

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Irrigation Experiment III

Catalogue No.: 3  
 This crop: P, 1R, 2R.  
 Site: Jacksons, Umhloti Valley.  
 Altitude: 140'  
 Soil: M.E. Shale, Windermere.  
 Design: Random Block  
 Variety: N:Co.310

Soil Analysis:

	pH.	OM %	Clay %	P	p.p.m.		
					K	Ca	Mg.
Plant	-	-	-	-	-	-	-
1R	5.81	5.09	-	18	115	-	-
2R	5.61	5.61	-	26	179	3230	-

Fertiliser:	N1	N2	N3	P	K1	K2
Plant:	A/N 300	600	900	1000	200	400
1R	A/N 300	600	900	1000	200	400
2R	A/N 300	900	1200	1000	400	800

Age:

Plant = 19 mths.	March 1956 - Oct. 1959.
1R = 14 "	Oct. 1957 - Dec. 1958. ✓
2R = 18 "	Dec. 1958 - June 1960. ✓

Object:

Treatments:

- WO = No irrigation. Dryland.  
 W1 = 1" irrigation when soil lost 1 inch from field capacity.  
 W2 = 1.5" " " " " 1½ " " " "  
 W3 = 2" " " " " 2 " " " "  
 N1 = Amm. Nitrate 300 lb. per acre.  
 N2 = " " 600 lb. per acre.  
 N3 = " " 900 lb. per acre.  
 K1 = " " 200 lb. per acre.  
 K2 = " " 400 lb. per acre.

Results:

Tons Cane per Acre.

Crop	WO	W1	W2	W3	N1	N2	N3	K1	K2
P	46.9	51.8	50.7	47.5	48.0	48.0	50.3	48.2	49.3
1R	40.6	43.4	47.2	47.7	40.1	45.1	49.0	43.7	55.8
2R	28.0	47.1	52.4	55.3	43.2	47.0	46.9	45.8	45.6

Sucrose % Cane.

Crop	WO	W1	W2	W3	N1	N2	N3	K1	K2
P	16.0	16.3	16.1	16.2	16.2	16.2	16.2	16.2	16.1
1R	14.7	15.4	15.5	14.8	15.5	15.4	15.0	15.2	15.4
2R	14.2	14.4	14.4	14.5	14.3	14.4	14.4	14.4	14.4

Tons Sucrose per Acre.

Crop	WO	W1	W2	W3	N1	N2	N3	K1	K2
P	7.49	8.44	8.16	7.67	7.77	7.76	8.14	7.80	7.93
1R	5.97	6.68	7.32	7.06	6.22	6.95	7.38	6.64	8.59
2R	3.98	6.77	7.55	8.02	6.19	6.79	6.76	6.59	6.58

Catalogue No. 3  
(first cycle)

Note: Water treatments shown on Page 1 refer to Plant crop only.  
Treatments for 1R and 2R were as follows :

$W_0$  = Dryland

$W_1$  = 1" irrigation when soil moisture deficit = 3"

$W_2$  = 1" irrigation when soil moisture deficit = 2"

$W_3$  = 1" irrigation when soil moisture deficit = 1"

SOUTH AFRICAN SUGAR INDUSTRY

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Irrigation Trial III

Catalogue No.: 3  
This crop: P, 1R, 2R, 3R. (second cycle)  
Site: Jackson, Umhloti Valley.  
Altitude: 140'  
Soil: M.E. Shale, Windermere.  
Design: Random Block.  
Variety: N:Co.376.  
Fertilizer:     N         P         K  
 Plant = Urea 675   500   415  
   1R = "   450   500   300  
   2R = LAN 1000   500   300  
   3R = "   800   500   300

Soil Analysis:

Plant	pH.	O.M.%	Clay %	p.p.m.			Mg.
				P	K	Ca	
1R	5.42	3.44	-	11	78	4730	915
2R	5.39	3.27	-	13	131	1084	262
3R	5.39	5.92	-	36	221	1106	592

Age:  
 Plant = 21 mths.   Sept. 1960 - June 1962.  
   1R = 14 mths.   June 1962 - Aug. 1963.  
   2R = 11 mths.   Aug. 1963 - July 1964.  
   3R = 12 mths.   July 1964 - July 1965.

Objects:

Plant - 1st Ratoon

Treatments: WO = No irrigation. Dryland.  
 W1 = 1 Inch irrigation when soil moisture below F.C. 1 inch.  
 W2 = 1½ " " " " " " " " 1½ "  
 W3 = 2 " " " " " " " " 2 "  
 W4 = 2½ " " " " " " " " 2½ "  
 W5 = 3 " " " " " " " " 3 "  
 W6 = 3½ " " " " " " " " 3½ "

2 - 3rd Ratoon

WO = No irrigation. Dryland.  
 ½ = ½ Inch irrigation when soil moisture deficit = ½ inch.  
 1 = 1 " " " " " " " " = 1 "  
 1½ = 1½ " " " " " " " " = 1½ "  
 2 = 2 " " " " " " " " = 2 "  
 2½ = 2½ " " " " " " " " = 2½ "  
 3 = 3 " " " " " " " " = 3 "

Results:

Crop	WO	W1	W2	W3	W4	W5	W6
P	45.4	71.4	63.3	57.9	62.0	56.0	54.4
1R	42.5	50.3	44.3	52.2	49.4	47.4	50.0
	WO	½"	1"	1½"	2"	2½"	3"
2R	26.8	50.6	47.7	42.8	43.4	37.4	52.9
3R	11.2	45.1	46.1	46.7	41.9	42.8	39.0

Sucrose % Cane

Crop	WO	W1	W2	W3	W4	W5	W6
P	12.6	13.8	14.3	14.0	13.8	13.4	13.8
1R	12.0	13.5	13.3	12.8	12.2	12.4	12.3
Crop	WO	½"	1"	1½"	2"	2½"	3"
2R	12.2	12.3	13.2	13.6	13.1	13.2	12.9
3R	9.5	12.6	12.7	12.5	12.2	12.5	12.3

Tons Sucrose per Acre.

Crop	W0	W1	W2	W3	W4	W5	W6
P	5.74 ✓	9.85	9.03	8.11	8.53	7.47	7.51
1R	5.09 ✓	6.78	5.89	6.69	6.04	5.87	6.15
Crop	W0	½"	1"	1½"	2"	2½"	3"
2R	3.28 ✓	6.20	6.30	5.83	5.68	4.95	6.83
3R	1.06 ✓	5.70	5.87	5.85	5.13	5.25	4.80

9th May, 1966.

Catalogue No. 3  
(second cycle)

Note: Water treatments on page 1 for 2R and 3R should read as follows:

2nd ratoon:

- W<sub>0</sub> : Dryland
- W<sub>1</sub> : 1" irrigation when soil moisture deficit = 1"
- W<sub>2</sub> : ½" " " " " " = ½"
- W<sub>3</sub> : 1" " " " " " = 2"
- W<sub>4</sub> : 1½" " " " " " = 1½"
- W<sub>5</sub> : 1" " " " " " = 3"
- W<sub>6</sub> : 1" " " " " " = 1" except no irrigation between May and September.

3rd ratoon:

- W<sub>0</sub> : Dryland
- W<sub>1</sub> : ½" irrigation when soil moisture deficit = ½"
- W<sub>2</sub> : 1" " " " " " = 1"
- W<sub>3</sub> : 1½" " " " " " = 1½"
- W<sub>4</sub> : 2" " " " " " = 2"
- W<sub>5</sub> : 2½" " " " " " = 2½"
- W<sub>6</sub> : 3" " " " " " = 3"

SOUTH AFRICAN SUGAR INDUSTRY.

AGRONOMISTS' ASSOCIATION.

IRRIGATION TRIAL III.

Catalogue No: 3  
This crop: 5th Ratoon.  
Site: Jackson  
 Umhloti Valley.  
Altitude: 140 ft.  
Soil series: Windermere,  
 shale.  
Design: Random block -  
 4 reps.  
Variety: N.Co 376  
Fertilizer: N. P. K.  
 Urea 300 D/S 100 300  
Water regime: Irrigated.

Soil Analysis:

	pH	OM%	Clay%
5R	6.19	6.33	-

  

	p.p.m.			
	P	K	Ca	Mg
	47	155	1237	649

Age: 15 mths. Aug'66 - Nov'67.  
Rainfall: 42.39"  
Irrigation: W0, W1, W2,  
 Nil 23.0" 21.0"  
 W3, W4 W5,  
 19.0" 17.0" 13.0"  
 W6.  
 17.0"

Treatments:

W0 = Dry Land Control.  
 W1 = 1" Irrigation every 14 days until harvest.  
 W2 = 1" " " 14 " dry off 1 month  
 W3 = 1" " " 14 " " " 2 months.  
 W4 = 1" " " 14 " " " 3 months.  
 W5 = 1" " Now, Thennil until full canopy,  
 then 1" every 14 days.  
 W6 = 1" Irrigation every 18 days.

Results:

TREATMENTS	T.C.A.	% SUCROSE	T.S.A.
W0	29.3	12.3	3.59
W1	46.6	14.7	6.84
W2	44.5	15.0	6.67
W3	48.7	14.7	7.16
W4	45.6	14.8	6.75
W5	41.6	15.2	6.32
W6	33.7	15.2	5.10
S.E. single yield =	4.51	0.27	0.82
C.V.	10.89%	1.86%	13.45%
L.S.D. between treatments @ 5%	6.70	0.40	1.21
L.S.D @ 1%	9.18	0.55	1.66

Catalogue No:

3

Comment:

For cane harvested in early summer there does not appear to be any response to drying off for periods of up to 3 months. This applies to both sucrose % cane and yield T.C.A.

It is interesting to see that early irrigation has not increased yields appreciably, and, in fact, this supports field policy of with-holding irrigation from young ratoons and concentrating on full canopy cane.