Av

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code : A(Plant)4/83/P
Cat. No.: 1449

TITLE: Transplants versus conventional setts: Spring planting in Hutton/Clansthal soil.

1. Particulars of the project

| | | |
|---|---|---|
| This crop | : | Plant |
| Site | : | CFS Field 4.1. |
| Region | : | North Coast Coastal |
| Soil system | : | Berea |
| Soil form/series: | | Hutton/Clansthal |
| Design | : | Observation with 3 reps |
| Variety | : | NCo 376 |
| Fertilizer | : | N P K |
| Kg/ha | : | 141 — 141 |
| Soil Description: | | A deep porous, light brown loamy sand. |

Soil analysis: Date: 2/11/82

| pH | O.M.% | Clay% | P.D.I. |
|---|---|---|---|
| 8,64 | - | 6 | - |

ppm

| P | K | Ca | Mg | Zn | Na |
|---|---|---|---|---|---|
| 76 | 62 | >1800 | 49 | 1,3 | 19 |

Age: 13,1 mnths Dates:(23/9/83-26/10/84)

Rainfall: 1628 mm; 144% of LTM: 1128 mm

Irrigation: NIL

2. Objectives:

- To compare yields and crop growth patterns of cane established from transplants or conventional setts in spring on a Hutton/Clansthal soil.

Motivation:

Single eyed setts grown in polystyrene seed trays have been established successfully in field observation trials at CFS and this technique may be useful in establishing seedcane nurseries or commercial crops.

3. Treatments

1. Conventional sett planting with 30% overlap.

2. Transplants at 0,5 m in-row spacing (16 week old transplants)

3. Notes on treatments

Single eyed setts were planted in polystyrene trays containing a mixture of filter cake and millroom waste. Each tray contained 72 transplants (Re-model 72) with dimensions 50 mm x 50 mm x 100 mm.

The young transplants were watered daily. After five weeks ± 15 g 1:0:1 (47) and 15 g of Roodelyon phosphate were added per litre of water three times a week. The watering continued on a daily basis up to the time of planting.

- Row spacing 1,4 m
- Conventional setts 400 mm long were overlapped by 30%, planted at 100 mm depth and covered with 50 mm soil.
- Transplants at 0,5 m intra-row spacing required 14284 plants per/ha or ± 2 tons single eyed setts.
- All treatments received water at a rate of 3 ℓ/m at planting in the furrow.
- Temik at 20 kg/ha was applied in the furrow to all plots
- At planting 200 kg/ha 1:0:1 (47) was applied in the planting furrow and 400 kg/ha was top-dressed in November.

Rainfall (mm)

| Months | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983-84 | 13 | 122 | 225 | 162 | 369 | 170 | 86 | 121 | 51 | 21 | 135 | 50 | 14 | 89 | 1628 mm |
| LTM | 73 | 92 | 118 | 99 | 147 | 103 | 106 | 56 | 64 | 22 | 34 | 52 | 70 | 92 | 1128 mm |

4. Results

4.1 Yield and crop characteristics at harvest

| Treatments | t/ha cane | Sucrose % cane | t/ha sucrose | Stalk counts $x10^{-3}$/ha | Stalk length (cm) |
|---|---|---|---|---|---|
| 1. Conventional sett planting | 86 | 14,74 | 12,7 | 115 | 189 |
| 2. Transplants at 0,5 m in-row spacing | 62 | 14,40 | 9,0 | 107 | 172 |
| Mean | 74 | 14,57 | 10,8 | 111 | 180 |
| CV% | 12,3 | 2,9 | 14,4 | 9,9 | 6,0 |

4.2 Third leaf % d.m. at 3,0 months on 20/12/83

| Treatments | % d.m. | | | | | Zinc |
|---|---|---|---|---|---|---|
| | N | P | K | Ca | Mg | ppm |
| 1. Conventional sett planting | 2,74 | 0,24 | 1,15 | 0,32 | 0,12 | 19 |
| 2. Transplants at 0,5 m in-row spacing | 2,45 | 0,24 | 1,03 | 0,34 | 0,13 | - |

4.3 Weed control

Two replications of each treatment were sprayed with Sencor + diuron ( 2 + 2 kg product/ha) on 4/10/83 ten days after planting when transplants were 250 mm high and before the setts had germinated; one replication was left unsprayed and was weeded by hand.

The herbicides caused leaf necrosis. However the indications are (acknowledging the limitations of inadequate replication) that ultimate yields were considerably higher where herbicides were used particularly in the case of the transplants.

5. Comments on results

- In an excellent rainfall year(144% of L.T.M.)and with good distribution the conventional sett planting system outyielded the transplants by 40%. During the first summer the rate of stalk elongation was similar for both treatments but the rate of growth of the transplants declined from autumn onwards relative to the growth from setts. The transplants tillered less than the plants produced from setts resulting in a comparatively low population. The transplants were described as being "poor and non-vigorous" at the time of planting but the reasons for this are not clear.

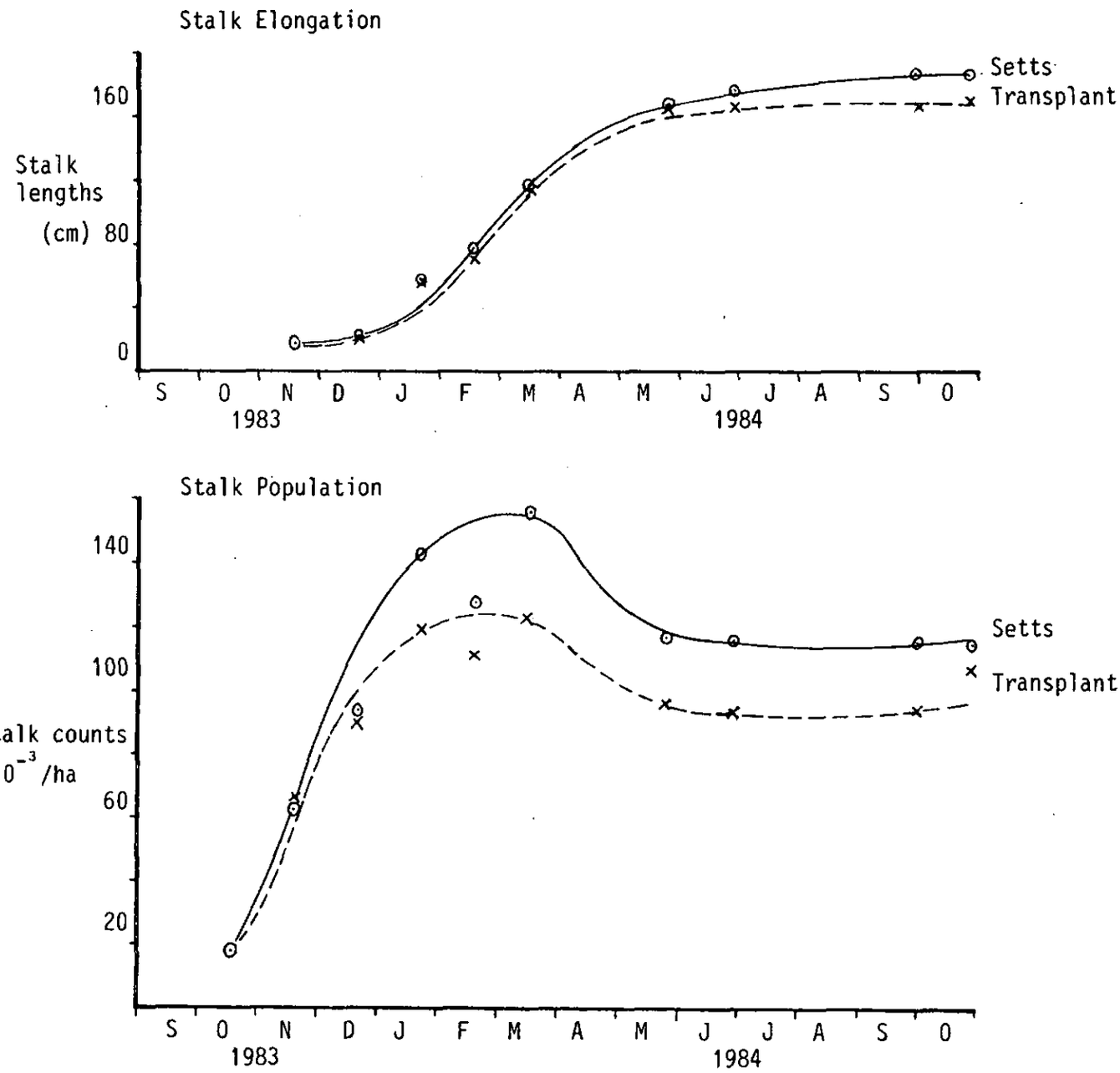
- Third leaf analyses showed the uptake of N and particularly K to be poorer in the leaves taken from the transplants compared with sett plants.

- Interveinal leaf chlorosis (iron chlorosis) was more marked in the crop planted from setts than that from transplants.

- The trial will continue into the first ratoon crop.

PKM/IS
20 November 1984

The growth pattern of NCo 376 planted in spring by means of conventional setts and transplants



SOUTH AFRICAN SUGAR INDUSTRY

A(v)

AGRONOMISTS' ASSOCIATION

Cat No : 1449
Project No :
Code No : A/PLANT/4/83

**Title :** Transplants versus conventional sets: Spring planting in Hutton/Clansthal soil
This crop : residual effects

## 1. Particulars of project

This crop : 1st ratoon

Site : CFS Field 4.1

Region : North Coast - Coastal

Soil system : Berea

Soil form/series: Hutton/Clansthal

Design : Observation x 3 Replications

Variety : NCo376

| Fertilizer/ Ameliorants | N | P | K |
|---|---|---|---|
| | 141 | - | 141 |

Soil description: A deep porous, light brown loamy sand

**Soil analysis** Date: 4.12.1989

| pH | OM % | Clay % | PDI |
|---|---|---|---|
| 8,53 | - | 10 | - |

ppm

| P | K | Ca | Mg | Zn | Na |
|---|---|---|---|---|---|
| >80 | 58 | >1800 | 47 | 1,6 | 23 |

Age: 13,3 months

Date: (26/10/84 - 4/12/85)

Rainfall: 1026 mm

92% of LTM: 1120 mm

Irrigation: Nil

## 2. Objectives:
To compare yields and crop growth patterns of cane established from transplants or conventional setts in spring on a Hutton form Clansthal series soil. This crop residual effects.

## 3. Motivation:
Single eyed setts grown in polystyrene seed trays have been established successfully in field observation trials at CFS and this technique may be useful in establishing seedcane nurseries or commercial crops.

## 4. Treatments:
1. Conventional sett planting with 30% overlap.
2. Transplants at 0.5m in-row spacing (16 week old transplants).

4.1 Notes on treatments:

- Top-dressed all plots over the cane row 1-0-1 (47) at 600 kg $ha^{-1}$ on 8/1/85 2,4 months after harvest.
- Trial kept weed free by regular hand weeding.

**Rainfall (mm)**

| Months | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1984-1985 | 29 | 57 | 46 | 135 | 333 | 18 | 2 | 32 | 17 | 2 | 0 | 60 | 225 | 70 | - | 1026 |
| LTM | 82 | 108 | 97 | 133 | 109 | 101 | 52 | 56 | 20 | 29 | 47 | 67 | 98 | 108 | 13 | 1120 |

## 5. Results

### 5.1 Yield and crop characteristics at harvest

| Treatments | t $ha^{-1}$ cane | Sucrose % cane | t $ha^{-1}$ sucrose | Stalk counts $x10^3$ $ha^{-1}$ | Stalk length (cm) | Stalk mass (kg) |
|---|---|---|---|---|---|---|
| T1 Conventional setts 30% overlap | 98 | 14,16 | 13,8 | 133 | 204 | 0,74 |
| T2 Transplants 0,5m in-row spacing | 81 | 14,44 | 11,8 | 129 | 190 | 0,63 |
| Mean | 90 | 14,30 | 12,8 | 131 | 197 | 0,68 |
| CV % | 5,1 | 3,8 | 2,6 | | | |
| SE of treatment mean ± | 2,62 | 0,31 | 0,19 | | | |
| LSD (0,05) | 15,97 | 1,91 | 1,16 | | | |
| (0,01) | 36,87 | 4,41 | 2,68 | | | |

### 5.2 Third leaf analysis % dm sampled on 5/2/85 at 3,3 months

| Treatments | % dm | | | | | | ppm | N/S Ratio |
|---|---|---|---|---|---|---|---|---|
| | N | P | K | S | Ca | Mg | Zinc | |
| T1 Conventional setts 30% overlap | 2,22 | 0,24 | 1,26 | 0,17 | 0,39 | 0,21 | 26 | 12,8 |
| T2 Transplants 0,5m in-row spacing | 2,30 | 0,24 | 1,28 | 0,18 | 0,41 | 0,21 | 25 | 12,7 |

## 6. Comments on results

**Leaf analysis**
There were no marked differences between conventional setts and transplants in leaf nutrient levels. All values were adequate.

**Cane and sucrose yields**
Both cane and sucrose yields were reduced in tranplants while cane quality was not affected as occurred in the plant crop.

**Crop measurements**
These showed consistently lower populations and stalk lengths in transplant cane. Low populations as a result of gaps may to some extent explain the poorer growth and yield in transplant plots. However the shorter stalks in the transplant plots in this crop may also have contributed adversely to yield and this is not easy to explain as a result of the transplanting system.

**Conclusion**
Yields in this first ratoon followed those of the plant crop showing that residual differences were maintained.

PETT/cvp
16 January 1990