TWINN CROP TRIAL

Illovo Sugar Malawi Limited, Dwangwa Estate

KEY RESULT

The trial tested a single application of TwinN plus 50% of standard nitrogen (N) versus the standard fertiliser program at two sites in 2008-09 to evaluate the capacity of TwinN to reduce the need for N fertiliser inputs in sugarcane. In both trials, yields and other key parameters measured in TwinN plots with 50% N were statistically equal to plots that received standard fertiliser applications.

RESULTS

Harvest Data from Field 4129

Treatment	TCHA	TERC HA	TCH	TER CH	POL %	ERSC %	FIBRE %	FLWR %	PITH %	HT	LEAF N %
T1: Standard	115.9	17.9	101.4	15.7	16.9	15.5	13.3	0.0	0.0	248.0	2.3
T2: TwinN	110.7	17.1	96.8	14.9	16.7	15.4	13.8	0.0	0.0	245.0	2.3
LSD 5%	16.4	1.7	14.4	1.5	1.1	1.3	1.9	0.0	0.0	12.2	0.7
CV	5.3	3.6	5.3	3.6	2.4	3.1	5.2	0.0	0.0	1.8	11.4

Fertiliser Inputs and Results of Leaf Analysis Field 4129

	TwinN					Standard				
	N	P	K	S	Zn	N	P	K	S	Zn
Fertiliser Inputs	92	0	100	74	0	183	0	100	74	0
	N%	P%	K%			N%	P%	K%		
Leaf Levels	2.3	0.2	1.1			2.2	0.2	1.2		

Harvest Data from Field 2107

Treatment	TCHA	TERC HA	TCH	TER CH	POL %	ERSC %	FIBRE %	FLWR %	PITH %	HT	LEAF N %
T1: Standard	125.3	18.7	102.7	15.4	16.2	14.9	15.5	15.5	18.5	265.7	1.5
T2: TwinN	119.7	18.0	98.1	14.7	16.4	15.0	14.9	15.8	10.8	278.4	1.6
LSD 5%	28.7	3.3	23.5	2.7	1.6	1.7	2.2	12.9	17.3	33.8	0.4
CV	8.6	6.7	8.6	6.7	3.6	4.1	5.2	30.2	43.3	4.6	8.2

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Fertiliser Inputs and Results of Leaf Analysis Field 2107

	TwinN					Standard				
	N	P	K	S	Zn	N	P	K	S	Zn
Fertiliser Inputs	125	0	50	73	0	250	0	50	73	0
	N %	P%	K%			N%	P%	K%		
Leaf Levels	1.6	0.2	1.5			1.6	0.2	1.7		

Field 4129 used a lower N input system and a single application of TwinN enabled a reduction in N fertiliser from 183 kg/ha to 92 kg/ha without any significant change in total yield or any other parameters. Similarly in Field 2107 which received a higher level of N inputs, a reduction in N inputs from 250 kg/ha to 125 kg/ha was achieved without yield penalty using a single application of TwinN. Leaf analysis showed levels of N and other elements were equal in the TwinN versus non-TwinN plots, demonstrating that use of TwinN was able to maintain N levels in the crop despite large reductions in applied N fertiliser. If yield increases are to be targeted using TwinN in this production system then application of 60% of standard N plus TwinN is recommended.

Two applications of TwinN are used in many sugar production systems and it is interesting to speculate on what the results would be in this system if two applications are tested. The capacity to reduce N inputs at Dwangwa Estate resulted in significant cost savings and the level of these cost savings will increase as prices of N fertiliser increases in the future. Additional benefits include a useful reduction in carbon footprint for the production system by reducing the application of urea, which has a large carbon footprint, compared with TwinN which has a small carbon footprint.

TRIAL DESIGN

The trials consisted of 5 replicates, each approximately 1 ha, in an alternated strip design and the trial was repeated at two sites, Fields 2107 and 4129.

Treatments: Field 2107

	Treatment 1 (T1)		Treatment 2 (T2)		Fertiliser Application Dates		
	Standard	kgN/ha	TwinN	kgN/ha	Basal	Top Dress 1	Top Dress 2
Min N	150		150		*	*	
TCH*	2		2		*	*	
MOP	100		100		24-Oct-08	*	
SA (kg)	305	64.1	305	64.05		24-Oct-08	10-Dec-08
UREA (kg)	404	185.8	132	60.72	*	28-Nov-08	20-Dec-08
	Total N	250	Total N	124.8			

TwinN application date: 2 Nov 08; Harvest date: 5 Aug 09; Ratoons: 7; Variety: R570; TCH 2008: 135 T/ha

Treatments: Field 4129
Fertiliser inputs were adjusted to provide these levels of nutrients:

TwinN					Standard				
N	P	K	S	Zn	N	P	K	S	Zn
92	0	100	74	0	183	0	100	74	0

TwinN application date: Nov 08; Harvest date: 7 Sept 09; Ratoons: 1; Variety: Co62175; TCH 2008: 135 T/ha