

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION.

NEMATODE TRIAL

<p>Catalogue No.: 182 <u>This Crop:</u> Plant Cane <u>Site:</u> Langespruit Section, 16(T) <u>Altitude:</u> 1,900 ft. <u>Soil Series:</u> Inanda <u>Design:</u> Random Blocks (5 reps.) <u>Variety:</u> N:Co.376 <u>Fertilizer:</u> (lb. p.a.)</p> <table style="margin-left: 100px;"> <tr> <td></td> <td>N</td> <td>P</td> <td>K</td> </tr> <tr> <td>Furrow:</td> <td>200</td> <td>34</td> <td>50</td> </tr> </table> <p>Treatments 2 & 6 received P as Filterpress cake. <u>Water Regime:</u> Dry Land.</p>		N	P	K	Furrow:	200	34	50	<p><u>Soil Analysis:</u></p> <table style="width: 100%;"> <tr> <td style="text-align: left;"><u>pH</u></td> <td style="text-align: center;"><u>OM%</u></td> <td style="text-align: right;"><u>Clay%</u></td> </tr> <tr> <td style="text-align: left;">5.76</td> <td style="text-align: center;">15.76</td> <td style="text-align: right;">-</td> </tr> </table> <hr/> <table style="width: 100%;"> <tr> <td style="text-align: center;">p.p.m.</td> </tr> <tr> <td style="text-align: center;">P K Ca Mg</td> </tr> <tr> <td style="text-align: center;">8 232 856 162</td> </tr> </table> <p><u>Age:</u> P - 20 months; 12.65 - 8.67. <u>Rainfall:</u> 74.06 inches. <u>Irrigation:</u> -</p>	<u>pH</u>	<u>OM%</u>	<u>Clay%</u>	5.76	15.76	-	p.p.m.	P K Ca Mg	8 232 856 162
	N	P	K															
Furrow:	200	34	50															
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8 232 856 162																		

Object: To determine the effects on crop yield following applications of filterpress cake, aqua ammonia and soil fumigants, to a soil known to be heavily infested with plant parasitic nematodes.

- Treatments:
1. Control - no nematodes.
 2. Filterpress cake (60 tons p.a.) - broadcast & incorporated 6½ weeks prior to planting.
 3. E.D.B. (40 gals. p.a. 2.25) - injected to 6 inch depth at 1 ft. square, 7 weeks prior to planting.
 4. Aqua ammonia (108 gals. = 200 N p.a.) - injected to 6 inch depth at 1 ft. intervals in furrow just prior to planting.
 5. Fumagon (104 lb. p.a. solid form) - applied in furrow and lightly covered just prior to planting.
 6. Filterpress cake (20 tons p.a.) - applied in furrow just prior to planting.

Fertilizer Notes:

- a) Treatment 4 received N in the form of aqua ammonia, whilst on all other treatments and 'Control', ammonium sulphate was applied.
- b) Treatments 2 & 6 received P as filterpress cake only; 108 & 32 lb. P p.a. respectively.

Analysis of Filterpress cake (wet weight).

Treatment	Moisture %	% N (total)	% P (citric)	% K (citric)
2. 60 t.p.a.	74.36	0.49	0.09	0.07
6. 20 t.p.a.	66.30	0.65	0.08	0.06

Counts of Parasitic Nematodes - (a) pre-treatment; (b) post-treatment at 50 days after planting).

TREATMENT	SOIL SAMPLE	PARASITIC NEMATODES IN 100 c.c. SOIL								Totals and Means
		Meloidogyne	Pratylenchus	Cricone-moides	Tylenchorhynchus	Xiphinema	Paratylenchus	Hoplolaims	Trichodorus	
1. Control	a) pre	65	35	5	52	1	47	63	89	357
	b) post	23	34	2	5	4	0	66	27	161
	Difference %	65	3	60	90	+300	100	+5	70	55
2. Filterpress (60 t.p.a.)	a) pre	95	34	9	47	4	62	124	105	480
	b) post	4	12	1	5	0	0	28	15	65
	Difference %	96	65	89	89	100	100	77	86	86
3. E.D.B.	a) pre	96	48	4	45	1	0	103	74	371
	b) post	1	10	1	1	0	0	21	22	56
	Difference %	99	79	75	98	100	0	80	70	85
4. Aqua Ammonia	a) pre	79	14	3	24	17	0	86	70	293
	b) post	3	18	2	4	0	0	36	22	85
	Difference %	96	+29	33	83	100	0	58	69	71
5. Fumagon	a) pre	79	45	15	69	0	0	101	84	393
	b) post	15	43	2	2	0	0	57	26	145
	Difference %	81	1	87	97	0	0	77	69	63
6. Filterpress	a) pre	50	43	9	59	1	0	111	86	359
	b) post	11	15	0	1	1	0	54	15	97
	Differnece %	78	65	100	98	0	0	51	83	73

Results: (Mean Yields)

Treatments	T.C.A.	S. % C.	T.S.A.
1. Control	36.2	14.12	5.11
2. Filterpress cake (60 t.p.a.)	59.2	13.82	8.18
3. E.D.B.	40.5	14.47	5.86
4. Aqua ammonia	32.9	14.19	4.68
5. Fumagon	35.9	14.14	5.07
6. Filterpress cake (20 t.p.a.)	58.1	13.84	8.04
Mean	43.8	14.10	6.16
S.E. of treatment mean	1.72	0.165	0.246
L.S.D. (0.05)	5.1	0.49	0.73
(0.01)	7.0	0.67	1.00
C.V. %	8.8	2.6	8.9

Comments: 1. Responses compared with 'Control' and Standard Errors:

Treatments	T.C.A.		S. & C.		T.S.A.	
	Response	S.E.	Response	S.E.	Response	S.E.
2 & 6. Filterpress cake Mean	22.4**	±2.11	-0.29	±0.202	3.00**	±0.301
3. E.D.B.	4.3)	0.35)	0.75*)
) ±2.43) ±0.233) ±0.348
4. Aqua ammonia	-3.3)	0.07)	-0.43)
5. Fumagon	-0.3)	0.02)	-0.04)

2. There is a significant response to Filterpress cake both for tons cane and tons sucrose per acre. Evidence is not significant of differences between the filterpress cake treatments.

3. E.D.B. shows a significant effect on tons sucrose per acre (P 0.05).

4. Costs:

Revenue and Expenditure per acre.

Revenue: Mean response 2.93 Tons Sucrose @ R31.98 per ton (based on average sugar price of R60 per ton).

Expenditure: a) Cartage of Filterpress cake - based on 16 miles at 20 c.p.m. by 6 ton loads - (16 x 20) x 20/6

b) Application of Filterpress - based on 2 units per ton @ 65c ea. - 20 tons = 40 units x 65c

c) Harvesting and Transport of 22 tons cane at R1.00 per ton.

Apparent financial benefit per acre.

Expenditure		Revenue	
R	c	R	c
-	-	93	70
10	67		
26	00		
22	00		
35	03		
93	70	93	70

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

NEMATODE TRIAL

Catalogue No.: 182
This Crop: R1
Site: Langespruit Section, L6(T)
Doornkop.
Altitude: 1,900 ft.
Soil series: Inanda
Design: Random Block (5 reps.)
Variety: N:Co.376
Fertilizer: lb.p.a.
N P K
161 17 100
Water regime: Dryland.

Soil Analysis:

<u>pH</u>	<u>OM%</u>	<u>Clay%</u>
6.05	15.76	-

<u>p.p.m.</u>			
<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>
13	214	782	Ample

Age: R1 - 22 months; 8.67 - 6.69

Rainfall: 78.47 inches.

Irrigation: -

Object: To determine the residual effects on yield of applications of filterpress, aqua ammonia and soil fumigants, to a soil infested with parasitic nematodes.

Treatments:

1.	Control	- no nematocide
2.	Filterpress	- 20 t.p.a.
3.	"	- 60 t.p.a.
4.	Aqua Ammonia	- 108 g.p.a.
5.	Fumagon	- 104 lb. p.a.
6.	E.D.B.	- 40 g.p.a.

Results:

TREATMENTS	T.C.A.	S. % C.	T.S.A.
Control	53.2	14.6	7.79
Fp. - 20 T.P.A.	59.4	13.8	8.18
Fp. - 60 T.P.A.	56.6	14.3	8.11
A. Ammonia	47.8	13.9	6.65
Fumagon	56.7	14.0	7.96
E.D.B.	58.1	14.5	8.43
MEAN	55.3	14.2	7.85
S.E. of Treatment Mean	2.58	0.17	0.38
L.S.D. (0.05)	7.6	0.5	1.13
(0.01)	10.4	0.7	1.55
C.V. %	10.4	2.6	11.0

Conclusions: No residual effect is proved although the filterpress treatments are better than the aqua ammonia.

SOUTH AFRICAN SUGAR INDUSTRY

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NEMATODE TRIAL

Catalogue No.: 182
This crop: 2R
Site: Doornkop Sugar Co. (Pty) Ltd.,
 Langespruit Section - L6 (T)
Altitude: 580m
Soil series: Inanda.
Design: Random Block (5 reps.)
Variety: NCo 376
Fertilizer: Urea 336 kg/ha; Double
 Supers. 112 kg/ha; Muriate of
 Potash 224 kg/ha.
Water regime: Dryland

Soil Analysis:

<u>pH</u>	<u>OM%</u>	<u>Clay%</u>	
5,7	-	-	
<u>P.P.M.</u>			
<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>
18	146	537	Ample

Age: (30.6.69/9.6.71) 23.3 months
Rainfall: 2362 mm
Irrigation: Nil.

Object: To study the residual effects of all treatments following an even top-dressing to all plots.
 No further fumigation treatments were applied.

- Treatments:
1. Control - no nematicide
 2. Filterpress - 22 t/ha (furrow) (20 t.p.a.)
 3. " - 67 t/ha (broadcast) (60 t.p.a.)
 4. Aqua Ammonia - 1213 litres/ha (108 g.p.a.)
 5. Fumagon - 117 kg/ha (104 lb. p.a.)
 6. E.D.B. - 449 litres/ha (40 g.p.a.)

Results:

Treatments	t Cane /ha	ERS %	t ERS /ha
1. Control	81	13,6	11,0
2. Fp. 22 T/ha	95	13,4	12,8
3. Fp. 67 T/ha	89	12,4	11,0
4. Aqua Amm.	85	13,3	11,3
5. Fumagon	91	13,2	11,9
6. E.D.B.	86	13,6	11,7
MEAN	88	13,3	11,6
S.E. of Treatment Mean	4,94	0,24	0,56
L.S.D. (0,05)	15	0,7	1,7
(0,01)	20	1,0	2,3
C.V.%	12,6	4,0	10,8

Conclusions:

- (i) There appears to be a residual positive response to the Filterpress (22 t/ha) treatment:-
 t Cane/ha 14,1 ± 6,98
 t ERS/ha 1,8* ± 0,79
- (ii) Residual responses to other treatments are not statistically significant.
- (iii) The Filterpress treatment (67 t/ha) has a lower Pol % Cane and Purity than the other treatments, resulting in an ERS % Cane which is significantly lower than for all other treatments. The previous crop did not exhibit this trend.