

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CAT.NO.: 1826

CODE: K8/90/Sw UBO 'W'

TITLE: LEVELS OF POTASSIUM APPLICATION FOR EARLY SEASON CANE ON A 'W' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 11th ratoon	Soil Analysis:	19/09/1990				
Site	: Ubombo Ranches Field Vuzamanzi	pH	OM%	Clay%	Silt%	Sand%	
		5.96	1.3	16.8	6.2	79.6	
Region	: Northern Irrigated (Swaziland)	ppm					
		P	Ko	Ca	Mg	(Ca+Mg)/K	
		17	116	497	233	6	
Design	: Randomized block, 6 replications	CEC	: 6.50 meq/100g soil				
		KDI	: 0.82				
Soil Set/Series:	'W' Wynn	Date	: 29/05/90-27/05/91				
		Age	: 12 months				
Variety	: NCo376	Rainfall	: 603 mm				
Fertilizer	: N P K	Irrigation:	1235 mm				
Total (kg/ha)	: 160 30 See Treatment	Total	: 1838 mm				

2. OBJECTIVES

- 2.1 To test the FAS soil-K threshold for winter cut cane grown on a light textured soil under irrigated conditions.
- 2.2 To determine the effect of low leaf-K content in Sept - Oct on yield and confirm the validity of downgrading leaf-K threshold for winter harvested cane.
- 2.3 To monitor the rate of K build-up in light soil including the subsoil.

3. TREATMENTS

3.1 Potassium

K <sub>0</sub>	K <sub>1</sub>	K <sub>2</sub>
0	75	150 kg K ha <sup>-1</sup>

Potassium as KCl (50 % K) was surface broadcast on 03/07/1990, 5 weeks after harvest.

### 3.2 Notes on Treatments

Nitrogen as Urea (46 % N) was applied at the rate of 160 kg N ha<sup>-1</sup> on 03/07/1990, 5 weeks after harvest.

Phosphorus as Single Supers (10.5 % P) was applied at the rate of 30 kg P ha<sup>-1</sup> on 03/07/1990, 5 weeks after harvest.

### 3.4 Notes on soil sampling

Topsoil: 40 cores were taken from each plot at a ratio of 16 on row to 24 interrow (ie. 1:1.5).

Subsoil: 20 cores were taken from 4 selected plots in the control and two selected plots in the 150 kg K ha<sup>-1</sup> at a ratio of 8 on row to 12 interrow (1:1.5).

## 4. RESULTS

### 4.1 Soil Analysis

Table 1: Properties of the soil profile - June 1990

Depth (cm)	pH	Clay %	OM %	CEC meq/100g soil	TCEC meq/100g clay	KDI
0-15	6.30	16.8	1.30	6.5	38.6	0.82
20-30	6.02	23.8	0.90	6.7	28.1	0.72
40-50	6.10	25.6	0.70	7.1	27.7	0.74

Note: Analysis done on a composite sample

Table 2: K, Ca, Mg status (ppm) of the soil profile - September 1990

Depth (cm)	Control				150 kg K ha <sup>-1</sup>			
	K	Ca	Mg	(Ca+Mg)/K	K	Ca	Mg	(Ca+Mg)/K
0-15	107(19)	500(21)	226(13)	7	189(63)	288(7)	575(45)	5
20-30	56(6)	537(93)	181(20)	13	89(20)	448(17)	202(17)	7
40-50	60(8)	532(39)	190(7)	12	78(23)	587(5)	223(0.41)	10

( ) Standard error

Note: Samples taken after fertilization from 3 plots in the control and 2 plots in the 150 kg K ha<sup>-1</sup> treatment

Table 3: K, Ca, Mg status (ppm) of the topsoil - September 1990

Treatment	K	Ca	Mg	(Ca+Mg)/K
	ppm			
K <sub>0</sub> Control	116	497	233	6
K <sub>1</sub> 75 kg K ha <sup>-1</sup>	153	546	245	5
K <sub>2</sub> 150 kg K ha <sup>-1</sup>	190	523	243	4
LSD (0.05)	59	96	36	
(0.01)	84	136	51	
Significance	NS	NS	NS	
Mean	153	521	240	
SE one plot	46	74	28	
CV %	29.9	14.3	11.7	

#### 4.2 Harvest Data

Table 4: Cane Yield, Sucrose % Cane and Sucrose Yield

Treatment	TC ha <sup>-1</sup>	Sucrose % Cane	T Suc ha <sup>-1</sup>
K <sub>0</sub> Control	111	11.69	13.1
K <sub>1</sub> 75 kg K ha <sup>-1</sup>	123	11.12	13.8
K <sub>2</sub> 150 kg K ha <sup>-1</sup>	122	11.67	14.2
LSD (0.05)	10	1.50	2.9
(0.01)	14	2.11	4.1
Significance	*	NS	NS
Mean	119	11.47	13.7
SE one plot	8	1.17	2.2
CV %	6.7	10.2	16.2

#### 4.3 Leaf Analysis

Table 5: Third Leaf Analysis (% dm) at 4.75 months in October

Treatment	N	P	K	Ca	Mg
K <sub>0</sub> Control	2.23	0.27	0.90	0.32	0.30
K <sub>1</sub> 75 kg K ha <sup>-1</sup>	2.16	0.26	1.02	0.29	0.25
K <sub>2</sub> 150 kg K ha <sup>-1</sup>	2.19	0.26	1.02	0.28	0.27
LSD (0.05)	0.018	0.010	0.19	0.081	0.070
(0.01)	0.24	0.013	0.26	0.11	0.10
Significance	NS	NS	NS	NS	NS
Mean	2.19	0.26	0.98	0.30	0.27
SE one plot	0.13	0.018	0.14	0.067	0.052
CV %	6.1	7.0	14.8	22.3	18.9

Figure 1: The effect of season on Leaf-K content

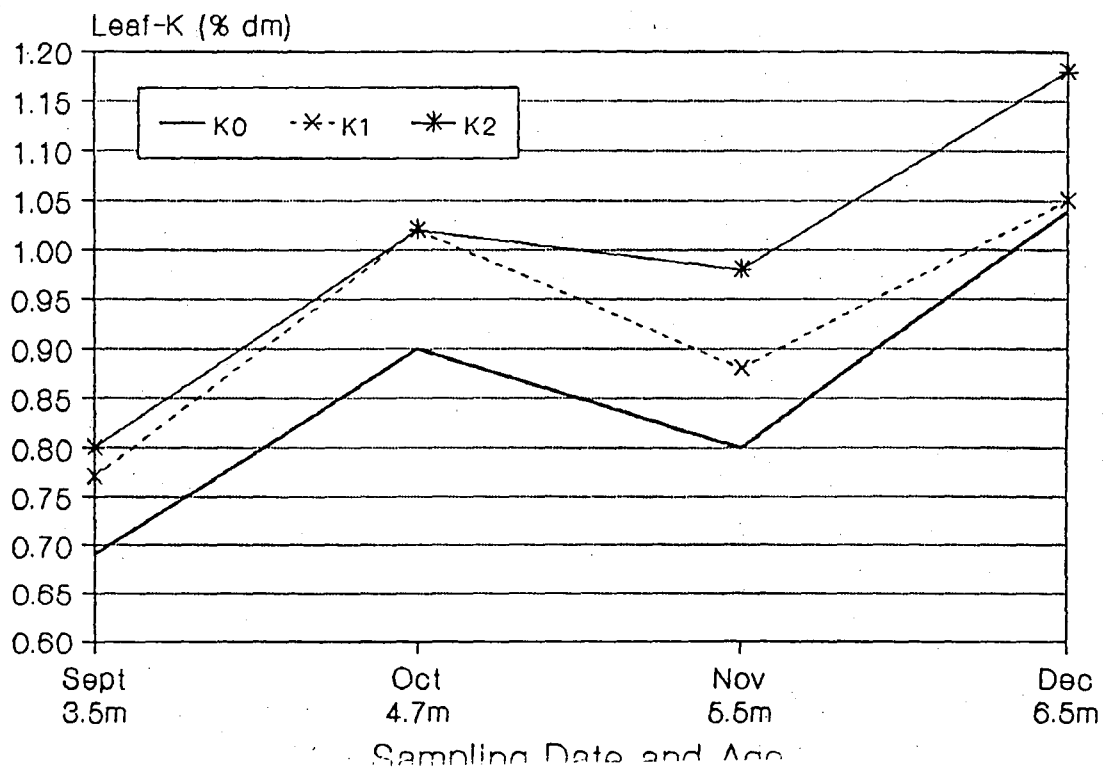
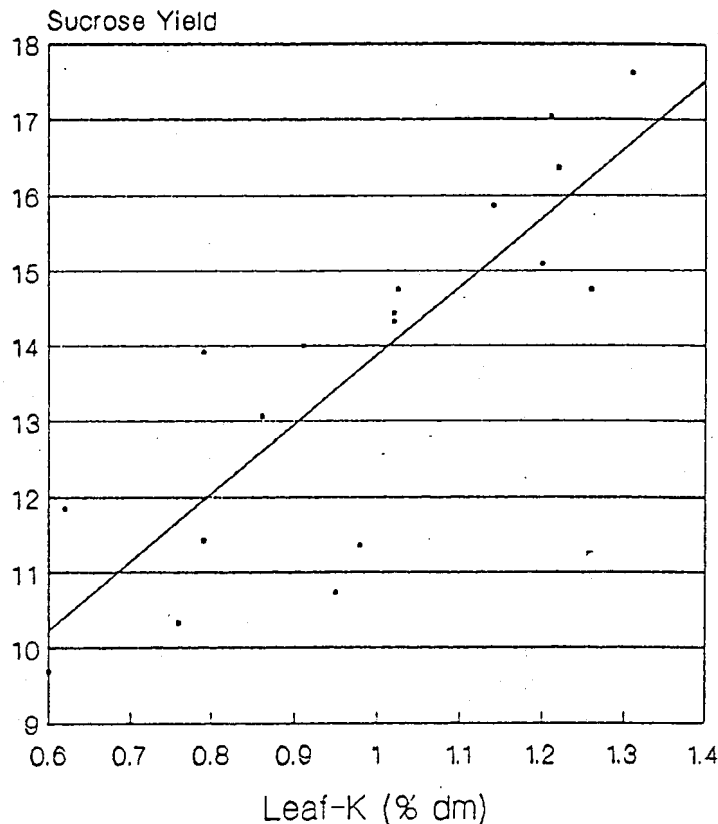


Figure 2: Relationship between Sucrose Yield and Leaf-K content in October



## 5. COMMENTS

### 5.1 Soil Analysis

Soil-K status of the control was close to the FAS threshold for soils with less than 30 % clay. Increasing K rates increased soil-K level and the difference between control and the highest rate of K was significant (Table 3). It is noted, however, that the CV % for soil-K values was high, indicating considerable variability in soil-K data.

The effects of K treatments on the soil-K status was most apparent in the topsoil although differences were also apparent in the subsoil (Table 2). These differences, however, must be viewed with caution as the high SE in the 150 kg K ha<sup>-1</sup> treatment indicates that they might have been due to chance. This interpretation is supported by the fact that leaching is obviously slow in this soil as shown by the sharp decrease in soil-K between topsoil and subsoil.

### 5.2 Harvest Data

#### Cane Yield

The effect of K treatments on cane yield was significant. The maximum yield of cane was achieved at the intermediate rate of 75 kg K ha<sup>-1</sup>.

#### Cane Quality

K treatments had no effect on sucrose content. It is noted, however, that the CV % for sucrose content was high possibly as a result of the high variability in soil-K content.

## Sucrose Yield

Sucrose yield tended to increase with increasing rates of K. The trend was not significant because the high CV % for sucrose content resulted in considerable variability in the sucrose yield data.

### 5.4 Leaf Analysis

Leaf analysis in October showed K content of the control plot to be above the FAS new threshold. It is apparent, however, that this new threshold is inadequate as sucrose yield continued to increase significantly for values of leaf-K content higher than the threshold (Fig. 1). Content of the other nutrients was above threshold.

Increasing K rates increased K uptake but the responses were generally not significant because of high variability in leaf-K content (Appendix 1). It is apparent that leaf-K was depressed before December and the K content of the control was found to be below the new FAS threshold despite the soil-K status being apparently adequate. This questions the validity of the FAS soil-K threshold for light textured soils.

## 6. CONCLUSION

- \* Variability in soil-K levels at this experiment site was high and was reflected in leaf-K and possibly in sucrose content.
- \* Cane yield responded significantly to K treatments and the maximum yield was achieved at the intermediate rate of 75 kg K ha<sup>-1</sup>.
- \* Indications were that the optimum soil-K level was between 116 and 153 ppm which is higher than the current FAS threshold of 112 ppm for soils with less than 30 % clay.
- \* Leaf-K content of the control was variable but was generally below the new FAS threshold and tended to confirm the inadequacy of the current FAS soil-K threshold for winter cut cane growing on light textured soils.
- \* Sucrose yield tended to increase with increasing leaf-K content and this relationship questioned the validity of downgrading the leaf-K threshold for winter cut cane.
- \* Sampling at depth, although variable, indicated that leaching of K in this soil was only moderate. The effectiveness of surface applied K as a means of replenishing the root zone with K is questioned.
- \* This trial has been continued and is now in its 12<sup>th</sup> ratoon.

Appendix 1Effect of season on Leaf-K content (% dm)

Sampling Date	13/09/90	19/10/90	14/11/90	12/12/90
Cane Age	3.50 m	4.75 m	5.50 m	6.50 m
K <sub>0</sub> Control	0.69	0.90	0.80	1.04
K <sub>1</sub> 175 kg K ha <sup>-1</sup>	0.77	1.02	0.88	1.05
K <sub>2</sub> 350 kg K ha <sup>-1</sup>	0.80	1.02	0.98	1.18
LSD (0.05)	0.18	0.19	0.13	0.27
(0.01)	0.26	0.26	0.18	0.39
Significance	NS	NS	*	NS
Mean	0.75	0.98	0.89	1.09
SE one plot	0.14	0.14	0.099	0.21
CV %	18.9	14.8	11.2	19.4

Effect of season on Leaf-Ca content (% dm)

K <sub>0</sub> Control	0.44	0.32	0.29	0.24
K <sub>1</sub> 175 kg K ha <sup>-1</sup>	0.45	0.29	0.27	0.22
K <sub>2</sub> 350 kg K ha <sup>-1</sup>	0.44	0.28	0.25	0.21
Mean	0.44	0.30	0.27	0.22

Effect of season on Leaf-Mg content (% dm)

K <sub>0</sub> Control	0.31	0.30	0.32	0.21
K <sub>1</sub> 175 kg K ha <sup>-1</sup>	0.36	0.25	0.30	0.20
K <sub>2</sub> 350 kg K ha <sup>-1</sup>	0.32	0.27	0.22	0.18
Mean	0.33	0.27	0.28	0.20

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EXPERIMENT RESULT

CODE: K8/90/Sw UBO 'W'

CAT No: 1826

TITLE: LEVELS OF POTASSIUM APPLICATION FOR EARLY SEASON CANE ON A 'W' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 12th ratoon	Soil Analysis: 11/03/92 (19/09/90*)				
Site	: Ubombo Ranches Field Vuzamanzi	pH	OM%	Clay%	Silt%	Sand%
		6.3	1.3*	16.8*	6.2*	79.6*
Region	: Northern Irrigated (Swaziland)	ppm				
		P	K <sub>o</sub>	Ca <sub>o</sub>	Mg <sub>o</sub>	(Ca+Mg)/K
		12	99	568	271	8.5
Design	: Randomized block, 6 replications	CEC	:	6.5* meq/100g soil		
		KDI	:	0.82*		
Soil Set/Series:	'W' Winn	Date	:	27/05/91-20/05/92		
Variety	: NCo376	Age	:	11.8 months		
Fertilizer	: N            P            K	Rainfall	:	426 mm		
Total (kg/ha)	: 140        -        See Treatment	Irrigation:	:	1344 mm		
		Total	:	1777 mm		

2. OBJECTIVES

- 2.1 To test the FAS soil-K threshold for winter cut cane grown on a light textured soil under irrigated conditions.
- 2.2 To determine the effect of low leaf-K content in Sept - Oct on yield and confirm the validity of downgrading leaf-K threshold for winter harvested cane.

3. TREATMENTS

3.1 Potassium

K<sub>0</sub>                      K<sub>1</sub>                      K<sub>2</sub>  
0                              75                              150 kg K ha<sup>-1</sup>

Potassium as KCl (50 % K) was surface broadcast and incorporated on 11/06/1991, 2 weeks after harvest.

### 3.2 Notes on Treatments

Nitrogen as Urea (46 % N) was applied at the rate of 140 kg N ha<sup>-1</sup> subdivided into 80 kg N ha<sup>-1</sup> 2 weeks after harvest and 60 kg N ha<sup>-1</sup> 3.5 months after harvest.

### 3.4 Notes on soil sampling

Topsoil: 40 cores were taken from each plot at a ratio of 16 on row to 24 interrow (ie. 1:1.5).

## 4. RESULTS

### 4.1 Soil Analysis

Table 1: P, K, Ca and Mg (ppm) status of the topsoil - March 1992

Treatment	P	K	Ca	Mg	(Ca+Mg)/K
	ppm				
Control	10	108	839	271	8.9
75 kg K ha <sup>-1</sup>	14	122	888	281	7.6
150 kg K ha <sup>-1</sup>	12	153	795	260	5.5
LSD (0.05)	4	48	103	28	2.6
Significance	NS	NS	NS	NS	*
Mean	12	128	841	271	7.4
S.E.D. ±	1.8	21.6	46.3	12.4	1.2
CV %	25.8	29.3	10.5	7.9	28.0

### 4.2 Leaf Analysis

Table 2: General Third Leaf Analysis (% dm) at 4.3 Months in October

Treatment	N	P	K	Ca	Mg
Control	2.32	0.22	0.49	0.32	0.35
75 kg K ha <sup>-1</sup>	2.31	0.21	0.53	0.28	0.30
150 kg K ha <sup>-1</sup>	2.34	0.22	0.67	0.28	0.26
LSD (0.05)	0.09	0.03	0.09	0.04	0.07
Significance	NS	NS	**	NS	NS
Mean	2.32	0.22	0.57	0.29	0.30
SE of Diff.	0.04	0.01	0.04	0.02	0.03
CV %	3.1	4.4	12.3	11.3	17.9



Table 3: Effect of Season on Leaf-K, Ca and Mg Content (% dm)

Sampling Date	17-09-91			07-10-91			20-11-91		
Cane Age (months)	3.6 m			4.3 m			5.7 m		
Treatment	K	Ca	Mg	K	Ca	Mg	K	Ca	Mg
Control	0.69	0.36	0.44	0.49	0.32	0.35	0.79	0.32	0.30
175 Kg K/ha	0.76	0.41	0.43	0.53	0.28	0.30	0.87	0.33	0.23
350 Kg K/ha	0.93	0.35	0.38	0.68	0.28	0.26	1.00	0.33	0.23
LSD (0.05)	0.19	0.06	0.06	0.09	0.04	0.07	0.12	0.09	0.04
Significance	*	NS	NS	**	NS	NS	**	NS	**
Mean	0.79	0.37	0.42	0.57	0.29	0.30	0.89	0.32	0.25
SE of Difference	0.08	0.03	0.03	0.04	0.02	0.03	0.05	0.04	0.02
CV %	18.2	13.3	11.7	12.3	11.3	17.9	10.2	21.2	11.8

#### 4.3 Harvest Data

Table 4: Cane Yield, Sucrose % Cane and Sucrose Yield

Treatment	TC ha <sup>-1</sup>	Sucrose % Cane	T Suc ha <sup>-1</sup>
Control	82	12.85	10.5
75 kg K ha <sup>-1</sup>	104	13.31	13.8
150 kg K ha <sup>-1</sup>	99	13.34	13.2
LSD (0.05)	20	0.76	2.4
Significance	NS	NS	*
Mean	95	13.17	12.5
SE of Difference	9	0.34	1.1
CV %	16.8	4.5	15.1

## 5. COMMENTS

### 5.1 Soil Analysis

Soil samples were only taken in this trial in March, 1992, 10 months after harvest and 9,5 months after fertilizer application. Samples at this time indicated that the soil K level in the control was marginal/deficient. Soil values were very variable at this site and Ca levels were inexplicably higher than in the previous crop.

## 5.2 Leaf Analysis

Leaf analysis in October showed that levels of N, P were satisfactory and were unaffected by treatment. K levels were surprisingly low in the control treatment considering that the soil K level was close to the current threshold level and that the Ca + Mg/K ratio did not indicate an imbalance of these nutrients. Leaf K levels decreased in all treatments in October but increased again in November following the typical spring depression in K levels.

Applications of K increased leaf K significantly at all sampling dates and higher leaf K values were consistently associated with higher rates of applied K. Levels of Mg were decreased by application of K but this response only reached statistical significance in the November sample.

## 5.3 Harvest Data

Cane yields were variable at this site presumably reflecting the variation in soil nutrient levels. Cane yields were clearly increased by the application of K but there were no differences between rates of K applied and the high variability resulted in the response being non-significant.

Sucrose content tended to be increased by the application of K but the response was relatively small and non significant. Despite the variability in cane yields, sucrose yields were significantly increased by the addition of K and the optimum treatment appeared to be 75 kg K/ha under these conditions.

## 6. CONCLUSION

- \* Soil K levels were highly variable at this site but indicated that K levels in the control were only marginally below the current threshold value for these soils (112 ppm). A significant response was therefore not anticipated.
- \* There were significant responses to applied K, however, and the highest yield was recorded after an application of 75 kg K/ha. The soil K level at this rate was 122 ppm.
- \* Leaf K values associated with this treatment were 0,76, 0,53 and 0,78 % dm in Sept., Oct. and Nov. respectively. Leaf K levels were consistently higher than this with the highest rate of applied K but this did not result in higher cane or sucrose yields.
- \* This trial has been continued and is in its 13<sup>th</sup> ratoon.

AGK/DMZ/fkd  
20.10.92

Appendix 1                      Third Leaf K, Ca and Mg ratio (% dm)

Treatment	Sept (3.6 m)		Oct (4.3 m)		Nov (5.7 m)	
	Ca + Mg	Ca + Mg/K	Ca + Mg	Ca + Mg/K	Ca + Mg	Ca + Mg/K
Control	0.80	1.26	0.67	1.49	0.62	0.80
75 kg K/ha	0.84	1.11	0.58	1.09	0.55	0.63
150 kg K/ha	0.73	0.84	0.54	0.83	0.56	0.56
Means	0.79	1.07	0.59	1.13	0.57	0.66

SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS' ASSOCIATION

Cat. No.: 1826

CODE: K8/90/Sw/Ubo 'W'

TITLE: LEVELS OF POTASSIUM APPLICATION FOR EARLY SEASON CANE ON AN 'W' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 13th Ratoon	Soil Analysis: 05/06/92				
Site	: Ubombo Ranches Field Vuzamanzi	pH	OM%	Clay %		
		5.4	1.3	16.8*		
Region	: Northern Irrigated (Swaziland)	ppm (control)				
		P	K	Ca	Mg	(Ca+Mg)/K
		14	71	609	244	14
Soil Set/Series	: 'W' (Winn)	CEC : 6.5 meq/100g soil*				
Design	: Randomised blocks 6 replications	KDI : 0.82*				
Variety	: NCo376	Date: : 20/05/92 -12/05/93				
		Age : 11.7 ms				
Fertilizer	: N            P            K	Rainfall : 281 mm				
Total (kg/ha)	:140        40        Treatment	<u>Irrigation: 1413 mm (overhead)</u>				
		Total : 1694 mm				

\* Sampled 19/09/90

2. OBJECTIVES

- 2.1 To test the new FAS soil K threshold for winter cut cane grown on a light textured soil under irrigated conditions.
- 2.2 To determine the effect of low leaf K content in September - October on yield and confirm the validity of downgrading leaf K threshold for winter harvested cane.

3. TREATMENTS

3.1 Notes on treatments

<u>K0</u>	<u>K1</u>	<u>K2</u>
0	75	150 kg K/ha

Potassium (KCl, 50% K) was broadcast 2 weeks after harvest.

### 3.2 Notes on Fertilizer

- \* Nitrogen (Urea, 46% N) was applied on the cane row at 140kg N/ha. Applications were divided into two dressing: 47 kg N/ha, 1 week after harvest and 93 kg N/ha, 4.8 months after harvest.
- \* Phosphorus (Superphosphate, 10.5%P) was applied on the cane row at 40 kg P/ha, 2 weeks after harvest.

### 3.3 Notes on Soil Sampling

Topsoil: 40 cores were taken in each plot at a ratio of 16 on row to 24 interrow (i.e. 1:1.5) two weeks after harvest (before fertilization).

## 4. RESULTS

### 4.1 Soil Analysis

Table 1: P, K, Ca and Mg status (ppm) of the topsoil - June 1992

Treatment	ppm				(Ca+Mg)/K
	P	K	Ca	Mg	
Control	13	71	609	244	14
K1 - 75 kg K/ha	14	79	618	283	12
K2 - 150 kg K/ha	14	110	611	258	8
LSD (0.05)	7	17	138	30	6
Significance	NS	**	NS	*	NS
Mean	14	87	613	262	11
SE Diff. $\pm$	3.3	7.8	61.9	13.5	2.7
CV%	42.2	15.6	17.5	8.9	40.9

### 4.2 Leaf Analysis

Table 2: Third leaf nutrient analysis (% dm) in October and November

Treatment	October (4.8 months)					November (5.8 months)				
	N	P	K	Ca	Mg	N	P	K	Ca	Mg
Control	1.80	0.22	0.59	0.35	0.42	1.76	0.22	0.74	0.26	0.35
K1 - 75 kg K/ha	1.74	0.22	0.75	0.32	0.32	1.74	0.22	0.94	0.21	0.24
K2 - 150 kg K/ha	1.74	0.22	0.86	0.34	0.30	1.76	0.22	1.08	0.19	0.22
LSD (0.05)	0.10	0.02	0.07	0.07	0.09	0.08	0.01	0.12	0.04	0.04
Significance	NS	NS	*	NS	*	NS	NS	**	**	**
Mean	1.76	0.22	0.73	0.34	0.34	1.76	0.22	0.92	0.22	0.27
SE Diff. $\pm$	0.04	0.01	0.07	0.03	0.04	0.04	0.00	0.05	0.02	0.02
CV%	4.2	5.9	16.9	16.1	20.4	3.6	5.5	10.4	10.9	13.7



## 5. COMMENTS

### 5.1 Soil Analysis

Soil K levels of the control were below the FAS threshold of 112 ppm (clay <30%) before K application. A response to applied K was therefore expected (table 1). K levels of the K2 treatment were higher than that of the control (a result of high rates of potassium applied in the two previous crops) but still slightly below the threshold.

Ca and Mg levels were relatively low in this light soil and no limitations to the uptake of K were expected. Increasing levels of K reduced the Ca+Mg/K ratio in the soil.

### 5.2 Leaf Analysis

Leaf P, Ca and Mg levels were sufficient and above their respective FAS thresholds in both months sampled. Leaf N levels of treatments receiving K were below threshold (1.8 %dm) in October and November. Leaf N levels of the control were above threshold in October but declined below in November (table 2).

Leaf K levels of the control treatment were well below the current FAS threshold level in October and November (0.85 %dm) and a response to applications of K was expected. Leaf K levels were improved by applications of K but levels of K1 remained below threshold in October. Results show that leaf K levels increased as the season progressed.

Leaf Ca and Mg levels were reduced by applications of K in both months.

### 5.3 Growth Data

Both stalk heights, and to a lesser extent, stalk populations were improved by applications of K (table 3).

### 5.4 Harvest Data

Cane yield, sucrose content and sucrose yield were significantly ( $P=0.05$ ) improved by applications of K. The highest cane yield, sucrose yield and sucrose content were obtained from the K2 treatment but the yield differences between K1 and K2 were small and not statistically significant (table 4).

## 6. CONCLUSION

- Soil K levels were below the threshold level before fertilization and the yield responses were expected.
- Results from this trial confirm the fact that a soil K level of 71 ppm (control K level) was not adequate to obtain optimum yields in this soil. Responses from the K1 and K2 treatments indicate that the K threshold currently recommended for this soil (112 ppm K) is a good measure of the amount of K needed by the plant for optimum yields.
- Differences between leaf K levels of the K1 and K2 treatments were not reflected in the yields obtained. This implies that the leaf K threshold for October/November was too high and may overestimate K requirements under certain conditions.
- This trial has been terminated and a summary of results for the 11th to 13th ratoon is attached.

**TERMINAL REPORT SUMMARY: TRIAL K8/90/Sw/Ubo 'W'**  
**11th to 13th ratoon**

Table 1: Texture, pH, OM, CEC and KDI analysis - June 1990

Depth (cm)	Texture (%)			pH	OM %	CEC - meq/100g soil	KDI (control plots)
	Clay	Silt	Sand				
0-15	16.8	6.2	79.6	6.3	1.3	6.5	0.82
0-30	23.8	5.0	76.0	6.0	0.9	6.7	0.72
0-50	25.6	4.0	72.9	6.1	0.7	7.1	0.74

Table 2: K, Ca and Mg status (ppm) of the topsoil 11th to 13th ratoon

Season	Crop	Analysis date	Treatment	ppm			(Ca+Mg)/K
				K	Ca	Mg	
1990/91	11R	19/09/90 (AF)	Control	116	497	233	7.4
			75 kg K/ha	153	546	245	5.9
			150 kg K/ha	190	523	243	4.7
			Mean	153	522	240	6
1991/92	12R	11/03/92 (AF)	Control	108	839	271	8.9
			75 kg K/ha	122	888	281	7.6
			150 kg K/ha	153	795	260	5.5
			Mean	128	841	271	7.4
1992/93	13R	05/06/92 (BF)	Control	71	609	244	14
			75 kg K/ha	79	618	283	12
			150 kg K/ha	110	611	258	8
			Mean	87	613	262	11

NB: AF - Samples taken after fertilization  
 BF - Samples taken before fertilization  
 \* - Significant (P=0.05)  
 \*\* - Significant (P=0.01)

Table 3: Rainfall and irrigation figures - 11th to 13th ratoon

Crop	Season	Period	Rainfall (mm)	Irrigation (mm)	Total (mm)
11th R	1990/91	29/05/90 - 27/05/91	603	1235	1838
12th R	1991/92	27/05/91 - 20/05/92	426	1344	1770
13th R	1992/93	20/05/92 - 12/05/93	281	1413	1694
Mean			437	1331	1767