TWINN CROP TRIAL

Sugarcane: Mandya, Karnataka, India, 2010

INTRODUCTION

The trial was conducted by researchers at the Zonal Agricultural Research Station, Mandya, Karnataka, to assess how much nitrogen rates could be reduced without yield loss when TwinN was applied, either once or twice. Application of TwinN plus full nitrogen (N) rate was also tested to assess whether yields could be increased by using TwinN. The capacity to reduce nitrogen fertiliser applications without yield penalty enables increased profitability, benefits to soils, less runoff of nitrates into waterways and a decrease in carbon footprint.

KEY RESULTS

- Standard fertiliser (100%N = 250 kgN/ha) plus two TwinN applications and 75%N plus two TwinN applications both gave a 10.6% (16.5 T/ha) yield increase over the 100%N treatment.
- 50%N plus 1 or 2 applications of TwinN both gave an 8.5% yield increase in yield over the 100%N treatment.
- 100%N gave a 48.2% increase over the zero N control, showing the trial site was N responsive.

TREATMENTS

Treatment No.	
T1 100%N (250 kgN/ha)	T7 25%N + 1 TwinN
T2 100%N + 2 TwinN	T8 25%N + 2 TwinN
T3 75%N + 1 TwinN	T9 Zero N + 1 TwinN
T4 75%N + 2 TwinN	T10 Zero N + 2 TwinN
T5 50%N + 1 TwinN	T11 N equivalents through organics + 2 TwinN
T6 50%N + 2 TwinN	T12 Absolute control (Zero N + standard P & K)

All plots received 100 kg/ha P and 125 kg/ha K

Mapleton Agri Biotec Pty Ltd

137 Obi Obi Road, Mapleton Qld 4560 Australia

Phone: +61 7 5445 7151
Email: TwinN@mabiotec.com
www.mabiotec.com

RESULTS

Figure 1: Yield (T/ha) from Treatments 1-12

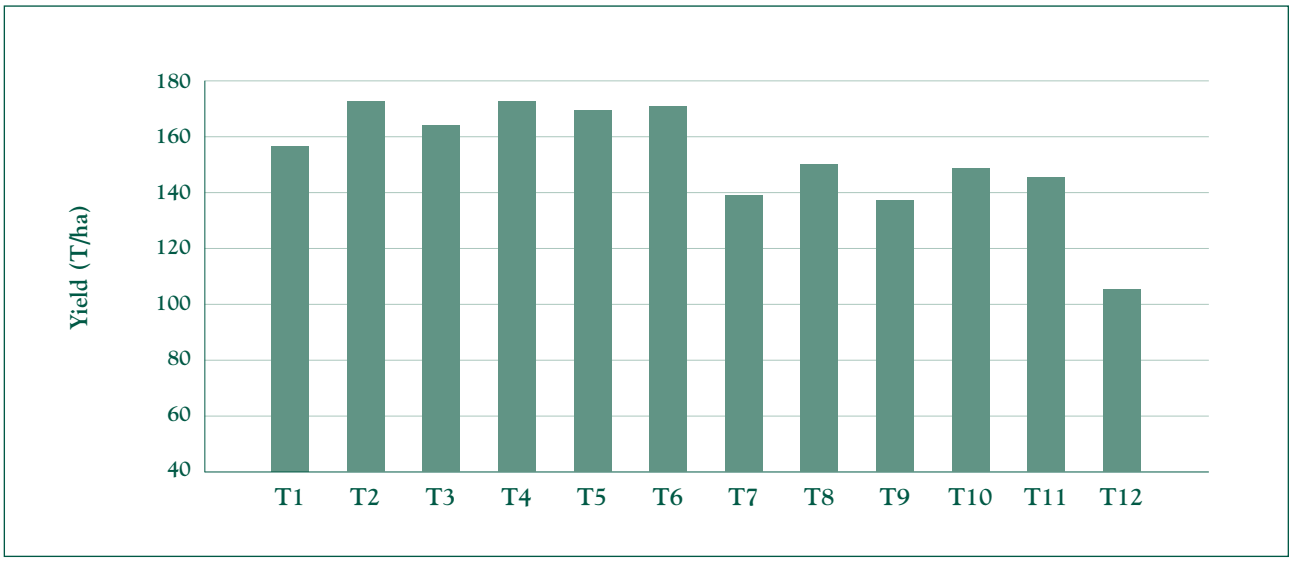

Table 1: Yield Parameters from Treatments 1-12

Treatment	Tiller No.	Cane Length (m)	Brix %	Pol %	Yield (T/ha)
T1 100%N	198	2.35	19.43	18.34	157
T2 100%N + 2 TwinN	193	2.60	19.30	18.43	173
T3 75%N + 1 TwinN	192	2.41	20.17	18.27	165
T4 75%N + 2 TwinN	192	2.60	18.97	18.08	173
T5 50%N + 1 TwinN	178	2.54	19.83	17.98	169
T6 50%N + 2 TwinN	187	2.57	19.43	18.66	171
T7 25%N + 1 TwinN	171	2.08	19.50	17.80	139
T8 25%N + 2 TwinN	163	2.27	18.97	18.06	151
T9 Zero N + 1 TwinN	170	2.06	19.60	17.74	137
T10 Zero N + 2 TwinN	175	2.24	19.00	17.90	148
T11 Organics + 2 TwinN	190	2.17	19.50	18.30	145
T12 Zero N + standard P & K	156	1.59	19.77	18.33	106
CD 5%	17	0.15	NS	NS	10.01

Two applications of TwinN applied to the standard fertiliser program (250:100:125 kg NPK/ha) increased yield by 16.5 T/ha (10.6%) and provided the highest yields in the trial. Reduction of N to 75%N (187.5 kgN/ha) plus two TwinN also gave an equivalent and statistically significant yield increase over the standard program. The 75%N plus one TwinN also increased yield over the standard but this increase was not statistically significant.

A further reduction to 50%N (125 kgN/ha) plus one or two TwinN resulted in a significant increase in yield over the standard. Reduction to 25%N plus one TwinN did result in a significant increase in yield while 25%N plus two TwinN produced a non-significant yield decrease.

Removal of all nitrogen fertiliser resulted in a large decrease in yield (-51 T/ha) showing that the site was strongly nitrogen responsive. Use of one or two applications of TwinN did increase yield over the zero N control, as did the use of organic sources of N plus two TwinN.

Tiller numbers were not significantly different between T1-4, T6 and T11, while the remaining treatments had reduced tiller numbers. Cane height was increased over the standard in T2, and T4-6, was similar in T3, and other treatments had reduced cane height. Brix % and Pol % were not affected by any treatments.

Use of two applications of TwinN versus one application did not produce significant increases in yield for T2-6 (50, 75, 100%N) but did increase yield at lower N% (0, 25%).

DISCUSSION

The ability to increase yields over the control with a 50 and 25% reduction in N fertiliser provides a valuable tool for sugarcane producers. This provides a strong economic advantage and also assists in reducing the negative effects of high nitrogen fertiliser rates on soil over time. Results from other trials suggest that a 25-60% reduction in N fertiliser is a safe level of reduction when combined with TwinN, and results from this trial are in line with that recommendation.

In countries where carbon footprint is an issue, this reduction in N fertiliser will substantially reduce the carbon footprint per ton yield since N fertilisers have a very high carbon footprint. The use of reduced nitrogen fertiliser applications also reduces the pollution of waterways with nitrates.

In this trial the use of two applications of TwinN did not confer any yield advantage over a single application and this also reduces work and cost in making an additional application of TwinN.

TRIAL SUMMARY

Trial performed and analysed by: Scientists from Zonal Agricultural Research Station, Mandya, Karnataka, India (University of Agricultural Sciences, Bangalore).

Soils

Soil was a well drained red sandy loam with the following soil properties:

Clay %	Silt %	Sand %	pH	Organic Carbon %
12.3	19.1	68.6	7 - 7.5	0.5

TRIAL DETAILS

Trial design: Randomised complete block, 12 treatments, 3 replicates

Plot size: 8 rows x 7m

Row spacing: 0.9m

Cultivar:	Co 62175
Planting date:	1 October 2009
TwinN applications:	1. At 5 leaf stage. 2. When applicable, at 2 months after the first application. Application was by backpack at 200 L/ha onto moist foliage and moist bare soil.
Harvest:	8 November 2010
Rainfall:	During crop growth period - 885 mm

CONCLUSION

The trial demonstrated that it is possible to increase yield or maintain yield using TwinN and different reductions in N fertiliser, up to a maximum reduction of 50% in N.