

**SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION**

EXPERIMENT RESULT

CODE: N2/86/Sw VOL 'D'/'E'

CAT. NO. 1631

TERMINAL REPORT

TITLE: PLACEMENT OF NITROGEN ON RATOON CANE ON MIXED 'D'/'E' SET SOILS

1. PARTICULARS OF PROJECT

This crop	:	2nd Ratoon						
Site	:	Volindi Estate - Field S10						
Region	:	Northern irrigated (Swaziland)						
Soil set	:	'D' & 'E'						
Design	:	Randomised blocks 4 replications						
Variety	:	NCa376						
Fertilizer	:	<table border="0" style="margin-left: 20px;"> <tr> <td>N</td> <td>P</td> <td>K</td> </tr> <tr> <td>160</td> <td>40</td> <td>148</td> </tr> </table>	N	P	K	160	40	148
N	P	K						
160	40	148						
Total (kg/ha)	:	<table border="0" style="margin-left: 20px;"> <tr> <td>160</td> <td>40</td> <td>148</td> </tr> </table>	160	40	148			
160	40	148						

Soil Analysis : Date 26/10/87					
pH	OM%	Clay %	PDI		
6,10	0,9	14	-		
ppm					
P	K	Ca	Mg	S	Zn
36	91	543	188	19	0,8
Age		: 10,9 months			
Dates		: 20/10/87 - 16/9/88			
Irrigation:		Not			
Rainfall :		available			
Total :					

2. OBJECTIVES

- 2.1 To continue investigating whether the different methods of nitrogen placement influence yields.
- 2.2 To establish whether the incorporation of nitrogen has any effect on its efficiency when irrigation is delayed.

3. TREATMENTS

- 3.1 Nitrogen banded on the row with no incorporation.
- 3.2 Nitrogen banded on the row and incorporated.
- 3.3 Nitrogen broadcast with no incorporation.
- 3.4 Nitrogen broadcast and incorporated.
- 3.5 Nitrogen buried in the interrow.

### Notes on Treatments

- \* Nitrogen as urea (46%N) at 160 kg N/ha was used in all the treatments as a single application 10 days after harvesting.
- \* Incorporation was carried out using a six tine cultivator followed by a Tiger tiller.
- \* Urea was buried by hand to a depth of 10 - 15 cm in the interrows for the N buried treatment.
- \* Irrigation commenced  $\pm$  6 days after nitrogen top-dressing. The first rainfall recorded after N application was at  $\pm$  3 weeks.

## 4. RESULTS

### 4.1 Crop growth data

Table 1. Treatment effects on cane heights (mm to TVD) and populations (x1000/ha) at 2,8 and 7,4 months of age.

TREATMENT	STALK HEIGHTS (mm to TVD)	STALK POPULATIONS (x 1000/ha)	
	7,4m (June)	2,8m (Jan)	7,4m (June)
N banded - no incorporation	1940	231	134
N banded + incorporated	2040	228	135
N broadcast - no incorp.	2020	240	159
N broadcast + incorporated	2100	243	136
N buried	2030	230	147

### 4.2 Harvest data

Table 2. Cane yield, sucrose % cane and sucrose yield.

TREATMENTS	CANE YIELD T/HA	SUCROSE % % CANE	SUCROSE YIELD T/HA
N banded - no incorporation	81	15,5	12,6
N banded + incorporated	89	15,7	13,9
N broadcast - no incorp.	91	15,7	14,3
N broadcast + incorporated	91	15,9	14,5
N buried	95	15,5	14,8
LSD Treatment (0,05)*	17	0,6	2,6
(0,01)**	24	0,9	3,6
Significance	N.S	N.S	N.S
Mean	89	15,7	14,0
CV %	12,4	2,6	12,0

### 4.3 Foliar analysis.

Table 3. Third leaf N, P, and K (%dm) values at 2,0 and 4,2 months of age.

TREATMENTS	2,0 MONTHS (DEC)			4,2 MONTHS (FEB)		
	N	P	K	N	P	K
N banded - no incorporation	2,55	0,29	1,27	1,54	0,19	1,23
N banded + incorporated	2,45	0,29	1,29	1,63	0,19	1,23
N broadcast - no incorp.	2,41	0,28	1,23	1,60	0,20	1,23
N broadcast + incorporated	2,54	0,28	1,31	1,63	0,20	1,28
N buried	2,50	0,26	1,18	1,76**	0,21	1,35*
LSD Treatment (0,05)* (0,01)**	0,28 0,39	0,34 0,48	0,15 0,21	0,15 0,21	0,20 0,28	0,11 0,15
Significance	N.S	N.S	N.S	**	N.S	*
Mean	2,50	0,29	1,30	1,63	0,20	1,27
CV%	7,2	7,8	7,9	6,0	6,4	5,4

### 5. COMMENTS

- 5.1 Cane yields for this season were lower than in the first ratoon and showed no significant yield benefits to the treatments. There was however a tendency for the buried N treatments to yield slightly higher than the others while the non-incorporated banded treatment was the lowest (N,S) (Table 2). Crop growth differences also showed a slight decrease in stalk height where N had been banded and left undisturbed.
- 5.2 Cane quality was similar for all treatments.
- 5.3 Sucrose yields approached statistical differences between the non-incorporated banded N and the buried N treatments.
- 5.4 The apparent yield benefits by burying N in the interrow may well be real as third leaf (%dm) values show differences between the lowest and highest yielding treatments that were highly significant (P=0,01) at 4,2 months of age in February (Table 3). The other third leaf nutrient levels seemed to be enhanced at this stage as well where N was buried.

### 6. SUMMARY

- 6.1 Nitrogen placement treatments were identical for the 1st and 2nd ratoon crops but the timing of the first post top-dressing irrigation differed between the two seasons. Irrigation commenced immediately after top-dressing N in the first season (1986/87) but was delayed for  $\pm$  1 week in the second (1987/88). It should be noted that the incorporated N was only slightly covered with a very sandy top-soil which may have been ineffective in preventing nitrogen losses. There was in addition strong evidence from the 2nd ratoon that N (%dm) values were higher and that more N was available where urea was buried.

- 6.2 As it is not always possible to follow N top-dressings with an incorporating irrigation, N losses could be prevented by burying N in the interrow as is practised widely in Australia.
- 6.3 A more comprehensive investigation is required to decide on the advantages of this N placement technique.

NBL/cg  
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