

TWINN CROP TRIAL



Sugarcane: Nakambala Estate, Zambia, 2009-2010

INTRODUCTION

An on-farm field trial was conducted by agronomists from Ilovo Sugar at three sites on a commercial sugarcane estate over the 2009-10 season. These commercial trials were performed to assess the capacity of TwinN to enable high yields at reduced levels of inorganic nitrogen (N) applications. Reduced chemical N applications are desirable to reduce costs, reduce carbon footprint of the cropping system and to improve soil structure and fertility.

KEY RESULT

An independent field trial at three sites in sugarcane showed:

- ◆ Two applications of TwinN in combination with either 50% or 65% of standard inorganic N application (140 kgN/ha) produced yields of sugar (pol) equivalent to the standard 100% N application protocol.

TREATMENTS

The trial compared the standard 100% N (140 kgN/ha) against TwinN in combination with 50% and 65% of standard N application. The comparison was made in three different field sites with different soil types and used two commercial cultivars.

Treatment		Plant basal dressing (kg/ha)	Urea top dress (kg N/ha)	Total inorganic N (kg/ha)
1. 100% inorganic N 0 TwinN	N	60	80	140
	P	70	0	
	K	100	0	
2. 50% inorganic N + 2 TwinN	N	60	10	70
	P	70	0	
	K	100	0	
3. 65% inorganic N + 2 TwinN	N	60	31	91
	P	70	0	
	K	100	0	

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RESULTS

Table 1: Yields for Variety N41 in Field 219

Treatment	Total yield (T/ha)	Pol %	Total Pol (T/ha)
1. 100% inorganic N, 0 TwinN	119	17.1	20.4
2. 50% inorganic N + 2 TwinN	107	17.2	18.5
3. 65% inorganic N + 2 TwinN	121	16.4	19.8

Table 2: Yields for Variety N25 in Field 706

Treatment	Total yield (T/ha)	Pol %	Total Pol (T/ha)
1. 100% inorganic N, 0 TwinN	142	13.3	18.8
2. 50% inorganic N + 2 TwinN	137	16.2	22.2
3. 65% inorganic N + 2 TwinN	125	15.2	18.9

Table 3: Yields for Variety N41 in Field 1218

Treatment	Total yield (T/ha)	Pol %	Total Pol (T/ha)
1. 100% inorganic N, 0 TwinN	155	15.4	23.9
2. 50% inorganic N + 2 TwinN	148	16.3	24.2
3. 65% inorganic N + 2 TwinN	151	16.3	24.7

Root Growth

Root growth was not quantified but was observed by the trial agronomists to be substantially greater in TwinN-treated plants at 6 months of age.

Figure 1: Root mass in cane sampled at six months, with labels A, B and C representing TwinN treatments 1, 2 and 3.



TRIAL SUMMARY

Performed and analysed by:	Ilovo Sugar Pty Ltd, Zambia
Trial design:	Randomised Complete Block Design, 3 replicates per treatment. This was repeated in three sites.
Crop:	Sugarcane
Varieties:	N25, N41
Replicate plot size:	6 rows x 10m long
Soil data:	The trial was repeated on three soil types which were classified only as light, medium and heavy.
TwinN applications:	The initial application of TwinN was made when the cane was 15 cm high and the second application was three months later. Application was onto leaves and soil in 100 L/ha water via knapsacks with a coarse nozzle during the evening period.

CONCLUSIONS

- ◆ Two TwinN applications combined with either 50% or 65% of standard nitrogen fertiliser application gave equivalent yields of sugar (pol) as the standard 100% nitrogen fertiliser application.
- ◆ TwinN provided similar results on light, medium and heavy soils.
- ◆ TwinN provided similar benefits in both sugarcane varieties N25 and N41.
- ◆ TwinN produced visually larger root systems in cane plants at six months of age.
- ◆ TwinN enabled reductions in nitrogen fertiliser that substantially reduce the carbon footprint of the crop system as well as reducing leaching of nitrogen into waterways.

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