

SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS ASSOCIATION

CODE: VAR 42/01/Sw/Ubo 'S'

CAT: 2184

RELEASED VARIETIES ON AN 'S' SET SOIL HARVESTED LATE SEASON

1. PARTICULARS OF PROJECT

This crop : 1 st Ratoon Trial crop : 2 nd Site : Ubombo Sugar Ltd Field : Speculation 4 Region : Northern Irrigated (Swd) Soil Set : 'S' Design : Split plot, 5 replication Variety : NCo376, N25, N36, N38 Fertilizer : N P K kg/ha 160 0 150	Soil Analysis: August, 2001 pH OM % Clay % Silt % Sand % 6.95 - - - - <div style="text-align: center;">-ppm</div> P K Ca Mg (Ca+Mg)/K 19 180 2705 893 20 Age : 12.2 months Date : 22/10/2002 – 29/10/2003 Rainfall : 278 mm Irrigation : 576 mm Total : 854 mm
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2. OBJECTIVES

- To compare the performance of varieties N25, N36 and N38 with that of NCo376 for a late season cycle on an 'S' set soil.
- To determine the ripening response of each variety to Fusilade Super at two rates of application.
- To compare the resistance/susceptibility of varieties to smut and eldana.
- To compare the third leaf nutrient contents of N25, N36 and N38 with established NCo376 thresholds.

3. TREATMENTS

- Varieties and ripening treatments in this trial were as follows:

Ripeners (main plots)

Control
 Fusilade @ 0.3 l/ha
 Fusilade @ 0.45 l/ha

Varieties (sub plots)

NCo376
 N25
 N36
 N38

- Fusilade was not applied in this crop because of high juice purity one week before intended application date.

4. FERTILIZERS

- 160kg N/ha (as Urea 46 % N), applied 2 weeks after harvest.
- No P was applied.
- 150kg K/ha (as KCl, 50% K) at 4 weeks after harvest.

5. RESULTS AND DISCUSSION

Leaf Analysis

- Levels of N, P, K, Ca and Mg were satisfactory and above their respective thresholds (Table 1).
- There were statistically significant differences in levels of P, K, Ca and Mg among varieties.

Table 1: Third leaf nutrient content (% dm) at 3.9 months of age in February

Variety	% dm				
	N	P	K	Ca	Mg
NCo376	2.00	0.23	1.25	0.23	0.18
N25	2.00	0.23	1.37	0.23	0.19
N36	2.01	0.22	1.23	0.24	0.20
N38	1.99	0.23	1.22	0.27	0.24
Mean	2.00	0.23	1.27	0.24	0.20
LSD (0.05)	NS	0.007	0.05	0.01	0.01
LSD (0.01)	-	NS	0.07	0.02	0.02
CV %	1.4	3.9	5.5	7.5	7.6

Table 2: Variety differences in third leaf nutrient content (% NCo376)

Variety					
N25	100	100	110**	100	106*
N36	101	96*	98	104*	111**
N38	100	100	98	117**	133**

* = Significant (P=0.05)

** = Significant (P=0.01)

Growth Measurements

- The stalk population of NCo376 was significantly higher than that of the other varieties at harvest (Table 3). N25 and N38 were intermediate and statistically similar.

- N36 stalks were significantly taller than those of the other varieties at harvest, while N25 and NCo376 were intermediate and statistically similar (Table 5).

Table 3: Growth measurements at various ages

Variety	Stalk population ('000/ha)					Stalk height (cm to TVD)				
	Feb. (3.9m)	Apr. (5.8m)	Jun. (8.1m)	Aug. (10.2m)	Oct. (12.0m)	Feb. (3.9m)	Apr. (5.8m)	Jun. (8.1m)	Aug. (10.2m)	Oct. (12.0m)
NCo376	130	120	119	122	123	149	233	265	267	272
N25	123	109	110	115	112	160	239	258	260	268
N36	105	102	109	104	101	174	254	279	286	285
N38	126	115	115	116	114	154	213	237	245	249
Mean	121	112	113	114	113	159	235	260	265	269
LSD (0.05)	8	6	3	8	8	6	11	9	12	8
LSD (0.01)	11	8	5	10	10	8	15	13	16	11
CV %	9.2	7.0	4.2	9.0	9.4	5.1	6.3	4.9	6.2	4.3

Pests and Diseases

- All varieties, except N25 were affected by Eldana at harvest. NCo376 had significantly a higher incidence than N36 while N38 was intermediate and statistically similar to N25 and N36 (Table 4).
- NCo376 had significantly a higher smut incidence than the other varieties, which were statistically similar to each other, while N36 had none (Table 4).

Table 4: Eldana damage at harvest and smut levels from December to February

Variety	Eldana	Smut (% smut whips)		
	% internodes damaged	Dec. (1.7m)	Jan. (3.0m)	Feb. (3.9m)
NCo376	0.27	0.18	1.85	1.88
N25	0.00	0.00	0.12	0.25
N36	0.04	0.00	0.00	0.00
N38	0.22	0.00	0.04	0.00
Mean	0.13	0.05	0.50	0.53
LSD (P=0.05)	0.18	0.09	0.44	0.61
LSD (P=0.01)	0.23	0.12	0.58	0.81
CV %	179.1	258.1	117.4	154.2

Harvest Results

- Cane yield for N25 and N38 was significantly higher than that of N36 and NCo376 which were similar (Table 5).
- Mean sucrose and erc% cane was significantly higher in N36 than in all the other varieties. All other varieties were statistically similar.
- There was no significant difference in mean sucrose and erc yield among varieties.

Table 5: Harvest Data

Variety	tc/ha	s%c	erc%c	ts/ha	t erc/ha
NCo376	120.2	16.34	14.97	19.6	18.0
N25	127.9	16.34	14.89	20.9	19.0
N36	120.2	17.18	15.77	20.7	19.0
N38	133.6	15.89	14.55	21.2	19.4
Mean	125.5	16.44	15.05	20.6	18.9
LSD (0.05)	6.99	0.62	0.73	NS	NS
LSD (0.01)	9.34	0.82	NS	-	-
CV%	7.6	5.1	6.6	9.9	11.1

NB: Sucrose measured as pol

6. CONCLUSIONS

- The cane yield of N25 and N38 was significantly higher than that of N36 and NCo376 while the cane quality of N36 was significantly higher than that of the other varieties.
- All varieties, except N25 were affected by Eldana at harvest, while NCo376 had significantly a higher incidence. NCo376 had significantly a higher incidence of smut infection than the other varieties, while N36 had none.
- Varietal differences in third leaf nutrient concentrations indicate that thresholds established for NCo376 may not be appropriate for the new N varieties.
- This trial has been continued and is now in its 2nd ratoon.

BMS/DB
10/3/2004

7. APPENDIX

Appendix 1: Sample data, August – October

23 Sep. 2003 (5.1 wks before harvest)									
Variety	Fresh wt. (g/stalk)	Moisture (% cane)	Dry wt. (g/stalk)	Purity (% cane)	Sucrose (%cane)	Erc (%cane)	Sucrose wt. (g/stalk)	Erc wt. (g/stalk)	Sucrose %dm
NCo376	831	71.0	241.0	90.2	15.9	14.5	132.6	120.9	55.0
N25	963	73.1	259.5	89.7	16.0	14.6	154.3	140.6	59.5
N36	1291	69.5	394.3	93.1	17.8	16.6	230.6	214.7	58.4
N38	999	73.1	268.8	90.9	15.8	14.5	157.1	144.1	58.7
Mean	1021	71.7	290.9	91.0	16.4	15.1	168.7	155.1	57.9
LSD (0.05)	83	0.71	26.98	1.23	0.64	0.69	17.41	16.79	1.98
LSD (0.01)	111	0.95	36.06	1.64	0.86	0.93	23.27	22.44	2.65
CV%	11.0	1.3	12.6	1.8	5.3	6.2	14.0	14.7	4.6
29 Oct. 2003 (at harvest - commercial topping height)									
Variety	Fresh wt. (g/stalk)	Moisture (% cane)	Dry wt. (g/stalk)	Purity (% cane)	Sucrose (%cane)	Erc (%cane)	Sucrose wt. (g/stalk)	Erc wt. (g/stalk)	Sucrose %dm
NCo376	869	70.1	259.9	91.0	16.3	15.0	141.8	129.9	54.7
N25	908	72.3	252.0	89.9	16.3	14.9	148.3	135.2	58.9
N36	1117	69.8	339.6	91.2	17.2	15.8	191.3	175.2	56.9
N38	929	72.6	254.1	90.7	15.9	14.6	147.7	135.3	58.1
Mean	956	71.2	276.4	90.7	16.4	15.1	157.3	143.9	57.2
LSD (0.05)	61	0.74	21.40	NS	0.62	0.73	11.88	11.66	2.25
LSD (0.01)	81	0.99	28.60	-	0.82	NS	15.88	15.59	3.00
CV%	8.6	1.4	10.5	3.2	5.1	6.6	10.2	11.0	5.3

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RELEASED VARIETIES ON AN 'S' SET SOIL HARVESTED LATE SEASON

1. PARTICULARS OF PROJECT

<p>This crop : 2nd Ratoon</p> <p>Trial crop : 3rd</p> <p>Site : Ubombo Sugar Ltd</p> <p>Field : Speculation 4</p> <p>Region : Northern Irrigated (Swd)</p> <p>Soil Set : 'S'</p> <p>Design : Split plot, 5 replication</p> <p>Variety : NCo376, N25, N36, N38</p> <p>Fertilizer : N P K kg/ha 160 0 0</p>	<p>Soil Analysis: August, 2001</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: left;">pH</td> <td style="text-align: left;">OM %</td> <td style="text-align: left;">Clay %</td> <td style="text-align: left;">Silt %</td> <td style="text-align: left;">Sand %</td> </tr> <tr> <td style="text-align: left;">6.95</td> <td style="text-align: left;">-</td> <td style="text-align: left;">-</td> <td style="text-align: left;">-</td> <td style="text-align: left;">-</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="5" style="text-align: center;">ppm</td> </tr> <tr> <td style="text-align: left;">P</td> <td style="text-align: left;">K</td> <td style="text-align: left;">Ca</td> <td style="text-align: left;">Mg</td> <td style="text-align: left;">(Ca+Mg)/K</td> </tr> <tr> <td style="text-align: left;">19</td> <td style="text-align: left;">180</td> <td style="text-align: left;">2705</td> <td style="text-align: left;">893</td> <td style="text-align: left;">20</td> </tr> </table> <p>Age : 12.2 months</p> <p>Date : 29/10/2003 – 2/11/2004</p> <p>Rainfall : 468 mm</p> <p>Irrigation : 544 mm</p> <p>Total : 1012 mm</p>	pH	OM %	Clay %	Silt %	Sand %	6.95	-	-	-	-	ppm					P	K	Ca	Mg	(Ca+Mg)/K	19	180	2705	893	20
pH	OM %	Clay %	Silt %	Sand %																						
6.95	-	-	-	-																						
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2. OBJECTIVES

- To compare the performance of varieties N25, N36 and N38 with that of NCo376 for a late season cycle on an 'S' set soil.
- To determine the ripening response of each variety to Fusilade Super at two rates of application.
- To compare the resistance/susceptibility of varieties to smut and eldana.
- To compare the third leaf nutrient contents of N25, N36 and N38 with established NCo376 thresholds.

3. TREATMENTS

- Varieties and ripening treatments in this trial were as follows:

Ripeners (main plots)

Control
Fusilade @ 0.3 l/ha
Fusilade @ 0.45 l/ha

Varieties (sub plots)

NCo376
N25
N36
N38

- Fusilade was not applied in this crop because of generally high juice purities at the time of application.

4. FERTILIZERS

- 160kg N/ha (as Urea 46 % N), applied 1 week after harvest (100kg/ha) and 7 weeks after harvest (60kg/ha).
- No P was applied.
- No K was applied.

5. RESULTS AND DISCUSSION

Leaf Analysis

- Levels of N, P, K, Ca and Mg were satisfactory and above their respective thresholds (Table 1).
- There were statistically significant differences in levels of P, Ca and Mg among varieties.

Table 1: Third leaf nutrient content (% dm) at 3.7 months of age in February

Variety	% dm				
	N	P	K	Ca	Mg
NCo376	1.91	0.23	1.19	0.26	0.22
N25	1.92	0.23	1.25	0.27	0.24
N36	1.92	0.22	1.18	0.29	0.25
N38	1.92	0.23	1.22	0.33	0.29
Mean	1.92	0.23	1.21	0.29	0.25
LSD (0.05)	NS	0.010	NS	0.02	0.02
LSD (0.01)	-	0.013	-	0.03	0.03
CV %	2.2	5.8	6.7	10.0	10.3

Table 2: Variety differences in third leaf nutrient content (% NCo376)

Variety					
N25	101	100	105	104	109*
N36	101	96**	99	112**	114**
N38	101	100	103	127**	132**

* = Significant (P=0.05)

** = Significant (P=0.01)

Growth Measurements

- The stalk populations of N25, N38 and NCo376 were statistically similar and significantly higher than that of N36 at harvest (Table 3).

- N36 stalks were significantly taller than those of the other varieties at harvest (Table 5). N38 had significantly the shortest stalks. N25 was statistically taller than NCo376.

Table 3: Growth measurements at various ages

Variety	Stalk population ('000/ha)						Stalk height (cm to TVD)					
	Jan. (2.5m)	Jan. (2.9m)	Feb. (3.7m)	Apr. (6.0m)	Jun. (8.0m)	Aug. (10.1m)	Jan. (2.5m)	Jan. (2.9m)	Feb. (3.7m)	Apr. (6.0m)	Jun. (8.0m)	Aug. (10.1m)
NCo376	194	170	155	125	112	113	64	96	131	238	249	249
N25	171	155	145	120	107	112	66	102	142	243	261	263
N36	147	128	121	100	97	89	82	122	160	268	278	274
N38	172	162	149	120	110	111	72	104	135	216	232	235
Mean	171	154	143	116	107	106	71	106	142	241	255	255
LSD (0.05)	9	11	10	7	5	5	5	6	8	7	6	8
LSD (0.01)	12	14	13	10	7	7	7	8	10	10	8	10
CV %	7.0	9.3	9.1	8.4	6.7	6.5	10.2	7.7	7.2	4.1	3.3	4.1

Pests and Diseases

- All varieties were affected by Eldana at harvest, but the incidence was very low. NCo376 had significantly a higher incidence than N36 while N38 was statistically similar to N25 and N36 (Table 4).
- NCo376 had significantly a higher smut incidence than the other varieties, which were statistically similar to each other. N36 had none (Table 4).

Table 4: Eldana damage at harvest and smut levels from January to February

Variety	Eldana	Smut (% smut whips)		
	% internodes damaged	Jan. (2.5m)	Jan. (2.9m)	Feb. (3.7m)
NCo376	0.02	0.87	0.98	0.56
N25	0.05	0.18	0.36	0.05
N36	0.04	0.00	0.01	0.00
N38	0.09	0.04	0.05	0.05
Mean	0.05	0.27	0.35	0.17
LSD (P=0.05)	NS	0.28	0.36	0.20
LSD (P=0.01)	-	0.38	0.48	0.27
CV %	300.3	141.1	140.9	167.3

Harvest Results

- Cane yield for N38 was significantly higher than that of the three other varieties. N25 was significantly higher than N36 and NCo376, which were statistically similar (Table 5).
- Mean sucrose and erc% cane was significantly higher in N36 than in all the other varieties. N25 and NCo376 were intermediate and statistically similar.
- As in the previous year, there was no significant difference in mean sucrose and erc yield among varieties.

Table 5: Harvest Data

Variety	tc/ha	s%c	erc%c	ts/ha	t erc/ha
NCo376	111	18.10	16.79	20.1	18.7
N25	121	17.78	16.38	21.4	19.7
N36	113	18.74	17.48	21.1	19.7
N38	128	17.16	15.75	21.9	20.1
Mean	118	17.95	16.60	21.1	19.6
LSD (0.05)	7	0.49	0.54	NS	NS
LSD (0.01)	9	0.66	0.72	-	-
CV%	8.2	3.7	4.4	8.2	8.2

NB: Sucrose measured as pol

6. CONCLUSIONS

- The cane yield of N38 was significantly higher than that of the three other varieties. The cane quality of N36 was significantly higher than that of the other varieties.
- All varieties were affected by Eldana at harvest, but the incidence was extremely low. NCo376 had significantly a higher incidence of smut infection than the other varieties, while N36 had generally none.
- Varietal differences in third leaf nutrient concentrations indicate that thresholds established for NCo376 may not be appropriate for the new N varieties.
- This trial has been continued and is now in its 3rd ratoon.

BMS
20/9/2005

7. APPENDIX

Appendix 1: Sample data

2 Nov. 2004 (at harvest)									
Variety	Fresh wt. (g/stalk)	Moisture (% cane)	Dry wt. (g/stalk)	Purity (% cane)	Sucrose (%cane)	Erc (%cane)	Sucrose wt. (g/stalk)	Erc wt. (g/stalk)	Sucrose %dm
NCo376	848	69.3	260.9	92.6	18.1	16.8	153.6	142.5	58.9
N25	914	70.8	266.9	91.3	17.8	16.4	162.4	149.6	60.9
N36	1138	68.9	353.3	93.4	18.7	17.5	212.9	198.5	60.5
N38	947	70.8	276.8	90.9	17.2	15.8	162.6	149.3	58.8
Mean	962	70.0	289.5	92.1	18.0	16.6	172.9	160.0	59.8
LSD (0.05)	69	1.01	22.90	1.15	0.49	0.54	12.68	11.98	NS
LSD (0.01)	93	1.35	30.60	1.54	0.66	0.72	16.95	16.01	-
CV%	9.8	2.0	10.7	1.7	3.7	4.4	10.0	10.2	4.3