

N₁ 44

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: FOL/2/82/Sw SIS
Cat. No.: 1391

TITLE: Foliar applied nutrients

1. Particulars of project

This crop : 8th ratoon
Site : SIS - Vuvulane
Field P6-Block 2
Region : Northern irrigated
(Swaziland)
Soil set/series: R/Rheebok
Design : Randomised blocks
10 replications
Variety : NCo 376
Fertilizer : See treatments

Soil Analysis: Date 25/8/1982

<u>pH</u>	<u>OM%</u>	<u>Clay%</u>	<u>PDI</u>
6,04	-	> 30	-

<u>ppm</u>			
<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>
12	208	1227	>220

Spray Method: CP-3 Knapsack with red Polijet nozzle

Volume: Average 280 l water/ha

Age of cane at spraying: 2,3 2,8
3,5 3,9 and 4,6 months

Age at harvest: 12 months

Dates: 9/7/1982 - 7/7/1983

Irrigation: 600 mm, 12 cycles with 50 mm per cycle of 12 hours

Rainfall: 544 mm

Total : 1144 mm

2. Motivation and objectives

- 2.1 Over the last three years five month old cane in this field has repeatedly produced low third leaf K% d.m. (1980- 0,98%, 1981-0,97%, 1982-1,02%). It was decided to try and boost these levels by using some soluble potassium containing fertilizers.
- 2.2 Because of the negative results gained from a similar trial using the same products, rates were increased to exceed those recommended and five applications were made.

3. Treatments

	<u>N(kg/ha)</u>	<u>P(kg/ha)</u>	<u>K(kg/ha)</u>
Granular fertilizer-standard	100,0	-	150,0
Granular fertilizer- but no potassium	100,0	-	-
Granular fertilizer-standard +Potaspray (5 sprays at 10% solution)	108,1	24,7	191,3
Granular fertilizer-standard +KNO ₃ (5 sprays at 10% solution)	118,1	-	202,9

Notes on Treatments

- Granular nitrogen as ammonium nitrate (34,5% N)
- Granular potassium as nitrate of potash (50% K)
- Granular forms of fertilizer were applied by hand over the cane row as a single application at one month of age.
- Foliar applied fertilizers were applied onto the foliage at 2,3 2,8 3,5 3,9 and 4,6 months of age.
- Reveseal 9 was used as the wetting agent at 2,8 l/ha

4. Results

Table I : Yield

Treatment	tc/ha	Suc % cane	ts/ha
Standard	75	14,9	11,1
Standard No K	76	15,0	11,4
Standard + Potaspray	79	14,8	11,6
Standard + KNO ₃	75	14,8	11,1
CV %	8,6	4,0	8,6
LSD (P= 0,05)	6,0	0,5	0,9

Table II: Crop growth measurements (cm to tvd) at 7,6 8,8 9,6 and 11,8 months of age and populations ('1000/ha) at 9,6 and 11,8 months of age.

Crop Age (m)	Stalk heights (cm)				Populations ('1000/ha)	
	7,6	8,8	9,6	11,8	9,6	11,8
Standard	120	160	174	188	139	112
Standard No K	122	161	173	191	145	114
Standard + Potaspray	130	166	180	194	149	115
Standard + KNO ₃	122	160	175	190	144	111

Third leaf analyses. (% d.m)

Treatments	Age in months													
	Sept 2,8		Oct 3,5		Nov 4,6		Dec 6,1		Jan 6,8		Feb 7,4		Mar 8,4	
	N	K	N	K	N	K	N	K	N	K	N	K	N	K
Standard	2,33	1,04	2,22	1,05	2,14	1,16	1,71	1,26	1,46	1,29	1,53	1,21	1,49	1,26
Standard No K	2,39	1,05	2,31	1,03	2,13	1,16	1,73	1,25	1,45	1,26	1,50	1,26	1,51	1,27
Standard + Potaspray	2,46	1,05	2,32	1,06	2,30	1,27	1,78	1,32	1,51	1,31	1,53	1,31	1,55	1,29
Standard + KNO ₃	2,46	1,11	2,39	1,06	2,24	1,29	1,77	1,27	1,50	1,31	1,58	1,28	1,54	1,27

5. Comments

5.1 Populations:

Stalk counts taken at 9,6 and 11,8 months of age showed that the plots that received the standard treatment and Potaspray had a slightly higher population but the difference was small.

5.2 Stalk heights:

Height measurements done at 7,6 8,8 9,6 and 11,8 months of age indicated that the cane that received Potaspray had slightly longer stalks.

5.3 Third leaf N levels:

Cane that received the two foliar applied products as well as the standard treatment were generally slightly higher in third leaf N levels than cane that was not sprayed. All third leaf N values were low from December onwards (from \pm 6 months of age).

5.4 Third leaf K levels:

It is generally the case in the lowveld that third leaf K values are low during September and October. Leaves from cane that received KNO_3 in addition to the granular fertilizer did not drop to the threshold level or below as did the K levels in leaves from the other treatments in September. The Potaspray treatment also raised third leaf K values at samplings from November onwards.

Cane that received no additional potassium had third leaf K levels that were comparable with that which received 150 kg k/ha. This indicates that the 208 ppm K in the soil was adequate and that the low third leaf K % d.m. values recorded at this site in the past was possibly influenced by season.

5.5 Cane yield:

The yield level was disappointing due to the lack of water in the area. There were no significant differences between the treatments.

5.6 Cane quality:

As in a previous foliar nutrient trial the foliar spray of KNO_3 and Potaspray slightly depressed sucrose % cane (n.s.).

5.7 Sucrose yield:

Differences between treatments were small and n.s.

5.8 This trial has been terminated.