0.9 t/ha for a sugar price of \$530/t.

Figure 2: Sensitivity of break-even yield to variations in sugar price



Conclusion

This study examined the economic impact of using ENTEC treated fertilisers on first ratoon cane in the Herbert.

Due to its lower application rate in this trial, the ENTEC treatment had a lower cost compared

to the standard fertiliser treatment. As a result, the ENTEC treatment would achieve the same profitability at a slightly lower yield compared to the standard fertiliser treatment.

At lower sugar prices, the ENTEC treatment can absorb a greater yield decrease before it becomes less profitable than the standard treatment.

Production results from the 2016 harvest will provide a clearer indication of the relative profitability of applying ENTEC-treated fertiliser.

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