

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: VAR 14/88/SW UBO SOM

CAT. NO: 1721

TITLE: VARIETIES ON A 'S' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: Plant	Soil Analysis:	4/11/89 before harvest				
Site	: Ubombo Ranches Field Speculation 4	pH	OM %	Clay %	PDI		
Region	: Northern irrigated (Swaziland)	6.9	2.37	30	-		
Design	: Randomised blocks (8 replications)	PDM					
Soil Set/Series:	'S'	P	K	Ca	Mg	S	Zn
Varieties	: NCo376; N14; N19	38	175	3087	880	23	2.05
Fertilizer	: N P K	Dates : 14/12/88 - 15/11/89					
Furrow	: 30 60 -	Age : 11 months					
Top-dress	: 90 - -	Rainfall : }					
Total (kg/ha)	: 120 60 0	Irrigation: } Not Available					
		Total : }					

2. OBJECTIVES

- 2.1 To compare the performance of released varieties on a late cycle on a 'S' set soil.
- 2.2 To assess the resistance of the varieties for Pests and Diseases.
- 2.3 To establish the ripener response of each variety to a standard rate of Fusilade Super applied late season.

3. TREATMENTS

3.1 Varieties: NCo376; N14; N19

3.2 Nitrogen and phosphorus were applied in the furrow at planting in the form of MAP (11 % N + 22 % P) at the rates of 30 kg N/ha and 60 kg P/ha. Four weeks after planting additional N was top-dressed in the form of Urea (46 % N) at the rate of 90 N/ha.

3.3 A ripener was not applied due to excessive lodging in N19.

4. RESULTS

4.1 GROWTH DATA

Table 1: Crop Growth Measurements and Populations at 1,5; 5 and 10,5 Months of Age

VARIETY	HEIGHT MEASUREMENTS (mm to TVD)		POPULATIONS (X 1000/ha)		
	5 MONTHS	10,5 MONTHS	1,5 MONTHS	5 MONTHS	10,5 MONTHS
NCo376	1130	1690	79	134	114
N14	1020	1620	75	137	105
N19	1080	1600	56	127	109

4.2 Harvest data

Table 2: Cane Yield, Cane Quality and Sucrose Yield

VARIETY	TONS CANE/HA	SUCROSE % CANE	TONS SUCROSE/HA
NCo376	92	14,10	12,9
N14	96	13,26	12,7
N19	81	15,15	12,2
LSD Variety Means (0,05)* (0,01)**	6 9	0,51 0,71	1,0 1,4
Significance	**	**	NS
Trial Mean CV %	89 7	14,17 3,40	12,6 7,7

Table 3: Yield per Month

VARIETY	TONS CANE/HA/MONTH	TONS SUCROSE/HA/MONTH
NCo376	8,36	1,17
N14	8,73	1,15
N19	7,36	1,11

4.3 Foliar analysisTable 4: Nutrient Content (% dm) of Third Leaf at 3.5 Months of Age

Variety	N	P	K	Ca	Mg	S	Zn ppm
NCo376	1.81	0.24	1.33	0.19	0.17	0.14	16.1
N14	1.71	0.22	1.32	0.25	0.19	0.15	13.5
N19	1.87	0.24	1.43	0.21	0.17	0.15	14.3
LSD Variety (0.05)*	0.063	0.012	0.066	0.014	0.013	0.007	1.04
(0.01)**	0.087	0.016	0.092	0.020	0.019	0.010	1.44
Significance	**	**	*	**	**	**	**
Mean	1.80	0.23	1.36	0.22	0.17	0.15	14.6
CV %	3.3	4.8	4.6	6.3	7.3	4.8	6.7

5. COMMENTS5.1 Growth measurements

Both population counts and stalk length were highest in NCo376.

5.2 Cane Yield

N14 produced the highest cane yields but was not significantly better than NCo376. The yield of N19 was significantly less than either NCo376 and N14.

5.3 Cane Quality

Quality was highest in N19 and lowest in N14. Difference in quality between all three varieties were significant.

5.4 Sucrose Yield

There were no significant differences in the yield of sucrose of the different varieties although NCo376 and N14 appeared to produce marginally higher yields than N19.

5.5 Foliar Analysis

Nutrient content in NCo376 was above current threshold levels indicating no nutritional limitation in this trial. Significant differences existed between the nutrient content of the various varieties.

The N, P and Zn content of N14 was lower than that of NCo376 while Ca was higher. The nutrient status of N19 was comparable to that of NCo376 except for K and Zn which were higher and lower than in NCo376 respectively.

6. CONCLUSION

- * Results of this trial showed that there was little difference between the performance of NCo376, N14 and N19 in this plant crop grown on 'S' set soil and harvested late in the season.
- * Foliar analysis confirmed the existence of varietal differences in nutrient uptake and the need to adjust current thresholds levels for different varieties.

PCH/aw/ynm
10 May 1990

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: VAR 14/88/SW UBO Som

CAT: 1721

TITLE: VARIETIES ON A 'S' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 1st ratoon	Soil Analysis: 04/11/89					
Site	: Ubombo Ranches Field speculation 4	pH	OM%	Clay%			
		6.95	2.38	<30			
Region	: Northern Irrigated [Swaziland]	ppm					
Design	: Randomised blocks (8 replications)	P	K	Ca	Mg	Mn	Zn
Soil Set/Series	: 'S'	38	175	23	3088	880	2.08
Varieties	: NCo376, N14, N19	Dates : 15/11/89 - 20/11/90					
Fertilizer	: N P K	Age : 12.2 months					
(Kg/ha)	140 40 60	Rainfall : 531 mm					
		Irrigation : 736 mm					
		Total : 1267 mm					

2. OBJECTIVES

- 2.1 To compare the performance of released varieties on a late cycle on a 'S' set soil.
- 2.2 To assess the resistance of the varieties to pests and diseases
- 2.3 To establish the response of each variety to a standard rate of Fusilade Super applied late season.
- 2.4 To compare the nutrient content of third leaf in each variety to the established NCo376 thresholds.

3. TREATMENTS

- 3.1 Varieties : NCo376, N14 and N19
- 3.2 Fertilizers: Nitrogen as Urea (46%) was applied at rates of 100 kg N ha⁻¹ and 40 kg N ha⁻¹ on 06/12/89 and 02/03/90 respectively.

Phosphorous as Single Supers (10.5% P) at 40 kg P/ha and Potassium as KCL (50%K) at the rate of 60 kg k/ha were applied 3 weeks after harvest.
- 3.3 Ripening : Fusilade was not applied due to lodging in N19

4. RESULTS4.1 Growth DataTable 1: Crop growth measurements and population counts at 2.5 and 4.1 months of age in February and March respectively

Variety	Height Measurements (mm to TVD)	Stalk Populations (x 1000/ha)	
	4 m	2.5 m	4 m
NCo376	1510	361	168
N14	1520	296	157
N19	1680	247	142
Mean	1570	301	156

4.2 Harvest DataTable 2: Cane yield, Cane Quality and Sucrose Yield

Variety	Tons Cane/ha	Suc % Cane	Tons Suc/ha
Nco376	129	14.66	18.9
N14	132	14.46	19.1
N19	117	15.32	18.0
LSD Variety (0.05)	3.5	0.92	1.1
(0.01)	5	1.28	1.5
Significance	**	NS	NS
Trial Mean	126	14.84	18.7
SE	3	0.86	1.0
CV%	2.6	5.8	5.4

4.3 Leaf Analysis

Table 3: Third leaf Nutrient content (%dm) at 3.5 months of age in February

Variety	N	P	K	Ca	Mg	S	Zn(ppm)
NCo376	1.61	0.23	1.31	0.72	0.17	0.14	11.8
N14	1.63	0.20	1.24	0.25	0.19	0.13	12.3
N19	1.54	0.27	1.36	0.22	0.16	0.13	11.0
LSD Variety (0.05)	0.054	0.015	0.11	0.031	0.025	0.004	4
(0.01)	0.075	0.020	0.16	0.043	0.034	0.006	1.9
Significance	**	**	NS	NS	NS	*	NS
Mean	1.59	0.21	1.30	0.23	0.17	0.14	11.7
SE	0.051	0.014	0.11	0.029	0.023	0.004	0.61
CV%	3.2	6.5	8.3	12.8	13.6	3.0	5.2

4.4 Smut Survey

Table 4: Percentage Smut whips at 2.5 months of age

Variety	% Smut Whip
NCo376	0.50
N14	0.00
N19	1.13

5. COMMENTS

5.1 Growth Measurements

Stalk populations were highest in NCo376 and lowest in N19. An inverse relationship between stalk population and stalk height was observed in all varieties.

5.2 Cane Yield

NCo376 and N14 outyielded N19 significantly. N14 tended to be better than NCo376 but the difference was not quite significant.

5.3 Cane Quality

There were no significant differences between varieties although sucrose content of N19 tended to be higher than NCo376 and N14.

5.4 Sucrose Yield

There were no significant differences in sucrose yield between varieties although NCo376 and N14 tended to be better than N19.

5.5 Leaf Analysis

Nutrient content in the third leaf of NCo376 in February was satisfactory except for N which was marginally below threshold and Zn which appeared deficient. The low status of N was only temporary as Urea was top-dressed in March and thus any adverse effect on growth was likely to have been small.

There were significant differences in the content of N, P and S between varieties. In comparison to NCo376 N was lower in N19 while P was lower in N14 and higher in N19. K tended to be lower in N14 while Ca and Mg were higher than in NCo376. Levels of S were lower in N14 and N19 than in NCo376.

5.6 Pests and Diseases

Both Eldana and Smut levels were low in this trial.

6. CONCLUSION

- * Results of this late harvested trial showed that there was little difference in performance between unripened NCo376 and N14 grown on a S Set soil. The performance N19 in this trial was relatively poor and may have resulted from excessive lodging.
- * Foliar analysis further confirmed varietal differences in nutrient uptake.
- * This trial is being continued and is now in its 2nd ratoon.

PCH/AGK/fjs
17 May 1991

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT PROPOSAL

CODE: VAR 14/88/Sw UBO Som

CAT.NO.: 1721

TITLE: VARIETIES ON A 'S' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 2nd ratoon	Soil Analysis: 07/12/90			
Site	: Ubombo Ranches Field speculation 4	pH	OM%	Clay%	
		7.3		<30	
		PPM			
Region	: Northern Irrigated [Swaziland]	P	K	Ca	Mg
		51	170	2775	734
Design	: Randomised blocks (8 replications)	Dates : 20/11/90 - 06/11/91			
Soil Set/Series	: 'S'	Age : 11.6 months			
Varieties	: NCo376, N14, N19	Rainfall : 570 mm			
Fertilizer	: N P K	Irrigation : 597 mm			
(Kg/ha)	150 20 100	Total : 1167 mm			

2. OBJECTIVES

- 2.1 To compare the performance of released varieties on a late cycle on a 'S' set soil.
- 2.2 To assess the resistance of the varieties to pests and diseases.
- 2.3 To establish the response of each variety to a standard rate of Fusilade Super applied late season.
- 2.4 To compare the nutrient content of third leaf in each variety to the established NCo376 thresholds.

3. TREATMENTS

- 3.1 Varieties : NCo376, N14 and N19
- 3.2 Fertilizers: Nitrogen as Urea (46 % N) and MAP (11% N) was applied on 30/11/90 at the rate 80 kg N ha⁻¹ and 10 kg N ha⁻¹ respectively, 1.5 week after harvest. A further 60 kg N ha⁻¹ as Urea (46 %) was applied on 28/02/91, 3.3 months after cutting.

Phosphorus as MAP (22% P) at the rate of 20 kg P ha⁻¹ and Potassium as KCL at the rate of 100 kg K ha⁻¹ were applied on 30/11/90 1.5 week after harvest.
- 3.3 Ripening : The trial was accidentally ripened by the Estate.

4. RESULTS

4.1 Growth Data

Table 1: Crop growth measurements and population counts at 7.5 months of age in July

Variety	Height Measurements (mm to TVD)	Stalk Population (* 1000/ha)
	7 m	7 m
NCo376	2143	167
N14	2199	135
N19	2277	120
Mean	2206	141

4.2 Harvest Data

This trial was not weighed or sampled due to uneven growth caused by drift of Fusilade from nearby commercial ripening.

4.3 Leaf Analysis

Table 2: Third leaf Nutrient content (%dm) at 2.7 and 5.1 months of age in February and April

Variety	% dm											ppm Zn
	N		P		K		S	Mg		S		
	Feb	Apr	Feb	Apr	Feb	Apr	Feb	Feb	Apr	Feb	Apr	Feb
NCo376	1.78	1.73	0.23	0.29	1.19	1.38	0.14	0.24	0.26	0.16	0.18	12.8
N14	1.72	1.73	0.21	0.27	1.15	1.28	0.14	0.26	0.28	0.18	0.21	11.3
N19	1.69	1.65	0.24	0.28	1.26	1.35	0.14	0.26	0.27	0.16	0.17	10.5
LSD Variety (0.05)*	0.07	0.10	0.01	0.01	0.07	0.08	0.01	0.02	0.03	0.02	0.02	1.1
(0.01)**	0.10	0.14	0.02	0.02	0.10	0.11	0.01	0.03	0.05	0.02	0.03	1.5
Significance	*	NS	**	**	*	*	NS	*	NS	*	**	**
Mean	1.73	1.71	0.23	0.28	1.20	1.33	0.14	0.25	0.27	0.17	0.19	11.5
SE	0.06	0.09	0.01	0.01	0.06	0.07	0.01	0.02	0.03	0.02	0.02	1.0
CV %	3.7	5.5	5.7	4.0	5.4	5.2	5.9	6.9	11.1	9.7	8.9	8.7

Table 3: Third Leaf Nutrient content of N14 and N19 at 2.7 months in February expressed as a percentage of NCo376

Variety	% dm						ppm
	N	P	K	S	Ca	Mg	Zn
N14	97	91**	97	100	108*	113*	88**
N19	95*	104*	106*	100	108*	100	82**
Mean	96	98	102	100	108	107	97

* Significant (P = 0.05)

** Highly significant (P = 0.05)

5. COMMENTS

5.1 Growth Measurements

Stalk populations were highest in NCo376 and lowest in N19 at 7.75 months of age in July. Stalk heights decreased in the order of N19>N14>NCo376. Growth measurements indicated that the yield trends recorded in this trial in previous harvests would be repeated in terms of cane yields (ie. NCo376 and N14 similar and N19 lower).

5.2 Leaf Analysis

The third leaf nutrient content of NCo376 in February was satisfactory except for S which was marginal and Zn which appeared to be deficient.

There were significant differences in nutrient content between the varieties with the exception of S. N, P, K and Zn levels were lower in N14 than in NCo376 while levels of Ca and Mg were higher. N and Zn levels were lower in N19 than in NCo376 while levels of P, K and Ca were higher.

5.3 Smut

Smut levels were very low in this second ratoon crop.

6. CONCLUSION

* This trial is being continued and is now in its 3rd ratoon.

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: Var 14/88/Sw Ubo Som

CAT No: 1721

TITLE: VARIETIES ON A 'S' SET SOIL

1. PARTICULARS OF PROJECT

This crop	: 3rd ratoon	Soil Analysis: 25/11/91			
Site	: Ubombo Ranches Field Speculation 4	pH 6.8	OM%	Clay%	<30
Region	: Northern irrigated (Swaziland)	DDM			
Design	: Randomised blocks (8 replications)	P 48	K 250	Ca 3172	Mg 813
Soil Set/Series:	'S'	Date	: 06/11/91 - 06/11/92		
Varieties	: NCo376; N14; N19	Age	: 12 months		
Fertilizer	: N P K (Kg/ha) : 140 - 75	Rainfall	: 377 mm		
		Irrigation:	1151 mm		
		Total	: 1528 mm		

2. OBJECTIVES

- 2.1 To compare the performance of released varieties on a late cycle on a 'S' set soil.
- 2.2 To assess the resistance of the varieties for Pests and Diseases.
- 2.3 To establish the response of each variety to a standard rate of Fusilade Super applied late season.
- 2.4 To compare the third leaf nutrient content of each variety to those in NCo376.

3. TREATMENTS

3.1 Varieties : NCo376, N14 and N19

3.2 Fertilizer: Nitrogen as Urea (46% N) was applied on 26/11/91 at the rate of 80 kg N ha⁻¹ 2.8 weeks after harvest. A further 60 kg N ha⁻¹ as Urea (46%) was applied on 31/01/92, 2.8 months after cutting.

Potassium as KCl (50% K) at the rate of 75 kg K ha⁻¹ was applied on 26/11/91 2.8 weeks after harvest.

3.3 Ripening : Fusilade was not applied because of lodging of N19.

3.4 Soil sampling

Topsoil: 40 cores were taken from four randomly selected plots representative of the four blocks at a ratio of 16 on row to 24 interrow (i.e. 1:1.5)

Subsoil: 20 cores were taken from 6 randomly selected plots 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 soil profile - May 1992

Depth (cm)	P	K	Ca	Mg	(Ca+Mg)/K
0 - 15	25	123	2301	894	26
20 - 30	26	106	2528	813	32
40 - 50	80	85	2815	847	43

4.2 Leaf Analysis

Table 2: Third leaf analysis (%dm) at 3.2, 4.8 and 5.2 months of age in February, March and April

Variety	N			P			K			Ca			Mg		
	Feb.	Mar.	Apr.	Feb.	Mar.	Apr.	Feb.	Mar.	Apr.	Feb.	Mar.	Apr.	Feb.	Mar.	Apr.
NCo376	1.55	1.51	1.60	0.19	0.21	0.23	1.05	1.26	1.30	0.25	0.21	0.21	0.16	0.14	0.17
N14	1.56	1.53	1.56	0.19	0.20	0.23	1.06	1.15	1.19	0.28	0.23	0.27	0.21	0.18	0.22
N19	1.53	1.42	1.52	0.19	0.21	0.22	1.26	1.24	1.35	0.27	0.24	0.29	0.16	0.13	0.16
LSD Variety (0.05)	0.12	0.07	0.06	0.01	0.01	0.01	0.20	0.09	0.19	0.05	0.02	0.05	0.03	0.01	0.03
Significance	NS	**	*	NS	NS	NS	NS	*	NS	NS	*	**	**	**	**
Mean	1.54	1.49	1.56	0.19	0.21	0.22	1.12	1.21	1.28	0.27	0.22	0.26	0.18	0.15	0.19
SED \pm	0.06	0.03	0.03	0.004	0.01	0.01	0.09	0.04	0.09	0.02	0.01	0.02	0.02	0.01	0.02
CV%	7.5	4.1	3.7	4.6	5.8	5.8	16.5	7.0	13.9	17.9	8.1	15.5	14.1	7.7	15.3

4.3 Harvest DataTable 3: Cane Yield, Cane Quality and Sucrose Yield

Variety	Tons cane/ha	Sucrose % cane	Tons sucrose/ha
NCo376	117	15.84	18.6
N14	128	15.70	20.0
N19	101	16.25	16.5
LSD Var. (0.05)	7	0.52	1.2
Significance	**	NS	**
Mean	115	15.93	18.4
SED \pm	3.3	0.24	0.5
CV %	5.7	3.0	6.0

Lodging score; NCo376; 2; N14: 1; N19: 8 (0 = No lodging, 9 complete lodging)

4.4 Smut surveyTable 4: Percentage smut whips at 2.2 months of age in January

Variety	% Smut whips
NCo376	3.44
N14	0.38
N19	0.00
Mean	1.27

4.5 EldanaTable 5: Eldana damage at harvest

Variety	% internodes damaged
NCo376	0.24
N14	7.00
N19	2.17
Mean	3.14

5. COMMENTS5.1 Soil Analysis

Soil analysis showed that levels of P and K were satisfactory.

5.2 Leaf Analysis

Levels of N were marginal/deficient between February and April while the other nutrients were satisfactory. There were differences in nutrient content between varieties and these were significant in the case of N, K, Ca and Mg. Levels of N in N19 were lower than in NCo376 while K was lower in N14.

5.3 Harvest Results

There were significant differences in cane yield between varieties N14 produced the highest cane yields, NCo376 was intermediate and N19 produced poor yields.

There were no statistically significant differences in sucrose content although sucrose content of N19 tended to be superior to N14 and NCo376.

There were significant differences in sucrose yield between varieties and the highest yields were recorded in N14. NCo376 was intermediate and N19 produced poor yields at this site.

5.4 Smut

Smut levels were highest in NCo376. Levels were low in N14 and no smut was recorded in N19.

5.5 Eldana

Levels of Eldana damage were relatively high in N14 this year.

6. CONCLUSIONS

- * The highest sucrose yields were once again recorded in N14 thus confirming it's good performance in the late season harvest period.
- * The performance of N19 was poor and may have resulted from relatively heavy lodging.
- * There were significant differences in nutrient content between varieties.
- * This trial has been continued and is now in its 4th ratoon.

SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS' ASSOCIATION

Cat. No.: 1721

CODE: VAR 14/88/Sw/UBO Som

TITLE: RELEASED VARIETIES ON A 'S' SET SOIL

1. PARTICULARS OF PROJECT

This crop : 4th Ratoon	Soil Analysis: 18/11/93		
Site : Ubombo Ranches Ltd. Field Speculation 4	pH 7.1	OM% -	Clay % <30
Region : Northern Irrigated (Swaziland)	ppm		
Soil Set/Series : 'S' (Somering)	P 28	K 183	Ca 2805
Design : Randomised Blocks 8 replications	Age : 12.3 months	Date: 06/11/92 - 16/11/92	
Varieties : NCo376, N14, N19	Rainfall : 382 mm	Irrigation: 924 mm (overhead)	
Fertilizer : N P K	Total : 1306 mm		
Total : 140 - 150			

2. OBJECTIVES

- 2.1 To compare the performance of released varieties in a late season cycle on a 'S' set soil.
- 2.2 To assess the resistance of varieties to pests and diseases.
- 2.3 To establish the response of each variety to a standard rate of Fusilade Super.
- 2.4 To compare the third leaf nutrient contents of each variety to that of NCo376.

3. TREATMENTS

- 3.1 Varieties: NCo376, N14 and N19
- 3.2 Ripener Fusilade Super, (hereafter referred to as Fusilade) was applied on half the plots of each variety. A CO₂ constant pressure knapsack with a hand held 'T' boom, delivering ±49 l/ha through two TK 1.5 nozzles, was used in calm, cool conditions.

Table 1: Details of ripening

Variety	Ripener rate	Date Applied	Age (mths)	Spray - Harvest (weeks)	% Purity at spraying
NCo376	Fus. 0.45 l/ha	12/10/93	11.2	4.8	92
N14	Fus. 0.6 l/ha	12/10/93	11.2	4.8	92
N19	Fus. 0.45 l/ha	12/10/93	11.2	4.8	93

3.3 Fertilizers

Nitrogen (Urea, 46% N) at 140kg N/ha and Potassium (KCl, 50% K) at 150kg K/ha was applied on the cane row 3 weeks after harvest

3.4 Soil Sampling

Soil samples were taken 2 days after harvest from 6 randomly selected plots.

4. RESULTS

4.1 Leaf Analysis

Table 2: Third leaf nutrient content (% dm) in January at 2.8 months

Variety	% dm				
	N	P	K	Ca	Mg
NCo376	1.85	0.22	1.21	0.27	0.20
N14	1.94	0.21	1.17	0.32	0.26
N19	1.89	0.22	1.19	0.32	0.21
LSD (0.05)	0.10	0.03	0.12	0.03	0.03
SE. Diff. +	0.04	0.02	0.06	0.02	0.02
Significance	NS	NS	NS	**	*
Mean	1.89	0.22	1.19	0.30	0.22
CV %	4.6	12.7	9.7	10.1	17.4

Table 3: Third leaf nutrient contents of N14 and N19 compared with NCo376

Variety	% of NCo376				
	N	P	K	Ca	Mg
N14	105	95	97	119**	130*
N19	102	100	98	119**	105

* Statistically significant at P=0.05

** Statistically significant at P=0.01

4.2 Growth data and Flowering

Table 4: Growth measurements and Percentage flowered stalks

Variety	Stalk height (cm to TVD)		Stalk population (*1000/ha)			% Flowered Stalks July 8.5 mths)
	Feb (3.0 mths)	May (6.7 mths)	Nov (12. mths)	Feb (3.0 mths)	May (6.7 mths)	
NCo376	87	229	249	225	127	56
N14	82	234	253	215	108	57
N19	90	237	248	213	106	7
Mean	86	234	250	213	114	40
CV %	12.3	3.3	5.2	13.4	8.3	46.6

4.5 Pests and Diseases

Table 5: Smut infection at 3.6 months of age in February and Eldana damage at harvest

Variety	% Smut whips	% Internodes Damaged		
		Control	Ripened	Mean
NCo376	7.67	0.23	0.63	0.43
N14	0.39	0.71	0.40	0.55
N19	0.00	0.38	0.73	0.55
Mean	2.69	0.44	0.59	0.51

4.4 Harvest Data

Table 6: Cane yield, sucrose % cane and sucrose yield

Variety	TCane/ha			Suc % Cane			TSuc/ha		
	C	R	Mean	C	R	Mean	C	R	Mean
NCo376	93	92	92	15.5	15.2	15.4	14.4	14.0	14.2
N14	98	100	99	15.1	14.8	15.0	14.8	14.8	14.8
N19	93	97	95	17.3	17.0	17.2	16.0	16.6	16.3
Mean	94	96	95	16.0	15.7	15.8	15.1	15.1	15.1
Interaction	NS			NS			NS		
LSD Var. (0.05)	8			0.6			1.4		
SE Diff. +	3.7			0.3			0.7		
Significance	NS			**			*		
LSD Rip. (0.05)	6			0.5			1.1		
SE Diff. +	3.0			0.2			0.5		
Significance	NS			NS			NS		
LSD Treat. (0.05)	11			0.9			2.0		
SE Diff. +	5.3			0.4			0.9		
CV %	7.8			3.7			8.7		

Note: C = Control
R = Ripened

5. COMMENTS

5.1 Leaf Analysis

Third leaf nutrient analysis at 2.8 months of age, showed that N, P, K, Ca and Mg levels were satisfactory and above their respective thresholds (table 2). Leaf Ca and Mg contents of N14 were significantly higher than those recorded in NCo376. The leaf Ca content of N19 was also significantly higher than that of NCo376 (table 3). There were virtually no differences in leaf P contents between the varieties. Leaf K levels of NCo376 were slightly higher than that of the other two varieties, while leaf N levels were highest in N14 followed by N19 and NCo376 (table 2).

5.2 Growth Data

No significant differences in cane height between the varieties were recorded at 3.0 and 6.7 months of age (February & May). The stalk population of NCo376, however, was significantly higher than that of the other two varieties at 6.7 months of age (table 4).

5.3 Flowering

High numbers of flowered stalks were recorded in varieties N14 and NCo376, while significantly fewer flowers were recorded in N19 (table 4).

5.5 Smut and Eldana

The highest smut infection was recorded in variety NCo376. No smut was recorded in N19 (table 5).

Eldana damage at harvest was low in this trial and differences between the varieties were not statistically significant. The effect of Fusilade on eldana damage was also not statistically significant (table 5).

5.4 Harvest Data

The highest cane yield in this trial was obtained from N14, although there were no statistically significant differences in cane yield between the three varieties. There were no significant responses to Fusilade (table 6).

The sucrose content of N19 was significantly ($P=0.01$), higher than that of the other two varieties while differences between NCo376 and N14 were not statistically significant (table 6)

It appears that the sucrose content of N19 remained stable during the last month before harvest, while the sucrose contents of the other varieties declined over this period. Samples taken at 4.8 and 1.7 weeks before, as well as at harvest, showed that moisture levels of all varieties were exceptionally low the extended dry-off period might have accounted for the decline in sucrose content of N14 and NCo376. (table 6, Appendix 1, figure 1).

The application of Fusilade had no statistically significant effect on the sucrose content of any of the varieties, presumably due to the advanced natural maturity at the time of ripener application (table 6, figure 1).

Sucrose yield of N19 was significantly ($P=0.05$) higher the other varieties. The application of Fusilade did not appear to have any effect on sucrose yield in any of the varieties (table 6).

6. CONCLUSIONS

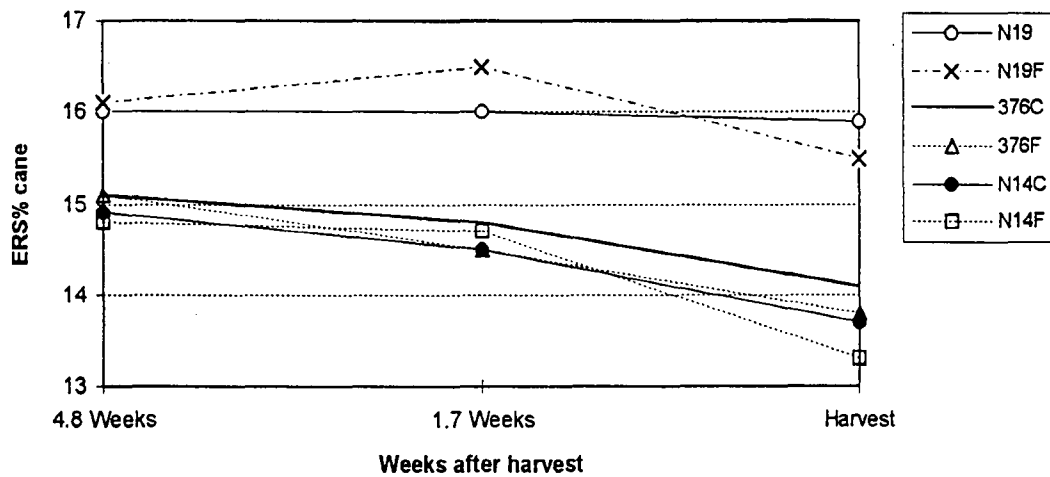
- Variety N19 out-yielded both N14 and NCo376 in this trial. This is the first time that this has occurred at this site and can be attributed to the fact that cane yields in the other varieties were lower than normal. The soil at this trial site is very shallow, and the low cane yield could have been the result of an extended dry-off period.
- Smut levels in N14 and N19 were very low at this site and levels of eldana damage were low in all varieties.
- Significant differences ($P=0.05$), were observed between the third leaf Ca and Mg levels of the different varieties in this trial.
- This trial has been terminated and a summary of results from the plant crop to the 4th ratoon is attached.

Appendix 1: Sucrose sample data

Variety/ Treatment	Date of Sample (weeks before harvest)														
	12/10/93 (4.8)					02/11/93 (1.7)					16/11/93 (0)				
	Pur%C	g/st	ERS %	gERS/st	moist%	Pur%C	g/st	ERS %	gERS/st	moist%	Pur%C	g/st	ERS %	gERS/st	moist%
NCo376 Control	91.7	573	15.1	87	67.0	92.9	497	14.8	74	68.0	90.6	740	14.1	104	67.9
NCo376 + F 0.45l	92.1	586	15.1	88	67.1	92.3	562	14.5	82	67.9	90.5	707	13.8	97	68.1
N14 Control	91.8	691	14.9	103	66.5	91.9	716	14.5	104	66.6	90.3	1009	13.7	137	66.9
N14 + F 0.6l	91.8	705	14.8	104	66.8	93.0	721	14.7	106	66.8	89.7	942	13.3	126	67.0
N19 Control	93.3	743	16.0	119	65.9	93.4	833	16.0	133	65.9	92.5	1072	15.9	171	65.5
N19 + F 0.45l	92.7	748	16.1	121	65.9	94.4	742	16.5	123	64.9	91.5	1051	15.5	163	65.2
LSD Treat. (0.05)	1.3	101	0.6	16	0.82	1.6	81	0.6	12	0.95	1.8	180	1.0	25	1.17
SE Difference ±	0.6	47.5	0.3	7.4	0.38	0.7	38.2	0.3	5.8	0.44	0.9	84.5	0.5	11.7	0.55
Significance	NS	**	**	**	NS	*	**	**	**	NS	**	**	**	**	NS
Mean	92.2	674	15.3	104	66.5	93.0	678	15.2	104	66.7	90.8	920	14.4	133	66.8
CV%	0.9	10.0	2.6	10.1	0.82	1.1	8.0	2.6	8.0	0.95	1.4	13.0	4.5	12.4	1.16

- * Pur%C = Purity % cane
- g/st = gram per stalk
- ERS% = % Estimated Recoverable Sucrose
- gERS/st = grams Estimated Recoverable Sucrose per stalk
- moist% = moisture %

Figure 1: Effect of Fusilade on ERS % cane



TERMINAL REPORT SUMMARY: TRIAL VAR 14/88/Sw/UBO Som
Plant to fourth ratoon

Table 1: Soil nutrient analysis - plant to 4th ratoon

Season	Crop	Analysis Date	pH	ppm						
				P	K	Ca	Mg	S	Zn	Na
1988/89	Plant	04/11/89	6.9	38	175	3087	880	23	2.1	7
1989/90	1R	04/11/89	6.9	38	175	3087	880	23	2.1	-
1990/91	2R	30/11/90	7.3	51	170	2775	734	-	-	-
1991/92	3R	25/11/91	6.8	48	250	3172	813	-	-	-
1992/93	4R	18/11/93	7.1	28	183	2805	918	-	-	-

Table 2: Rainfall and irrigation figures - plant to 4th ratoon

Season	Crop	Period	Rainfall (mm)	Irrigation (mm)	Total (mm)
1988/89	Plant	14/12/88-15/11/89	-	-	-
1989/90	1 R	15/11/89-20/11/90	531	736	1267
1990/91	2 R	20/11/90-06/11/91	-	-	-
1991/92	3 R	06/11/91-06/11/92	377	1151	1528
1992/93	4 R	06/11/92-16/11/93	382	924	1306

Table 3: Growth measurements at various ages

Season	Crop	Month	Age (mths)	Stalk height (cm to TVD)				Stalk population (* 1000/ha)			
				NCo376	N14	N19	Mean	NCo376	N14	N19	Mean
1988/89	Plant	Jan	1.5	-	-	-	-	79	75	56	70
		May	4.7	113	102	108	108	134	137	127	133
		Oct	10.5	169	162	160	164	114	105	109	109
1989/90	1 R	Mar	4.2	151	152	168	157	168	157	142	156
1990/91	2 R	-	-	-	-	-	-	-	-	-	-
1991/92	3 R	Jan	2.3	-	-	-	-	88	56	152	99
1992/93	4 R	Feb	3.0	87	82	90	86	225	215	213	218
		May	6.7	229	234	237	233	127	108	106	114
		Nov	12.2	249	253	248	250	-	-	-	-

Table 4: Cane yield, sucrose content and sucrose yield - plant to 4th ratoon

Variety	Season (crop)					
	1988/89 (P)	1989/90 (1R)	1991/92 (3R)	1992/93(4R)		Mean
				C		
	TCane/ha					
NCo376	92	129	119	93	92	108
N14	96	132	130	98	100	114
N19	81	117	104	93	97	99
Mean	90	126	118	94	96	
	Sucrose % cane					
NCo376	14.1	14.7	15.6	15.5	15.2	15.0
N14	13.3	14.5	15.5	15.1	14.8	14.6
N19	15.2	15.4	16.5	17.3	17.0	16.0
Mean	14.17	14.84	15.88	16.0	15.7	
	TSuc/ha					
NCo376	12.9	18.9	18.7	14.4	14.0	16.2
N14	12.7	19.1	20.2	14.8	14.8	16.7
N19	12.2	18.0	17.2	16.0	16.6	15.9
Mean	12.6	18.7	18.7	15.1	15.1	

NB: 2nd ratoon crop was not harvested because of accidental aerial spraying with Fusilade.

C = Control

R = Ripened

Table 5: Smut survey results - plant to 4th ratoon

Season	Crop	Month	Age (mths)	% Smut whips		
				NCo376	N14	N19
1988/89	Plant	February	1.7	0.00	0.00	0.00
1989/90	1 R	"	2.5	0.50	0.00	0.13
1991/91	2 R	-	-	-	-	-
1991/92	3 R	January	2.2	3.44	0.38	0.00
1992/93	4 R	February	3.6	7.67	0.39	0.00

Table 6: Eldana damage at harvest

Season	Crop	Month	Age (mths)	% Internodes damaged		
				NCo376	N14	N19
1988/89	Plant	November	11.0	0.05	0.00	0.09
1989/90	1 R	"	12.2	-	-	-
1991/91	2 R	"	-	-	-	-
1991/92	3 R	"	12.0	0.24	7.00	2.17
1992/93	4 R	"	12.3	0.43	0.55	0.55

Table 7: Third leaf analysis at various ages - plant to 4th ratoon

Season	Crop	Mth/ Age (m)	NCo376							N14							N19							
			(% dm)						Zn	(% dm)						Zn	(% dm)						Zn	
			N	P	K	Ca	Mg	S	(ppm)	N	P	K	Ca	Mg	S	(ppm)	N	P	K	Ca	Mg	S	(ppm)	
1988/89	Plant	Mar. (3.5)	1.81	0.24	1.33	0.19	0.17	0.14	16.1	1.71	0.22	1.32	0.25	0.19	0.15	13.5	1.87	0.24	1.43	0.21	0.17	0.15	14.3	
1989/90	1R	Feb. (3.5)	1.61	0.23	1.31	0.72	0.17	0.14	11.8	1.63	0.20	1.24	0.25	0.19	0.13	12.3	1.54	0.27	1.36	0.22	0.16	0.13	11.5	
1990/91	2R	Feb. (2.6)	1.78	0.23	1.19	0.24	0.16	0.14	12.8	1.72	0.21	1.15	0.26	0.18	0.14	11.3	1.69	0.24	1.26	0.26	0.16	0.14	10.5	
1991/92	3R	Feb. (3.2)	1.55	0.19	1.05	0.25	0.16	-	-	1.56	0.19	1.05	0.20	0.21	-	-	1.53	0.19	1.26	0.27	0.16	-	-	
		Mar. (4.0)	1.51	0.21	1.26	0.21	0.14	-	-	1.53	0.20	1.15	0.20	0.18	-	-	1.42	0.21	1.24	0.24	0.13	-	-	
		Apr. (5.2)	1.60	0.23	1.30	0.21	0.17	-	-	1.56	0.23	1.19	0.27	0.22	-	-	1.52	0.22	1.35	0.29	0.16	-	-	
1992/93	4R	Jan. (2.0)	1.05	0.22	1.21	0.27	0.20	-	-	1.94	0.21	1.17	0.32	0.26	-	-	1.69	0.22	1.19	0.32	0.21	-	-	
Mean			1.57	0.22	1.24	0.24	0.17	0.14	13.57	1.66	0.21	1.18	0.27	0.20	0.14	12.4	1.64	0.23	1.30	0.26	0.16	0.14	11.9	
Leaf nutrient levels as a % of NCo376																								
Season	Crop	Age (m)								N14							N19							
1988/89	Plant	Mar. (3.5)	-	-	-	-	-	-	-	94	92	99	-	-	107	84	103	108	100	-	-	107	89	
1989/90	1R	Feb. (3.5)	-	-	-	-	-	-	-	101	87	95	-	-	93	104	96	117	104	-	-	93	93	
1990/91	2R	Feb. (2.6)	-	-	-	-	-	-	-	97	91	97	-	-	100	88	95	104	106	-	-	100	82	
1991/92	3R	Feb. (3.2)	-	-	-	-	-	-	-	101	100	101	112	131	-	-	99	100	120	108	100	-	-	
		Mar. (4.0)	-	-	-	-	-	-	-	101	95	91	110	129	-	-	94	100	90	114	93	-	-	
		Apr. (5.2)	-	-	-	-	-	-	-	98	100	92	129	129	-	-	95	96	104	138	94	-	-	
1992/93	4R	Jan. (2.0)	-	-	-	-	-	-	-	105	95	97	119	130	-	-	102	100	98	119	105	-	-	
Mean			-	-	-	-	-	-	-	100	94	96	117	130	100	92	98	102	105	120	98	100	80	