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SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code : VAR 5/84/Sw MHL Hab
Cat. No.: 1500

TITLE : RELEASED VARIETIES ON A HABELO SERIES SOIL

1. PARTICULARS OF PROJECT

This crop : Plant
Site : Mhlume Sugar Co. Field 205/5
Region : Northern Irrigated Swaziland
Soil set/series: 'H'/Habelo
Design : Randomised Blocks 8 replications
Varieties : NCo 376, N14, N17

Fertilizer	N	P	K
Furrow	41	62	41
T/Dress	80	-	40
Kg/ha	121	62	81

Soil analysis : Date 8/2/1984 (by Estate)

pH	OM %	Clay %	PDI
6,9	-	14	-

ppm

P	K	Ca	Mg	Zn	S
100	104	1160	182	-	-

Age : 11 months
Dates : 24/10/84 - 24/9/85
Rainfall : 435 mm (gross)
Irrigation : 650 mm (gross)
Total : 1085 mm

2. OBJECTIVES

2.1 To test the performance of N17 compared to N14 and NCo 376 on duplex soils for a mid season cycle.

2.2 To observe the tolerance of these varieties to pests and diseases.

2.3 To determine to what degree sucrose yields can be improved by spraying with a standard rate of Fusilade prior to harvest.

3. TREATMENTS

3.1 Varieties : NCo 376, N14, N17

3.2 400 kg/ha 2.3.2 (36) was placed into the furrow and lightly covered before planting.

3.3 8 L/ha of Dieldrin was sprayed by hand into the furrows.

3.4 Setts were pre-cut into 3 node lengths and Bayleton dipped in cold water for 5 minutes before being double stick planted.

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3.5 Irrigation commenced ± 24 hours after planting.

3.6 The trial was top-dressed with urea and KCl 6,5 weeks after planting.

3.7 444 ml Fusilade/ha was sprayed at the 9-10 leaf stage 5,5 weeks before harvesting.

4. RESULTS

4.1 Table I Crop growth measurements and populations at 3,2; 5,1; and 9,5 months of age.

	STALK HEIGHT (mm TO TVD)		POPULATIONS (X 1000/HA)		
VARIETY	5,1 MONTHS	9,5 MONTHS	3,2 MONTHS	5,1 MONTHS	9,5 MONTHS
NCo 376	1440	1890	172	141	132
N14	1300	1890	152	121	114
N17	1570	2160	151	130	116

4.2 Table II Cane yield, cane quality and sucrose yield

	CANE YIELD (TC/HA)		CANE QUALITY (SUC % CANE)		SUCROSE YIELD (TS/HA)	
VARIETY	CONTROL	RIPENED	CONTROL	RIPENED	CONTROL	RIPENED
NCo 376	94	96	14,9	14,7	13,9	14,1
N14	94	91	13,0	13,3	12,3	12,1
N17	98	92	15,4	15,6	15,1	14,4
MEAN	95	93	14,4	14,5	13,8	13,5
CV %	15,6		3,9		15,3	
LSD (0,05)*	15,7		0,6		2,2	
LSD (0,01)**	21,7		0,8		3,1	
SIGNIFICANCE	N/S		**		*	

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

VARIETY	TC/HA/MONTH	TC/HA/100 mm (GROSS)
NCo 376	8,6	8,7
N14	8,4	8,5
N17	8,7	8,8

4.4 Table IV Third leaf analysis at 3,4 months of age in February and 5,7 months of age in April.

	3,4 MONTHS FEBRUARY					5,7 MONTHS APRIL				
VARIETY	N%	P%	K%	S%	ZN ppm	N%	P%	K%	S%	Zn ppm
NCo 376	1,85	0,27	1,19	0,20	19	1,81	0,21	1,29	0,14*	13*
N14	1,79	0,24	1,14	0,20	22	1,71	0,20	1,17	0,13*	16
N17	1,79	0,26	1,18	0,19	18	1,67	0,21	1,22	0,15	15*

* = Marginal to low

5. COMMENTS

5.1 All three varieties had to be gapped up at 1,5 months of age due to uneven germination. Subsequent cane growth was good and fairly even which is unusual on these soils. Stalk height measurements showed best growth from the N17 plots while NCo 376 had the highest population counts. The crop did not appear to suffer from water stress at any period.

5.2 *Cane yields for the plant crop were generally good with no real differences between varieties. Fusilade had no noticable effect on yields.

*Cane quality of NCo 376 and particularly N17 was superior to that of N14. Sucrose % cane for N14 was significantly (P = 0,01) less than NCo 376 for both ripened and unripened cane while the quality of N17 was significantly (P = 0,01) better than NCo 376 for ripened cane only. Fusilade was sprayed during a high sucrose period and consequently failed to increase cane quality significantly.

*N17 produced the highest tons sucrose/ha yield which was not significant compared to NCo 376 but was significant (P = 0,05) compared to N14.

*These results are encouraging as N17 could be a suitable replacement for N14 which is noted for its lower cane quality. N17 appears to suffer more than N14 under stress conditions and appears to have germination problems.

*Third leaf nutrient levels were above threshold for all varieties at 3,4 months of age in February. The primary elements were still above threshold at 5,7 months of age in April.

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*A smut inspection during February at 3,9 months of age showed all varieties to be disease free in the plant crop. A subsequent inspection in the 1st ratoon has shown a high incidence of smut in NCo 376.

*There was minimal eldana damage to the plant crop, the highest recorded being ± 3% joints bored in sprayed NCo 376.

5.3 This trial has been re-established and is now in the 1st ratoon, N17 has again proved to be slow in germination and tillering.

NBL/gj
4.2.86

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: VAR 5/84/Sw MHL H

CAT: 1500

TERMINAL REPORT

TITLE : RELEASED VARIETIES ON A 'H' SET SOIL

1. PARTICULARS OF PROJECT

This crop	:	2nd ratoon
Site	:	Mhlume Sugar co. Field 205/6
Region	:	Northern Irrigated (Swaziland)
Design	:	Randomised Blocks 8 Replications
Soil Set/Series	:	'H'/Habelo
Varieties	:	NCo 376 N14 N17
Fertilizer Top Dress (Urea & KCL)	:	N 160 - P - K 300 kg/ha

Soil analysis : Date 14/11/86

pH	OM %	Clay %	PDI
7,5	-	<14	-

ppm

P	K	Cu	Mg	S	Na
>80	96	1400	302	44	83

Date	:	20/10/86 - 15/9/87
Age	:	10,8 months
Irrigation	:	780mm
Rainfall	:	555mm
Total	:	1335mm

2. OBJECTIVES

2.1 To continue testing the performance of the industry's current most important varieties on a duplex 'H' set soil during a mid season cycle.

2.2 To observe the tolerance of these varieties to pests and diseases.

3. TREATMENTS

3.1 Varieties : NCo 376 N14 N17

3.2 Nitrogen as Urea (46% N) was applied in November as a single dressing at 3,4 weeks after harvesting.

3.3 Potassium as KCL (50% K) was applied over the row at 3,4 weeks after harvesting.

3. TREATMENTS

3.4 The cane was mature prior to harvest and was not chemically ripened.

4. RESULTS

4.1 Growth Data

Table I. Crop growth measurements and populations at 2,9 6, 8,2 and 9,5 months of age.

	STALK HEIGHTS (MM TO TVD)			POPULATIONS (x1000/HA)			
VARIETY	6m	8,2m	9,5m	2,9m	6m	8,2m	9,5m
NCo 376	1710	1900	1890	294	145	136	136
N14	1690	1960	1960	186	120	111	109
N17	1890	2100	2140	181	138	128	128
MEAN	1763	1987	1997	220	134	125	124

4.2 Harvest Data

Table II. Tons cane/ha, Sucrose % cane and Tons Sucrose/ha.

VARIETY	CANE YIELD (TC/ha)	CANE QUALITY (Suc % cane)	SUCROSE YIELD (TS/ha)
NCo 376	90	14,1	12,6
N14	89	14,4	12,8
N17	91	15,2	13,8
LSD (0,05)*	18	0.9	2,7
LSD (0,01)**	25	1,2	3,7
SIGNIFICANCE	N.S	*	N.S
MEAN	90	14,5	13,1
CV %	18,7	5,5	19,3

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

VARIETY	TC/Ha/MONTH	TC/100mm
NCo 376	8,3	6,7
N14	8,2	6,7
N17	8,4	6,8
MEAN	8,3	6,7

4. RESULTS

4.3 Foliar analysis.

Table IV. Third leaf analysis for N, P and K (%dm) at 2,8 3,7 4,5 and 5,5 months.

	2,8m (JAN)			3,7m (FEB)			4,5m (MAR)			5,5m (APRIL)		
VARIETY	N%	P%	K%	N%	P%	K%	N%	P%	K%	N%	P%	K%
NCo 376	1,88	0,32	1,35	1,79	0,26	1,25	1,73	0,28	1,27	1,70	0,27	1,25
N14	1,78*	0,28	1,31	1,66*	0,25	1,19	1,63*	0,25	1,17	1,56	0,24	1,14
N17	1,75*	0,32	1,39	1,65*	0,27	1,23	1,56*	0,26	1,20	1,53*	0,25	1,16

*= Marginal (using S.S.A provisional thresholds)

Table V. Third leaf analysis for S (%dm) and Mn (ppm) at 2,8 3,7 4,5 and 5,5 months of age.

	2,8m (JAN)		3,7m (FEB)	4,5m (MARCH)		5,5m	
VARIETY	S%	Mn.ppm	S%	S%	MN ppm	S%	Mn ppm
NCo 376	0,17	29,3	0,13	0,11**	24,1	0,13	25,5
N14	0,16	31,0	0,14	0,12*	24,8	0,12*	26,9
N17	0,17	31,3	0,14	0,12*	27,8	0,14	30,9

*= Marginal (SASA thresholds)

**= low (SASA thresholds)

NOTE : SASA threshold for third leaf manganese is 15 ppm.

4,4 Smut.

Table VI. Smut whips as percentage total stalks/ha at 2,8 months of age in January.

VARIETY	% SMUT WHIPS
NCo 376	9,60
N14	0,06
N17	0,13

4,5 Eldana.

Table VII. Eldana damage at harvest.

VARIETY	% INTERNODES DAMAGED
NCo 376	9,6
N14	13,8
N17	8,1

4.6 Flowering.

Table VIII. Percentage flowered cane at ± 8 months of age in June.

VARIETY	% FLOWERING
NCo 376	Nil
N14	14,4
N17	Nil

5. COMMENTS

5.1 As expected CV% were high for this variable soil.

5.2 Although the 2nd ratoon was harvested prematurely, cane yields were acceptable and did not differ significantly between varieties.

5.3 Sucrose % cane for N17 was significantly greater than NCo 376 but differences just failed to gain significance between this variety and N14.

5.4 Sucrose yields were higher for N17 (n.s.) due to comparatively better cane quality and cane yields.

5.5 Third leaf sampling showed N14 and N17 to be slightly deficient in N (using SSA standards) while sulphur appeared to be marginal to low for all varieties at 4,5 months of age. Checks for manganese were carried out following suspicions of low foliar Mn (ppm) for other cane on this estate. Third leaf values for this nutrient were found to be well in excess of the threshold (15ppm) at all sampling ages.
All the varieties seemed to be adequately supplied with the remaining nutrients.

5.6 A smut survey carried out at 2,8 months of age in January proved NCo 376 to be more infected with the disease than the other varieties.

5.7 N14 had the highest eldana damage at harvest while that of the other two varieties was similar.

5.8 N14 was the only variety to flower in this trial which may have had some influence on its yield.

6. SUMMARY (Plant to 2nd ratoon inclusive.)

6.1 Harvest date. Plant to 2nd ratoon inclusive.

Table IX. Tons cane/ha/month.

VARIETY	PLANT CROP	1st RATOON	2nd RATOON	MEAN
NCo 376	8,6	7,1	8,3	8,0
N14	8,4	8,0	8,2	8,2
N17	8,7	8,1	8,4	8,4

Table X. Sucrose % cane.

VARIETY	PLANT CROP	1st RATOON	2nd RATOON	MEAN
NCo 376	14,9	15,6	14,1	14,9
N14	13,0	14,6	14,4	14,0
N17	15,4	16,7	15,2	15,8

Table XI. Tons sucrose/ha/month.

VARIETY	PLANT CROP	1st RATOON	2nd RATOON	MEAN
NCo 376	1,26	1.10	1.17	1.18
N14	1,12	1,16	1,19	1,16
N17	1,37	1,35	1,28	1,33

Table 1X shows cane yields over the crops expressed on a monthly yield basis with N17 being the highest yielding variety.

The cane quality of non-ripened N17 was greater than the others for all the crops harvested (Table X).

The comparatively good cane yields and better cane quality of N17 resulted in higher sucrose yields for this variety.

This is the only occasion where N17 has repeatedly outperformed both NCo 376 and N14 in the Swaziland variety trial programme.
It appears to do well under marginal soil conditions but harvests should be restricted to the late season to realise this variety's full potential.

6.2 Foliar analysis.

Third leaf N (%dm) values over the three crops indicated values for NCo 376 approximately 6% higher than N14 and 8% higher than N17. Rates of fertilizer nitrogen applied were based on recommendations for NCo 376 on duplex soils which suggests that higher N rates are possibly required for the other two varieties.
In addition, third leaf K and S (%dm) values for N14 were usually below that of the other two (see previous trial reports).

6.3 Smut

Smut increased steadily in variety Nco 376 from 0% in the plant crop to 9,6% by the 2nd ratoon. Despite regular roguing, traces of the disease were evident in both N14 and N17 by the second ratoon. (Table V1 of 2nd ratoon report).

6. SUMMARY

6.4 Eldana

There did not seem to be a trend for varietal preferance by eldana. (See previous trial data).

6.5 General

This trial had to be terminated before the planned duration of a plant and three ratoons but has been replaced by two more that are established on similar duplex soils.

NBL/cg
13/2/1988