A1

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code : A/NT X Water/84/P
Cat. No. : 1522

Title : The influence of soil moisture on the efficacy of nematicides

1. Particulars of the project

This crop : Plant
Site : Field 704, La Mercy
Region : North Coast Coastal
Soil systems : Berea
Soil form/series : Clansthal
Design : 3x3x2x2 - 1 rep.
Variety : NCo376 and N18

Fertilizer/kg ha^{-1} : N P K

Ameliorants			
i.f. 31.10.84	70	-	70
t/d 20.12.84	118	-	118
	188	-	188

29.10.84 Broadcast 2t/ha Dolomitic lime

Soil analysis: Date : 5.9.84

pH	O.M.%	Clay %	P.D.I.
4.60		6	

ppm

P	K	Ca	Mg	Zn	Al
34	32	56	9	1.1	10

Age: 12 months Dates:(1.11.84 - 29.10.85)
Rainfall: 705mm 71% OF L.T.M.: 1000mm
Irrigation: See irrigation effects

N	D	J	F	M	A	M	J	J	A	S	O
71	58	135	327	9	0	26	12	2	4	28	33

2. Objectives

1. To measure the efficacy of Temik and Curaterr under adequate and inadequate moisture conditions
2. To compare the yields of two varieties under three water regimes on a very weak sand in the presence or absence of nematicides
3. To determine whether soil moisture at planting (or at the time of nematicide application) has an influence on the efficacy of nematicides

3. Treatments

3.1 Irrigation

1. No irrigation
2. 100% of crop requirement including effective rainfall (W_1)
3. 50% of the difference between rainfall and full crop requirement (W_2)

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3.2 Nematicides

1. Control - no nematicides
2. Curaterr at 30 kg ha^{-1}
3. Temik at 20 kg ha^{-1}

3.3 Varieties

1. NCo376
2. 71L760 (N18)

3.4 Moisture at planting

1. Dry at planting
2. Wet at planting (3ℓ water m^{-1} applied by drippers)

Notes on treatments

° Irrigation water was applied through drippers placed 600 mm apart on the soil surface of every interrow

° P & L account was kept for each treatment using a TAM of 70 mm.
W_1 plots received about 13.8 mm irrigation when available soil moisture dropped below 56 mm
W_2 plots received about 13.8 mm irrigation when available soil moisture dropped below 34 mm

° The trial was planted after good rainfall; soil moisture was high in all plots and it was not possible to impose the different soil moisture treatments at planting.

4. Results

Table 1 YIELDS FROM PLOTS TREATED WITH OR WITHOUT NEMATICIDES AT THREE LEVELS OF SOIL MOISTURE

	tc/ha			pol % cane			t suc/ha					
	W_0	W_2	W_1	W_0	W_2	W_1	W_0	△	W_2	△	W_1	△
No nematicide	39	66	77	13.8	13.2	13.6	5.4		8.7		10.5	
Curaterr	63	105	99	14.3	13.6	14.4	9.0	+3.6	14.3	+5.6	14.3	+3.8
Temik	78	107	102	14.7	13.6	14.5	11.5	+6.1	14.6	+5.8	14.8	+4.3
MEAN	60	93	93	14.3	13.5	14.2	8.6		12.5		13.1	

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Table 2

YIELDS OF TWO VARIETIES AND THREE SOIL MOISTURE REGIMES

	tc/ha				pol % cane				t suc/ha			
	W_0	W_2	W_1	MEAN	W_0	W_2	W_1	MEAN	W_0	W_2	W_1	MEAN
N18	58	96	91	82	14.6	13.8	14.4	14.3	8.5	13.2	13.1	11.6
NCo376	62	90	95	82	13.9	13.1	13.9	13.6	8.6	11.8	13.2	11.2
S.E.		3.6				0.16				0.55		
LSD (P=0.05)		10.8				0.49				1.66		

Table 3

YIELDS OF TWO VARIETIES TREATED WITH TWO NEMATICIDES

	tc/ha		pol % cane		t suc/ha		Stalk pop (x1000/ha)		Stalk length(cm)	
	N18	NCo376	N18	NCo376	N18	NCo376	N18	NCo376	N18	NCo376
Control	66	56	14.0	13.1	9.2	7.3	96	101	170	146
Curaterr	89	90	14.4	13.8	12.7	12.3	110	130	201	194
Temik	90	101	14.5	14.0	12.9	14.2	107	136	207	209
S.E.		5.1						3.6		
LSD(P=0.05)		15.2						10.9		

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Table 4 MAIN EFFECTS

TREATMENT	t cane/ha	Pol % cane	t suc/ha
Water			
W_0	60	14.3	8.6
W_2	93	13.5	12.5
W_1	93	14.1	13.1
Nematicides			
Control	61	13.5	8.2
Curaterr	89	14.1	12.5
Temik	96	14.3	13.6
Varieties			
N18	81	14.3	11.6
NCo376	82	13.6	11.3

Table 5

RAINFALL (W_0) AND TOTAL WATER (mm) APPLIED TO W_2 AND W_1 PLOTS

Month		N	D	J	F	M	A	M	J	J	A	S	O	TOTAL
Rain	W_0	71	58	135	327	9	0	26	12	2	4	28	33	705 mm
Irrigation	W_2	0	37	0	14	67	122	95	46	86	116	92	109	784 mm
Irrigation	W_1	14	55	55	39	75	72	109	74	92	104	101	98	888 mm
TOTAL	W_0	71	58	135	327	9	0	26	12	2	4	28	33	705 mm
Moisture	W_2	71	95	135	341	76	122	121	58	88	120	120	142	1489mm
Received	W_1	85	113	190	366	84	194	135	86	94	108	129	131	1715mm

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Table 6

% JOINTS BORED BY ELDANA WITH
VARIOUS WATER AND NEMATICIDE TREATMENTS

Irrigation regime	Nematicide	% Joints bored
W_0	Nil	3.35
W_0	Curaterr	8.74
W_0	Temik	5.72
W_1	Nil	1.53
W_1	Curaterr	2.15
W_1	Temik	2.19
W_2	Nil	1.02
W_2	Curaterr	2.84
W_2	Temik	4.69

S.E. diff = $\pm$ 1.008
L.S.D. (0.05) = 2.1

5. Comments

5.1 Soil moisture

Soil moisture was depleted at intervals and wilting point was reached on 203 days in the W_0 plots. Rainfall disrupted soil moisture differences between W_1 and W_2 plots during the first 5 months of growth (see fig. 1). Thereafter differences between W_1 and W_2 plots were maintained until the time of harvesting. Total rainfall during the growth was 705 mm. Irrigation supplied W_2 plots with 784 mm and W_1 plots with 888 mm.

Cane not treated with a nematicide responded nearly linearly to irrigation (see fig. 2) in terms of cane yields.

5.2 Nematicides

Temik improved cane yields by 39 tc ha^{-1} which was 15 tc ha^{-1} more than the responses to Curaterr in the W_0 plots (only rainfed). Responses to Temik and Curaterr were similar in W_1 and W_2 plots with the responses to Temik only 3 tc ha^{-1} greater than from Curaterr in both W_1 and W_2 treatments. The responses to both nematicides were substantially smaller in W_1 plots than in W_2 plots due mainly to the improved yields of untreated cane in W_1 plots.

Responses to Temik declined in terms of sucrose yields with increasing soil moisture from 6,0 t ha^{-1} (W_0) to 4,2 t ha^{-1} (W_1). Responses to Curaterr were similar in W_0 and W_1 plots (3.6 t suc ha^{-1}) and were substantially greater in W_2 plots (5.4 t suc ha^{-1}).

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5.3 Varieties

N18 yielded 2.1 tons suc ha^{-1} more than NCo376 in W_0 plots which were not treated with a nematicide. The response of NCo376 to Curaterr was 5.0 t suc ha^{-1} and 6.9 t suc ha^{-1} to Temik. The responses of N18 to Temik and Curaterr were similar at 3.7 and 3.5 t suc ha^{-1} respectively. The additional moisture from W_1 treatments did not increase the yields of N18 achieved from W_2 treatments. In comparison, yields of NCo376 increased progressively with increase in available moisture (from W_0 to W_1).

Note : The highest yield in terms of moisture received was 11,02 tc/ha/100 mm from Temik treated plots which received 705 mm water (W_0)

5.4. Eldana

The percent joints bored in cane sampled at harvest showed significant interaction effects between irrigation regime and nematicide. At low water regimes cane treated with nematicides tended to have higher eldana damage levels while at high water levels (W_1) these effects were not so marked.

5.5 Future

The trial has been continued for the first ratoon with the same treatments.

RAD/PETT/1b
21 August 1986

Figure 2

YIELDS FROM NEMATICIDES AND VARIOUS AMOUNTS OF MOISTURE RECEIVED

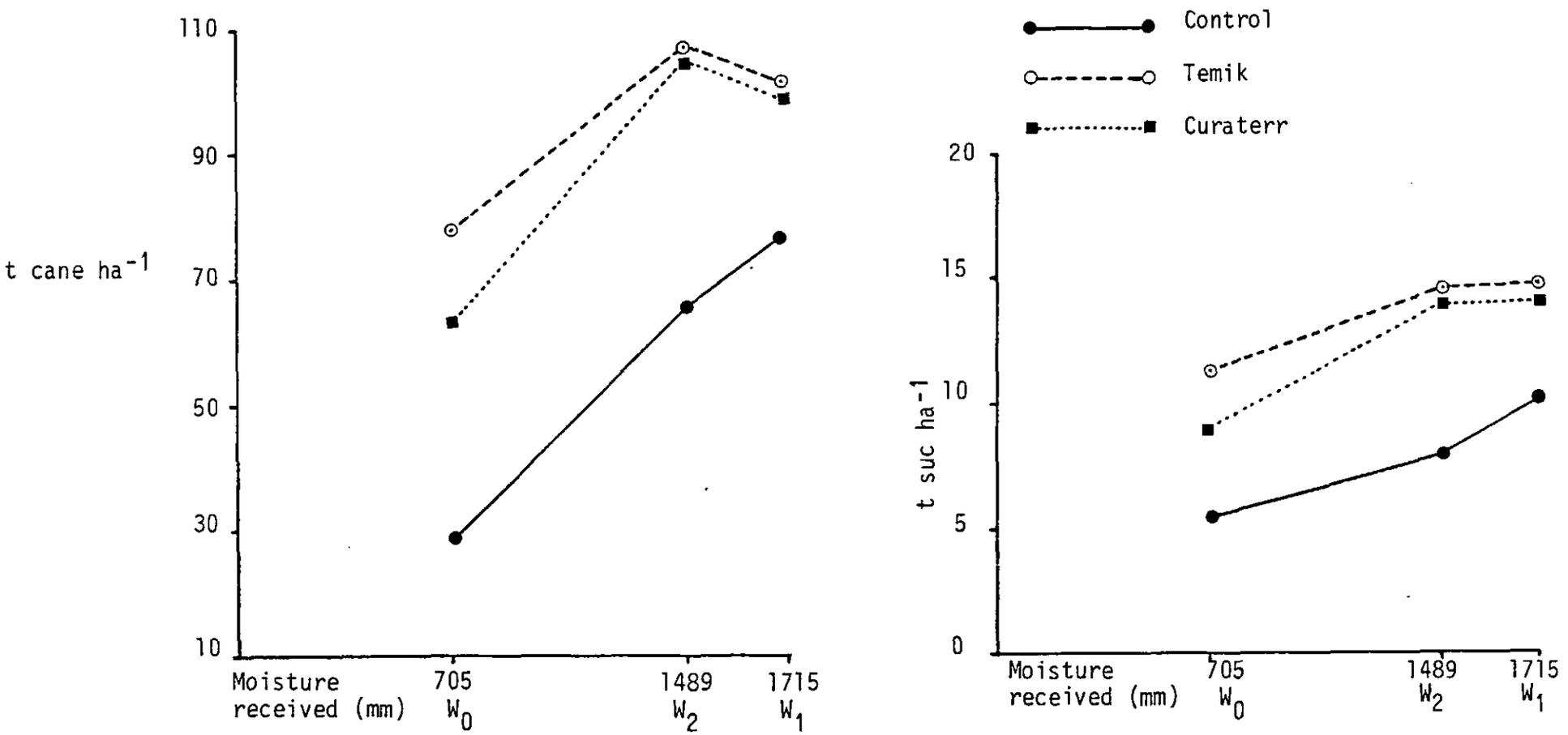
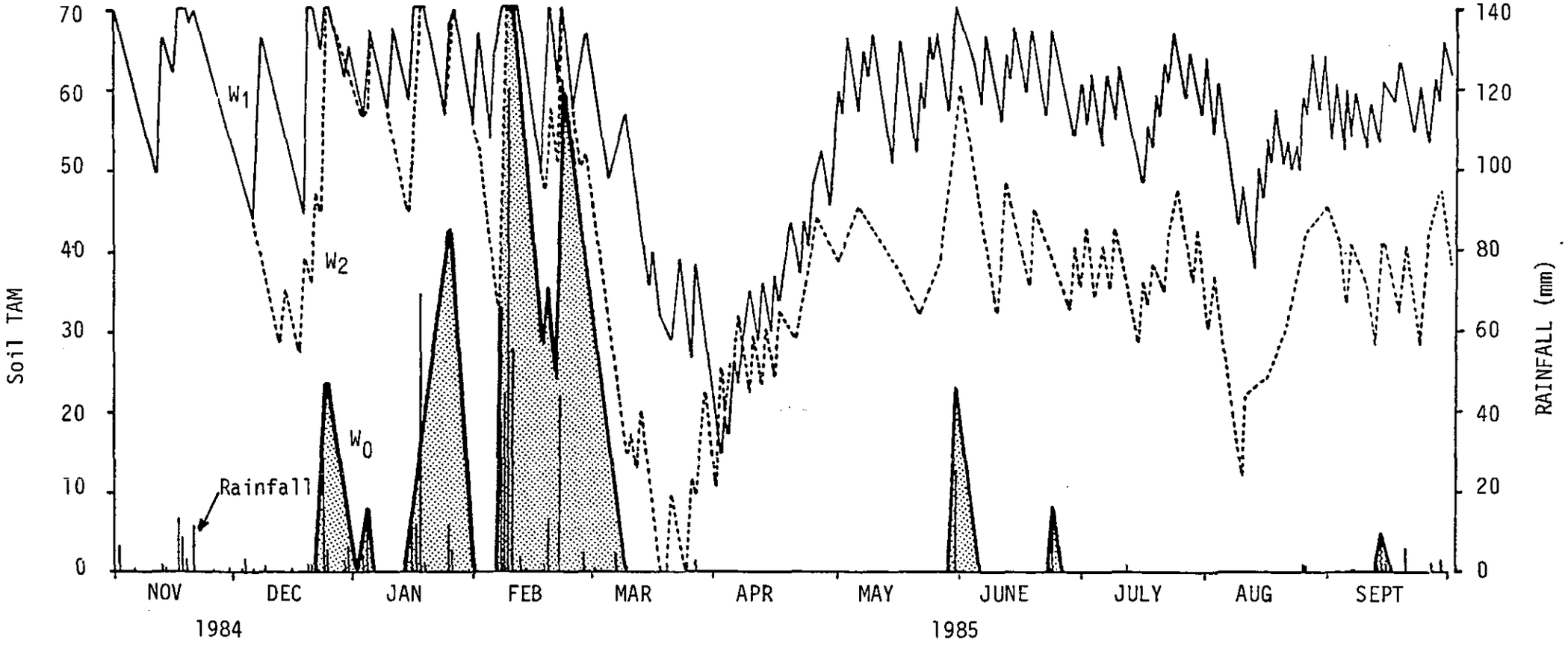


Figure 1

Calculated soil moisture (using profit & loss account) in plots receiving different irrigation regimes

W_0 - no irrigation
W_1 - 100% crop requirement
W_2 - 50% crop requirement



SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: A/NTxWater/84/R_1

Cat No.: 1522

TITLE : The influence of soil moisture on the efficacy of nematicides.

1. Particulars of the project.

This crop	: 1st ratoon
Site	: Field 704 La Mercy
Region	: North Coast Coastal
Soil system	: Berea
Soil form/series	: Hutton/Clansthal
Design	: 3 x 3 x 2 x 2 (1 rep)
Variety	: NCo 376 & N18
Fertilizer/ Ameliorants 14/11/85	: N 165, P, K 165

Soil analysis: Date: 29.10.85

pH	O.M.%	Clay %	P.D.I.
5,74	-	5	-

ppm

P	K	Ca	Mg	Zn	Al
27	55	137	37	1,3	-

Age: 12,2mths Dates: 29.10.85 - 6.11.86

Rainfall: 742mm L.T.M.:

Irrigation: see treatments

N	D	J	F	M	A	M	J
76	86	117	36	161	74	0	30

J	A	S	O
1	36	35	90

2. Objectives:

1. To measure the efficacy of Temik and Curaterr under adequate and inadequate moisture conditions.
2. To compare the yields of two varieties under three water regimes on a weak sand in the presence or absence of nematicides.
3. To determine whether soil moisture at the time of nematicide application has an influence on the efficacy of nematicides.

3. Treatments:

3.1. Irrigation.

1. No irrigation (W_0).
2. About 10mm when TAM reaches 56mm according to P & L account (W_1).
3. About 10mm when TAM reaches 34mm according to P & L account (W_2).

3.2. Nematicides.

1. No nematicide - control.
2. Curaterr at 30kg ha^{-1}.
3. Temik at 20kg ha^{-1}.

3.3. Varieties.

1. NCo 376.
2. N18 (71L760).

3.4. Moisture when nematicides are applied.

1. Dry at time of application.
2. Moist at time of application.

Notes on treatments.

* Irrigation water was applied through drippers placed 600mm apart on the soil surface in every interrow.
* Treatment 3.4 could not be applied because no attempt was made to exclude rain which filled the soil profile a few days after harvesting the plant crop and on several occasions thereafter.
* Nematicides were applied on 14/11/85 - two weeks after harvesting the plant crop. All treatments were applied as they were in the plant crop.

4. Results.

Table 1. Yields from plots with or without nematicides at three levels of soil moisture.

	t c ha^{-1}			pol % cane			t suc ha^{-1}					
	W0	W2	W1	W0	W2	W1	W0	Δ	W2	Δ	W1	Δ
No nematicide	44	81	102	12,9	15,3	15,5	5,7		12,4		15,8	
Curater	81	114	115	14,9	15,0	15,5	12,1	6,4	17,1	4,7	17,8	2,0
Temik	95	131	122	14,7	15,1	15,1	14,0	8,3	19,8	7,4	18,4	2,6
MEAN	73	109	113	14,2	15,1	15,4	10,6	7,35	16,4	6,05	17,3	2,3
S.E.D.		±10,4			±0,38				±1,33			
LSD(P=0,05)		22			0,8				3,2			

Table 2. Yields of two varieties and three soil moisture regimes.

	t c ha^{-1}				pol % cane				t suc ha^{-1}			
	W0	W2	W1	MEAN	W0	W2	W1	MEAN	W0	W2	W1	MEAN
N18	65	105	103	91	14,5	15,5	15,8	15,3	9,6	16,3	16,2	14,0
NCo 376	82	112	124	106	13,8	14,8	14,9	14,5	11,5	16,4	18,5	15,5
S.E.D.		±8,5				±0,31				±1,25		
LSD(P=0,05)		18				0,7				2,6		

Table 3. Yields of two varieties treated with Temik and Curaterr.

	t c ha^{-1}		pol % cane		t suc ha^{-1}		stalk pop $x\ 1000\ ha^{-1}$		stalk length(cm)	
	N18	NCo376	N18	NCo376	N18	NCo376	N18	NCo376	N18	NCO376
Control	71	81	14,9	14,3	10,6	11,5	103	130	180	173
Curaterr	97	110	15,6	14,7	15,2	16,1	110	147	215	212
Temik	104	128	15,3	14,6	16,0	18,6	112	152	223	224
MEAN	91	106	15,3	14,5	14,0	15,5	108	143	206	203
S.E.D.	±8,5		±0,31		±1,25		±4,1		±12,9	
LSD(P=0,05)	18		0,7		2,6		9		27	

Table 4. Main effects.

Treatment	t cane ha^{-1}	pol % cane	t suc ha^{-1}
Water			
WO	73	14,2	10,6
W2	109	15,1	16,4
W1	113	15,4	17,3
Nematicides			
Control	76	14,6	11,3
Curaterr	103	15,1	15,6
Temik	116	15,0	17,3
S.E.D. ±	5,6	0,22	0,88
LSD(P=0,05)	12,6	0,46	1,9
Varieties			
NCo 376	106	14,5	15,5
N18	91	15,3	14,0
S.E.D. ±	4,9	0,18	0,72
LSD(P=0,05)	10,6	0,38	1,5

Table 5. Rainfall (mm) and irrigation applied to W1 and W2 plots.

	N	D	J	F	M	A	M	J	J	A	S	O	N	TOTALS
Rainfall (mm)	76	86	117	36	161	74	0	30	1	36	35	90	0	742mm
Effective rainfall (W0)	66	86	112	36	119	74	0	30	1	36	35	90	0	W0 = 685mm
W2	66	86	57	36	80	67	0	30	1	36	35	90	0	W2 = 584mm
W1	66	86	53	36	54	59	0	30	1	18	25	90	0	W1 = 518mm
Irrigation W2	0	23	58	91	85	82	83	45	92	101	69	63	0	W2 = 792mm
W1	0	57	83	115	110	67	100	67	100	100	77	69	0	W1 = 945mm
Total effective moisture W0	66	86	112	36	119	74	0	30	1	36	35	90	0	W0 = 685mm
received W2	66	109	115	127	165	149	83	75	93	137	104	153	0	W2 = 1376mm
W1	66	143	136	151	164	126	100	97	101	118	102	159	0	W1 = 1463mm
No of days when TAM = 0 in W0 plots according to P & L account	0	0	6	16	10	17	30	19	31	27	20	21	0	197

Table 6. % joints bored by eldana with various water and nematicide treatments.

Irrigation regime	nematicide	% joints bored
WO	nil	12,92
WO	Curaterr	6,73
WO	Temik	7,65
W2	nil	3,10
W2	Curaterr	2,89
W2	Temik	4,09
W1	nil	2,45
W1	Curaterr	3,20
W1	Temik	3,33
MEANS WO		9,10
W2		3,36
W1		2,99
No nematicide		6,16
Curaterr		4,28
Temik		5,02

5. Comments.

5.1. Soil moisture.

Good rains in November, January and March filled the soil profile in all plots. WO plots received 685mm of effective rainfall in this crop. Soil moisture was depleted to zero to P & L acc.) on 197 days. The total effective moisture (rainfall and irrigation) received in W2 plots was 1376mm which was 93% of that received in W1 plots. All plots were at field capacity when the trial commenced in November and soil moisture content was high when nematicides were applied. Because plots had different soil moisture status it was estimated that of the 742mm rainfall recorded at La Mercy, 685mm were effective in WO plots, 584mm in W2 plots and 518mm in W1 plots. W2 plots received 792mm through irrigation and W1 plots received 945mm. The total effective moisture received by W1 plots was 87mm more than in W2 plots. The responses to the added moisture in W2 and W1 plots were 5,8 and 6,7

ton suc ha^{-1} more than the yields from W0 plots, respectively. Cane yields were 10,6 t/ha/100mm, 7,92 t/ha/100mm and 7,7 t/ha/100mm for W0, W2 and W1 moisture regimes respectively.

5.2. Interaction

5.2.1. W x V x N

There was no evidence of a three way interaction (f value = 0,52).

5.2.2. W x V and N x V (see Tables 2 & 3)

There was also no evidence of any interaction between varieties and water or varieties and nematicides. From these data no conclusions could be drawn concerning the differences in responses of N18 and NCO 376 to moisture levels and nematicides.

5.2.3. N x W (see Table 1)

There is evidence that responses to nematicides were affected by moisture levels; decreasing with increased available soil moisture from 7,4 t suc ha^{-1} at W0 to 2,3 t suc ha^{-1} at W1. Maximum yields from nematicide treated cane were achieved at W2 moisture level (18,45 t suc ha^{-1}) while untreated cane suprisingly responded to the additional moisture (+87mm) of the W1 treatment by producing a further 21 t cane ha^{-1} and 3,4 t suc ha^{-1}.

5.3. Nematicides (Temik and Curaterr) (see Table 4)

The mean responses to Curaterr and Temik were 4,3 and 6,0 t suc ha^{-1} respectively. There is no evidence of soil moisture levels or varieties having had an effect on the response differences between Temik and Curaterr.

5.4. Varieties (see Table 4)

The mean yield differences between NCO 376 and N18 were statistically significant (P = 0,05). There is no statistical evidence that the higher yields from NCO 376 were influenced by responses to nematicides or soil moisture levels. Sucrose yields of N18 have been 103% and 90% of NCO 376's in the plant and 1st ratoon crops respectively.

5.5. Eldana (see Table 6)

The percentage of joints bored were low in irrigated plots (W1 and W2) and although differences between varieties and nematicides were small, fewer joints were bored in NCO 376

than in N18 while there appeared to be more joints bored in nematicide treated cane.

In rainfed plots (WO) eldana damage was substantially higher. In these plots (WO) treated with a nematicide, the damage was appreciably lower than plots not treated with a nematicide. N18 had 11,4% joints bored compared with 6,8% for NCO 376 (S.E.D. = $\pm$ 0,99).

RAD/lp
9/11/87

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: A/NTxWATER/84/R2

Cat. No.: 1522

TITLE : The influence of soil moisture on the efficacy of nematicides.

1. PARTICULARS OF THE PROJECT

This crop	: 2nd ratoon			
Site	: Field 704 La Mercy			
Region	: North Coast Coastal			
Soil system	: Berea			
Soil form/series	: Hutton/Clansthal			
Design	: 3 x 3 x 2 x 2 (1 rep)			
Variety	: NCo376 & N18			
Fertilizer/ Ameliorants	:	N	P	K
		165	-	165

Soil analysis ; Date :					
pH			Clay %		
6,19			5		
ppm					
P	K	Ca	Mg	Zn	
22	46	177	46	1,5	
Age : 12,6			Date : 6/11/86 - 25/11/87		
Rainfall : See results L.T.M.					
Irrigation : Table 5					

2. OBJECTIVES :

1. To measure the efficacy of Temik and Curaterr under adequate and inadequate moisture conditions.
2. To compare the yields of two varieties under three water regimes on a weak sand in the presence or absence of nematicides.
3. To determine whether soil moisture at the time of nematicide application has an influence on the efficacy of nematicides.

3. TREATMENTS :

3.1. Irrigation

1. W_o - No irrigation
2. W_1 - Full crop requirement
3. W_2 - 50% of the difference between W_1 and W_0

3.2. Nematicides

1. No nematicides - Control
2. Curaterr at 30kg ha^{-1}
3. Temik at 20kg ha^{-1}

3.3. Varieties

1. NCo376
2. N18 (71L760)

3.4. Moisture when nematicides are applied

1. Dry at time of application
2. Moist at time of application

Notes on treatments

* Irrigation water was applied through dripper lines placed in every interrow. Emitters spaced at 600mm were capable of delivering 2 ℓ water hr^{-1}.
* Treatment 3.4 was not applied as no attempt was made to exclude rain. Soil moisture was high in all plots at the time of applying the nematicides.

4. RESULTS

Table 1. Yields from plots with and without nematicide at three levels of soil moisture.

	tcha^{-1}			pol % cane			tsucha^{-1}					
	W_0	W_2	W_1	W_0	W_2	W_1	W_0	Resp.	W_2	Resp.	W_1	Resp
No nematicide	32	59	69	13,7	13,6	14,4	4,4		8,0		9,9	
Curaterr	44	79	81	13,4	14,9	13,8	5,9	1,5	11,8	3,8	11,2	1,3
Temik	89	99	96	14,0	13,9	13,7	12,3	7,9	13,8	5,8	13,2	3,3
MEAN								4,7		4,8		2,3
S.E.D.		± 8,7			±1,19		±1,27	±1,80	±1,27	±1,80	±1,27	±1,8
LSD(P=0,05)		18,3			2,5		2,66		2,66		2,66	
% difference Temik-Curaterr	51	20	16				52		14		15	

Table 2. Yields of two varieties in three soil moisture regimes.

	tcha^{-1}			pol % cane			tsucha^{-1}			Stalk pop x 100 ha^{-1}		
	W_0	W_2	W_1	W_0	W_2	W_1	W_0	W_2	W_1	W_0	W_2	W_1
N18	47	76	72	13,9	14,4	14,0	6,5	10,9	10,1	112	110	113
NCo376	63	82	92	13,5	13,9	14,0	8,5	11,5	12,8	107	137	147
S.E.D.	± 7,1			± 0,35			± 1,03			± 7,8		
LSD(P=0,05)	14,95			0,75			2,17			16,4		

Table 3. Yields of two varieties with and without Temik and Curaterr.

	tcha^{-1}		pol % cane		tsucha^{-1}		stalk pop x 1000 ha^{-1}	
	N18	NCo376	N18	NCo376	N18	NCo376	N18	NCo376
Control	49	57	14,0	13,8	7,0	7,9	112	118
Curaterr	61	76	14,4	13,7	8,8	10,5	108	141
Temik	85	104	13,9	13,9	11,9	14,4	114	132
MEAN	65	79	14,1	13,8	9,2	10,9	112	130
S.E.D.	± 7,1		± 0,35		± 1,03		± 7,8	
LSD(P=0,05)	14,95		0,75		2,17		16,4	

Table 4. Main effects

Treatment	t cane ha^{-1}	pol % cane	t suc ha^{-1}
Water			
W_0	55	13,7	7,5
W_2	79	14,1	11,2
W_1	82	14,0	11,5
Nematicides			
Control	53	13,9	7,4
Curaterr	68	14,0	9,6
Temik	95	13,9	13,1
Varieties			
NCo376	79	13,8	10,9
N18	65	14,1	9,2

Table 5. Rainfall and irrigation applied to W_1 and W_2 plots.

Figure 1. Soil moisture levels of three water regimes (using P & L acc).

Table 5. Rainfall and irrigation applied to W_1 and W_2 plots.

Details		Month													Total
		N	D	J	F	M	A	M	J	J	A	S	O	N	
Rainfall (mm)		104,0	158,7	129,8	128,1	140,6	68,7	71,0	67,6	11,4	77,1	465,4	97,5	120,3	1640,2
Effectve rainfall (mm)	W_0	104,0	127,7	118,0	128,1	140,6	68,7	71,0	67,6	11,4	77,1	306,4	97,5	120,3	1438,4
	W_2	104,0	115,8	112,9	113,4	114,8	68,7	62,4	60,8	11,4	77,1	318,2	97,5	110,8	1367,8
	W_1	83,8	95,0	97,8	83,4	94,7	55,7	29,9	58,8	11,4	77,1	247,8	97,5	104,5	1137,4
Irrigation (mm)	W_2	0	0	0	42,7	39,0	29,8	61,1	6,8	58,1	38,8	55,8	7,1	15,3	354,5
	W_1	0	38,5	29,9	49,7	86,1	69,2	73,6	44,2	68,4	35,0	60,8	33,7	8,0	597,1
Total effective moisture rec'd(mm)	W_0	104,0	127,7	118,0	128,1	140,6	68,7	71,0	67,6	11,4	77,1	306,4	97,5	120,3	1338,4
	W_2	104,0	115,8	112,9	156,1	153,8	98,5	123,5	67,6	69,5	115,9	374,0	104,6	126,1	1722,3
	W_1	83,8	133,5	127,7	133,1	180,8	124,9	103,5	103,0	79,8	112,1	308,6	131,2	112,5	1734,5
No of days when TAM = 0 in plots	W_0	0	0	0	1	1	6	19	1	21	14	18	0	0	81

Table 6. Percentage internodes bored by eldana for various water and nematicide treatments and varieties.

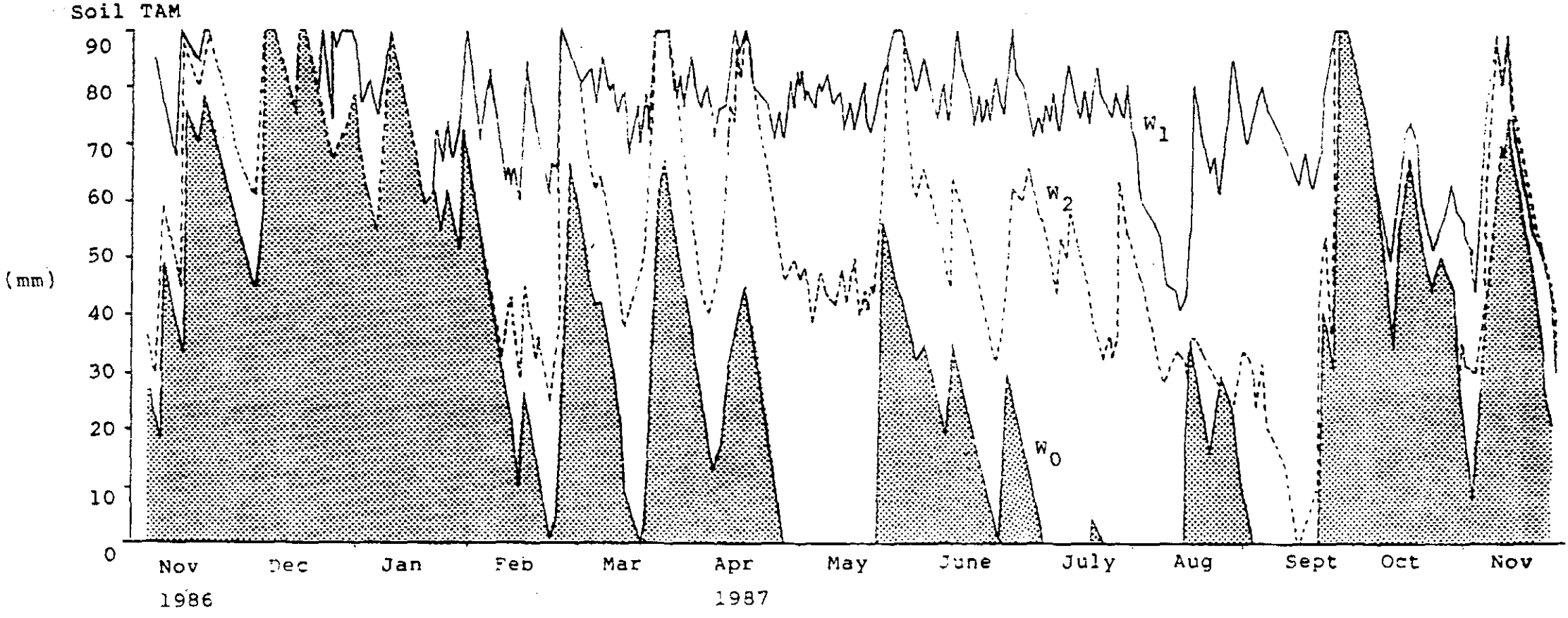
Moisture regime	nematicide	% internodes	% stalks bored
W_0	Nil	3,94	32,5
W_0	Curaterr	3,31	35,0
W_0	Temik	4,57	30,0
W_2	Nil	2,64	27,5
W_2	Curaterr	3,59	25,0
W_2	Temik	3,43	40,0
W_1	Nil	3,37	20,0
W_1	Curaterr	2,54	30,0
W_1	Temik	6,01	32,5
S.E.D.		± 1,88	± 11,6
LSD(P=0,05)		3,95	24,4
MEANS W_0		3,94	32,5
W_2		3,22	27,5
W_1		3,97	30,8
No Nematicide		3,31	26,7
Curaterr		3,15	30,0
Temik		4,67	34,2
NCo376		3,15	26,1
N18		4,27	34,4
S.E.D.		± 1,08	± 6,7
LSD(P=0,05)		2,28	14,08

Figure 1. Soil moisture levels of 3 water regimes (using P & L acc).

W_0 - No irrigation

W_2 - 50% of difference between W_1 and W_0

W_1 - Full crop requirements



5. COMMENTS

5.1. Soil moisture

Good rainfall during the first three months of the crop maintained soil moisture at a high level in all plots. Only from mid February could soil moisture differences be established. On many occasions the differences in soil moisture between W_1 and W_2 plots were nullified by rainfall. During the period April to September, soil moisture was depleted for 79 days in W_0 plots (see figure 1). The total effective moisture received by W_1 and W_2 was very similar and only about 400mm more than that for W_0 plots.

5.2. Interaction (Water x variety and Nematicide x variety)

The data shown in tables 2 and 3 provide no statistical evidence that NCo 376 and N18 respond differently to nematicides. NCo 376 responded to increased soil moisture (W_1 and W_2 plots) by producing significantly (P=0,05) more millable stalks than N18.

5.3. Nematicide x water

The small response to Curaterr in the W_0 plots is similar to that measured in the plant crop and unlike the more substantial response in the previous crop (R_1). Cane not treated with a nematicide responded to the additional water applied to W_2 and W_1 plots. This added response to the water applied in W_1 plots is surprising since the total effective moisture recorded for W_1 and W_2 was very similar. Nematicide treated cane yielded no better in W_1 plots than in W_2 plots and consequently the average response to nematicides declined with increasing levels of soil moisture. This trend is clearly evident in the responses from Temik.

5.4. Nematicides

The mean response to Curaterr and Temik were 2,2 and 5,7 tons sucrose ha^{-1} respectively. The difference of 3,5 tons sucrose ha^{-1} (= 61%) in favour of Temik is highly significant (P=0,01). The differences between response from Temik and Curaterr declined from 6,4 tons suc ha^{-1} in W_0 plots (1338mm of effective moisture) to 2,0 tons suc ha^{-1} in W_1 plots (1734mm of effective moisture). Curaterr treated cane and cane not

treated with a nematicide yielded 37tcha^{-1} more in W_1 plots than in W_0 plots. In contrast Temik treated cane responded to the additional moisture applied to W_1 plots by producing only 10tcha^{-1} more than in the W_0 plots.

5.5. Varieties

Results in table 2 indicate that yields of NCo 376 were significantly (P=0,05) higher than those from N18 for the W_0 and W_1 water regimes. Sucrose yields of N18 have declined from 103% of NCo 376 in the plant crop to 84% of NCo 376's in this 2nd ratoon crop.

5.6. Eldana

The data in table 6 shows that the percentage of internodes bored by eldana was very low and differences between treatments were small.