

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: FT 12NK80

Cat. No.: 1262

TITLE: Rates of nitrogen and potassium for ratoon cane grown on a granite derived soil on the South Coast

1. Particulars of project

<u>This crop</u>	5th ratoon	<u>Soil analysis:</u> Date: 25 November 1980					
<u>Site</u>	C.G. Smith Sugar Co. Ltd - Nkwifa (Dam site)	<u>pH</u>	<u>O.M. %</u>	<u>Clay %</u>	<u>P.D.I.</u>		
<u>Region</u>	South Coast Coastal	5,77	1,27	7			
<u>Soil system</u>	Umzinto Coast Lowlands	ppm					
<u>Soil form/series</u>	Kroons tad	<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>	<u>Zn</u> <u>Al</u>	
<u>Design</u>	6 x 3 Factorial with 2 replications	14	78	41389	1,79		
<u>Variety</u>	NCo 376	<u>Age:</u> 12,5 m <u>Dates:</u> 20.11.80-4.12.81					
<u>Fertilizer kg/ha</u>	N P K ↓ 40 ↓ (5see treatments)	<u>Rainfall:</u> 835 mm <u>L.T.M.:</u>					
		<u>Irrigation:</u> Nil					

Soil profile description:

Grey medium/coarse sandy topsoil (orthic) \pm 300 mm deep overlying a light grey horizon (E horizon) with a water table at \pm 900 mm.

Objectives

To measure the response to levels of nitrogen and potassium on ratoon cane grown in a Kroonstad soil form on the South Coast.

3. Treatments

Levels of N and K (kg/ha)

<u>Nitrogen</u>	<u>Potassium</u>
N0 - 0	K0 - 0
N1 - 100	K1 - 125
N2 - 130	K2 - 250
N3 - 160	
N4 - 190	
N5 - 220	

Notes on treatments

1. Nitrogen was applied as urea and potassium as KCl in a single application in November at approximately two weeks of age.
2. P was applied to all plots in December at about four weeks of age.
3. Treatments N0K0 and N5K0 were not applied in this trial due to inadequate plot numbers.

4. Results

4.1 Yield

Tons cane/ha

kg/ha	N0 0	N1 100	N2 130	N3 160	N4 190	N5 220	Mean
K0 - 0	-	59	59	65	63	-	61
K1 - 125	65	72	65	52	68	72	66
K2 - 250	55	67	70	66	73	58	65
Mean	60	66	65	61	68	65	

C.V. % 14,4
 LSD (0,05) Treatment means 19,7
 N Means (N1 to N4) 11,4
 K Means (K1 vs K2) 8,06

Sucrose % cane

kg/ha	0	125	250	Mean
0	-	13,9	13,5	13,9
125	13,7	13,3	13,4	12,7
250	12,9	13,7	13,2	13,6
Mean	13,3	13,6	13,4	13,4

C.V. % 4,3
 LSD (0,05) Treatment means 1,2
 N Means (N1 to N4) 0,71
 K Means (K1 vs K2) 0,52

Tons sucrose/ha

kg/ha	0	125	250	Mean
0	-	8,1	7,9	9,1
125	8,9	9,6	8,7	6,6
250	7,0	9,2	9,3	9,1
Mean	8,0	9,0	8,6	8,2

C.V. % 17,2
 LSD (0,05) Treatment means 3,12
 N Means (N1 to N4) 1,84
 K Means (K1 vs K2) 1,3

4.2 Treatment effects on harvested crop characteristics

N kg/ ha	Stalk population x 1 000/ ha	Stalk length (cm)	Stalk mass (kg)
N1	126	141	0,48
100	134	151	0,49
130	137	144	0,47
160	129	139	0,47
190	141	156	0,48
220	132	145	0,49
N1	130	145	0,47
125	137	147	0,48
250	133	146	0,49

4.3 Third leaf analyses

Treatment \ Age (m)	Age (m)		
	2,5 Feb	3,8 Mar	4,8 Apr
		N % d.m.	
NO	2,04	1,92	1,68
N1	2,08	2,02	1,73
N2	2,05	2,00	1,77
N3	2,28	2,03	1,72
N4	2,17	2,10	1,79
N5	2,04	2,06	1,76
		K % d.m.	
KG	1,18	1,01	1,29
K1	1,14	1,10	1,34
K2	1,25	1,18	1,40

5. Comments on results

- 5.1 The crop was harvested relatively young (12,5 months) with a mean yield of 5,1 tc/ha/m and 7,7 tc/ha/100 mm rainfall.
- 5.2 The variability in the trial is high (C.V.% 14,4 for tc/ha) and the responses to N and K do not reach a level of statistical significance.
- 5.3 A yield of 57,6 tc/ha/annum from applying no nitrogen to a Kroonstad soil is reasonably good; although the soil is relatively deep.
- 5.4 There is an indication only of a small response (6,5 tc/ha) to N (mean of N1 to N5 compared with N0) and stalk population was increased with nitrogen fertilizer. The lack of any response to levels greater than 100 kg/ha nitrogen is confirmed by the third leaf data which indicate adequacy up to five months in all treatments except for the N0 level.
- 5.5 There is also a small indication (n.s.) of a potassium response from K0 to K1 only, and this is reflected slightly in stalk measurement and the third leaf data.