S O U T H A F R I C A N S U G A R I N D U S T R Y

A G R O N O M I S T S' A S S O C I A T I O N

NOTICE OF ANNUAL MEETING

The Annual Meeting of the Association will be held in the Sezela Hall at 10 a.m. on Wednesday, 21st September. The following programme has been prepared:

10 a.m.

1. Committee report for 1965/66 (Mr. R. Wyatt).

2. Reports on:

   (a) Variety trials (Dr. Shuker)

   (b) Depth of furrow experiments (Mr. J. Boyce)

   (c) Irrigation and drying off experiments (Mr. J. Hill)

   (d) Heat treatment of cane setts (Mr. Allsopp)

   (e) Land preparation trials (Mr. Gilfillan)

   (f) Filter cake experiments (Mr. Wyatt)

   (g) Phosphate responses in relation to soil analyses (Dr. Shuker)

3. General discussion.

1 p.m.

Lunch will be served at the Sezela Hall. Members will be the guests of Messrs. Reynolds Bros. Ltd.

2.30 p.m.

A tour of the Reynolds Bros. Estates to points of particular interest will be made during the afternoon.

Members are requested to prepare any data which might contribute to the discussions which will follow the presentation of individual reports. Other data on different subjects of interest may be presented in the "General Discussion".

SOUTH AFRICAN SUGAR INDUSTRY.

AGRONOMISTS' ASSOCIATION.

Catalogue No:
This Crop: Plant
Site: Research Station
Altitude: 1000'
Soil Series: Paragneiss
Design: Latin Square
Variety: -
Fertilizer: 150 N, 70 P, 50 K

Water Regime: Irrigated when available.
Moisture depleted to 50%

Soil Analysis:

pH	OM%	Clay%
6.0	1.2	20

p.p.m.			
P	K	Ca	Mg
44	200	1400	300

Age: 16
Rainfall: -
Irrigation: -

Object: Variety Trial

Treatments: See Results.

Results:

VARIETIES.	CP.29/116	NCo 376	NCo 293	Co 421	NCo 334	NCo 310
Tons Cane	101.2	97.7	92.1	83.1	82.4	80.57
T.C.A.M.	6.37	6.11	5.76	5.19	5.15	5.04
Tons Sucrose	10.99	11.81	10.98	9.527	9.91	9.93
T.S.A.M.	.68	.73	.68	.59	.62	.62

No significant differences between 376, 116 and 293. NCo 376 superior to 310, 334, 421, while 29/116 was superior to 334 and 421.

SOUTH AFRICAN SUGAR INDUSTRY.

AGRONOMISTS' ASSOCIATION.

Catalogue No:
This Crop: 1st Ratoon
Site: Research Station
Altitude: 1000'
Soil Series: Paragneiss
Design: Latin Square
Variety: -
Fertilizer: 175 N, 30 P, 50 K

Water Regime: Irrigated when available.
Moisture depleted to 50%

Soil Analysis:

pH	OM%	Clay%
6.0	1.2	20

p.p.m.			
P	K	Ca	Mg
40	120	1400	310

Age: 13 Months.
Rainfall: -
Irrigation: -

Object: Variety Trial

Treatments: See results

Results:

VARIETIES	NCo 376	CP 29/116	NCo 293	NCo 334	NCo 310	Co 421
Tons Cane	74.4	69.5	67.7	64.4	64.3	58.8
T.C.A.M.	5.72	5.34	5.21	4.95	4.95	4.52
Tons Sucrose	9.08	7.91	8.93	8.14	8.73	7.05
T.S.A.M.	.70	.61	.68	.63	.67	.54

N.Co 376 was superior to 29/116, 310 and 421
N.Co 293 was superior to 421

SOUTH AFRICAN SUGAR INDUSTRY.

AGRONOMISTS' ASSOCIATION.

Catalogue No:
This Crop: Plant
Site: Research Station
Altitude: 1000'
Soil Series: Paragneiss
Design: Latin Square.
Variety: -
Fertilizer: 150 N. 70 P 50 K

Water regime: Irrigated when available.
Moisture depleted to 50%

Soil Analysis:

pH	OM%	Clay%
6.3	1.3	20

p.p.m.			
P	K	Ca	Mg
36	210	1200	310

Age: 12 Months

Rainfall: -
Irrigation: -

Object: Variety Trial.

Treatments: See results.

Results:

VARIETIES	Co. 462	CB 36/14	N50/211	NCo.79	NCo.310	CB.38/22
Tons Cane	61.7	61.6	60.3	59.0	57.8	57.7
T.C.A.M.	5.14	5.13	5.03	4.92	4.81	4.80
Tons Sucrose	8.34	8.37	7.91	8.48	8.50	8.49
T.S.A.M.	.69	.70	.66	.71	.71	.71

No significant difference between varieties.

SOUTH AFRICAN SUGAR INDUSTRY.

AGRONOMISTS' ASSOCIATION.

Catalogue No:
This Crop: 1st Ratoon
Site: Research Station
Altitude: 1000'
Soil Series: Paragneiss
Design: Latin Square
Variety: -
Fertilizer: 175 N, 30 P, 50 K

Water Regime: Irrigated when available. Moisture depleted to 50%

Soil Analysis:

pH	OM%	Clay%
6.2	1.1	20

p.p.m.			
P	K	Ca	Mg
38	200	1200	300

Age: 10 Months

Rainfall: -
Irrigation: -

Object: Variety Trial

Treatments: See results

Results:

VARIETIES	CB 36/14	Co 462	N50/211	NCo 79	CB 38/22	NCo 310
Tons Cane	62.1	61.9	60.7	55.5	55.0	53.9
T.C.A.M.	6.21	6.19	6.07	5.55	5.50	5.39
Ton Sucrose	7.08	6.65	5.87	7.35	6.17	7.05
T.S.A.M.	.71	.67	.59	.74	.62	.71

N.Co 79 was significantly superior to CB 38/22 and 50/211.

CB 36/14 was significantly superior to N 50/211

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

FURROW DEPTH

The results of three experiments conducted at Mount Edgecombe on Alluvial, Black Dolerite and Middle Ecca soils have shown that in general, there is an advantage to be gained in terms of yield per acre from shallow furrows compared with medium and deep furrows, and that the effects may even continue to be expressed in the first ratoon yields. However, these experiments were laid down with the plot rows made up of 7 stools of cane each 3 ft. apart, the five inner stools being harvested as a net plot.

In order to verify these results under normal planting conditions with setts placed continuously in the furrow two experiments are being conducted at Chaka's Kraal under dryland and irrigated conditions. Both experiments were planted with variety N:Co.376 in November 1964 and the plant crops were harvested in July 1966. The furrows were drawn with the bottom of each furrow 4, 8 and 12 inches below the top of the ridge. The setts were covered with 2 inches of soil in all treatments. During cultivation all treatments were reduced to a flat soil surface. Rainfall during the growing period totalled 58.5 inches and the amount of water applied to the irrigated experiment was 31.5 inches.

Shoot and stalk counts were made monthly, together with measurements of the vertical ground cover percentage. In both experiments, though to a lesser degree under irrigated conditions, the maximum and final populations were greater from shallower furrows. Ground cover measurements showed that under irrigated conditions, full canopy was attained earlier with shallower furrows, whilst under dryland conditions, there was little difference between treatments. Soil thermometers were placed within the row immediately after planting and data were obtained for 5 cm. and 10 cm. depths until full canopy was attained. Initially, temperatures were higher in the shallower furrows but following the attainment of full canopy this situation was reversed.

The results of the plant crops of the experiments are shown in Tables I and II.

TABLE I

Furrow Depth Under Irrigated Conditions

Plant Crop Results (21 months)

Treatment	T.C.A.	S. % Cane	T.S.A.	Stalk Count x 10^{-3}	Stalk Length (ft)	Mean Diameter (mm)
T_1 4"	66.5	16.16	10.74	53.4	7.43	23.9
T_2 8"	70.2	15.98	11.21	51.4	7.69	24.4
T_3 12"	71.0	15.67	11.11	50.1	7.90	25.3
L.S.D. (0.05)	5.8	0.60	0.83	3.3	0.42	0.6
(0.01)	8.1	0.84	1.15	4.5	0.58	0.9
C.V. (%)	7.8	3.5	7.0	5.9	5.1	2.4

TABLE II

Furrow Depth Under Dryland Conditions

Plant Crop Results (21 months)

Treatment	T.C.A.	S. % Cane	T.S.A.	Stalk Count x 10^{-3}	Stalk Length (ft)	Mean Diameter (mm)
T_1 4"	50.1	16.27	8.15	54.0	6.10	24.4
T_2 8"	58.3	15.95	9.30	51.5	6.45	25.4
T_3 12"	58.3	15.95	9.31	53.2	6.62	25.7
L.S.D.						
(0.05)	6.2	0.48	1.08	6.4	0.41	0.8
(0.01)	8.6	0.66	1.50	8.9	0.57	1.2
C.V. (%)	10.4	2.8	11.3	11.1	6.0	3.1

It is evident that under irrigated conditions the yield from the shallowest furrow depth tended to be decreased, though not significantly. The shallowest furrow depth gave significantly shorter and thinner stalks, but the population of stalks was significantly greater with shallow compared to deep furrows. While there was no significant evidence of any effect of furrow depth on sucrose % cane, it is notable that the sucrose % cane was higher from shallow furrows. The cane in three plots was heavily lodged. Two of these were 4 in. furrow treatments and one was an 8 in. furrow treatment. Slight lodging took place in an additional seven plots, three being 4 in. furrow treatments and four were 12 in. furrow treatments.

Under dryland conditions (Table II) the shallowest furrow depth gave a significant decrease in yield and the stalks were shorter and thinner. There was no significant evidence of any effect on stalk populations or sucrose % cane, but it is again notable that the sucrose % cane was higher from shallow furrows. There was no evidence of lodging under dryland conditions.

In neither of these experiments was there any significant difference between the medium and deep furrows. The depression of yield from shallow furrows in both experiments, which appears to be associated with shorter and thinner stalks, serves to indicate that furrows used in commercial practice should not be too shallow. At the same time the data does confirm the view that furrows need not be excessively deep. No ready explanation is evident for the reduction of yield in the face of higher initial and final plant populations from the shallowest furrows.

19th September, 1966.

Effects of Varying Temperatures on Germination and Yield of Hot Water Treated Cane.

Introduction:

During the first season of H.W.T. on a commercial scale at Doornkop, it was noted that certain varieties responded differently to H.W.T., and that different batches of treated cane of the same variety also gave a varying response. On studying the recorded temperature charts it became apparent that germination was directly related to temperature, being unaffected, or even slightly enhanced at the lower levels of the accepted effective temperature range, and adversely affected by temperatures at the upper levels. These observations were supported by reported findings of other workers in this field, so it was decided to lay down an experiment in which these effects of temperature could be studied more closely.

Procedure & Results.

The treatments, each replicated 5 times, were as listed below. The variety N:Co. 376 was used for all treatments and apart from the H.W.T., all plots received identical fertilizer, weeding, cultivation, etc.

1. Control - no H.W.T.
2. Normal H.W.T. - 124°F (51.1°C)
3. Overheating - 126°F (52.2°C)
4. Underheating - 120°F (48.9°C)
5. Tops only - 124°F

Treatments 1 - 4 included the tops (uppermost set cut from each stalk) while in treatment 5 only the tops were planted. In all cases topping was slightly below the normal level for seed cane as it was accepted that the very young soft eyes would be adversely affected by H.W.T.

Stalk Count at 13 Weeks after Planting:

Treatment.	Average No. of Stalks per plot	% of Control.
1.	578	100
2.	374	65
3.	59	10
4.	629	109
5.	64	11

Harvest Results at 23 months:

Treatment.	Yield T.P.A.	% of Control.
1.	44.7	100
2.	37.5	84
3.	17.0	38
4.	55.5	124
5.	13.1	29

Conclusions:

1. Rigid temperature control is extremely important when subjecting cane to hot water treatment.

2. Temperature in the treatment tanks should be limited to a maximum of ± 123°F.

3. Germination of the youngest eyes at the tops of the stalks is adversely affected by H.W.T.

4. Heating the cane to just below the minimum temperature considered necessary to kill the R.S.D. virus appears to stimulate germination.

RW/TM/15/9/66.

LAND PREPARATION EXPERIMENTS

21.9.66

E.C. GILFILLAN

GENERAL.

Three land preparation experiments have been laid down at Tongaat so far. One on recent sand (Fernwood series), and two on shale soil (Windermere and Milkwood series). The plot size used in the first two experiments was 100 ft. x 28 ft. It was felt however that this was too small for the proper effect of the implements to be realised, and so in the third trial a plot size of 180 ft. x 88 ft. was used, with 15 ft. turning breaks provided between the plots.

TREATMENTS.

A.

FERNWOOD SERIES EXPERIMENT:

1. Deep ploughing to 30 inches, followed by normal field treatment.

2. 7 Tons trash per acre disced in, followed by normal field treatment.

3. Minimum tillage :- Killing the old cane chemically and furrowing and planting the old interrow.

4. Normal field treatment which consisted of disc ploughing, rotavation, furrowing and planting.

In fact, it proved impossible to eradicate the old cane chemically, so it was taken out with hoes so as to cause minimum soil disturbance. All plots were split at planting for Fumigon applied at three gallons per acre at one square foot intervals, by means of an injection gun to a depth of nine inches.

B.

WINDERMERE SERIES EXPERIMENT

1. Maximum preparation :- Normal field treatment plus rotavation.

2. Minimum tillage - as above.

3. Filter press - 40 T.P.A. plus normal field treatment.

4. Control - Normal field treatment which consisted of cross sub-soiling to a depth of 22" followed by a heavy Rome harrow plough, a light harrow, furrowing and planting.

2/...

C.

MILKWOOD SERIES EXPERIMENT

1. Maximum preparation - as above, but plots split for sub-soiling before and after preparation.

2. Minimum tillage - as above, but plots split for sub-soiling versus no sub-soiling.

3. Deep ploughing followed by normal preparation. Plots split for filter press in the line at planting versus no filter press.

4. Control - Filter press at 40 T.P.A. plus normal preparation. Plots split for sub-soiling before and after preparation.

RESULTS.

The only trial harvested so far has been the Fernwood series trial. The only difference obtained worthy of note was an approximate 50% increase in yield due to the Fumigon. The plots were split for Fumigon to try and determine whether any treatment, (particularly deep ploughing) had any effect on the Nematode population. Although slight differences are apparent, it is felt that nothing significant will be obtained. The results however, have yet to be properly analized.

MEASUREMENTS.

Gypsum blocks at depths of 6", 18", 30" and 42" were put in, in the two experiments on shale soils. The results from the Milkwood series trial are presented below. In this case, two blocks at each depth were put in, in each half of the plot, making a total of 16 blocks per whole plot. These blocks are read twice a week from two central panels in each plot. It must be emphasized that the moisture reading obtained from these blocks can only be used on a qualitative basis.

Growth and population are measured once a month on all trials and weed counts were also taken on the Milkwood series experiment.

An Infiltrometer has been used in the Milkwood series experiment for the past three months, and the average results for 12 readings per treatment are presented below.

MEASUREMENTS TAKEN ON THE MILKWOOD SERIES EXPERIMENT

Date planted: 14.12.65. Variety: NCo 376
Rainfall to date: 15.56 inches.

The trial grew rapidly until the end of February, but from then on growth virtually ceased due to the effects of the drought. Of the 15.56 inches of rain, the experiments received

3/...

over 10 inches in the first three months, and only 5 inches in the last six months. As a result the experiment is showing severe symptoms of drought. An attempt was made to assess the damage, but no definite pattern emerged of one treatment withstanding the drought better than any of the others.

The results of a weed count taken two months after planting are as follows :- (The whole experiment had received a complete weeding one month after planting)

TREATMENT		WATER-GRASS	BROAD-LEAF
Deep ploughing	FP	560	102
	NFP	1286	50
Control	SSAP	6424	68
	SSBP	5078	80
Maximum preparation	SSAP	3660	147
	SSBP	2432	140
Minimum Tillage	SS	2500	197
	NS	3985	331

The trial was weeded twice more before winter, whereas the deep ploughing treatment was only weeded once.

Height and population figures taken on 8th August, 1966, are as follows :-

TREATMENT		HEIGHT (INCHES)	POPULATION
Deep ploughing	FP	18.2	6844
	NFP	14.8	6140
Control	SSAP	16.0	6254
	SSBP	17.1	5824
Maximum Preparation	SSAP	17.3	5196
	SSBP	15.3	5342
Minimum Tillage	SS	14.8	5403
	NSS	13.8	4886

These differences in growth and population were apparent by the end of February and no major changes have occurred since then.

4/...

INFILTRATION READINGS

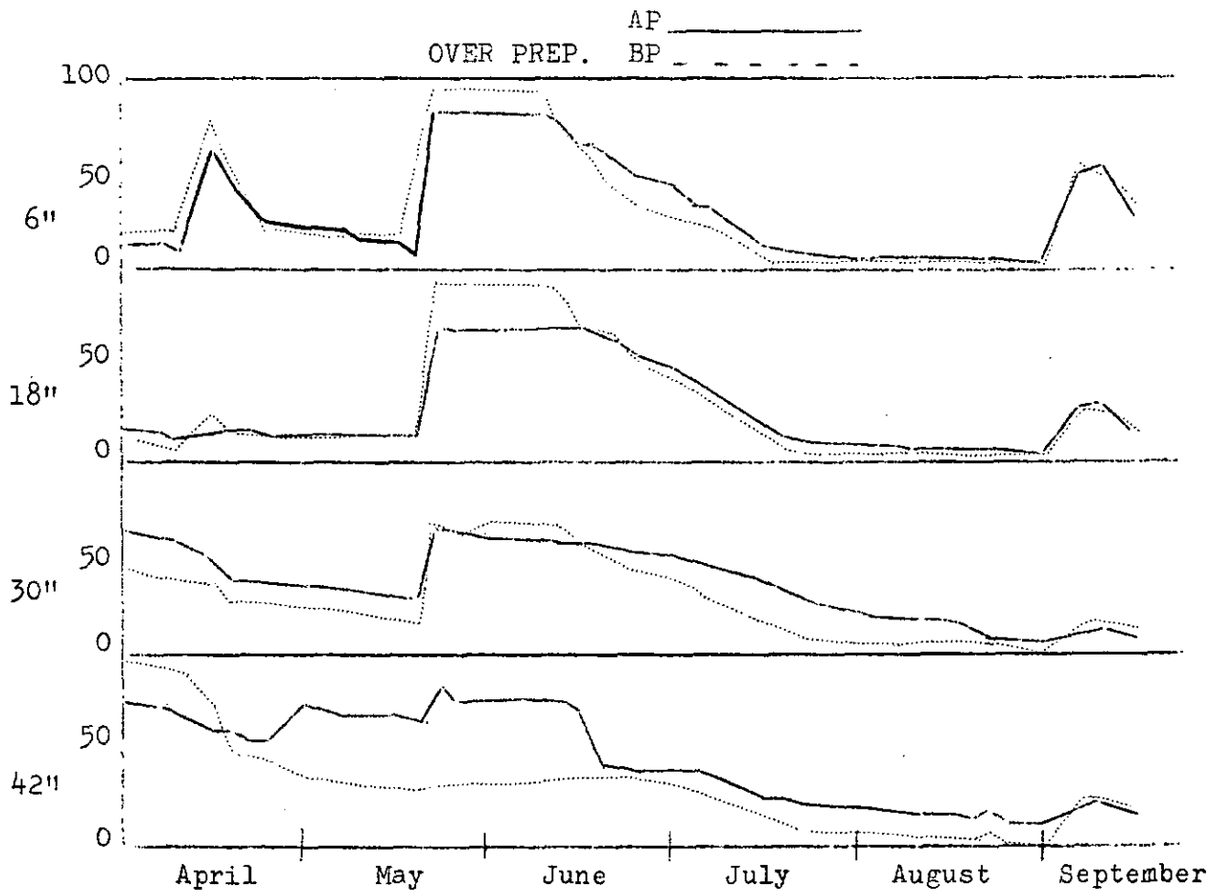
Treatment		Bulk Density Top 3"	Second 3"	Infiltration (inches in 1st hour)	Percolation rate (inches per hour)
Deep Ploughing	FP	1.38	1.39	10.6	8.9
	NFP	1.40	1.41	10.7	9.0
Control	SSAP	1.32	1.31	7.5	6.0
	SSBP	1.30	1.33	8.2	6.4
Maximum Preparation	SSAP	1.30	1.34	9.8	8.0
	SSBP	1.36	1.32	9.3	7.1
Minimum Tillage	SS	1.31	1.32	8.0	6.2
	NSS	1.34	1.35	7.7	6.4

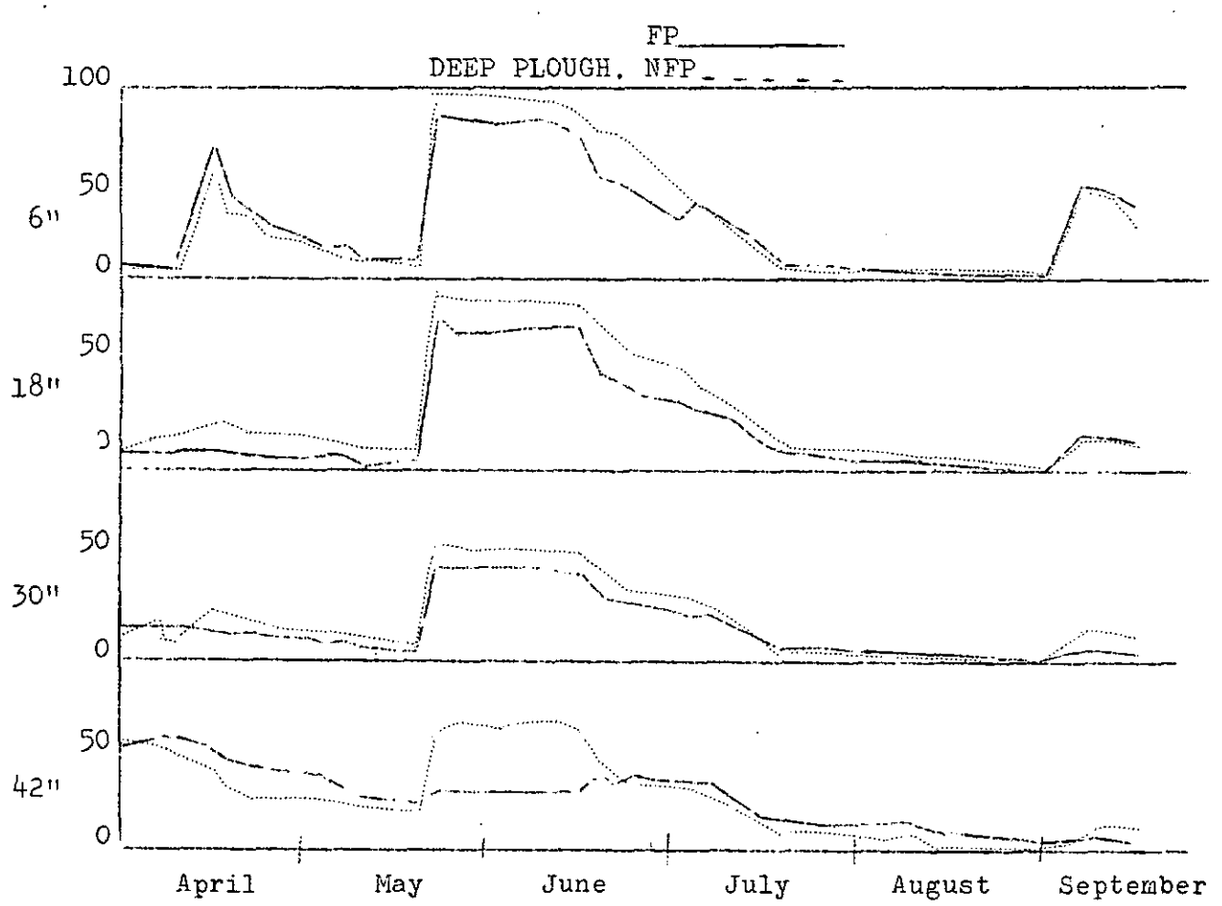
From all the above data it can be clearly seen that deep ploughing with filter press in the line is the outstanding treatment so far.

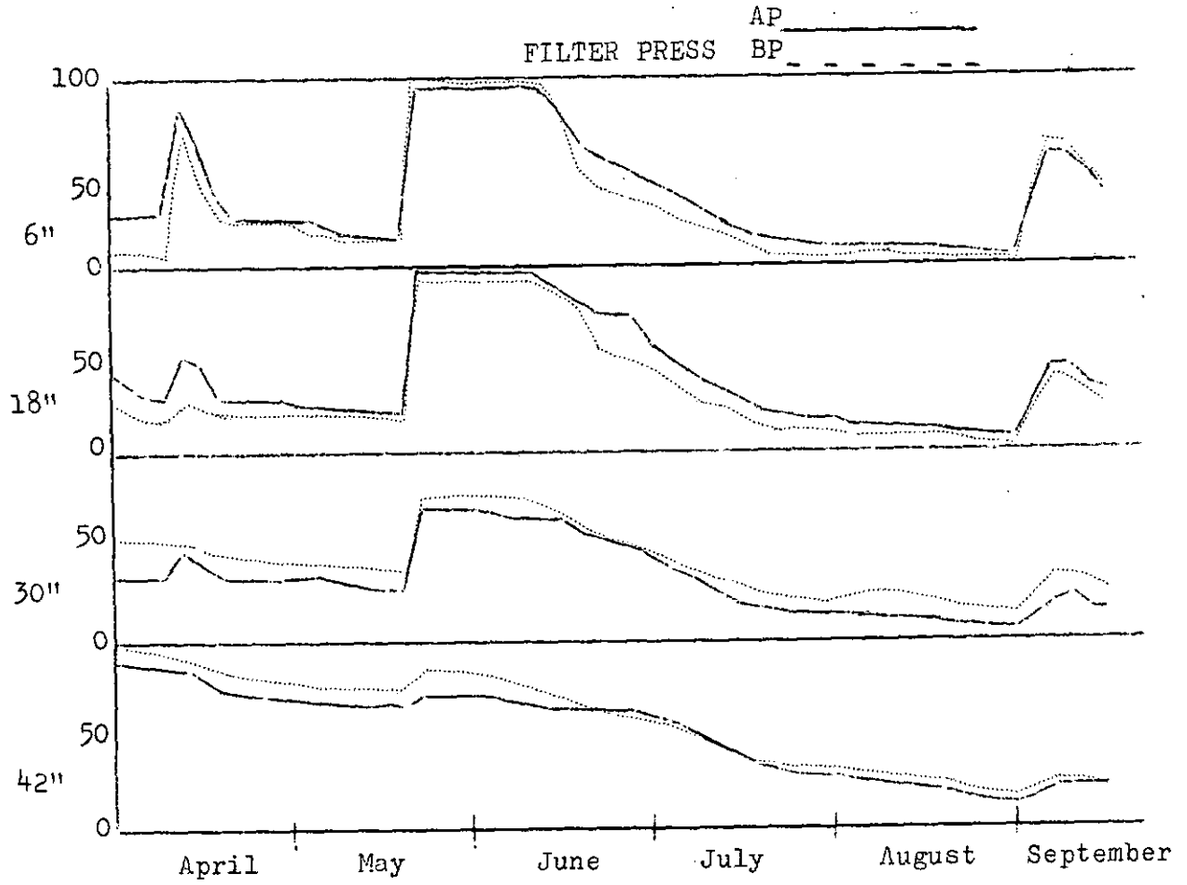
Whether the final yield increase over the other treatments will make this treatment economically justifiable, however, can only be determined after a number of ratoons.

ECG/JT

GYPSUM BLOCK MOISTURE READINGS



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FILTER PRESS BP
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50
6"
0
50
18"
0
50
30"
0
50
42"
0
April
May
June
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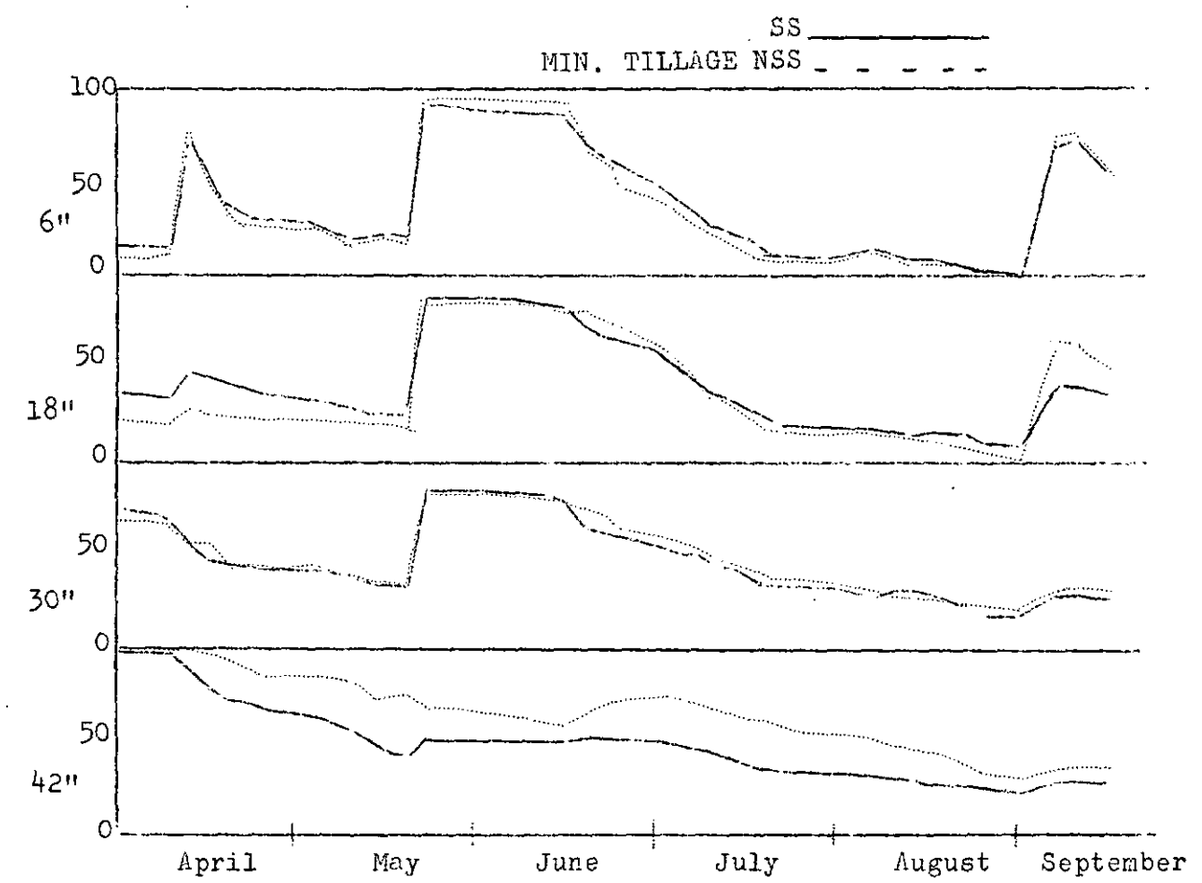
August
September


SS
MIN. TILLAGE NSS
100
50
6"
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August
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DOORNKOP SUGAR COMPANY (PTY) LIMITED.

R. Wyatt

Filterpress cake Trials.

The results obtained from the first filterpress cake trials to be harvested by this Company and, observation of a more recently established trial, confirms as correct our policy of applying the bulk of this material to the high organic matter Inanda, rather than the Cartref, soil series.

Harvest results reported by other Agronomists to the S.A.S.I.A.A. and appearing in that associations file, which has been distributed to all members, appear to strengthen the argument in favour of this policy. Of the four trials, situated on Cartref soils, reported, two appear to give consistant responses to filterpress cake in plant cane, with little if any residual response in the ratoon. The results obtained from the five trials on Inanda on the other hand all show big responses to applications of this material.

The following tables show the results obtained by Doornkop :

Table 1. Filterpress cake & Phosphate Trial. (Catalogue No. 291)
Soil Series: Inanda.

Results: (T.C.A.)

Treatments				
Phosphate (lb.p.a.)	Filterpress cake (tons p.a.)			
	0	10	20	Mean
Nil	45.2	53.3	55.8	51.4
Supers 400	47.2	52.6	59.2	53.0
Reno 400	46.9	58.4	55.3	53.6
Mean	46.5	54.8	56.8	
Supers + Reno 400 ea.	48.4			

This produced significant evidence that application of Filterpress cake, on the average, increases yield for T.C.A., but no evidence of a difference between 10 and 20 ton applications.

Table 2. Filterpress cake (rates & placement) Trial. (Catalogue No. 293)
Soil Series: Cartref.

Treatments	T.C.A.	S. % C.	T.S.A.
1. Control	44.6	13.87	6.17
2. F.P. 30 t.p.a. broadcast	40.5	13.21	5.29
3. " 60 " "	41.6	12.99	5.57
4. " 10 " in furrow	38.8	13.47	5.18
5. " 20 " " "	41.5	13.79	5.78

There is no significant evidence of the existence of differences between treatments.

It is surprising that the addition of organic matter, to this sandy loam of 0.7% organic matter content, has not benefitted the crop. The lack of response may in part be caused by a possible concentration of roots in the shallow area in proximity to the filterpress cake, whereas a deaper rooting system would have been more beneficial to the crop during the periods of extreme moisture stress which occurred only too frequently during the past seasons. Under these conditions the organic material, which would normally aid in the retention of moisture, has not been able to conserve sufficient moisture to increase crop yield.

Table 3./.....

Table 3. Soil Fumigation & Filterpress cake Ratoon Trial. (Catalogue No. 296)
Soil Series: Inanda.

Treatments	T.C.A.	S. % C.	T.S.A.
1. Control	29.3	15.91	4.66
2. Filterpress cake 10 t.p.a.	38.4	15.52	5.96
3. Nemagon 80 E.C.	27.6	16.04	4.43
4. Filterpress cake + Nemagon	44.2	15.39	6.79
S.E. of treatment mean	2.21	0.146	0.330
L.S.D. (0.05)	7.1	0.47	1.05
(0.01)	10.2	0.67	1.51

Comments :

1) Evidence is significant of a response to Filterpress cake in that an increased T.C.A. & T.S.A. are recorded, whilst there is a depressing effect on S. % C. as per details :

	T.C.A.	S. % C.	T.S.A.
Average response	12.8	-0.52	1.83
S.E. of response	2.21	0.146	0.330
95% Confidence	7.8	-0.19	1.08
Limits	17.8	-0.85	2.58

2) There is no significant evidence of any effect of Nemagon.

3) Nematode Counts :

If the nematode counts, done prior to application of the treatments, are taken into consideration, the magnitude of this response to filterpress cake is even more gratifying.

In comparing the mean nematode counts for each treatment the following picture develops :

Treatments	Nematode Count as % of Filter-press cake treatment count
1. Control	24
2. Filterpress cake	100
3. Nemagon	3
4. Filterpress cake + Nemagon	9
Means	
2 & 4 Filterpress cake	100
1 & 3 Control & Nemagon	25

These data show the parasitic nematode populations of the Filterpress cake treatments to be on average 400% higher than in those treatments not having Filterpress cake. Nematode counts in all treatments however, are considered sufficiently high to cause some damage to cane.

Unfortunately conditions following the harvest of this trial have been poor for the determination of the nematode populations resulting from treatment effects and so this will be done a few weeks after good Spring rains have fallen.

4./----------

4) Costs:

Because of the encouraging response to Filterpress cake of 12.8 Tons Cane per acre obtained in this experiment, the following costs have been calculated in order to determine the financial benefit to be gained from this treatment.

Revenue & Expenditure per acre.

Filterpress cake (10 tons per acre) - average response 12.8 Tons Cane per acre.

	Exp. R. c	Rev. R. c
Revenue: 12.8 tons cane at R3-50 per ton		44-80
Expenditure:		
a) Cartage of Filterpress cake - based on 16 miles @ 20 c.p.m. by 6 ton loads - (16 x 20) x $\frac{10}{6}$	5-33	
b) Application of Filterpress cake - based on 1 unit per ton @ 50c	5-00	
c) Harvesting & Transport of 12.8 tons cane @ 85c per ton	10-88	
Totals.	21-21	44-80

Nett Gain of Revenue over Expenditure R23-59

Remarks:

i) The minimum yield response to treatment required to cover Expenditure is 6.1 tons cane per acre, and this is 1.7 tons less than the "95% lower confidence limit" of 7.8 tons cane.

ii) Further experimentation on these lines may indicate other savings :

a) a lower fertiliser requirement could result from this treatment,

b) lower rates of filterpress cake may result in the same response,

c) mechanising the application of the material is most important in saving labour units and, may prove the cheaper method.

iii) Savings could also be effected by :

a) a lower weeding requirement,

b) higher production per unit area; thus also releasing land for alternate crops, such as coffee, which yield a bigger profit per unit area than sugarcane at present prices.

iv) An estimated 1,400 acres per annum of both Plant and Ratoon canes could benefit from this treatment.

Taking the Estates' filterpress allocation into account, only 900 acres could be covered by a 10 ton per acre application. The lower "Confidence Limit" response of 8 tons cane per acre would result in an increased tonnage of 7,200 from this area.

Providing that this additional tonnage is not required for milling and estimating the average yield per acre to be 55 tons cane, then approximately 130 acres of our better soils could be made available for alternatives, or, at an average yield of 30 tons cane per acre, approximately 240 acres of marginal land could be put to more suitable use.

Alternatively/.....

Alternatively, the additional revenue from 7,200 tons cane at R3-50 per ton would be R25,200.

The additional revenue to be made by the factory from the lower "Confidence Limit" response of 1.08 Tons Sucrose per acre, has not been dealt with here but would be of considerable gain to the Company.

In a preliminary survey of parasitic nematode populations on the Inanda soil series of our Estates, the counts have without exception been high and, although the effects of these on sugarcane yields have as yet not been determined, present indications are that they are not inconsiderable.

We mention this because the response obtained to Filterpress cake on Inanda series, having a high organic matter content, would not seem so surprising in the light of findings as published by J.R. Christie (1), Watson (2), Linford & Yap (3) and others, who deal with control of nematodes from biological aspects.

Smith & Batista (4) have interesting comments to make in this regard :

"Applications of organic matter to the soil stimulate microbial action and some microorganisms produce substances which retard or inhibit the growth of others. It seems possible that the beneficial effect of the mulch in reducing root-knot injury results from some metabolic by-product in the decomposition of the organic matter, to the stimulation of some organisms antagonistic to the parasitic nematode, or to an improved fertility condition which permits growth of the plant in spite of the root-knot producing nematode."

Certain areas situated on Inanda and sometimes Trevanian soil series on our Estates produce cane having a poor appearance, often in combination with indifferent growth. Applications of Magnesium and Zinc in the past did not alter this situation and, together with considered adequate supplies of N, P, K fertiliser, the problem might well be one of parasitic plant nematodes and their effect on plant nutrient and moisture uptake by the plant.

A study of the breakdown of this valuable bi-product of our sugar mills, filterpress cake, in the soil is essential if we are to understand fully the reasons for benefits which we are experiencing. It might even be possible to reproduce these effects in our soils by some less expensive method and the S.A.S.A. Experiment Station have been requested to include this in their already full programme being undertaken by the Department of Microbiology.

Future filterpress cake trials to be laid down by the Company will cover the following aspects :

a) relative merits of application to Plant or Ratoons,

b) Levels - the lower range in particular,

c) Placement,

d) Nitrogen availability.

Besides the normal chemical analysis of the soils, nematode counts and measurement of microbiological activity resulting from the treatments will be undertaken.

Literature Cited.

1. Christie, J.R. 1959. "Plant Nematodes, their bionomics & control" (31-32) Agricultural Experiment Stations, University of Florida, Gainesville, Florida.

2. Watson, J.R. 1944. Mulches to control root-knot. Proc. Fla. Acad. Sci. 7(2-3):151-153.

3. Linford, M.B., & Francis Yap. 1939. Root-Knot nematode injury restricted by a fungus. Phytopathology 29(7):596-609.

4. Smith, F.B., & J.W. Batista. 1942. The nematode problem from the soil microbiological standpoint. Proc. Soil Sci. Soc. Fla. 4-B: 144-147.

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Minutes of a meeting to discuss co-ordination of nematode investigations, held at the Experiment Station, Mount Edgecombe, on Monday 12th September 1966, at 2.30p.m.

Present: Dr. G.D. Thompson (Chairman)
Mr. L. Allsopp
Mr. P.J.M. de Robillard
Dr. J. Dick
Mr. E. Gilfillan
Dr. G.W. Shuker
Mr. C. Wardle
Mr. R. Wyatt

It was agreed that the need for co-ordination of investigations, and for the sharing of information, exists. While there could be no objection to nematocide trials being carried out on company fields by commercial firms, the work of the Experiment Station staff would be facilitated if they could be informed of the existence of such trials and of the results obtained. It was therefore agreed that the Experiment Station should have access to this information.

It was agreed that companies would make available a limited number of sites on which the Experiment Station could co-operate with them in the conduct of experiments. This would, inter alia, enable treatments other than nematocides to be investigated on a field scale. In this connection, any differences in susceptibility between sugarcane varieties would be a suitable topic for investigation. Experimental sites would be selected on the basis of a preliminary nematode survey.

Dr. Dick informed the meeting that improved facilities for nematode diagnosis were being developed at the Experiment Station and that it would be possible to handle an increased number of soil samples. These facilities would be available to assist companies wishing to carry out nematode surveys or experiments on control. Preliminary surveys should be on a fairly wide basis and fields in which infestations were disclosed could later be examined in greater detail.

It was agreed that standardisation of sampling methods was desirable. Proposed methods and quantities are indicated in Schedule I. Information which should accompany samples is shown in Schedule II.

It was decided not to proceed with a suggestion that the Mechanisation Engineer be asked to investigate machinery for applying nematocides as this was considered to be premature.

There being no further business the meeting was closed at 4.30 p.m.

Schedule I.

Sampling methods for nematodes.

Soil samples should be taken by means of the Mount Edgecombe 9 inch sampler, and ten cores would constitute a sample. In field experiments on nematode control, pre-treatment sampling of each plot to test the uniformity of the site would be followed by at least two samplings after treatments. Suitable times would be one month after planting and at harvest of the plant cane crop, and on each occasion ten cores would be taken from each plot. In surveys, sampling for nematodes could be achieved by abstracting at least 160 ml. of the soil collected for chemical analysis, but this portion should immediately be packed in a plastic bag to prevent desiccation.

Samples of roots are difficult to standardise quantitatively, but should consist of at least 50 ml, preferably of actively growing root-tip material. It is often easier to obtain suitable samples from the inter-row than from the row.

Schedule II.

Information which should accompany samples.

Date of collection.
Name of Estate or Company.
Name, number or location of field.
Where fields have been subdivided for sampling, code number for identifying site.
Soil type and series.
State of cane growth (to indicate whether sample is from a recognisable poor area or not).

On a suggestion by Mr. Gilfillan it was decided that, where possible, soil moisture data should be quoted.