

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: K14/90/SW/UBO 'S'

CAT.NO.: 1832

TITLE: LEVELS OF POTASSIUM APPLICATION FOR LATE SEASON CANE ON AN 'S' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 3 <sup>rd</sup> ratoon	Soil Analysis: 22.05.91
Site	: Ubombo Ranches Field Station 1	pH OM% Clay% Silt% Sand%
Region	: Northern Irrigated (Swaziland)	6.50 3.10 38.3 13.3 44.4
Design	: Randomised block, 6 replications	ppm
Soil Set/Series:	'S' Somerling	P Ko Cao MgO (Ca+Mg)/K
Variety	: N14	225 159 3965 1132 32
Fertilizer	: N P K	CEC : 52.0 meq/100g soil
Total (Kg/ha)	170 30 See treatment	KDI : 0.56
		Date : 07.11.90-06.11.91
		Age : 12.0 months
		Rainfall : 487 mm
		Irrigation: 1272 mm
		Total : 1759 mm

2. OBJECTIVES

2.1 To test the FAS soil-K threshold for heavy clay soil when growing cane on a summer cycle.

2.2 To monitor leaf-K content in relation to soil-K levels.

3. TREATMENTS

3.1 Whole plots (granular application)

<u>K<sub>0</sub></u>	<u>K<sub>1</sub></u>	<u>K<sub>2</sub></u>
0	175	350 kg K ha <sup>-1</sup>

Potassium as KCl (50% K) was surface broadcast on 19.12.90, 6 weeks after harvest.

3.2 Notes on Treatments

Nitrogen as an Anhydrous Ammonia (82% N) at the rate of 140 kg N ha<sup>-1</sup> was injected in the interrow on 08.11.91 a day after harvest. On the same day N as DAP (18% N) at the rate of 27 kg N ha<sup>-1</sup> was topdressed on the cane row.

Phosphorous as DAP (20% P) at the rate of 30 kg P ha<sup>-1</sup> was topdressed on the cane row on 08.11.91 a day after harvest.

### 3.3 Notes on soil sampling

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

Subsoil: 20 cores were taken from 3 selected plots in each of the control and 300 kg K ha<sup>-1</sup> treatments at a rate of 8 on row to 12 interrow (1:1.5).

## 4. RESULTS

### 4.1 Soil Analysis

Table 1: Properties of the soil profile - May 1991

Depth (cm)	pH	OM%	Clay%	CEC	TCEC meq/100g clay	KDI
0-15	6.89 (0.63)	3.10 (0.18)	38.3 (2.98)	32.00 (2.98)	83.50	0.56 (0.09)
20-30	6.23 (0.03)	2.65 (0.15)	-	29.18 (0.25)	-	0.83 (0.05)
40-50	6.40 (0.00)	2.30 (0.20)	-	30.37 (0.96)	-	0.87 (0.02)

( ) Standard error

Note: Samples taken after fertilization in 2 selected plots of the control

Table 2: K, Ca, Mg status (ppm) of the soil profile - May 1991

Depth (cm)	Control				350 kg K ha <sup>-1</sup>			
	K	Ca	Mg	(Ca + Mg)/K	K	Ca	Mg	(Ca + Mg)/K
0-15	131 (11)	3540 (201)	1157 (188)	36	204 (3)	3540 (201)	1157 (188)	23
20-30	169 (40)	3675 (266)	947 (83)	27	131 (20)	3707 (216)	995 (112)	36
40-50	106 (7)	3695 (15)	1054 (86)	45	73 (9)	3870 (327)	994 (94)	67

( ) Standard error

Note: Samples taken after fertilization in 2 selected plots of the control and 4 plots of 350 kg K ha<sup>-1</sup> treatment.

Table 3: K, Ca and Mg status (ppm) of the topsoil - May 1991

Treatment	K	Ca	Mg	(Ca+Mg)/K
K <sub>0</sub> Control	159	3965	1132	32
K <sub>1</sub> 175 kg K ha <sup>-1</sup>	194	3975	1067	26
K <sub>2</sub> 350 kg K ha <sup>-1</sup>	229	4140	1188	23
LSD (0.05)	72	360	192	
(0.01)	102	512	273	
Significance	NS	NS	NS	
Mean	194	4027	1129	
SE one plot	56	279	149	
CV%	28.8	6.9	13.2	

#### 4.2 Harvest Data

Table 4: Cane Yield, Sucrose % and Sucrose Yield

Treatments	TC ha <sup>-1</sup>	Suc %	T Suc ha <sup>-1</sup>
K <sub>0</sub> Control	107	14.73	15.7
K <sub>1</sub> 175 kg K ha <sup>-1</sup>	109	15.29	16.6
K <sub>2</sub> 350 kg K ha <sup>-1</sup>	119	14.72	17.6
LSD (0.05)	17	0.55	2.4
(0.01)	25	0.78	3.5
Significance	NS	NS	NS
Mean	112	14.91	16.6
SE one plot	13	0.43	1.9
CV%	12.0	2.8	11.4

#### 5.3 Leaf Analysis

Table 5: Third leaf analysis (% dm) at 3.0 and 6.3 months of age

Treatments	N		P		K		Ca		Mg	
	Feb	Mar	Feb	Mar	Feb	Mar	Feb	Mar	Feb	Mar
K <sub>0</sub> Control	2.03	1.90	0.29	0.21	1.11	0.82	0.32	0.42	0.26	0.32
K <sub>1</sub> 175 kg K ha <sup>-1</sup>	2.04	1.90	0.30	0.20	1.12	0.90	0.35	0.41	0.26	0.32
K <sub>2</sub> 350 kg K ha <sup>-1</sup>	2.02	1.90	0.29	0.21	1.11	0.89	0.36	0.41	0.25	0.28
LSD (0.05)*	0.09	0.17	0.01	0.02	0.14	0.06	0.06	0.04	0.06	0.04
(0.01)**	0.13	0.24	0.02	0.03	0.70	0.08	0.08	0.06	0.08	0.06
Significance	NS	NS	NS	NS	NS	**	NS	NS	NS	*
Mean	2.03	1.90	0.30	0.21	1.12	0.87	0.34	0.41	0.26	0.31
SE one plot	0.07	0.14	0.01	0.01	0.11	0.04	0.04	0.02	0.04	0.02
CV%	3.5	7.2	3.1	6.0	9.8	4.7	12.1	5.9	15.4	7.6

### 5. COMMENTS

#### 5.1 Soil Analysis

Soil-K status of the control was above FAS threshold for soils containing between 30 and 40% clay. The (Ca + Mg)/K ratio was high, indicating that the availability of K might be limited by the high content of Ca and Mg.

Increasing K rates resulted in an increase in soil-K levels but the responses were non significant due to high variability in the soil-K data.

The effect of K treatments was most apparent in the topsoil. Profile analysis of K level in the control tended to be variable, but it was clear from the 350 kg K ha<sup>-1</sup> treatment that the difference in K between the 0-15 and 40-50 cm layer was large, indicating that leaching was slow. Hence, surface application of K to this soil is likely to remain positionally unavailable to the bulk of the root system.

KDI increased with depth, indicating a lowering of the K fixing capacity of the soil and deep placement of K could be envisaged as means of replenishing the bulk of the root zone with K.

## 5.2 Harvest Data

### Cane Yield

Cane yield tended to increase with increasing K treatments but the responses were not significant.

### Cane Quality

The effect of K treatments on sucrose content were variable and non significant.

### Sucrose Yield

Sucrose yields reflected cane yields and tended to increase with increasing K rates but the responses were not significant.

## 5.3 Leaf Analysis

Leaf-K status of the control in February was above threshold and increasing K rates had no effect on K content until a relatively late stage. This tended to indicate that the surface applied K was positionally unavailable to the cane, certainly during the early stages of growth.

Leaf content of the other nutrients was above threshold.

## 6. CONCLUSIONS

- \* There was a trend in this trial for sucrose yield to respond to K application but the responses were not significant.
- \* Soil-K and leaf-K content of the control were above FAS threshold and the trend for yield to respond was therefore surprising.
- \* Evidence from soil and leaf analysis appeared to question the effectiveness of surface application of K fertilizer as a means of replenishing the root zone with K.
- \* This trial has been continued into the 4th ratoon with view to assessing the merit of cultivation as means to incorporate K fertilizer at depth.

SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: K14/90/Sw/UBO 'S'

CAT No: 1832

TITLE: LEVELS OF POTASSIUM APPLICATION FOR LATE SEASON CANE ON AN 'S' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 4th ratoon	Soil Analysis:	22/04/92				
Site	: Ubombo Ranches Field Station 1	pH	*OM%	*Clay%	*Silt%	*Sand%	
		6.6	3.1	38.3	13.3	44.4	
Region	: Northern Irrigated (Swaziland)	ppm					
		P	Ko	CaO	Mgo	(Ca+Mg)/K	
		207	122	3600	1089	39	
Design	: Randomized blocks 6 replications	CEC	: 52.0 meq/100g soil				
		KDI	: 0.56				
Soil Set/Series:	'S' Somerling	Date	: 06.11.91-28.11.92				
Variety	: N14	Age	: 12.73 months				
Fertilizer	: N            P            K	Rainfall	: 377 mm				
Total (kg/ha)	140      60      See Treatment	Irrigation:	1788 mm				
		Total	: 2165 mm				

\* Sampled 22.05.91

2. OBJECTIVES

- 2.1 To test the new FAS soil K threshold for summer cut cane grown on a heavy clay soil under irrigated conditions.
- 2.2 To monitor leaf-K content during summer in relation to soil-K levels.

3. TREATMENTS

3.1 Potassium

<u>K<sub>0</sub></u>	<u>K<sub>1</sub></u>	<u>K<sub>2</sub></u>
0	175	350 kg K/ha

Potassium as KCl (50 %) was broadcast on 16.12.91, 7 weeks after harvest on the surface and an alubuster implement was used to incorporate the fertilizer applied in the interrow to a depth of ± 35 cm.

3.2 Notes on Treatments

Nitrogen

<u>Application</u>	<u>kg N/ha</u>	<u>Fertilizer</u>	<u>Date</u>
1	80	Amm. Sulphate (21% N)	16.12.91
2	60	Urea (46% N)	21.01.92
<u>Total</u>	<u>140</u>		

Phosphorus

Due to high soil P values, no Phosphorus was applied in 1991.

3.3 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), on 22.04.92.

4. RESULTS4.1 Soil Analysis

Table 1: pH, K, and Mg status (ppm) of the topsoil - April 1992

Treatment	K ppm	Ca ppm	Mg ppm	(Ca+Mg)/K
K <sub>0</sub> Control	122	3600	1089	39
K <sub>1</sub> 175 kg K ha	149	3363	1053	30
K <sub>2</sub> 350 kg K ha	239	3477	1050	21
LSD (0.05)	76.9	317.8	97.4	7.9
Significance	*	NS	NS	*
Mean	170	3480	1064	30
SE Difference	34.5	142.6	43.7	3.5
CV %	35.1	7.1	7.1	20.4

4.2 Leaf Analysis

Table 2: Results of leaf Analysis in March and April at 3.8 - and 4.5 months of age

Date	24 March 1992					13 April 1992				
Age	3.8 months					4.5 months				
Treatment	N	P	K	Ca	Mg	N	P	K	Ca	Mg
K <sub>0</sub> Control	1.60	0.27	1.06	0.30	0.24	1.69	0.23	0.96	0.28	0.29
K <sub>1</sub> 175 kg K ha	1.60	0.27	1.15	0.30	0.24	1.53	0.23	1.01	0.27	0.30
K <sub>2</sub> 350 kg K ha	1.61	0.27	1.21	0.30	0.23	1.54	0.23	1.03	0.23	0.28
LSD (0.05)	0.08	0.00	0.08	0.04	0.00	0.09	0.00	0.13	0.04	0.04
Significance	NS	NS	*	NS	NS	NS	NS	NS	*	NS
Mean	1.60	0.27	1.14	0.30	0.24	1.56	0.23	1.01	0.26	0.29
SED	0.04	0.00	0.04	0.02	0.00	0.04	0.00	0.06	0.02	0.02
CV %	3.9	6.7	5.5	11.2	6.3	4.6	5.03	10.1	12.3	8.5

### 4.3 Harvest Data

Table 3: Cane Yield, Sucrose % Cane and Sucrose Yield

Treatment	TC/ha	Sucrose % cane	T Suc/ha
K <sub>0</sub> Control	137	15.4	21.0
K <sub>1</sub> 150kg K ha	136	15.4	20.9
K <sub>2</sub> 300kg K ha	144	15.4	22.1
LSD (0.05)	16.06	1.00	2.61
Significance	NS	NS	NS
Mean	138.7	15.4	21.3
SED	7.21	0.45	1.17
CV %	9.0	3.6	9.6

## 5. COMMENTS

### 5.1 Soil Analysis

Due to soil K levels in the control being lower than the FAS threshold value of 150 ppm (38% clay), a yield response was expected in this trial. Soil K levels were significantly increased by applications of K ( $P=0.05$ ), and soil K levels measured in the different treatments reflected the fact that different amounts of K were applied to the soil. Ca+Mg/K ratios differed significantly ( $P=0.05$ ) and ratios in the control and 175kg K/ha treatments were higher than 26, the critical ratio proposed for summer cut cane. An application of 350 kg K/ha successfully lowered the Ca+Mg/K ratio (table 1).

### 5.2 Leaf Analysis

Leaf nutrient analysis showed that N levels were sufficient in March but that applications of K induced lower N levels in April. Leaf K levels in March were above the 1.05 (%dm) threshold level, differed significantly and reflected the amounts of K applied to the soil. This was not the case in April, when leaf levels declined below thresholds, particularly in the control and 175kg K/ha treatments. Very consistent leaf P and Mg levels were observed in March and April in this trial, with levels differing only marginally between treatments. Significant differences in Leaf Ca levels were observed between treatments in April.

### 5.3 Harvest Data

There were no significant differences between treatments in terms of cane yields, sucrose content or sucrose yields in this trial. The higher rate of K appeared to increase yields. The pattern of response was not consistent however, since the lower rate did not induce an increase in yield. Responses should therefore be treated with caution.

## 6. CONCLUSIONS

- \* Soil K levels in the control plots of this trial were below the threshold level of 150 ppm, and a yield increase was expected.
- \* Leaf K levels in the control treatments were above the FAS threshold level in March, but not in April, and a yield improvement was expected.
- \* No consistent or statistically significant yield responses were observed in this trial.
- \* This trial will be continued and is now in its 5th ratoon.

AJD/vnm  
11.02.93



SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS' ASSOCIATION

Cat. No.: 1832

CODE: K14/90/Sw/Ubo 'S'

TITLE: LEVELS OF POTASSIUM APPLICATION FOR LATE SEASON CANE ON AN 'S' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 6th Ratoon	Soil Analysis: 08/12/92				
Site	: Ubombo Ranches Field Station 1	pH	OM%	Clay %		
		6.8	3.1	38		
Region	: Northern Irrigated (Swaziland)	ppm (control)				
		P	K	Ca	Mg	(Ca+Mg)/K
		314	133	4248	1469	43
Soil Set/Series	: 'S' Somerling	CEC : 52.0 meq/100g soil				
Design	: Randomized blocks 6 replications	KDI : 0.56				
Variety	: N14	Age : 12.1 months				
		Dates : 28/11/92 - 01/12/93				
Fertilizer	: N P K	Rainfall : 329 mm				
Total (kg/ha)	: 160 - Treatment	<u>Irrigation : 1153 mm</u>				
		Total : 1482 mm				

2. OBJECTIVES

- 2.1 To test the new FAS soil-K threshold for summer cut cane grown on a heavy clay soil under irrigated conditions.
- 2.2 To monitor leaf-K content during summer in relation to soil-K levels.

3. TREATMENTS

3.1 Notes on treatments

<u>K0</u>	<u>K1</u>	<u>K2</u>
0	175	350 kg K/ha

Potassium as KCl (50% K) was broadcast 1½ week after harvest.

3.2 Notes on fertilizers

Nitrogen (Urea, 46% N) was applied on the cane row at 160 kg N/ha, 1½ week 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).

Subsoil: 20 cores were taken from 3 selected plots in the control and K2 treatments respectively, at a ratio of 8 on row to 12 interrow (i.e. 1:1.5).

## 4. RESULTS

### 4.1 Soil Analysis

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

Treatment	ppm				(Ca+Mg)/K
	P	K	Ca	Mg	
Control	303	133	4248	1469	43
K1 175 kg K/ha	370	174	3907	1363	34
K2 350 kg K/ha	268	248	3768	1297	21
LSD (0.05)	141	47	430	180	7
Significance	NS	**	NS	NS	**
Mean	314	185	3974	1376	33
SE Diff. $\pm$	63.2	21.2	192.9	80.7	3.2
CV%	34.9	19.8	8.4	10.2	17.1

Table 2: K, Ca and Mg status (ppm) of the soil profile - December 1992

Depth (cm)	Control				350kg K/ha			
	K	Ca	Mg	(Ca+Mg)/K	K	Ca	Mg	(Ca+Mg)/K
0 - 15	112	4003	1699	51	174	3800	1357	30
20 - 30	117	3987	1548	47	200	3943	1350	26
40 - 50	82	4010	1846	71	148	3720	1493	35

### 4.2 Leaf Analysis

Table 3: Third leaf nutrient analysis (% dm) at various ages

Treatment	January (1.7 months)					February (2.9 months)				
	N	P	K	Ca	Mg	N	P	K	Ca	Mg
Control	2.26	0.33	0.87	0.56	0.56	1.86	0.28	0.93	0.22	0.24
K1 175 kg K/ha	2.23	0.33	1.04	0.51	0.49	1.87	0.26	1.07	0.24	0.21
K2 350 kg K/ha	2.22	0.33	1.18	0.48	0.45	1.84	0.27	1.15	0.25	0.21
LSD (0.05)	0.07	0.55	0.18	0.10	0.08	0.10	0.05	0.12	0.07	0.02
Significance	NS	NS	**	NS	*	NS	NS	**	NS	*
Mean	2.34	0.33	1.03	0.51	0.50	1.86	0.27	1.05	0.23	0.22
SE Diff. $\pm$	0.03	0.02	0.08	0.04	0.04	0.05	0.02	0.05	0.03	0.01
CV %	2.6	10.9	13.4	14.6	12.6	4.3	13.6	9.0	23.0	6.8

### 4.3 Growth Data

Table 4: Growth measurements in April and September

Treatment	Stalk height (cm to TVD)		Stalk population (* 1000/ha)	
	April (4.8 mths)	September (10 mths)	April (4.8 mths)	September (10 mths)
Control	195	246	110	97
K1 175kg K/ha	201	245	108	101
K2 350kg K/ha	206	249	111	103
Mean	201	247	109	100

### 4.4 Harvest Data

Table 5: Cane yield, sucrose % cane and sucrose yield

Treatment	TCane/ha	Suc.%Cane	TSuc/ha
Control	93	13.60	12.7
K1 175 kg K/ha	94	14.25	13.4
K2 350 kg K/ha	101	14.47	14.6
LSD (0.05)	6	0.96	1.5
Significance	*	NS	NS
Mean	96	14.11	13.6
SE Diff. ±	2.8	0.43	0.7
CV %	5.0	5.3	8.9

## 5. COMMENTS

### 5.1 Soil Analysis

Soil K levels of the control were below the FAS threshold level of 150 ppm K (soils with between 30 and 40% clay) before fertilisation, indicating that a yield response was expected (table 1).

Soil K levels of treatments receiving K were above the soil K threshold level before fertilization. Soil K levels in the K2 treatment were well above levels measured in the K1 treatment.

Ca and Mg levels were high, suggesting a possible limitation on K uptake from the soil. Increasing K levels reduced Ca and Mg levels in the soil solution and reduced the Ca+Mg/K ratio.

Sampling at depth showed that soil K levels were highest in the 20 - 30cm soil layer. This indicates that K applied on the surface is steadily leaching into lower soil layers (table 2).

Soil K levels of the K2 treatment sampled from each plot (table 1) differed substantially from levels measured when only three plots were sampled (table 2). The fact that different sampling methods were used to obtain the samples might explain these differences.

## 5.2 Leaf Analysis

Leaf N, P, Ca and Mg levels were satisfactory and no deficiencies were observed (table 3).

Leaf K levels of the control were above current threshold levels for this variety (N14) in January (0.80 %dm) and in February (0.90 %dm).

Leaf K levels of applications receiving K were higher than the threshold and were increased above the control in both months sampled.

The uptake of Mg was reduced by increasing K levels in January and February. Leaf Ca was similarly reduced in January, but increased from levels of the control in February.

## 5.3 Growth Data

Stalk length was improved by K treatments early in the growing season (4.8 months), although this effect was not observed at the age of 10 months (table 4).

Stalk population was increased marginally by K applications (table 4).

## 5.4 Harvest Data

Cane yields of the K2 treatment (350 kg K/ha) was significantly higher than that of the other treatments. There was no response to the K1 rate and yields obtained from this treatment were the same as those obtained from the control treatment (table 5).

Sucrose content was improved by increased rates of potassium although the differences were not quite statistically significant (table 5).

Sucrose yields were increased with increasing rates of K. The higher rate of potassium gave the highest yield.

## 6. CONCLUSION

- The soil K level of the control treatment was below the threshold level before fertilization, and a yield response was expected.
- Leaf K levels of the control were above threshold and a yield increase was not expected.
- Sucrose yield of both the K1 and K2 treatments were increased by applications of K. The increase in the sucrose yield of the K1 treatment was largely the result of increased sucrose content. The increase in the sucrose yield of the K2 treatment however, was the combined result of increased cane yield as well as increased sucrose content.
- Results obtained from this trial confirm current soil K thresholds but suggest that leaf K thresholds for this variety are too low.
- This trial has been terminated and a summary of results for the 4th to 6th ratoons is attached.

**TERMINAL REPORT SUMMARY: TRIAL K14/90/Sw/UBO 'S'**  
4th to 6th ratoon

**Table 1:** Properties of the soil profile - May 1991

Depth (cm)	pH	Clay %	OM %	CEC meq/100g soil	TCEC meq/100g soil	KDI
0-15	6.9	38.0	3.10	32.0	83.5	0.56
20-30	6.2		2.65	29.2		0.83
40-50	6.4		2.30	30.4		0.87

Note: Samples taken after fertilization in 3 selected control plots.

**Table 2:** K, Ca and Mg status (ppm) of the soil profile - 4th and 6th ratoon

Depth (cm)	May 1991- 4th Ratoon								
	K0				K2				
	K	Ca	Mg	(Ca+Mg)/K	K	Ca	Mg	(Ca+Mg)/K	
0-15	131	3540	1157	36	204	3540	1157	23	
20-30	169	3675	947	27	131	3707	995	36	
40-50	106	3695	1054	45	73	3870	994	67	
Depth (cm)	December 1992 - 6th Ratoon								
	0-15	112	4003	1699	51	174	3800	1357	30
	20-30	117	3987	1548	47	200	3943	1350	26
	40-50	82	4010	1846	71	148	3720	1493	35

**Table 3:** K, Ca and Mg status (ppm) of the topsoil - 4th and 6th ratoon

Crop	Control			K1			K2		
	K	Ca	Mg	K	Ca	Mg	K	Ca	Mg
1990/91	159	3965	1132	194	3975	1067	229	4140	1188
1991/92	122	3600	1089	149	3363	1053	239	3477	1050
1992/93	133	4248	1469	174	3907	1363	248	3768	1297
Mean	138	3937	1230	172	3748	1161	238	3795	1178

**Table 4** Third leaf nutrient analysis (% dm) at various ages - 4th to 6th ratoon

Nutrient	1990/91					1991/92					1992/93				
	mth	Age (mths)	Treatment			mth	Age (mths)	Treatment			mth	Age (mths)	Treatment		
			K0	K1	K2			K0	K1	K2			K0	K1	K2
N	Feb	3	2.03	2.04	2.02	Mar	3	1.60	1.60	1.61	Jan	2	2.26	2.23	2.22
	Mar	4	1.90	1.90	1.90	Apr	4	1.69	1.53	1.54	Feb	3	1.86	1.87	1.84
P	Feb	3	0.29	0.30	0.29	Mar	3	0.27	0.27	0.27	Jan	2	0.33	0.33	0.33
	Mar	4	0.21	0.20	0.21	Apr	4	0.23	0.23	0.23	Feb	3	0.28	0.26	0.27
K	Feb	3	1.11	1.12	1.11	Mar	3	1.06	1.15	1.21	Jan	2	0.87	1.04	1.18
	Mar	4	0.82	0.90	0.89	Apr	4	0.96	1.01	1.03	Feb	3	0.93	1.07	1.15
Ca	Feb	3	0.32	0.35	0.36	Mar	3	0.30	0.30	0.30	Jan	2	0.56	0.51	0.48
	Mar	4	0.42	0.41	0.41	Apr	4	0.28	0.27	0.23	Feb	3	0.22	0.24	0.25
Mg	Feb	3	0.26	0.26	0.25	Mar	3	0.24	0.24	0.23	Jan	2	0.56	0.49	0.45
	Mar	4	0.32	0.32	0.28	Apr	4	0.29	0.30	0.28	Feb	3	0.21	0.21	0.21

Table 5: Cane yield, sucrose % cane and sucrose yield - 4h to 6th ratoon

Crop	T Cane/ha			Sucrose % cane			T Sucrose/ha		
	Control	K1	K2	Control	K1	K2	Control	K1	K2
1990/91	107	109	119	14.7	15.3	14.7	15.7	16.6	17.6
1991/92	137	136	144	15.4	15.4	15.4	21.0	20.9	22.1
1992/93	93	94	101	13.6	14.3	14.5	12.7	13.4	14.6
Mean	112	113	121	14.6	15.0	14.9	16.5	17.0	18.1

Table 6: Summary of rainfall and irrigation figures - 4th to 6th ratoon

Crop	Season	Period	Rainfall (mm)	Irrigation (mm)	Total (mm)
4th R	1990/91	07/11/90 - 06/11/91	487	1272	1759
5th R	1991/92	06/11/91 - 28/11/92	377	1788	2165
6th R	1992/93	28/11/92 - 01/12/93	329	1153	1482
Mean			398	1404	1802