

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: Var 4/84/sw SIM R/S

Cat No.: 1495

TITLE : RELEASED VARIETIES X RIPENER ON A 'R' SET SOIL

1. PARTICULARS OF PROJECT

This Crop	: 1st Ratoon	Soil Analysis	: 28/10/1985				
Site	: Simunye Sugar Estate Field 606	pH	OM %	Clay %	PDI		
Region	: Northern Irrigated (Swaziland)	6,7	-	>30	-		
Design	: Randomised blocks with 8 Replications	ppm					
Soil Set	: 'R' with some S set pockets	P	K	Ca	Mg	S	Zn
Varieties	: NCo 376, N14, N17	19	203	2557	828	19	-
Fertilizer	: N P K S	Dates : 17/10/1985 - 11/11/1986					
Top Dress (Ann. Sul.)	120	Age : 12,8 months					
(KCl)	100	Rainfall : 701,3 mm					
(S. Super)	40	Irrigation : 1024,0 mm					
Total kg/ha	120 40 100 175	Total : 1725,3 mm					

2. OBJECTIVES

- \* To compare testing the performance of N17 compared to N14 and NCo 376 for a late cycle on a shallow 'R' set soil.
- \* To determine the disease and pest tolerance of these varieties.
- \* To establish to what degree a standard rate of Fusilade Super would ripen each variety.

### 3. TREATMENTS

3.1 Varieties : NCo 376, N14, N17

3.2 Fertilizers: See under Particulars of Project for rates

\* Nitrogen was applied as a single dressing as Ammonium Sulphate over the cane row 2 weeks after cutting.

\* Potassium was banded over the row as KCl 2 weeks after harvest.

\* Phosphate as Single Supers was banded on the row 4 weeks after harvest.

3.3 A ripener was not sprayed as the cane was severely lodged towards the end of the season.

3.4 Sucrose sampling took place one day before harvest and each sample consisted of twelve stalks per plot.

### 4. RESULTS

4.1 TABLE I Crop growth measurements and populations at 1,4 and 5,75 months of age.

VARIETY	STALK HEIGHTS MM TO TVD		STALK POPULATIONS (X 1000/HA)		
	1m	5,75m	1m	4m	5,75m
NCo 376	1690	2495	280	171	148
N14	1630	2445	270	130	121
N17	1690	2625	230	154	139
MEAN	1670	2522	260	152	136

4.2 TABLE II Cane yield, cane quality and sucrose yield

VARIETY	CANE YIELD T/HA	ERS % CANE	ERS YIELD T/HA	SUC % CANE	SUCROSE YIELD T/HA
NCo 376	165	13,6	22,3	15,1	24,8
N14	165	13,9	23,0	15,4	25,4
N17	151	14,9	22,5	16,3	24,6
LSD (0,05)*	9	0,6	1,8	0,5	1,8
(0,01)**	12	0,8	2,4	0,7	2,5
SIGNIFICANCE	**	**	N.S	**	N.S
MEAN	160	14,1	22,6	15,6	24,9
CV %	5,3	3,8	7,3	3,2	6,9

4.3 TABLE III Yield per month and per 100 mm water

VARIETY	TC/HA/MONTH	TC/HA/100 MM
NCo 376	12,9	9,6
N14	12,9	9,6
N17	11,8	8,8
MEAN	12,5	9,3

4.4 TABLE IV Third leaf (% dn) values at 4 and 6 months of age

VARIETY	4 MONTHS (FEBRUARY)			6 MONTHS (APRIL)		
	N	P	K	N	P	K
NCo 376	1,77	0,24	1,28	1,74	0,22	1,17
N14	1,67**	0,19*	1,08	1,59**	0,19*	0,99*
N17	1,64**	0,22	1,19	1,47**	0,20	1,07
MEAN	1,70	0,22	1,18	1,60	0,21	1,08

\* = Marginal

4.5 TABLE V Percentage smut whips/ha at 1 and 2 months of age

VARIETY	% SMUT WHIPS/HA	
	1 MONTH	2 MONTHS
NCo 376	4,1	3,0
N14	Nil	Nil
N17	Nil	Nil

5. COMMENTS

- 5.1 Cane growth at this site was exceptional with the result that the entire trial was heavily lodged at harvest.
- 5.2 Crop growth measurements taken at 4 and 5,75 months of age showed all the varieties to be well grown. Height measurements taken at 5,75 months of age showed growth to be in excess of the plant crop at the same age.
- 5.3 \* Cane yields were very high and comparable to yields from surrounding commercial fields. As in the plant crop cane yields for N17 were significantly (P = 0,01) less than for both NCo 376 and N14.

- \* Cane quality for N17 on the other hand was significantly ( $P = 0,01$ ) greater in sucrose % and Ers % cane than the other two varieties owing to the good ripening potential of N17 at the end of the season.
  - \* The comparatively lower cane yield of N17 prevented tons sucrose and tons Ers/ha yield reaching significant levels above N14 and NCo 376. N17 was more severely lodged than the other two varieties which may have influenced cane yield.
  - \* N14 appeared to be the best variety but failed to gain significant increases in yields over the other varieties.
- 5.4 Third leaf analysis for sampling at 4 months of age showed N to be low in both N14 and N17 while P was marginal in N14. At 6 months of age N was still deficient in N14 and N17 while both P and K were low in N14. Current thinking is to determine different third leaf nutrient thresholds for each variety as certain cultivars appear to require higher rates of fertilizers.
- 5.5 Scout surveys carried out at 1 and 2 months of age showed NCo 376 to be infected with no incidence of the disease recorded in N14 and N17.
- 5.6 This trial has been re-established and is now in its 2nd ratoon.

NBL/gj

16.3.1987

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SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: VAR 4/84/SW Sim R/S  
CAT: 1495

TITLE; RELEASED VARIETIES X RIPENER ON A 'R' SET SOIL

1. PARTICULARS OF PROJECT

<p>This crop : 2nd ratoon</p> <p>Site : Simunye Sugar Estate Field 606</p> <p>Region : Northern Irrigated (Swaziland)</p> <p>Design : Randomised Block 8 Replications</p> <p>Soil Set : 'R' with some 'S' set pockets</p> <p>Varieties : NCo 376 N14 N17</p> <p>Fertilizer :    <u>N</u>    <u>P</u>    <u>K</u></p> <p>Top dress urea    140    -    -</p> <p style="padding-left: 40px;">KCL           -    -    300</p> <hr style="width: 50%; margin-left: 0;"/> <p>Total            140    -    300</p>	<p>Soil Analysis : Date 1/12/1986</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: left;">pH</td> <td style="text-align: center;"><u>OM %</u></td> <td style="text-align: center;"><u>Clay %</u></td> <td style="text-align: center;"><u>PDI</u></td> </tr> <tr> <td style="text-align: left;">6,74</td> <td style="text-align: center;">-</td> <td style="text-align: center;">&gt;30</td> <td style="text-align: center;">-</td> </tr> </table> <hr style="width: 100%;"/> <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="5" style="text-align: center;">ppm</td> </tr> <tr> <td style="text-align: center;"><u>P</u></td> <td style="text-align: center;"><u>K</u></td> <td style="text-align: center;"><u>Ca</u></td> <td style="text-align: center;">Mg</td> <td style="text-align: center;"><u>S</u></td> </tr> <tr> <td style="text-align: center;">46</td> <td style="text-align: center;">220</td> <td style="text-align: center;">3190</td> <td style="text-align: center;">843</td> <td style="text-align: center;">25</td> </tr> </table> <p>Dates : 11/11/86 - 8/10/87</p> <p>Age : 10,9 months</p> <p>Rainfall : 574mm</p> <p>Irrigation : 1192mm</p> <p>Total : 1766mm</p>	pH	<u>OM %</u>	<u>Clay %</u>	<u>PDI</u>	6,74	-	>30	-	ppm					<u>P</u>	<u>K</u>	<u>Ca</u>	Mg	<u>S</u>	46	220	3190	843	25
pH	<u>OM %</u>	<u>Clay %</u>	<u>PDI</u>																					
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46	220	3190	843	25																				

2. OBJECTIVES

- 2.1 To continue testing the performance of the industry's three most important varieties for a late cycle on a shallow 'R' set soil.
- 2.2 To determine the disease and pest tolerance of these varieties.
- 2.3 To establish to what degree the recommended rate of Fusilade Super would ripen each variety.

3. TREATMENTS

3.1 Varieties : NCo 376 N14 N17

3.2 Fertilizers :

- a) Nitrogen as urea was applied as a single dressing over the cane row at 3 weeks after harvesting.
- b) Potassium as muriate of potash was banded over the row as a single application at 3 weeks after harvesting.

3.3 Ripener.

As for the plant and 1st ratoon crops, severe lodging prevented the use of a chemical ripener.

### 3. TREATMENTS

#### 3.4 Sampling.

Sucrose samples consisted of 16 stalks from each plot and were taken one day before cutting.

### 4. RESULTS

#### 4.1 Crop Growth data

Table I. Crop growth measurements and populations at 2,8 and 4,9 months of age.

VARIETY	STALK HEIGHTS (MM TO TVD)		STALK POPULATIONS (X1000/HA)	
	4,9 months		2,8 months	4,9 months
NCo 376	2460		195	186
N14	2290		177	142
N17	2430		188	163

Note : Early lodging prevented further growth measurements being recorded.

#### 4.2 Harvest Data

Table II. Cane yield, cane quality and sucrose yield.

VARIETY	CANE YIELD TONS HA	ERS % CANE	ERS YIELD TONS HA	SUC % CANE	SUC YIELD TONS HA
NCo 376	136	13,2	17,9	14,7	20,0
N14	133	13,8	18,3	15,2	20,1
N17	123	14,1	17,5	15,7	19,3
LSD (0,05)*	7	0,6	1,4	0,5	1,3
LSD (0,01)**	10	0,9	1,9	0,7	1,8
SIGNIFICANCE	**	**	N.S	**	N.S
MEAN	131	13,7	17,9	15,2	19,8
CV %	5,0	4,4	7,1	3,0	6,3

Table III. Yield per month and per 100mm water.

VARIETY	TONS CANE/HA/MONTH	TONS CANE/100 MM
NCo 376	12,5	7,7
N14	12,2	7,5
N17	11,3	7,0
MEAN	12,0	7,4

#### 4.3 Foliar Analysis

Table IV. Third leaf (%dm) value at 2,0 3,0 and 3,8 months of age.

VARIETY	2.0 MONTHS JANUARY			3,0 MONTHS FEBRUARY			3,8 MONTHS MARCH		
	N%	P%	K%	N%	P%	K%	N%	P%	K%
NCo 376	2,23	0,27	1,27	2,06	0,26	1,26	1,86	0,24	1,29
N14	2,09	0,23	1,04*	1,92	0,23	1,11	1,75	0,21	1,15
N17	2,10	0,25	1,13	1,91	0,25	1,21	1,73	0,22	1,21
MEAN	2,14	0,25	1,14	1,96	0,25	1,19	1,78	0,22	1,22

#### 4.4 Smut

Table V. Percentage smut whips/ha at 2,8 months of age.

VARIETY	% SMUT WHIPS/HA AT 2,8 MONTHS
NCo 376	3,30
N14	0,02
N17	0,01

#### 5. COMMENTS

- 5.1 All the varieties lodged at an early age during late summer storms of 1987.
- 5.2 Both NCo 376 and N14 produced similar cane yields that were significantly better than that of N17.
- 5.3 The sucrose % cane of N17 was significantly higher than for both NCo 376 and N14. Ers % cane differences were not as marked as for sucrose % cane as the fibre content of N17 was far greater than that of N14.
- 5.4 Sucrose yields were as for the plant and 1st ratoon, highest for N14(n.s.) followed by NCo 376.
- 5.5 Although the cane quality of N17 is normally comparatively higher for a late cycle crop, its sucrose yield at this site has not bettered the other varieties due to their greater potential on better soils.
- 5.6 Third leaf nutrient analysis for samples taken in January (2,0m) February (3,0m) and March (3,8m) showed that all varieties to be generally well supplied with N, P and K. The low third leaf K (%dm) value for N14 in January is surprising as initial soil K values were high before top-dressing at 300kg K/ha.

5. COMMENTS

5.7 The smut situation for NCo 376 has remained unchanged since the 1st ratoon but traces of the disease were present in the other two varieties at 2,9 months of age.

5.8 This trial has been re-established and is now in its final year (3rd ratoon).

NBL/cg  
15/2/1988



**SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION**

EXPERIMENT RESULT

Code: VAR 4/84/SW Sim R/S  
CAT. NO.: 1495

TERMINAL REPORT

TITLE: RELEASED VARIETIES \* RIPENER ON A 'R' SET SOIL

1. PARTICULARS OF PROJECT

This crop : 3rd ratoon Site : Simunye Sugar Estate - Field 606 Region : Northern Irrigated {Swaziland} Design : Randomised Blocks 8 replications Soil Set : 'R' with some 'S' set pockets Varieties : NCO376; N14; N17. Fertilizer : N        P        K Top dress (Urea) : 140 (B. supers)                20 (KCL)                                150 Total (kg/ha) : 140        20        150	Soil analysis: Date 21/10/87 <table border="0" style="margin-left: 20px;"> <tr> <td style="text-align: center;"><u>pH</u></td> <td style="text-align: center;"><u>OM%</u></td> <td style="text-align: center;"><u>Clay%</u></td> <td style="text-align: center;"><u>PDI</u></td> </tr> <tr> <td style="text-align: center;">6.9</td> <td style="text-align: center;">-</td> <td style="text-align: center;">&gt;30</td> <td style="text-align: center;">-</td> </tr> </table> <table border="0" style="margin-left: 20px;"> <tr> <td colspan="4" style="text-align: center;"><u>ppm</u></td> </tr> <tr> <td style="text-align: center;"><u>P</u></td> <td style="text-align: center;"><u>K</u></td> <td style="text-align: center;"><u>Ca</u></td> <td style="text-align: center;"><u>Mg</u></td> </tr> <tr> <td style="text-align: center;">32</td> <td style="text-align: center;">295</td> <td style="text-align: center;">2189</td> <td style="text-align: center;">905</td> </tr> </table> Dates: 8/10/87 - 30/9/88 Age : 11.7 months Rainfall : 666 mm Irrigation : 1216 mm Total : 1882 mm	<u>pH</u>	<u>OM%</u>	<u>Clay%</u>	<u>PDI</u>	6.9	-	>30	-	<u>ppm</u>				<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>	32	295	2189	905
<u>pH</u>	<u>OM%</u>	<u>Clay%</u>	<u>PDI</u>																		
6.9	-	>30	-																		
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32	295	2189	905																		

2. OBJECTIVES

- 2.1 To continue testing the performance of NCO376; N14 and N17 for a late cycle on a shallow 'R' set soil.
- 2.2 To determine the disease and pest tolerance of these varieties.
- 2.3 To determine to what extent a recommended rate of Fusilade Super will ripen each variety.

3. TREATMENTS

- 3.1 Varieties : NCO376 ; N14 ; N17.
- 3.2 Fertilizers : (a) Nitrogen as urea was applied as a single dressing 2 weeks after harvesting.  
 (b) Phosphorus as single supers was applied at 2 weeks after cutting.

(c) Potassium as muriate of potash was applied 2 weeks after harvesting.

3.3 Ripener : A ripener was not applied as the entire trial had lodged.

3.4 Sampling : Sucrose samples were taken at harvest and comprised 20 stalks from each plot.

#### 4. RESULTS

##### 4.1 HARVEST DATA

Table 1. Cane yield, cane quality and sucrose yield.

VARIETY	CANE YIELD T/HA	ERS% CANE	ERS T/HA	SUC % CANE	SUC T/HA
NC0376	127	13.7	17.3	15.1	19.1
N14	136	14.4	19.6	15.7	21.3
N17	113	14.9	16.7	16.3	18.3
LSD VAR. (0.05)*	5	0.5	1.0	0.4	1.0
(0.01)**	7	0.6	1.3	0.5	1.3
Significance	**	**	**	**	**
Mean	125	14.3	17.9	15.7	19.6
CV%	3.6	3.1	5.1	2.4	4.6

Table 2. Yield per month and per 100mm water.

VARIETY	TONS CANE/HA/MONTH	TONS CANE/HA/100mm
NC0376	10.9	6.7
N14	11.6	7.2
N17	9.7	6.0
Mean	10.7	6.6

#### 4.2 FOLIAR ANALYSIS

Table 3. Third leaf (%dm) values at 2.2; 3.0 and 4.2 months of age.

Variety	2.2 m Dec			3.0 m Jan			4.2 m Feb		
	N	P	K	N	P	K	N	P	K
NCO376	2.50	0.27	1.46	2.20	0.26	1.32	1.71	0.21	1.29
N14	2.42	0.24	1.36	1.95	0.21	1.20	1.64*	0.20	1.15
N17	2.44	0.27	1.45	2.03	0.22	1.21	1.59*	0.19	1.20

\*=Deficient (SASA thresholds)

#### 4.3 SMUT

Table 4. Smut whips as percentage total stalks/ha at approximately 3 months of age.

VARIETY	% SMUT WHIPS
NCO376	3.79
N14	0.23
N17	Nil

#### 5. COMMENTS

- 5.1 Growth at this site was very good with the result that lodging took place at the end of summer.
- 5.2 N14 produced the highest cane yields which were significantly greater than for NCO376 and N17. The cane yield for NCO376 was significantly better than that for N17.
- 5.3 The highest cane quality was in N17 which was just significantly greater than N14. Both Ers % cane and sucrose % cane for NCO376 were significantly below that of the remaining two varieties.
- 5.4 N14 sucrose and Ers tons/ha yields were significantly ( $P=0.01$ ) higher than the other varieties.
- 5.5 Third leaf nutrient (%dm) values were generally high but N became deficient in N14 and N17 at 4.2 months of age in February.
- 5.6 Smut was present in NCO376 with traces in N14 as well while N17 was free of infection.

## 6. SUMMARY (PLANT TO 3RD RATOON INCLUSIVE)

### 6.1 HARVEST DATA

Table 5. Tons cane /ha/month for four crops.

Variety	Plant crop	1st ratoon	2nd ratoon	3rd ratoon	Mean
NCo376	9.3	12.9	12.5	10.9	11.4
N14	9.0	12.9	12.2	11.6	11.4
N17	8.3	11.8	11.3	9.7	10.3

Table 6. Sucrose % cane for four crops (naturally ripened).

Variety	Plant crop	1st ratoon	2nd ratoon	3rd ratoon	Mean
NCo376	14.1	15.1	14.7	15.1	14.8
N14	15.2	15.4	15.2	15.7	15.4
N17	15.4	16.3	15.7	16.3	15.9

Table 7. Tons sucrose/ha yields for four crops.

Variety	Plant crop	1st ratoon	2nd ratoon	3rd ratoon	Mean
NCo376	16.7	24.8	20.0	19.1	20.2
N14	17.3	25.4	20.1	21.3	21.0
N17	16.4	24.6	19.3	18.3	19.6

6.2 There was no difference between average cane yields for NCo376 and N14 over the four crops. However, NCo376 appeared to give lower yields in the 3rd ratoon which may have been brought about by early lodging of this variety. Average cane yields for N17 were approximately 11% less than the other two varieties.

6.3 Sucrose % cane was highest in N17 while N14 produced better cane quality than NCo376 in all four crops.

6.4 Sucrose yields were high for all varieties after the plant crop. Comparable cane yields and superior cane quality enabled N14 to outyield NCo376 on this soil type during the mid - season. This was achieved by preventing water stress which is known to seriously effect the performance of N14. Lower cane yields of N17 were once again responsible for poorer sucrose yields.

6.7 N14 is a high performing variety when grown under stress free conditions on these soils during the mid - season.

- 6.5 Third leaf nutrient values over the three crops shows lower nitrogen (%dm) levels for N14 and N17. This suggests that adjustments be made to N (%dm) thresholds or that higher rates of nitrogen are required by these varieties.
- 6.6 Smut was contained at very low levels in N14 and N17 but increased in NCO376 from 0.3 % in the plant crop to 3.8 % by the 3rd ratoon. Each crop was rogued once or twice during mid - summer each year which was not sufficient to control the disease in NCO376.

20/3/89