AV

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code: Seed 1/82/SW Sim
Cat No: 1415

Title: Evaluation of seedcane from three sources

1. Particulars of Project

This crop : Plant
Site : Field 606 Simunye Estate
Region : Northern Irrigated (Swaziland)
Soil set/series : R/Rhebok
Design : Randomised blocks with 8 reps.
Variety : NCo 376
Fertilizer (kg/ha:

| | N | P | K |
|---|---|---|---|
| in furrow | 19 | - | 60 |
| topdress | 100 | - | - |

Soil Analysis: Date: 16/10/1982

| pH | OM% | Clay% | PDI |
|---|---|---|---|
| 5,88 | - | >30 | 0,32 |

ppm

| P | K | Ca | Mg | S | Zn |
|---|---|---|---|---|---|
| 16 | 456 | >1800 | >220 | 35 | 1,3 |

Age: 12 months
Dates: 14/11/1982 - 14/11/1983
Irrigation: 995 mm
Rainfall: 568 mm
Total: 1 563 mm

2. Objectives

To determine whether seedcane from the Malkerns Seed Scheme has a higher yield potential than seed grown in the lowveld of Swaziland and the Eastern Transvaal (Pongola).

3. Treatments

- Swaziland lowveld seed
- Malkerns seed
- Pongola seed

NOTE: Fertilizer was applied into the planting furrow and lightly covered before planting.

- Seed was cut into three bud setts, dipped into Bayleton and planted with setts slightly overlapping.
- Cutting knives were periodically dipped into a Jeyes fluid solution
- Irrigation commenced soon after planting
- Top dressing was done by hand over the cane row approximately 7 weeks after planting.

## 4. Seedcane history

### 4.1 Swaziland lowveld seed

Eleven month old plant cane was cut from a nursery at Ubombo Ranches to supply seed representative of the Swaziland lowveld. This plant cane had received 350 kg MAP/ha at planting and was topdressed with 350 kg ammonium nitrate/ha. The nursery was originally established with seed from Malkerns that had been HWT before being planted in the highveld.

### 4.2 Malkerns seed

Seed from the highveld seed scheme was 1st ratoon which had been HWT before planting in the highveld. The crop was topdressed with 380 kg 1-0-1(47)/ha and cut for trial purposes at ± 11 months of age.

### 4.3 Pongola seed

This seed was 1st ratoon cane that was previously HWT before being planted at the Pongola Experiment Farm. This crop was topdressed with 350 kg Urea/ha and cut for seed at ± 11 months of age.

## 5. Seedcane data

Table 1 Stalk diameters (mm) number of buds/ha, stalk lengths (cm) and the amount of seedcane planted (t/ha)

| Seed source | Stalk diameter (mm) | Buds/m | Stalk length (cm) | Tons seed/ha |
|---|---|---|---|---|
| Swaziland lowveld | 249 | 14,6 | 143 | 6,9 |
| Malkerns | 217 | 15,4 | 175 | 7,1 |
| Pongola | 216 | 13,9 | 179 | 7,1 |
| Mean | 227 | 14,6 | 166 | 7,0 |

## 6. Results

### 6.1 Harvest data Table II Yield

| Seed source | tc/ha | tc/ha/m | Suc % cane | ts/ha |
|---|---|---|---|---|
| Swaziland lowveld | 155 | 12,9 | 14,0 | 21,7 |
| Malkerns | 144 | 12,0 | 13,8 | 19,9 |
| Pongola | 146 | 12,2 | 14,3 | 20,9 |
| Mean | 148 | 12,4 | 14,1 | 20,8 |
| CV% | 12,8 | | 5,3 | 14,1 |
| LSD (0,05) | 21 | | 0,8 | 3,2 |

6.2 Third leaf data

Table III Third leaf NPK % dm

| | Month and age at planting | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan 2,0 | | | Feb 3,5 | | | Mar 4,3 | | | Apr 5,3 | | |
| Treatment | N | P | K | N | P | K | N | P | K | N | P | K |
| Swaziland lowveld | 2,65 | 0,29 | 1,93 | 2,05 | 0,21 | 1,68 | 1,86 | 0,21 | 1,61 | 1,95 | 0,22 | 1,59 |
| Malkerns | 2,69 | 0,30 | 1,96 | 2,04 | 0,20 | 1,77 | 1,88 | 0,22 | 1,68 | 1,93 | 0,22 | 1,61 |
| Pongola | 2,68 | 0,29 | 1,96 | 2,08 | 0,21 | 1,71 | 1,93 | 0,22 | 1,69 | 1,96 | 0,21 | 1,61 |
| Mean | 2,67 | 0,29 | 1,95 | 2,06 | 0,21 | 1,72 | 1,89 | 0,22 | 1,66 | 1,95 | 0,22 | 1,60 |

6.3 Table IV Crop growth measurements (cm to TVD) at 3,1; 4,1; 4,8; and 5,7 months of age and populations (x 1000/ha) at 1,8; 2,7; 3,1; 4,1; and 4,8 months of age

| | Stalk heights (cm) | | | | Popualtions x 1000/ha | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Crop age (m) / Treatments | 3,1 | 4,1 | 4,8 | 5,7 | 1,8 | 2,7 | 3,1 | 4,1 | 4,8 |
| Swaziland lowveld seed | 83 | 140 | 170 | 201 | 184 | 209 | 183 | 187 | 181 |
| Malkerns seed | 83 | 142 | 170 | 203 | 176 | 206 | 187 | 187 | 183 |
| Pongola Seed | 82 | 142 | 172 | 204 | 173 | 199 | 184 | 180 | 179 |
| Mean | 83 | 141 | 171 | 203 | 178 | 205 | 185 | 185 | 181 |

7. Comments

. Seedcane quality: Cane stalks from Ubombo Ranches were very much thicker and shorter than those from the other two sources. There was little difference in the number of eyes per meter and approximately the same tonnage of seed/ha was planted for each treatment. Some exceptionally thin stalks of Malkerns seed were planted into certain guard rows for observational purposes. There was no visual difference in growth between the good and poor seed from Malkerns.

. Populations: Stalk counts taken until 4,8 months of age indicated only minor differences in populations between treatments although the Pongola seed produced counts that were at all stages slightly below those from the other two seed sources.

. Stalk heights: At no stage was there any difference in stalk heights between treatments. High winds caused severe lodging at 6 months of age that prevented further measurements being taken.

. Yields: There is no statistical evidence of yield differences between treatments. The experiment is not sufficiently precise to be able to detect differences of the order of 10-15% with reasonable

reliability. Yields from plots 4 and 15 were excluded from the analysis as they were considered extreme.

Smut: Some smut whips were found in one plot of the Pongola seed.

Ratoon regrowth: All plots germinated well after harvesting but shoot counts taken at 5,3 weeks after cutting indicated that the Malkerns and Ubombo Ranches cane had about 5 shoots/meter more than that from Pongola. The 1st ratoon crop has been top-dressed and will be harvested again in November 1984.

NBL/PMO
26.3.84

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SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

CODE : SEED 1/82/Sw SIM Rhe

TITLE : EVALUATION OF SEEDCANE FROM THREE SOURCES

1. PARTICULARS OF PROJECT

Cat. No. : 1415
This crop : 1st Ratoon
Site : Field 606
: Simunye estate
Region : Northern Irrigated
: Swaziland
Soil Set/Series : 'R'/Rhebok
Design : Randomised Blocks
: with 8 Replications
Variety : NCo 376
Fertilizer (kg/ha) : N 123 P 40 K 80

Soil Analysis : Date (1983 Data)

| pH | OM% | Clay % | P.D.I. |
|---|---|---|---|
| 5,8 | - | >30 | - |

ppm

| P | K | Cy | Mg | S | Zn |
|---|---|---|---|---|---|
| 16 | 456 | >1800 | >220 | 35 | 1,3 |

Age : 12,7 m
Dates : 14/11/83 - 4/12/84
Irrigation : 705 mm
Rainfall : 1187 mm
Total : 1892 mm (Gross)

2. OBJECTIVES

To determine whether non-significant yield differences attributable to different sources of seedcane in the plant crop would continue into the 1st ratoon.

3. TREATMENTS

* Swaziland lowveld seed - (Ubombo Ranches)
* Malkerns seed - (Swaziland Highveld seedcane scheme)
* Pongola seed - (S.A.S.A. Experimental farm)

Fertilizer in the form of Urea, Muriate of Potash and Saaiphos was applied by hand over the cane row 2 weeks after harvesting.

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## 4. RESULTS

### 4.1 Harvest Data

Table I - Yield Results

| Seed Source | Tc/ha | Tc/ha/Month | Suc % Cane | Ts/ha |
|---|---|---|---|---|
| Swaziland Lowveld | 80 | 6,3 | 14,4 | 11,5 |
| Malkerns | 77 | 6,1 | 14,4 | 11,1 |
| Pongola | 70 | 5,5 | 14,2 | 10,0 |
| Mean | 76 | 6,0 | 14,3 | 10,9 |
| CV % | 8,7 | | 2,7 | 9,0 |
| LSD (0.05) | 7 | | 0,4 | 1,0 |
| LSD (0,01) | 10 | | 0,6 | 1,4 |

RSD?

### 4.2 Crop Growth Measurements and Populations

Table II - Stalk heights (mm to TVD) and populations (x 1000/ha)

| | STALK HEIGHTS (mm) | | POPULATIONS (x1000/ha) | | |
|---|---|---|---|---|---|
| | CROP AGE (MONTHS) | | CROP AGE (MONTHS) | | |
| TREATMENTS | 3,2 | 5,7 | 1,3 | 3,2 | 5,7 |
| Swaziland Lowveld Seed | 1310 | 1670 | 435 | 270 | 178 |
| Malkerns Seed | 1300 | 1670 | 427 | 289 | 179 |
| Pongola Seed | 1300 | 1630 | 402 | 287 | 177 |
| Mean | 1300 | 1660 | 421 | 282 | 177 |

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4.3 Third Leaf Data

Table III - Third Leaf NPK (% dm)

| | MONTH AND AGE AT SAMPLING | | | | | |
|---|---|---|---|---|---|---|
| | FEB (3.0 MONTHS) | | | MARCH (3,9 MONTHS) | | |
| | N | P | K | N | P | K |
| Swaziland Lowveld | 1,85 | 0,20 | 1,64 | 1,70 | 0,23 | 1,46 |
| Malkerns | 1,91 | 0,21 | 1,62 | 1,70 | 0,23 | 1,48 |
| Pongola | 1,83 | 0,21 | 1,67 | 1,74 | 0,23 | 1,41 |
| Mean | 1,86 | 0,21 | 1,64 | 1,71 | 0,23 | 1,45 |

4. COMMENTS

* Populations :

Tiller counts taken between 1 and 2 weeks after cutting were high especially for cane from the Swaziland Lowveld seed. Populations decreased with crop age and counts taken at 5,7 months of age showed there to be little difference between treatments.

* Stalk Heights :

There was little difference in stalk heights between treatments but cane from the Swaziland Lowveld and Malkerns seed did appear to be slightly better grown than than from Pongola at 5,7 months of age.

* Yields :

Yields for the 1st ratoon were very low due to extreme water stress imposed on the crop during the first quarter of 1984. The prime objective of this trial was to compare yield results from cane derived from the Swaziland Lowveld and Malkerns seed sources. Yield differences from both the plant and 1st ratoon crops have failed to reach levels of significance discrediting the claim that higher yields can be expected from Highveld seed. Yields from the Pongola seed source deteriorated in the 1st ratoon and was significantly inferior to the other two treatments.

* Third leaf analysis showed the major nutrients to be above theshold for all treatments up to 3,9 months of age in March.

* Smut levels recorded at 2,4 months of age in January were 5,0% for Pongola, 3,8% for Swaziland lowveld, and 2,9% for the Malkerns seed treatment.

* This trial has been terminated.

NBL/gj
15.4.85