SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

PROGRAMME FOR ANNUAL GENERAL MEETING

20 OCTOBER 1983

9.00 - 9.30	Tea
9.30 - 9.45	Chairman's Report
9.45 - 10.15	Some observations from the Chairman of a Pest and Disease Committee Trevor Polkinghorne
10.15 - 10.45	The field records processing service at the Experiment Station Eric Hulbert
10.45 - 11.15	The SASA's "Field Records System" Bernard Viljoen
11.15 - 11.45	Field records processing on Schmidt Estates Arthur Eggers
11.45 - 12.15	Field records processing on Windemere Farm Chris Chance
12.15 - 12.45	Interpreting field records Murt Murdoch
12.45 - 14.00	Lunch
14.15 - 14.45	Responses to N in ratoon cane grown in various Swaziland soils Noel Leibbrandt
14.45 - 15.15	N recommendations based on soil type Tony Wood and Jan Meyer
15.15 - 15-45	Pre-trashing for eldana control and the effect of N on the incidence of eldana John Lewis

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

SOME OBSERVATIONS FROM THE CHAIRMAN OF A PEST AND DISEASE COMMITTEE

By Trevor Polkinghorne

When suggestions were first made that rules and regulations be promulgated in order to control and eliminate pests and diseases in the sugar industry, there were reservations that these conditions would infringe on the right of growers to farm their farms to the best of their ability.

In my experience these were short lived as all could see what the alarming spread of eldana was doing to the sugar industry.

The 1980 drought and our current disastrous situation has highlighted the urgency in trying to control if not eliminate the very obvious threats of pests and diseases. Who knows what could have happened if these rules had been in force when eldana first reared it's ugly head in the Mtunzini area.

When these committees were first formed I was of the opinion that growers needed to be educated to think pests and diseases. As chairman I considered it my duty to stick my neck out and be positive about any action that should be taken. I hung my hat on, 'Age of cane at harvest' in order to restrict eldana.

Our Mill Group was broken up into cells and each cell addressed by members of the Experiment Station, individuals who agreed with the above principle and myself. I was very encouraged by the response. Our group reduced its age of cane at harvest significantly. Unfortunately last year's Umhlali fire and the current drought is making it extremely difficult to continue this process because of size of cane. The point about the exercise at that time was that all growers were now talking eldana and trying to act.

Since those days the other aspects of pests and diseases have been taken up, and items such as Mosaic, Smut, RSD, and disease free seedcane have been actively pursued.

What of the future? I see no problem in implementing the regulations that were recently gazetted by Government. There will be the exceptions, and necessary action will have to be taken. I see the role of committees being one of assistance, of giving encouragement, to pass on information and constantly keep growers of sugarcane on their toes in order to grow better quality cane.

The decisions to go ahead and form Pests and Diseases Committees is the right one and in the interest of all concerned.

20 October 1983

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

SASA EXPERIMENT STATION FIELD RECORD SYSTEM - E. Hulbert

1. The analysis of farm records can be a useful management tool on which to make better decisions. However, judgement is always involved in the interpretation of yield data obtained from commercial production. Therefore it is possible to have more than one interpretation from the same set of data. Where certain ground rules are followed, experimental evidence is used, bias recognised and common sense prevails, such differences should be minor and infrequent.

   Nevertheless it must be recognised that wrong interpretations are going to be made from time to time (which could be costly) but on balance there is far more to be gained by using the power of the computer to produce data previously unavailable (except at high cost).

2. For proper interpretation to be attempted, a full set of data is essential. Averages on their own can be misleading and the availability of ranges and frequencies form an essential component of data.

12 October 1983

SASA Experiment Station – Field Records Summary

Data Sheet

NAME .....

.....

Season	
Area Code	OFFICE USE
Grower No.	OFFICE USE

1 2 3 4 5	9 10	11 12 13 14	15 16	17 18	19 20	21 22		25 26	27 28	29 30	31 32	33 34	1 decimal	1 decimal	no decimals	1 decimal	no decimals			no decimals	no decimals			
FIELD NUMBER	Ratoon	Variety	Soil		Trash vs Burn	Month of Harvest		Extension Area Codes				Year	Field size	Age	Tons cane	Tons sucrose	Fertilizer (kg/ha)			Rainfall (mm)	Irrigation (mm)			
			Parent	Colour													N	P	K					
*	*	*	*										*	*	*									

APPENDIX I

1. RATOON

Plant = 0 .... and thereafter use ratoon number as code

eg. 2nd Ratoon = 2
5th Ratoon = 5

2. VARIETIES

Use the numeric part of the variety name

eg. NCo 376 = 376
N6 = 6
CB36/14 = 3614

3. BURN / TRASH

1 = Burn
2 = Trash
3 = Heavy trash +100 mm
4 = Light trash <100 mm
5 = Trash open on the line
6 = Cold burn, tops scattered
7 = Hot burn, tops scattered
8 = Tops lined and reburnt

4. MONTH OF HARVEST

1 = January
2 = February, etc

5. EXTENSION AREA CODES

To be supplied by Extension Officer

SOIL PARENT MATERIAL

NUMERIC CODE

Swaziland Quartzite	1
Swaziland Basic Rock	2
Swaziland Shales	3
Amphibolite	4
Pre Granite Quartz	5
Tugela Schist	6
Granite	7
Table Mountain Ordinary	9
Table Mountain Mistbelt	10
Dwyka Tillite	12
Lower Ecca (Shale)	13
Middle Ecca (Sediments)	14
Beaufort Sediments	15
Cave Sandstone	16
Dolerite	18
Basalt	19
Cretaceous Sediments	20
Red Recent Sands	22
Grey Recent Sands	23
Alluvium	24

SOIL COLOUR

Soil colour	Soil structure	Soil texture*	Drainage	Rooting depth**	Main soil form	Soil code
Red	Friable	Light	Excessive	Deep	Hutton, Bainsvlei, Shepstone	01
		Medium	Fast	Deep		02
		Heavy	Good	Deep		03
	Blocky	Heavy	Good	Deep	Shortlands	04
Yellow/ brown	Friable	Light	Fast	Deep	Clovelly, Griffin	05
		Medium	Good	Deep		06
		Heavy	Good	Deep		07
		Medium	Moderate to poor	Moderate	Avalon, Glencoe, Pinedene	08
Black	Heaving blocky	Heavy	Moderate	Moderate	Arcadia	09
		Heavy	Poor	Moderate	Rensburg	10
	Non-heaving blocky	Heavy	Moderate	Moderate	Inhoek, Mayo, Bonheim (red) Tambankulu, Milkwood	11
		Heavy	Poor	Moderate	Bonheim (non-red), Willowbrook	12
	Organic (>10% carbon)	Moderate	Poor, wet bottom land	Moderate	Champagne	13
Dark brown	True humic	Medium	Fast	Deep	Inanda/Magwa, Kranskop, Nomanci	14
	Humic phase	Medium	Fast	Deep	Hutton, Griffin, Clovelly, Glenrosa	15
Grey	Friable	Light	Excessive	Deep	Fernwood	16
			Good	Moderate	Cartreff, Glenrosa	17
			Good	Shallow	Glenrosa, Mispah	18
	Structured subsoil	Light	Moderate	Moderate	Swartland, Valsrivier	19
		Medium	Moderate	Moderate		20
		Heavy	Poor	Moderate		21
	Mottled or gleyed subsoil	Light	Poor	Shallow	Longlands, Westleigh, Escourt, Sterkzpunt, Wasbank	22
		Medium	Poor	Shallow		23
		Heavy	Poor	Shallow		24
		Medium	Poor bottom land	Moderate	Katspruit, Kroonstad	25
	Recent alluvial		Good	Deep	Dundee and Oakleaf	26

*Soil texture: Light texture 0–15% clay Medium texture 16–35% clay Heavy texture 36% clay

**Rooting depth: Deep usually >1 m Moderate 0,5 to 1 m Shallow <0,5 m

FIELD	YR	RAT	VAR.	(SOIL) PM	COL	BAT	MTH HAS	(EO.CODES) 1	2	3	4	SIZE HA	AGE	TONS CANE	T.CANE /HA	T.CANE /HA/MTH	T.CANE /KG.N	T.CANE /KG.P	T.CANE /KG.K
37	79	1	376	14	0	0	0	0	0	0	1	4.1	18.0	425.	103.7	5.76	0.68	0.0	0.68
37	80	2	376	14	0	0	0	0	0	0	1	4.1	20.0	496.	121.0	6.05	0.0	0.0	0.0
37	82	3	376	14	0	2	5	1	0	0	2	4.1	18.0	435.	106.1	5.89	0.75	0.0	0.75
38	79	1	376	14	0	0	0	0	0	0	2	3.7	15.0	265.	71.6	4.77	0.47	0.0	0.47
38	81	2	376	14	0	2	0	0	0	0	1	3.7	19.0	435.	117.6	6.19	0.0	0.0	0.0
38	82	3	376	14	0	2	9	1	0	0	1	3.7	13.0	215.	58.1	4.47	0.51	0.0	0.28
39	79	1	376	14	0	0	0	0	0	0	1	4.8	18.0	320.	66.7	3.70	0.44	0.0	0.44
39	81	2	376	14	0	2	0	0	0	0	1	4.8	20.0	429.	89.4	4.47	0.0	0.0	0.0
39	82	3	376	14	0	2	9	1	0	0	1	4.8	13.0	247.	51.5	3.96	0.45	0.0	0.24
4	78	3	999	24	0	0	0	0	0	0	2	6.7	11.0	750.	111.9	10.18	0.79	0.0	0.79
4	79	5	376	25	0	0	0	0	0	0	2	6.2	14.0	804.	129.7	9.26	0.85	0.0	0.85
4	80	6	376	25	0	0	0	0	0	0	2	6.2	12.0	901.	145.3	12.11	0.0	0.0	0.0
4	81	7	376	25	0	2	0	0	0	0	2	6.2	11.0	838.	135.2	12.29	0.0	0.0	0.0
4	82	8	376	24	0	1	7	7	0	0	1	6.2	12.0	866.	139.7	11.64	0.91	0.0	0.91
40	80	4	376	14	0	0	0	0	0	0	1	2.3	22.0	413.	179.6	8.16	0.0	0.0	0.0
40	81	5	376	14	0	2	0	0	0	0	2	2.3	14.0	137.	59.6	4.25	0.0	0.0	0.0
41	80	0	376	14	0	0	0	0	0	0	1	2.0	20.0	141.	70.5	3.52	0.0	0.0	0.0
41	81	1	376	14	0	2	0	0	0	0	1	2.0	15.0	111.	55.5	3.70	0.0	0.0	0.0
42 →	80	0	376	14	0	0	0	0	0	0	1	3.8	21.0	269.	70.8	3.37	0.0	0.0	0.0
42 →	81	1	376	14	0	2	0	0	0	0	1	3.8	15.0	330.	86.8	5.79	0.0	0.0	0.0
42 →	82	2	376	18	0	2	9	7	0	0	1	3.8	12.0	321.	84.5	7.04	0.65	0.0	0.65
43	79	6	376	14	0	0	0	0	0	0	1	5.0	17.0	420.	84.0	4.94	0.72	0.0	0.72
43	81	0	376	14	0	2	0	0	0	0	1	5.0	18.0	560.	112.0	6.22	0.0	0.0	0.0
43	82	1	376	18	0	2	9	0	0	0	1	5.0	13.0	430.	86.0	6.62	0.74	0.0	0.74
44	79	3	376	14	0	0	0	0	0	0	1	4.1	20.0	402.	98.0	4.90	0.84	0.0	0.84
44	82	0	376	14	0	2	12	0	0	0	1	3.1	14.0	254.	81.9	5.85	0.58	0.0	0.58
45	79	1	376	14	0	0	0	0	0	0	1	6.8	18.0	657.	96.6	5.37	0.60	0.0	0.0
45	80	2	376	14	0	0	0	0	0	0	2	6.8	16.0	550.	80.9	5.06	0.0	0.0	0.0
45	82	3	376	14	0	2	5	0	0	0	2	6.8	19.0	929.	136.6	7.19	0.89	0.0	0.89
46	79	1	376	14	0	0	0	0	0	0	1	5.0	20.0	513.	102.6	5.13	0.64	0.0	0.0
46	80	2	376	14	0	0	0	0	0	0	2	5.0	16.0	497.	99.4	6.21	0.0	0.0	0.0
46	81	3	376	14	0	2	0	0	0	0	1	5.0	15.0	461.	92.2	6.15	0.0	0.0	0.0
47	80	0	376	14	0	0	0	0	0	0	1	3.6	20.0	355.	98.6	4.93	0.0	0.0	0.0
47	81	1	376	14	0	2	0	0	0	0	2	3.6	14.0	249.	69.2	4.94	0.0	0.0	0.0
47	82	2	376	14	0	2	9	0	0	0	1	3.6	11.0	191.	53.1	4.82	0.41	0.0	0.41
48	80	0	376	14	0	0	0	0	0	0	1	5.0	20.0	712.	142.4	7.12	0.0	0.0	0.0
48	81	1	376	14	0	2	0	0	0	0	1	5.0	15.0	500.	100.0	6.67	0.0	0.0	0.0
49	79	0	376	14	0	0	0	0	0	0	1	5.2	21.0	434.	83.5	3.97	0.0	0.0	0.0
49	81	1	376	18	0	2	0	0	0	0	1	5.2	21.0	554.	106.5	5.07	0.0	0.0	0.0
49	82	2	376	18	0	2	11	0	0	0	1	5.2	14.0	326.	62.7	4.48	0.54	0.0	0.54
5	79	4	999	22	0	0	0	0	0	0	2	6.6	15.0	596.	90.3	6.02	0.64	0.0	0.64
5	81	5	999	22	0	2	0	0	0	0	1	6.6	18.0	695.	105.3	5.85	0.0	0.0	0.0
5	82	6	999	22	0	2	8	8	0	0	1	6.6	13.0	652.	98.8	7.60	0.70	0.0	0.70
5A	78	3	805	24	0	0	0	0	0	0	2	1.2	15.0	110.	91.7	6.11	0.78	0.0	0.78
5B	78	0	376	24	0	0	0	0	0	0	2	2.9	14.0	342.	117.9	8.42	1.01	0.0	1.01

APPENDIX 2

SOUTH AFRICAN SUGAR ASSOCIATION EXPERIMENT STATION — BIOMETRY DEPARTMENT

SUMMARY OF FIELD RECORDS — **Measurements** — 19/3/74 TO 19/8/79

Components

Crop	Code	No of fields	Total hectare	Mean age	Total t cane	T cane /ha	T cane /ha MT	T cane /100MM	Total t suc	Mean Suc %	T suc /ha	T suc /ha M
Plant	1	38,	272,9	21,9	26 634,	98,	4,46	5,65	3 381,	12,8	12,39	0,57
1st ratoon	2	32,	256,9	18,6	22 692,	88,	4,75	6,53	2 895,	12,8	11,27	0,61
2nd ratoon	3	34,	263,6	19,0	22 103,	84,	4,41	5,35	2 903,	12,8	11,01	0,58
3rd ratoon	4	40,	399,3	19,7	30 738,	77,	3,90	5,24	3 828,	12,6	9,59	0,49
4th ratoon	5	26,	216,0	19,8	17 049,	79,	3,99	4,93	1 984,	11,9	9,19	0,46
5th ratoon	6	13,	93,8	16,9	7 040,	75,	4,45	5,24	946,	14,0	10,09	0,60
6th ratoon	7	3,	13,3	14,5	1 223,	92,	6,35	6,35	150,	12,1	11,31	0,78
Grand mean	7	186,	1 515,8	18,5	127 476,	84,	4,52	5,90	16 088,	12,7	10,61	0,57
Varieties												
NCo 376	1	57,	469,8	19,1	43 266,	92,	4,81	5,93	5 441,	12,6	11,58	0,61
NCo 310	2	55,	487,1	21,2	38 397,	79,	3,72	4,86	4 847,	12,6	9,95	0,47
N55/805	3	34,	223,4	18,1	19 828,	89,	4,91	6,08	2 506,	12,4	11,22	0,62
CB36/14	4	17,	85,0	13,8	7 169,	84,	6,10	8,06	904,	13,3	10,63	0,77
N53/216	5	8,	102,5	18,7	7 113,	69,	3,70	5,32	918,	14,2	8,95	0,48
N7	6	1,	10,0	28,0	1 078,	108,	3,85	4,40	134,	12,5	13,44	0,48
NCo 382	7	7,	36,8	17,9	2 298,	62,	3,50	5,02	287,	12,4	7,80	0,44
NCo 293	8	3,	51,2	24,6	3 169,	62,	2,52	3,63	361,	11,5	7,05	0,29
N50/211	9	1,	5,0	18,0	450,	90,	5,00	9,00	58,	13,0	11,70	0,65
Mixed	10	3,	45,0	21,5	4 711,	105,	4,87	5,63	631,	12,9	14,02	0,65
Grand mean	10	186,	1 515,8	18,5	127 476,	84,	4,52	5,90	16 088,	12,7	10,61	0,57
Soil types												
Middle Ecca	1	65,	588,9	19,2	50 319,	85,	4,46	5,85	6 361,	12,7	10,80	0,56
Alluvium	2	21,	107,3	17,3	8 729,	81,	4,71	6,10	1 080,	12,4	10,07	0,58
TMS	3	64,	526,0	19,8	43 988,	84,	4,23	5,32	5 667,	12,8	10,77	0,54
Dwyka	4	26,	210,4	21,0	17 820,	85,	4,03	5,07	2 115,	12,1	10,05	0,48
Dolorite	5	10,	83,2	20,8	6 622	80,	3,83	4,94	865,	13,8	10,40	0,50
Grand mean	5	186,	1 515,8	18,5	127 476,	84,	4,52	5,90	16 088,	12,7	10,61	0,57

APPENDIX 3

SOUTH AFRICAN SUGAR ASSOCIATION EXPERIMENT STATION — AGRONOMETRY DEPARTMENT

SUMMARY OF FIELD RECORDS — 1973/74 TO 1978/79

Age	Code	No of fields	Total hectare	Mean age	Total t cane	T cane /ha	T cane /ha MT	T cane /100MM	Total t suc	Mean suc %	T suc /ha	T suc /ha M
10 months	1	2,	4,6	10,0	293,	64,	6,37	4,86	34,	11,6	7,48	0,75
11 months	2	7,	41,0	11,0	2 321,	57,	5,15	7,94	320,	14,7	7,80	0,71
12 months	3	11,	53,3	12,0	3 955,	74,	6,18	7,28	467,	11,4	8,77	0,73
13 months	4	14,	87,1	13,0	6 409,	74,	5,66	7,12	752,	12,1	8,63	0,66
14 months	5	7,	41,8	14,0	3 388,	81,	5,79	8,98	426,	12,2	10,19	0,73
15 months	6	12,	100,9	15,0	8 301,	82,	5,48	6,95	1 133,	13,6	11,23	0,75
16 months	7	10,	60,4	16,0	4 784,	79,	4,95	6,32	586,	12,4	9,69	0,61
17 months	8	13,	106,4	17,0	8 365,	79,	4,62	5,79	1 034,	12,1	9,72	0,57
18 months	9	15,	108,2	18,0	9 768,	90,	5,02	5,98	1 144,	11,9	10,58	0,59
19 months	10	14,	144,1	19,0	11 420,	79,	4,17	5,15	1 487,	13,5	10,32	0,54
20 months	11	13,	122,8	20,0	12 071,	98,	4,92	5,81	1 576,	13,2	12,84	0,64
21 months	12	11,	84,7	21,0	8 111,	96,	4,56	6,02	1 075,	12,7	12,69	0,60
22 months	13	11,	115,6	22,0	10 610,	92,	4,17	5,99	1 366,	13,1	11,82	0,54
23 months	14	10,	77,3	23,0	6 602,	85,	3,71	4,84	1 006,	14,6	13,01	0,57
24 months	15	14,	141,9	24,0	11 364,	80,	3,34	4,16	1 490,	13,1	10,50	0,44
25 months	16	0,	0,0	0,0	0,	0,	0,0	0,0	0,	0,0	0,0	0,0
26 months	17	0,	0,0	0,0	0,	0,	0,0	0,0	0,	0,0	0,0	0,0
27 months	18	3,	20,0	27,0	2 115,	106,	3,92	4,78	249,	11,8	12,47	0,46
28 months	19	4,	41,2	28,0	3 814,	93,	3,31	4,46	401,	11,4	9,74	0,35
29 months	20	1,	15,0	29,0	1 566,	104,	3,60	3,80	187,	11,9	12,47	0,43
Grand mean	20	186,	1 515,8	18,5	127 476,	84,	4,52	5,90	16 088,	12,7	10,61	0,57

Summary

Season	No of fields	Total hectare	Mean t age	Total t cane	T cane /ha	T cane /ha MT
1975/76	45,	130,1	18,9	14 416,	110,8	5,86
1976/77	35,	113,9	17,9	12 886,	113,1	6,32
1977/78	39,	118,8	19,9	13 388,	112,7	5,68
1978/79	25,	83,9	21,5	11 011,	131,2	6,10
1979/80	37,	103,7	21,3	13 940,	134,4	6,30
Grand mean	181,	550,4	19,8	65 641,	119,3	6,04

APPENDIX 4

WHOLE EXTENSION AREA

	CANE				SUCROSE				Sucrose %
Season	ha	Mean age	tc/ha	tc/ha/m	ha	Mean age	tc/ha	tc/ha/m	
1978/79	5655	17,4	99	5,7	1031	17,8	11,2	0,63	12,4
1979/80	4989	18,6	100	5,4	1222	18,6	12,1	0,65	12,8
1980/81	3641	18,5	74	4,0	637	18,7	9,4	0,50	13,0
1981/82	2809	19,1	88	4,6	824	18,1	11,4	0,61	11,8
1982/83	5217	16,1	85	5,3	2208	15,9	9,6	0,60	11,5
	22306	17,7	90	5,1	5921	17,4	10,6	0,61	12,1

COASTAL SANDS

Season	Ha	Mean age	tc/h	tch/m
1978/79	452	16,9	111	6,6
1979/80	489	19,3	110	5,7
1980/81	295	17,1	82	4,8
1981/82	407	18,9	100	5,3
1982/83	777	16,5	86	5,2
	2420	17,6	97	5,5

COASTAL HINTERLAND

Season	Ha	Mean age	tc/h	tch/m
1978/79	2118	16,5	90	5,5
1979/80	1460	17,5	87	5,0
1980/81	897	17,8	71	4,0
1981/82	818	18,9	85	4,5
1982/83	1612	14,4	75	5,2
	6905	16,7	83	5,0

RISING PLATEAU

Season	ha	Mean age	tc/h	tc/h/m
1978/79	1817	17,4	95	5,5
1979/80	1571	17,8	93	5,2
1980/81	1166	17,9	64	3,6
1981/82	915	18,1	81	4,5
1982/83	1144	14,5	79	5,4
	6613	17,2	84	4,9

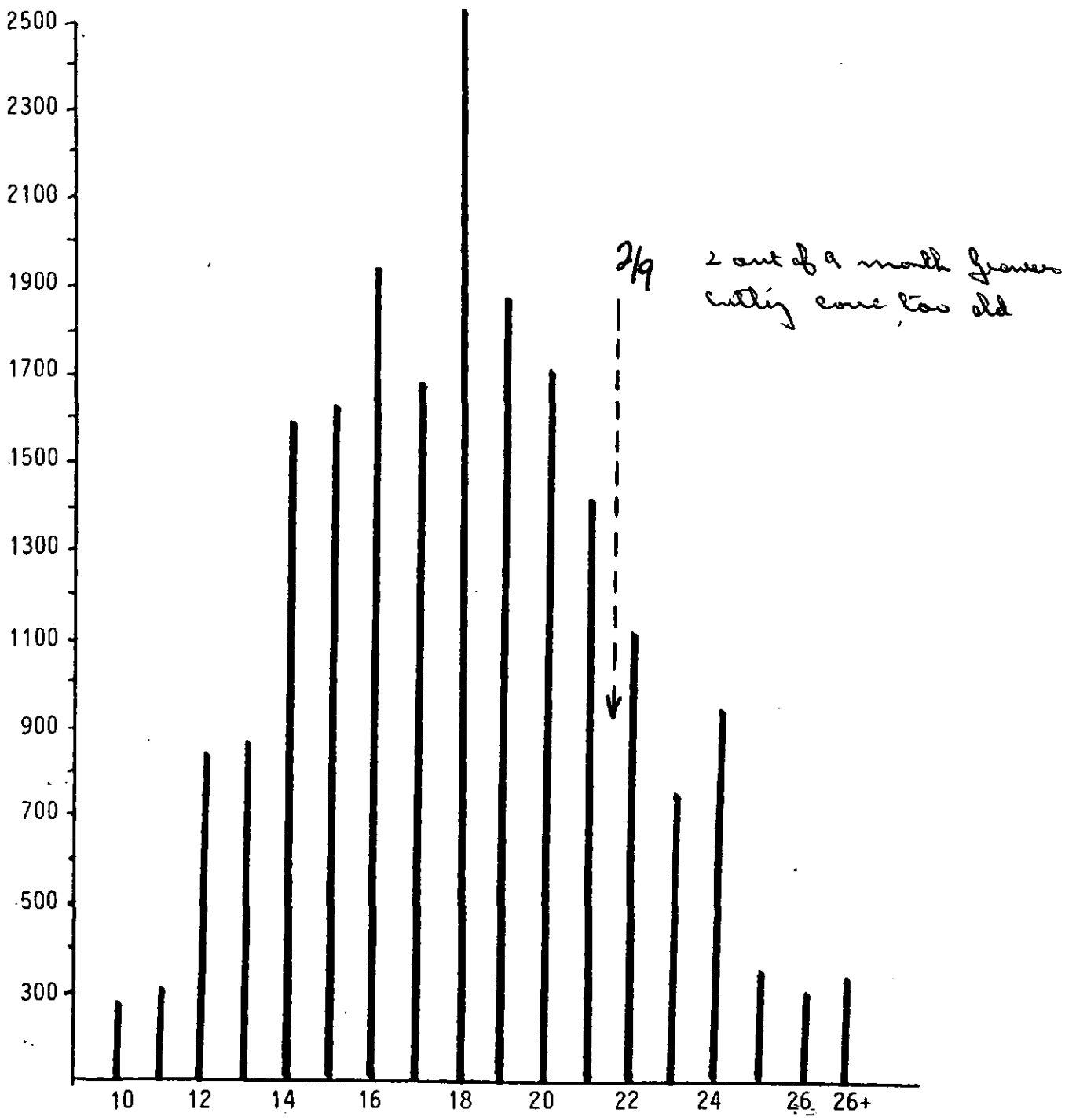
UPPER PLATEAU

Season	Ha	Mean age	tc/h	tc/h/m
1978/79	1268	18,9	113	6,0
1979/80	1468	20,2	116	5,7
1980/81	1283	20,0	82	4,1
1981/82	669	20,6	95	4,6
1982/83	1684	18,5	98	5,3
	6371	19,5	102	5,2

	Whole extension area		Homogeneous* areas — tons cane			
Season	Cane	Sucrose	1	2	3	4
1978/79	100	100	100	100	100	100
1979/80	95	103	86	91	95	95
1980/81	80	79	73	73	65	68
1981/82	92	97	80	82	87	77
1982/83	93	95	78	94	98	88

* 1 = Coastal sands 2 = Coastal hinterland 3 = Rising plateau 4 = Upper plateau

DISTRIBUTION OF CUTTING AGE BY HA - DURBAN NORTH COAST EXTENSION AREA



1976/77 - 1981/82 Season

(Average age 18 months)

APPENDIX 7

TONGAAT PEST AND DISEASE COMMITTEE

7th December 1982

Dear Grower,

Recently an Eldana meeting for all Tongaat growers was called. The purpose was to review the precentage area being harvested. This is due to the fact that Eldana levels are once again high on the majority of the farms in the Coastal Sands and Coastal Hinterland groups.

The table below indicates a recommended age for harvesting and % area to be harvested.

RECOMMENDATION:

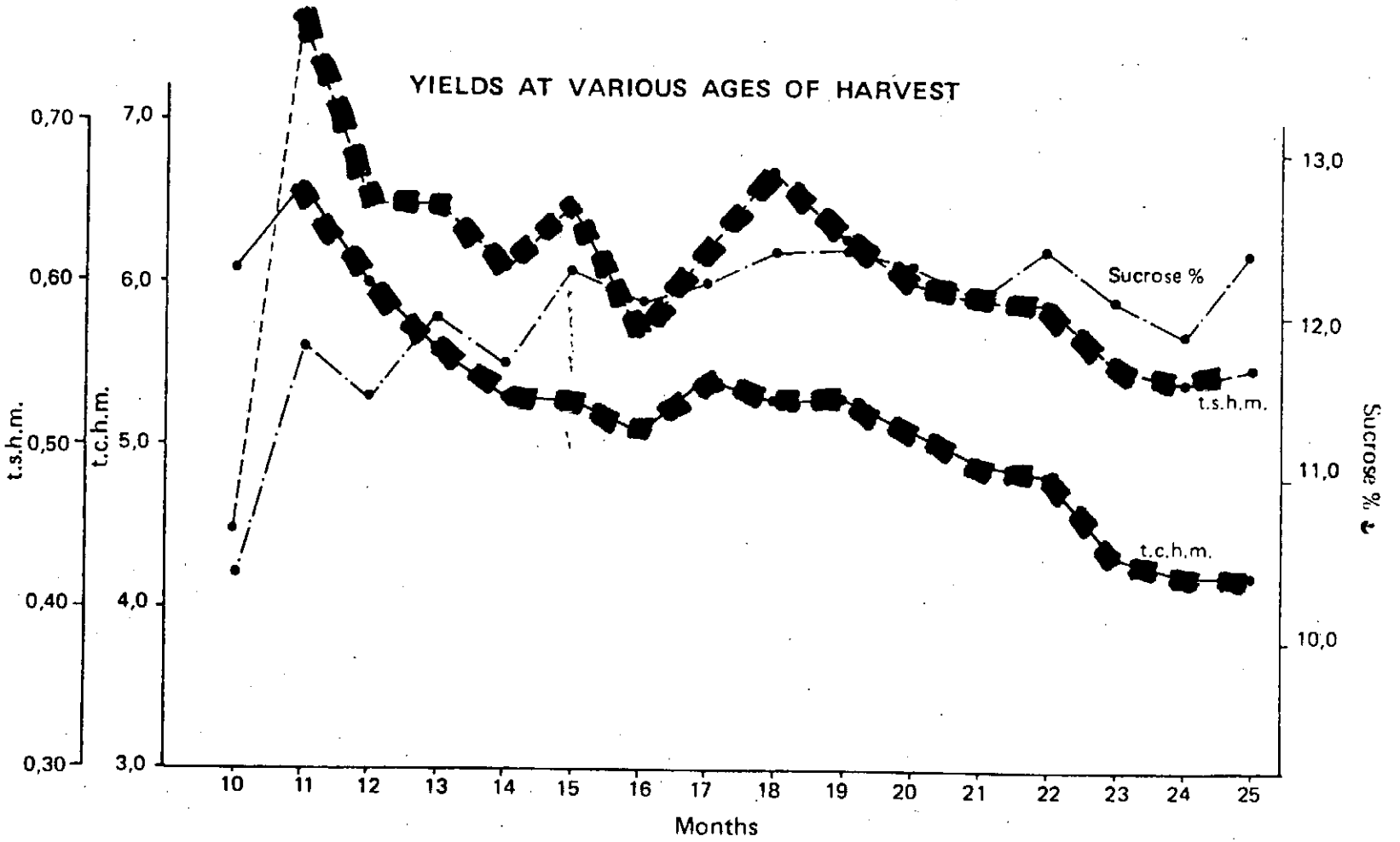
DARNALL Recommendations

AREA	% AREA HARVESTED		AGE AT MAY/APRIL	OLDEST CANE AT END OF SEASON (JANUARY)	450,000 t Sample: 5 Year	82/83
COASTAL SANDS	70%	17.1m	21 (20) 16	18	17,6	16,5
COASTAL HINTERLAND	76%	15.7m	20 (19) 17	17	16,5	14,4
[illegible]SING PLATEAU	72%	16.6m	21 (20) 18	18	17,2	14,5
UPPER PLATEAU	64%	18.7m	23 (22) 21	20	19,5	18,5
	A		B C	D		E

Thanking you,

D.C. Pair-Glass

CHAIRMAN : TONGAAT P & D COMMITTEE


YIELDS AT VARIOUS AGES OF HARVEST
t.s.h.m.
t.c.h.m.
Sucrose %
Months
0,70
0,60
0,50
0,40
0,30
7,0
6,0
5,0
4,0
3,0
13,0
12,0
11,0
10,0
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

APPENDIX 8

LOWER SOUTH COAST

Tc/h/m = 7,43 - 0,1351 x age at harvest

DURBAN NORTH COAST

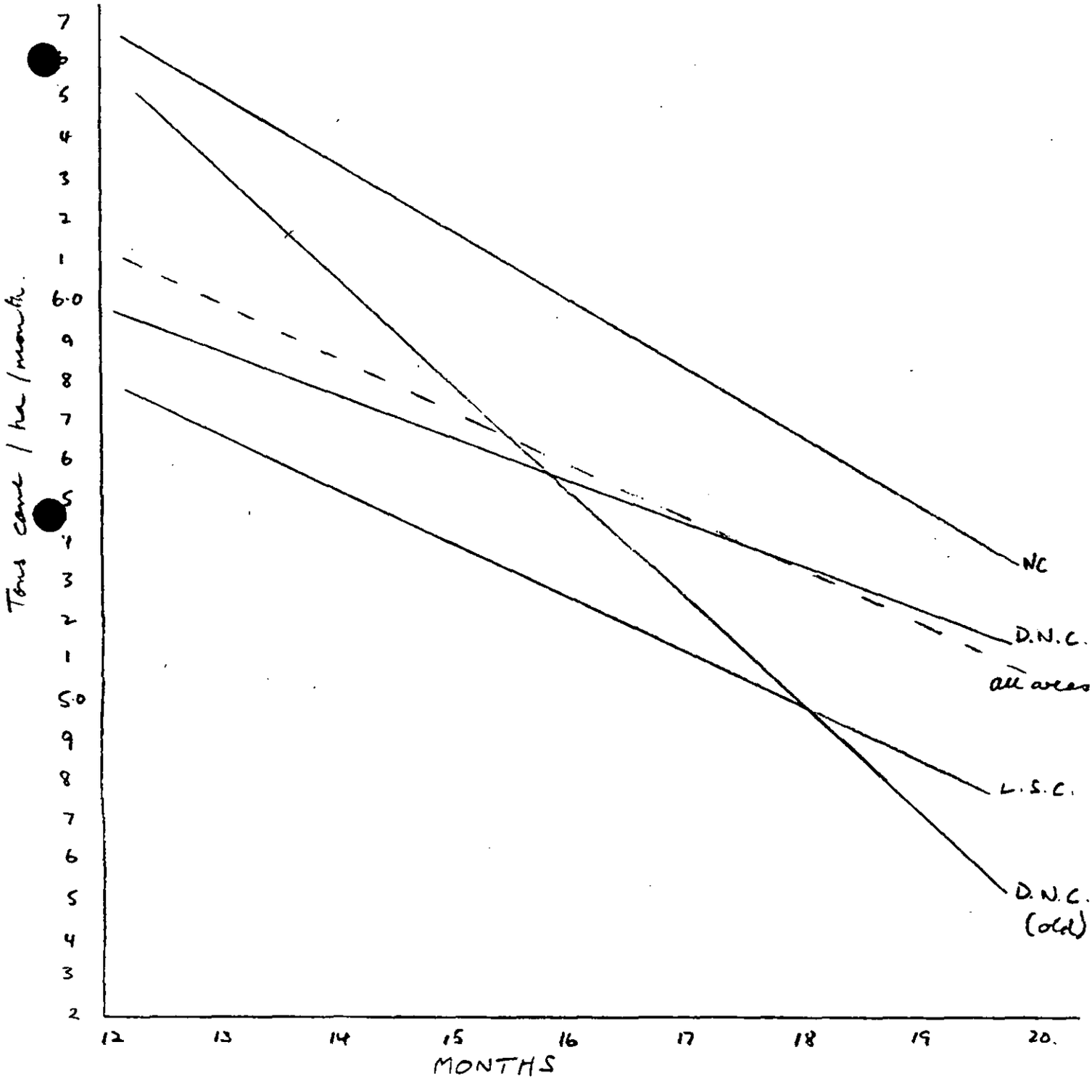
Tc/h/m = 7,33 - 0.1109 x age at harvest

NORTH COAST

Tc/h/m = 8,74 - 0,1705 x age at harvest

ALL AREAS

Tc/h/m = 7,83 - 0,13885 x age at harvest



	15 MONTH CYCLE S.A. Cane Growers.						18 MONTH CYCLE					
	92,74tc/ha cut, 80 ha cut,						102,08tc/ha cut, 66,6 ha cut,					
	WITHOUT ELDANA 7 419 tons A			WITH ELDANA 6 474 tons B			WITHOUT ELDANA 6 798 tons C			WITH ELDANA 5 370 tons D		
COSTS	R/t	R/ha	TOTAL	R/t	R/ha	TOTAL	R/t	R/ha	TOTAL	R/t	R/ha	TOTAL
Transport (1)	1,04	77,16	7 716	1,04	67,33	6 733	1,04	70,70	7 070	1,04	55,85	5 585
Crop Ins. & Levies	0,19	14,10	1 410	0,19	12,30	1 230	0,19	12,92	1 292	0,19	10,20	1 020
Consumbables & Sundries	0,05	3,71	371	0,05	3,24	324	0,05	3,40	340	0,05	2,69	269
Fertilizer	1,91	141,85	14 185	2,19	141,85	14 185	1,92	130,40	13 040	2,43	130,40	13 040
Lic. & Ins.	0,16	12,13	1 213	0,19	12,13	1 213	0,18	12,13	1 213	0,23	12,13	1 213
Office & Admin.	0,24	17,51	1 751	0,27	17,51	1 751	0,26	17,51	1 751	0,33	17,51	1 751
E.S.C.	0,27	19,95	1 995	0,31	19,95	1 995	0,29	19,95	1 995	0,37	19,95	1 995
Misc. (2)	0,17	12,41	1 241	0,19	12,41	1 241	0,18	12,41	1 241	0,23	12,41	1 241
Maint. & Buildgs.	0,24	17,64	1 764	0,27	17,64	1 764	0,26	17,64	1 764	0,33	17,64	1 764
O/H (3)	1,68	125,00	12 500	1,93	125,00	12 500	1,84	125,00	12 500	2,33	125,00	12 500
Labour Wages & other Labour (4)	3,08	228,30	22 830	3,53	228,30	22 830	3,18	216,16	21 616	4,03	216,16	21 616
Rations (5)	0,87	64,73	6 473	1,00	64,73	6 473	0,93	63,11	6 311	1,18	63,11	6 311
Seed (6)	0,36	27,00	2 700	0,42	27,00	2 700	0,33	22,50	2 250	0,42	22,50	2 250
Weed Killer (7)	0,67	49,60	4 960	0,77	49,60	4 960	0,61	41,29	4 129	0,77	41,29	4 129
Contract/Plant Hire	0,07	5,12	512	0,08	5,12	512	0,08	5,12	512	0,10	5,12	512
Mech. Maint. (8)	1,23	91,25	9 125	1,41	91,25	9 125	1,28	87,15	8 715	1,62	87,15	8 715
Fuel (9)	0,84	62,33	6 233	0,96	62,33	6 233	0,87	59,29	5 929	1,10	59,29	5 929
TOTAL	13,07	969,79	96 979	14,80	957,69	95 769	13,49	916,68	91 668	16,75	897,77	89 777
REVENUE												
13% sucrose Gross	21,84	1620,15	162 015	21,90	1417,67	141 767	21,89	1487,94	148 794	21,95	1178,98	117 898
Net	8,77	650,36	65 036	7,10	459,98	45 998 X	8,40	57,26	57 126	5,20	281,21	28 121 X
12,5% Gross	21,01	1558,90	155 890	21,07	1364,22	136 422				21,13	1134,80	113 480
Net	7,94	589,11	58 911	6,27	406,53	40 653				4,38	237,03	23 703

3% decrease in milled sdg at harvest

S.A.S.A. EXPERIMENT STATION EXTENSION DIVISION

ESTATE : EXAMPLE — CUTTING PROGRAM 83/84

DELIVERY RATE : 35.0 (10) — DATE CUTTING STARTS : 5.0 (11)

CUT ORDER	FIELD NO	AREA	VARIETY	CROP	AGE	--ESTIMATED-- TC/H/M	%	CUT AGE	(EST.YIELD) TONS	T/HA	END DATE
1	7	8.0	376	P6	20	3.5	100.	20.0	560.	70.	5.6
*2	8	6.0	310	R2	18	5.0	115.	18.6	641.	107.	6.3
3	6	10.0	805	R1	16	6.5	100.	17.3	1122.	112.	7.5
4	1	8.0	376	R2	17	3.5	120.	19.5	653.	82.	6.2
5	3	10.0	376	P	17	6.0	100.	20.2	1209.	121.	9.4
6	10	12.0	376	R1	10	7.1	90.	14.4	1106.	92.	10.6
7	2	6.0	211	R4	9	4.3	100.	14.6	376.	63.	11.0
8	5	6.0	376	R4	15	4.0	100.	21.0	504.	84.	11.5
9	4	10.0	376	R2	13	5.3	100.	19.5	1035.	104.	12.6
10	9	10.0	376	R3	12	4.7	110.	19.6	1014.	101.	1.7
		(1)				*	(2)	(3)	(4)	(5)	(6)

S.A.SUGAR ASSOCIATION EXPERIMENT STATION EXTENSION DIVISION

CUTTING CYCLE SUMMARY

NUMBER OF FIELDS CUT	10.	
TOTAL AREA CUT	86.	
TOTAL TONS CUT	8224.	(7)
AVERAGE CUTTING AGE	18.5	(8) ***
AVERAGE TONS/HA/MONTH....	5.2	(9) **

APPENDIX 11

Yield data for varieties

			CANE	
Variety	Ha	Mean age	tc/ha	tc/h/m
NCo 376	15627	18,0	92	5,1
N55/805	4032	17,0	83	4,9
NCo 310	404	18,0	86	4,9
NCo 293	292	20,1	98	4,9

			SUCROSE		
Variety	Ha	Mean age	ts/ha	ts/h/m	Sucrose %
NCo 376	4516	17,5	10,8	0,61	12,1
N55/805	632	16,7	9,0	0,54	12,3
NCo 310	212	19,2	10,9	0,57	12,6
NCo 293	38	20,4	12,5	0,61	12,5
N11	34	14,6	10,8	0,74	11,3

Comment

a) In this sample, all other varieties (12) occupied a total area of less than 300 ha.

b) 7% of the cane harvested is designated as 'mixed variety' and this is mostly mixed fields of NCo 376 and N55/805. 70% of cane harvested is NCo 376 and 18% is N55/805. Thus 95% of the cane harvested is either NCo 376 or N55/805.

VARIETIES x SOIL TYPE TABLE T.C/H /MTH. (WEIGHTED MEANS)

	NCO 376		N55/805		MIXED		MEANS	
TMS	10 ①	8.35	34 ②	6.40	8	6.65	53	6.75
UWYKA	15 ③	6.18	20 ④	6.22	1	4.49	36	6.05
GRAND MEAN	25	6.80	54	6.33	9	6.23	90	6.45

VARIETIES x SOIL TYPE TABLE TOTAL HECTAR

	NCO 376		N55/805		MIXED		MEANS	
TMS	10 ⑤	23.40	34 ⑥	95.10	8	45.70	53	167.90
UWYKA	15 ⑦	50.00	20 ⑧	62.40	1	9.10	36	121.50
GRAND MEAN	25	73.40	54	157.50	9	54.80	90	292.65

SOILS

Yield of cane on different soil types based on parent material

	Parent material	Ha	Mean age	CANE tc/h	CANE tc/h/m
8	TMS ordinary	6706	17,0	85	5,0
4=	TMS mistbelt	5505	19,6	103	5,3
4=	Middle Ecca	1710	16,9	89	5,3
11	Lower Ecca	1252	17,9	81	4,5
10	Dwyka	1004	17,3	83	4,8
2	Recent Sand	604	18,2	110	6,0
7	Recent Sand red	1015	17,1	89	5,2
9	Recent Sand grey	908	17,0	83	4,9
3=	Dolerite	1011	17,0	91	5,4
3=	Alluvium	706	15,9	86	5,4
1	Alluvium sand	294	15,0	93	6,2
4	Alluvium clay	37	13,4	71	5,3

	Parent material	Ha	Mean age	SUCROSE ts/h	SUCROSE ts/h/m	SUCROSE Sucrose %
7	TMS ordinary	2042	16,4	9,2	0,56	12,1
3=	TMS mistbelt	1360	19,6	12,7	0,64	12,3
8	Middle Ecca	117	15,9	8,4	0,53	11,2
6=	Dwyka	386	17,7	10,7	0,60	12,6
2 {	Recent Sand	33	18,2	12,4	0,68	12,1
	Recent Sand red	386	16,9	11,4	0,67	11,8
5	Recent Sand grey	243	16,7	10,2	0,61	11,6
3=	Dolerite	368	17,9	11,5	0,64	12,0
6=	Alluvium	181	17,6	10,6	0,60	12,3
1	Alluvium sand	51	13,3	9,8	0,74	12,2

RATOON AGE

Yields in relation to crop stage

	CANE						Sucrose %
	ha	tc/h	tc/h/m	ha	ts/h	ts/h/m	
Plant	3324	102	5,5	823	11,1	0,63	11,8
1st ratoon	3623	94	5,3	930	11,0	0,64	12,0
2nd	3361	91	5,2	899	10,9	0,62	12,2
3rd	3280	90	5,1	834	10,9	0,63	12,3
4th	3077	85	4,8	756	10,1	0,57	12,1
5th	2228	83	4,8	698	9,7	0,57	12,3
6th	1381	84	4,8	483	9,9	0,59	12,0
7th	647	89	5,2	239	10,6	0,62	12,0
8th	479	90	4,9	159	10,3	0,58	12,4
9th	241	80	4,7	47	11,2	0,62	12,4
10th plus	290	–	–	190	–	–	–
–	22306	90	5,1	5921	10,6	0,61	12,1

① ② ③

FERTILIZER

Yields per unit of Nitrogen and Potassium

	ha	Tons cane/kg N	Tons cane/kg K
Heavy clay soils	2 116	0,71	0,62
TMS ordinary	2 370	0,74	0,73

Comment:

The above figures are the averages of ten estates.

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

SOUTH AFRICAN SUGAR ASSOCIATION FIELD RECORD SYSTEM

BY

BERNARD VILJOEN

ORIGINATION OF THE FRS SYSTEM

The SASA Field Record System (FRS) came into being when an "ad hoc" committee represented by members from the Cane Growers Association, Experiment Station, SASA Data Processing Division and the Cane Testing Service met on the 21st September 1981 to discuss the possibility of collecting field records via Autolab.

On the 28th January 1982 the SASA Council members agreed that a trial scheme could be implemented at two mills in the Industry viz Maidstone where a pilot scheme of the Experiment Station had been in operation for some years ; and to obtain a wider spectrum of cane varieties and soil types together with a more complicated delivery system, at Amatikulu as well.

OPERATION OF THE FRS SYSTEM

In order to join the scheme a farmer (grower or MCP section manager) has to describe his fields using the form F.R.1 attached*.

His local extension officer is at his service to assist with the task and answer any queries the farmer may have; and also to help in measuring percentage slopes etc.
(See Appendix 'A').

Having registered his farm the farmer is required on a daily basis to submit the number(s) of the field(s) that are currently being harvested. The system caters for up to three fields being simultaneously harvested.

For this purpose an FRS tag is used which is attached to the bundle chain and remains with the bundle from the field to the reloading zone for positive identification. When the bundles are reloaded into hilos or railtrucks, the information is transcribed by the zone clerk or haulage driver onto the delivery notes that accompany the load to the mill. The FRS tags are then removed and stapled to the farmer's copy of the delivery note and returned to him for verification i.e. it enables the farmer to check that the information contained on the bundle tag was correct and accurately transcribed onto the delivery note.

INSTRUCTIONS ON HOW TO COMPLETE THIS FORM.

1. When joining the S.A.S.A. Field Record System for the take-on then complete all columns with the assistance of your local Extension Officer.

2. THEREAFTER, when any of the following changes take place in the fields on your farm - complete a new Field Description Form using the relevant columns as described below:

   (i) Where a field has been replanted with the same variety after plough out or minimum tillage used; and there is no other change in the field - then complete the Field No. and Date Planted columns only. (Tick minimum tillage if applicable).

   (ii) Where there is no change in the field BUT a new variety has been planted - then complete Field No., Variety and Date Planted columns only. (Tick minimum tillage if applicable).

   (iii) Where field layouts have been re-designed resulting in a change in area and numbering then complete all columns. However, where a field has been planted and the Standing Ratoon is 00 the last column, i.e. Date Last Harvested, is left blank.

   (iv) Fields that have been fallow should be re-registered when planted and all columns completed except the last one, i.e. Date Last Harvested is left blank.

VARIETY	CODE	VARIETY	CODE	SOILS	ALPHA CODE
Mixed	01	N 12	31	Swaziland Quartzite	SWQ
N:Co 376	02	N 13	32	Swaziland Basic Rock	SWR
N:Co 310	03	N 14	33	Swaziland Shales	SWS
N:Co 293	04	N 15	34	Amphibolite	AMP
N: 50/211	05	N 16	35	Pre Granite Quartz	PGQ
N:Co 382	06			Tugela Schist	TUS
Co 331	07			Granite	GRA
N:Co 339	08			Table Mountain Sandstone	TMS
N:Co 292	09			Table Mountain Ordinary	TMO
N:Co 334	10			Table Mountain Mistbelt	TMM
N:Co 301	11			Table Mountain Trevanian	TMT
N 7	12			Table Mountain Boulder Beds	TBB
Co 281	13			Dwyka Tillite	DWY
N: 51/539	14			Lower Ecca (Shale)	LES
N: 51/168	15			Middle Ecca (Sediments)	MES
Unknown	16			Beaufort Sediments	BFS
N: 53/216	17			Cave Sandstone	CSS
N: 52/219	18			Dolerite - Basalt - Diabase	DBD
N: 10	19			Dolerite	DOL
Co 290	20			Basalt	BAS
CB 36/14	21			Cretaceous Sediments	CRS
CB 38/22	22			Recent Sands	RCS
N: 55/805	23			Red Recent Sands	RSR
N 6	24			Grey Recent Sands	RSG
N 8	25			Alluvium	ALL
N 11	26			Alluvial (Sand)	ALS
POJ 2725	27			Alluvial (Clay)	ALC
POJ 2878	28			Mixed	MIX
Uba	29				
J 59/3	30				

NOTE: Obtain the Binomial System code; and your nearest Met Station code, if you do not maintain rainfall records on your farm; from your local Extension Officer.

I FR1

S.A.S.A. FIELD RECORD SYSTEM FIELD DESCRIPTION FORM

Grower Code

Farm Name : . . . . . Met.Station

Field No.	Field Size (ha)	Soil Classification: Parent Material	Soil Classification: Binomial System	Aspect	% Slope	Standing Ratoon No.	Variety	Row Spacing (m)	Tick for Minimum Tillage	Date Planted: Month	Date Planted: Year	Date last Harvested: Month	Date last Harvested: Year

* If plant crop designate (00)

FULL INSTRUCTIONS are printed on the back

√

P.T.O.

SOUTH AFRICAN SUGAR ASSOCIATION FIELD RECORD SYSTEM

REF:FRS16 - 22/06/83

FIELD DESCRIPTION

FIELD NO	SIZE HA	PARENT MATERIAL	BINOMIAL SYSTEM	ASPECT	SLOPE %	RATOON	VARIETY	ROW SPACE	TILLAGE	PLANT DATE	HARVEST DATE	FIELD CHANGE	CANE AGE AT 1ST MAY
001	1,4	MES		FLAT		06	23	1,3	CONVENTIONAL	04/74	12/81	12/81	-
001	1,4	MES		FLAT		00	2	1,3	MINIMUM	03/82			13
002	,7	MES		FLAT			2	1,3	CONVENTIONAL	04/74		12/81	-
002	,7	MES		FLAT		01	2	1,3	MINIMUM	10/81	01/83		3
003A	2,0	MES		FLAT		05	3	1,3	CONVENTIONAL	11/74	10/82	10/82	-
003A	2,0	MES		FLAT		00	32	1,3	MINIMUM	02/83			2
003B	2,2	MES		FLAT		06	2	1,3	CONVENTIONAL	04/75	11/82		5
004A	2,1	MES		FLAT		06	2	1,3	CONVENTIONAL	01/75	11/82		5
004B	2,4	MES		FLAT		06	2	1,3	CONVENTIONAL	04/75	11/82		5
005	2,1	MES		FLAT		03	2	1,3	CONVENTIONAL	04/77	12/81		16
006	1,7	MES		FLAT		13	2	1,3	CONVENTIONAL	09/66	12/82		4
007	2,3	MES		FLAT		07	2	1,3	CONVENTIONAL	01/74	12/82		4
008	5,0	MES		FLAT		07	23	1,3	CONVENTIONAL	10/72	06/82	06/82	-
009	3,0	MES		WEST	2,0	15	2	1,3	CONVENTIONAL	10/64	01/83		3
010	1,4	MES		FLAT		09	2	1,3	CONVENTIONAL	10/72	01/83		3
011	2,7	MES		WEST	1,0	13	2	1,3	CONVENTIONAL	03/65	01/82		15
012A	4,1	MES		WEST	2,0	04	2	1,3	CONVENTIONAL	10/76	01/82		15
012B	7,9	MES		WEST	2,0	05	2	1,3	CONVENTIONAL	09/75	09/82		7
012C	3,0	MES		WEST	3,0		23	1,3	CONVENTIONAL	02/71		09/78	-
012C	3,0	MES		WEST	3,0	02	26	1,3	CONVENTIONAL	08/79	06/82		10
013A	1,0	MES		EAST	22,0	05	2	1,3	CONVENTIONAL	10/75	10/82		6
013B	1,6	MES		EAST	6,0	05	2	1,3	CONVENTIONAL	10/75	10/82		6
014A	1,9	MES		EAST	20,0	07	2	1,3	CONVENTIONAL	02/74	11/82		5
014B	1,9	MES		EAST	15,0		2	1,3	CONVENTIONAL	11/67		06/81	-
014B	1,9	MES		EAST	15,0	01	2	1,3	CONVENTIONAL	09/81	01/83		3

Where cane is despatched directly from the farm to the mill and is not reloaded; the delivery note is completed on the farm.

On arrival at the mill weighbridge the delivery details are punched into the Autolab terminal at the same time as all other information required for cane payment.

In Autolab a system of monitoring the data for accuracy and other error checks has been incorporated and the Senior Technologist at the mill is responsible for this part of the operation.

From these details the field number is printed on the daily sucrose advice and a weekly summary is produced by Autolab and sent to the farmer by the CTS. The farmer is required to verify the data and make amendments where necessary (See Appendix I).

This data check is essential to ensure that the data is accurate. Errors, missing information and wrong allocations are corrected by the CTS when the data check form is returned and these amendments are relayed to the data processing division in Durban, so that when the farmer receives his productivity reports they are correct.

The system has been refined to the point that when these basic steps and checks are complied with, then 100% accuracy is attained.

Once a month the farmer is required to submit form FR2/3 attached*. He has the choice of only "ticking" the harvest completed column and obtaining a print-out containing limited information; the more enthusiastic farmer will complete all the relevant columns and be supplied with a comprehensive report for each month of the cutting season.

At the end of the season an annual report is compiled by the SASA computer which is based upon the current season's data, and in combination with previous season's data, field history and homogeneous area reports are produced.

This annual report is sent to the farmer who is then at liberty to call in his extension officer and assisted by this report will be able to make meaningful decisions.

ADVANTAGES OF F.R.S. OVER OTHER SYSTEMS

The FRS has four clear advantages over the existing Experiment Station's record system. They are as follows:

1) FRS is able to give accurate field sucrose figures because the actual sucrose tests and cane tonnages relating to each field are used, and

.../3

APPENDIX I

AA30?9023 SUGAR INDUSTRY CENTRAL BOARD PAGE 5
WEEKLY F.R.S. DATA CHECK
83/09/26 WEEK NUMBER 24

******* THE CHANCE TRUSTS *******

DELIVERY DAT	CONSIGNMENT NOTE	TONS CANE	BUNDLES DELIVERED	******BUNDLE ALLOCATION******* FLD1 BUN		FLD2 BUN	FLD3 BUN	REMARKS
83/09/22	58[illegible]	23,900	5	201	5	0	0	
83/09/22	58[illegible]	20,640	4		0	0	0	NOTHING ENTERED ON C/D NOTE
83/09/23	58A49	11,600	4	201	4	0	0	
83/09/23	58735	24,540	6	201	6	0	0	
83/09/24	58[illegible]76	23,020	4		0	0	0	TAG NOT SUPPLIED - DRIVER WROTE 'MISSING' ON C/D NOTE
83/09/24	58790	22,380	5	201	4	0	0	NOTHING ENTERED ON C/D NOTE
		126,080						

INSTRUCTIONS
****
Please check that the number of bundles allocated to each field in the above table is correct.
If found correct, no further action is necessary.

TO MAKE CORRECTIONS
****
Cross out the incorrect field number and/or number of bundles, and alongside make the correction, ensuring that the total number of bundles allocated equals the total number shown for each delivery.

PLEASE RETURN THIS FORM TO THE C.T.S. CHEMIST WITHOUT DELAY SO THAT THE AMENDMENTS CAN BE PROCESSED TO ENSURE ACCURACY OF YOUR FIELD RECORDS

I F R 2

S.A.S.A. FIELD RECORD SYSTEM

MONTHLY RETURN

Month Year

Grower Code

FARM NAME: . . . . . [- √ -]

Field No.	** Area Harvested	Fertilizer Application (Kg/ha) N	Fertilizer Application (Kg/ha) P	Fertilizer Application (Kg/ha) K	Total Irrigation (mm)	Tons Seed Cane	Harvest Completed	* Field Change	Nematicide	Ripener	Herbicide

NB Rainfall return on the back

(Tick these columns where applicable

I FR3 Month Year

Grower Code

Day of Month		Rainfall in (mm)			Day of Month		Rainfall in (mm)		
0	1				1	7			
0	2				1	8			
0	3				1	9			
0	4				2	0			
0	5				2	1			
0	6				2	2			
0	7				2	3			
0	8				2	4			
0	9				2	5			
1	0				2	6			
1	1				2	7			
1	2				2	8			
1	3				2	9			
1	4				3	0			
1	5				3	1			
1	6								

TOTAL

NOTE :

Please round off all rainfall figures e.g. 10,5 should be 11
10,4 should be 10

A. FIELD CHANGE

This column should be 'ticked' to indicate:-

(i) The field has been ploughed out.

(ii) The field has been planted useing minimum tillage. Please remember to 'tick' the minimum tillage column on the Field Description Form.

(iii) A new variety has been planted.

(iv) When fields that have been FALLOW are planted.

(v) Where field layout has been re-designed and there is a change in area and/or field numbering.

NB When a field change has been indicated on the Monthly Return then a FIELD DESCRIPTION FORM (FR1) showing the changes made MUST accompany this form.

**B. PARTIAL HARVEST

When a field has been partially harvested, and only then; the area should be stated. DO NOT 'tick' the Harvest Completed column, until the balance of the field has been completed.

A partial harvest is when:-

(i) A field is only partially cut leaving the balance for seedcane.

(ii) A fire has forced the cutting of a portion of the field that is not ready for harvest but is still millable and the balance will not be harvested for at least 3 months.

(iii) Contingency cutting along access roads following wet weather, or where firebreaks have been cut and the intention is not to complete the harvesting during the next 3 months.

This does not include firebreaks for burning purposes where the field will be harvested within a day or two.

NB Where a field is not completed at the end of the month but will be completed during the ensuing month does not constitute a partial harvest. It should be left until the harvest is completed and then 'ticked'.

C. HARVEST COMPLETE

This column is 'ticked' to indicate that the field has been harvested and all cane has been removed and despatched to the mill.

NB Cane slashed back to create a new ratoon e.g., after a fire or severe drought; where the cane was unmillable, is treated as having been harvested and the harvest completed column should be ticked. Obviously there will be no yield figures from such a field

2) the productivity reports are produced within the current season's operation with a final annual report immediately available at the close of the season, without further input by the farmer*, and

3) historic records for two full crop cycles are produced for comparison and evaluation**, and

4) the farmer need only prepare a monthly statement i.e. his monthly return, and this document serves as a valuable control and managerial aid.

* See Appendix II
** See Appendix III.

The disadvantages of using a micro-computer for field record purposes by a farmer, are as follows:

1) No homogeneous area comparison reports are available against which to relate and evaluate his own performance, and

2) he does not have an accurate sucrose yield per field; but out of necessity must use the average sucrose shown on his weekly CTS return to evaluate the performance of that field unless he identifies the field of origin for each consignment. Should there be mixed consignments (which are common on small farms) or a field harvested across two or three weeks in different combination with other fields then a masking of the true value of these varieties and their performance on the soils within those fields is evident, and

3) the use of a micro-computer entails entering the details of all consignments and allocating sucrose on a daily basis i.e. a duplication of work already being performed, which could be a tedious operation whereas the FRS system does this automatically, and

4) the power of the SASA computer employed with the FRS system readily affords detailed inspection and comparisons of historical data and caters for amendments at bundle level, whereas the records maintained by a micro-computer are limited in storage capacity unless large sums of money are spent on increasing this capacity, and

5) in addition the annual maintenance contract for such a machine could be expensive. Alterations to or upgrading of the existing software would be on an individual basis and this would be expensive, whereas there is no expense incurred by the farmer for the maintenance of the FRS system.

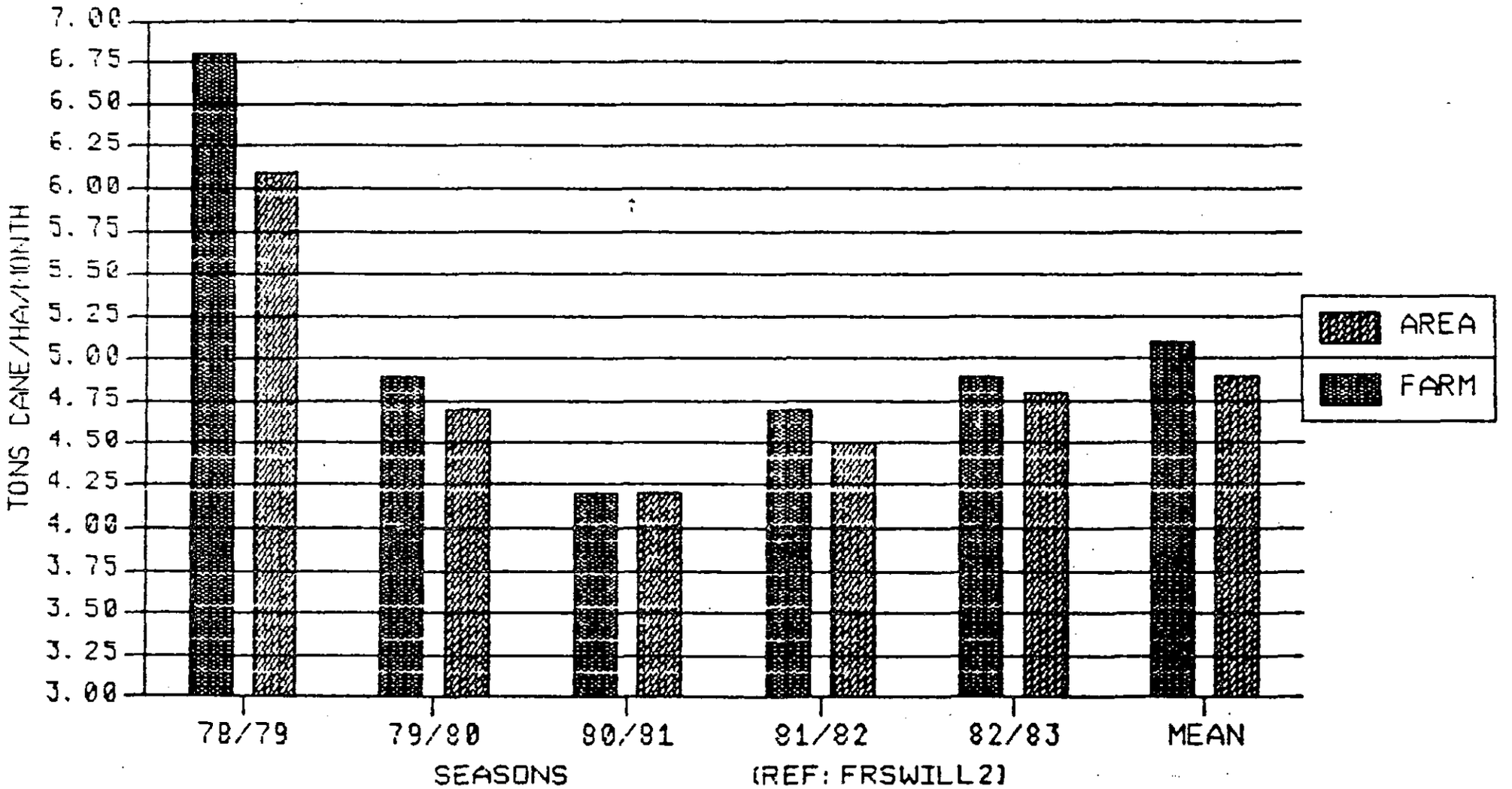
REF:FRS09 - 22/06/83 MONTH ENDING:31/03/83

FIELD NO.	AREA CUT	RAT	AGE (MTH)	VAR	RAIN &IRRIG (MM)	TONS CANE YIELD	TONS CANE /UNIT	TONS CANE /HECT	/HECT /MONTH	/HECT /100MM	POL%	RELATIVE PROD-UCED	SUCROSE /HECT	/HECT /MONTH
002	,7	00	15	2	1201	48,7	5,4	69,6	4,6	5,8	13,3	6,4	9,3	,62
003A	2,0	05	16	3	1291	132,1	5,3	66,0	4,1	5,1	13,5	17,8	8,9	,56
003B	2,2	05	17	2	1372	179,1	6,2	81,4	4,8	5,5	12,9	23,1	10,5	,62
004A	2,1	05	16	2	1299	176,9	5,9	84,2	5,3	6,5	13,2	23,3	11,1	,70
004B	2,4	05	16	2	1299	197,8	4,9	82,4	5,2	6,3	13,4	26,5	11,0	,69
006	1,7	12	12	2	881	126,3	4,9	74,3	6,2	8,4	13,3	16,8	9,9	,82
007	2,3	06	12	2	881	180,4	5,5	78,4	6,5	8,9	13,4	24,1	10,5	,88
008	5,0	07	12	23	1086	277,6	5,3	55,5	4,6	5,1	12,4	34,4	6,9	,57
009	3,0	14	13	2	966	262,4	5,0	87,4	6,7	9,1	12,6	33,0	11,0	,85
010	1,4	08	13	2	966	115,4	5,0	82,4	6,3	8,5	12,7	14,6	10,5	,81
012B	7,9	04	14	2	1129	550,7	6,0	69,7	5,0	6,2	12,9	71,0	9,0	,64
012C	3,0	01	14	26	1419	191,6	5,6	63,8	4,6	4,5	12,5	23,9	8,0	,57

REF:FRS11 - 22/06/83 ANNUAL REPORT OF CANE YIELDS BY FIELD AS AT THE 1982/83 SEASON

HARV DATE	AREA HARV	RAT	AGE (MTH)	RAIN &IRRIG (MM)	FERTILIZER "N"	"P"	"K"	TONS CANE YIELD	/HECT	/HECT /MONTH	/HECT /100MM WATER	RELATIVE POL%	PROD-	SUCROSE /HECT	/HECT /MONTH	CHEMICALS NEM	RIP	HERBICIDE
FIELD NO:001 PLANTED:04/74 SIZE: 1,4HA VARIETY:23 PARENT:MES BINOMIAL: ASPECT:FLAT SLOPE: ROW SPACE: 1,3M TILL: CON																		
06/75	1,4	0	14	1255				95,0	67,9	4,8	5,4					NO	NO	NO
09/76	1,4	1	15	2026				96,0	68,6	4,6	3,4					NO	NO	NO
10/77	1,4	2	13	1771				91,0	65,0	5,0	3,7					NO	NO	NO
05/79	1,4	3	19	2282				129,0	92,1	4,8	4,0					NO	NO	YES
08/80	1,4	4	15	1163				70,0	50,0	3,3	4,3					NO	NO	YES
12/81	1,4	5	16	1930	117	14	144	72,0	51,4	3,2	2,7					NO	NO	NO
FIELD NO:001 PLANTED:03/82 SIZE: 1,4HA VARIETY: 2 PARENT:MES BINOMIAL: ASPECT:FLAT SLOPE: ROW SPACE: 1,3M TILL: MIN																		
		0		628	130	61	170									NO	NO	NO
FIELD NO:002 PLANTED:04/74 SIZE: ,7HA VARIETY: 2 PARENT:MES BINOMIAL: ASPECT:FLAT SLOPE: ROW SPACE: 1,3M TILL: CON																		
06/75	,7	0	14	1255				67,0	95,7	6,8	7,6					NO	NO	NO
08/76	,7	1	14	1945				57,0	81,4	5,8	4,2					NO	NO	NO
10/77	,7	2	14	1853				54,0	77,1	5,5	4,2					NO	NO	NO
12/78	,7	3	14	1835				61,0	87,1	6,2	4,7					NO	NO	NO
06/80	,7	4	18	1529				46,0	65,7	3,7	4,3					NO	NO	YES
11/81	,7	5	17	1924	46	15	76	39,0	55,7	3,3	2,9					NO	NO	NO
		PLANTED:10/81																
01/83	,7	0	15	1201	146	73	206	48,7	69,6	4,6	5,8	13,4	6,5	9,3	,62	NO	NO	YES
		1		159	118	26	154									NO	NO	NO
FIELD NO:003A PLANTED:11/74 SIZE: 2,0HA VARIETY: 3 PARENT:MES BINOMIAL: ASPECT:FLAT SLOPE: ROW SPACE: 1,3M TILL: CON																		
06/76	2,0	0	19	2590				291,0	145,5	7,7	5,6					NO	NO	NO
08/77	2,0	1	14	1663				157,0	78,5	5,6	4,7					NO	NO	NO
07/78	2,0	2	11	1494				168,0	84,0	7,6	5,6					NO	NO	NO
10/79	2,0	3	15	1424				121,0	60,5	4,0	4,2					NO	NO	YES
06/81	2,0	4	20	2160	152	8	169	196,0	98,0	4,9	4,5					NO	NO	NO
10/82	2,0	5	16	1291	132	15	162	132,2	66,1	4,1	5,1	13,5	17,8	8,9	,56	NO	NO	YES
FIELD NO:003A PLANTED:02/83 SIZE: 2,0HA VARIETY:32 PARENT:MES BINOMIAL: ASPECT:FLAT SLOPE: ROW SPACE: 1,3M TILL: MIN																		
		0		74	40	60	80									NO	NO	NO
FIELD NO:003B PLANTED:04/75 SIZE: 2,2HA VARIETY: 2 PARENT:MES BINOMIAL: ASPECT:FLAT SLOPE: ROW SPACE: 1,3M TILL: CON																		
06/76	2,2	0	14	1854				311,0	141,4	10,1	7,6					NO	NO	NO
08/77	2,2	1	14	1663				240,0	109,1	7,8	6,6					NO	NO	NO
07/78	2,2	2	11	1494				240,0	109,1	9,9	7,3					NO	NO	NO
09/79	2,2	3	14	1331				193,0	87,7	6,3	6,6					NO	NO	YES
06/81	2,2	4	21	2243	201	22	245	253,0	115,0	5,5	5,1					NO	NO	NO

TONS CANE PER HECTARE PER MONTH
FOR LAST 5 SEASONS



Unless the farmer owns or intends to make use of a computer for other purposes it does not justify the capital outlay for a computer for the sole use of recording field yields.

The recording of field numbers will also be a valuable aid, should reduced frequency testing of cane be introduced, and for cane quality control; both of which are at present undergoing consideration by the Industry.

Last but by no means least is that given sufficient support, the information gained from across the whole industry, will provide the Experiment Station with a valuable data bank. This information will then enable the Experiment Station to make evaluations and recommendations that will be to the benefit and improve the profitability of the Industry in general.

GENERAL PROGRESS

Since the introduction of the pilot scheme many improvements and refinements have taken place. The trial scheme has now been extended to include two MCP sections of Smith Sugar and two MCP sections of Tongaat-Huletts and this has brought a third mill (Gledhow) into the operation.

The rate at which this project can be extended to incorporate all mills is dependant upon three factors:-

1) the success of the pilot scheme, and

2) the availability of Autolab at the mills, and

3) a decision by Council to proceed with the implementation of the scheme beyond the current trial stage.

DIS: FRS
DOC: FRS 4

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

FIELD RECORD PACKAGE

By Arthur Eggers

THIS PACKAGE CONSISTS OF:

A. FIELD RECORDS PROGRAM.
B. RAINFALL AND ESTIMATE PROGRAM.

FIELD RECORDS PROGRAM

The Field records Program of this package records for each field the following data:

a. Field number.
b. Area.
c. Variety.
d. Plant/ratoon.
e. Soil Type Code.
f. Last N P & K applied in Kilograms.
g. Age, Current and Last Cut.
h. Rainfall, Current and Last Cut.
i. Tons Cut, Yield & Growth.
j. Number of Loads and Average weight.
k. Sucrose %, Tons, Yield & Growth.
l. Response to Rainfall, N, P, & K.
m. Weedicide and other Operations Records.
n. Historic records & analysis.

RAINFALL & ESTIMATE PROGRAM

This program records the amount of rainfall a field of a particular age has had since it's last harvest. This information is automatically recorded in the appropriate field record for use in analysis of yield per 100 mm of rain.

Automatically adjusted are the following:

a. Average for that month.
b. Cumulated annual rain to date.
c. Rainfall for each age group.
d. Average for each group.
e. Percent actual/average for each group.
f. Appropriate actual Field Record.
g. Age of each field is adjusted for the new month.

ESTIMATE OF CROP

This part of the program will keep record of your estimate on a monthly or daily basis or as required.

You will be able to print the Estimate in a full Estimate Book format.

NUMERIC FIELD RECORDS

RECORDS TO END MONTH NUMBER 5

F.NO	AREA	PL/RAT	VARIETY	SOIL	KG/N	KG/P	KG/K	AGE	RAIN	AGE CUT	TONS CUT	YIELD	GROWTH	T/100MM	POL %	S/HA/M
1	3.5	1	376	12	165	0	165	17	1033	0	0.00	0.00	0.00	0.00	0.00	0.00
2	2.2	4	N13	11	170	34	170	6	227	0	0.00	0.00	0.00	0.00	0.00	0.00
3	5.6	2	376	12	170	34	170	12	554	0	0.00	0.00	0.00	0.00	0.00	0.00
4	4.6	0	N11	13	105	95	105	10	539	0	0.00	0.00	0.00	0.00	0.00	0.00
5	1.1	3	376	13	0	0	0	1	31	15	85.00	77.27	5.15	9.10	12.10	0.62
6.1	6.0	4	805	12	155	0	155	11	546	0	0.00	0.00	0.00	0.00	0.00	0.00
6.2	1.9	5	N13	13	0	0	0	1	31	16	180.00	94.73	5.92	9.45	12.50	0.74
7	1.3	5	376	10	170	35	170	15	784	0	0.00	0.00	0.00	0.00	0.00	0.00
8.1	11.2	3	376	12	0	0	0	1	31	15	900.00	80.35	5.35	9.46	12.20	0.65
8.2	2.3	6	376	12	165	31	165	6	227	0	0.00	0.00	0.00	0.00	0.00	0.00
9	1.5	3	376	14	160	45	0	7	351	0	0.00	0.00	0.00	0.00	0.00	0.00
10	3.5	5	376	14	205	0	0	5	188	0	0.00	0.00	0.00	0.00	0.00	0.00
11	3.4	1	376	13	170	0	170	8	454	0	0.00	0.00	0.00	0.00	0.00	0.00
12	3.6	5	805	13	170	35	170	10	539	0	0.00	0.00	0.00	0.00	0.00	0.00
12.1	4.2	5	376	13	205	0	0	12	554	0	0.00	0.00	0.00	0.00	0.00	0.00
12.2	2.6	0	376	13	85	102	85	7	351	0	0.00	0.00	0.00	0.00	0.00	0.00
14	3.5	1	805	13	155	55	155	6	227	0	0.00	0.00	0.00	0.00	0.00	0.00
15	3.4	4	376/805	12	165	0	0	12	554	0	0.00	0.00	0.00	0.00	0.00	0.00
16	2.5	5	376	13	0	0	0	1	31	16	205.00	82.00	5.12	8.18	12.60	0.64
19	1.6	5	376	14	150	22	0	6	227	0	0.00	0.00	0.00	0.00	0.00	0.00
20	6.5	1	376	12	130	22	130	12	554	0	0.00	0.00	0.00	0.00	0.00	0.00
21	4.4	7	376	12	165	32	165	15	784	0	0.00	0.00	0.00	0.00	0.00	0.00
22.1	2.6	0	376	12	95	65	0	8	454	0	0.00	0.00	0.00	0.00	0.00	0.00
22.2	4.5	6	376	12	170	0	170	6	227	0	0.00	0.00	0.00	0.00	0.00	0.00
24	3.6	2	805	12	155	0	155	8	454	0	0.00	0.00	0.00	0.00	0.00	0.00
25	1.9	3	N11	25	166	32	166	9	521	0	0.00	0.00	0.00	0.00	0.00	0.00
26	4.4	1	376	12	164	33	164	10	539	0	0.00	0.00	0.00	0.00	0.00	0.00
27	4.6	2	805	12	85	0	0	5	188	0	0.00	0.00	0.00	0.00	0.00	0.00
28	3.5	6	376	12	0	0	0	1	31	16	360.00	102.85	6.42	10.26	12.00	0.77
29	5.0	1	376	25	135	0	135	8	454	0	0.00	0.00	0.00	0.00	0.00	0.00
30	2.6	5	805	12	165	45	165	4	124	0	0.00	0.00	0.00	0.00	0.00	0.00
31	2.5	4	376	12	135	0	135	5	188	0	0.00	0.00	0.00	0.00	0.00	0.00
31.1	1.4	6	376	12	180	45	180	6	227	0	0.00	0.00	0.00	0.00	0.00	0.00
32	1.1	3	376	12	166	0	166	5	188	0	0.00	0.00	0.00	0.00	0.00	0.00
33	5.6	4	376	25	185	42	185	12	554	0	0.00	0.00	0.00	0.00	0.00	0.00
34	5.1	2	376	12	165	0	165	13	603	0	0.00	0.00	0.00	0.00	0.00	0.00
35	2.1	6	376	12	155	35	155	8	454	0	0.00	0.00	0.00	0.00	0.00	0.00
36	2.6	4	805	12	185	45	185	12	554	0	0.00	0.00	0.00	0.00	0.00	0.00
37	6.1	8	376	12	190	55	190	7	351	0	0.00	0.00	0.00	0.00	0.00	0.00
38	4.2	3	805	25	165	32	165	8	454	0	0.00	0.00	0.00	0.00	0.00	0.00
		AVERAGES								15.6		87.44	5.59	9.29	12.28	0.68
20.2		TOTALS TO DATE									1730.00					

RECORD OF AREAS BY RATOON

PLANT	9.8	6.8 %
RATOON 1	26.3	18.2 %
RATOON 2	18.9	13.1 %
RATOON 3	21.0	14.6 %
RATOON 4	22.3	15.5 %
RATOON 5	21.2	14.7 %
RATOON 6	13.8	9.5 %
RATOON 7	4.4	3.0 %
RATOON 8	6.1	4.2 %
FALLOW	0.0	0.0 %
TOTAL AREA	143.8 Ha	

FIELDS STILL TO BE TOPDRESSED

FIELD NUMBER	AREA IN Ha
5	1.1
6.2	1.9
8.1	11.2
16	2.5
28	3.5
TOTAL AREA	20.2

FIELDS WHICH HAVE < 100 KG NITROGEN APPLIED

FIELD NUMBER	AREA IN Ha
12.2	2.6
22.1	2.6
27	4.6

MAY

AGE IN MONTHS	ACTUAL RAINFALL	AVERAGE RAINFALL	PERCENTAGE
1	32	67	47
2	45	162	27
3	81	286	28
4	125	412	30
5	189	545	34
6	228	661	34
7	352	778	45
8	456	885	51
9	522	974	53
10	540	1024	52
11	547	1062	51
12	555	1107	50
13	604	1177	51
14	688	1278	53
15	785	1412	55
16	881	1544	57
17	1034	1684	61
18	1087	1802	60
19	1235	1919	64
20	1284	2027	63
AVERAGE FOR THE GROUP			48

SUGAR INDUSTRY CENTRAL BOARD
****

MONTHLY ESTIMATE OF CANE CROP

Season 1983/84
Mill DEMOVILLE
Quota No. DM 222

Growers Name: DEMONSTRATION FARM
Address: P.O. BOX 111, DEMOVILLE, 4444

DETAILS OF CANE FIELDS				FIRST CANE ESTIMATE			PROGRESSIVE CANE ESTIMATE		
FIELD NO. /MAP	AREA HA.	CANE PLANT RAT/N	VARIETY	CANE YIELD AGE CANE MONTHS	METRIC T/HA	METRIC T/FIELD	HARVESTED CANE TO DATE	STILL TO BE HARVESTED METRIC TONS	TOTAL CANE PER FIELD SEASON
6.2	1.9	4	N13	17	115	220	180	0	180
16	2.5	4	376	17	115	290	205	0	205
28	3.5	5	376	17	115	400	360	0	360
5	1.1	2	376	16	110	120	85	0	85
8.1	11.2	2	376	16	95	1060	900	0	900
7	1.3	5	376	15	120	160	0	160	160
[illegible]	4.4	7	376	15	75	330	0	330	330
[illegible]	5.1	2	376	13	95	480	0	480	480
3	5.6	2	376	12	95	530	0	530	530
12.1	4.2	5	376	12	90	380	0	380	380
15	3.4	4	376/805	12	90	310	0	310	310
20	6.5	1	376	12	85	550	0	550	550
33	5.6	4	376	12	85	480	0	480	480
36	2.6	4	805	12	95	250	0	250	250
6.1	6.0	4	805	11	65	390	0	390	390
4	4.6	0	N11	10	75	350	0	350	350
12	3.6	5	805	10	85	310	0	310	310
26	4.4	1	376	10	85	370	0	370	370
25	1.9	3	N11	9	65	120	0	120	120
11	3.4	1	376	8	65	220	0	220	220
22.1	2.6	0	376	8	85	220	0	220	220
24	3.6	2	805	8	90	320	0	320	320
29	5.0	1	376	8	80	400	0	400	400
35	2.1	6	376	8	70	150	0	150	150
38	4.2	3	805	8	60	250	0	250	250
[illegible]	1.5	3	376	7	65	100	0	100	100
12.2	2.6	0	376	7	95	250	0	250	250
37	6.1	8	376	7	85	520	0	520	520
	110.5					9530	1730	7440	9170

****
Cane Estimate Metric tons
.....

MILL GROUP BOARD.....!.....!
!
MILLER.....!.....!
****

.....
(Signature)

DATE.....

REMARKS.(In terms of items 2.14,2.15 and 2.16).....

.....

GROWTH RATES compared to NUTRIENT LEVELS

Field No.	K.Val	P.Val	T/H/M/	K<200	K>200	count	P<=80	P>80	count	S/H/M	K<200	K>200
210	151	181	4.3	4.3	0	1	0	4.3	0	.36	.36	0
208	240	96	6.7	0	6.7	0	0	6.7	0	.65	0	.65
221	183	90	6.8	6.8	0	1	0	6.8	0	.58	.58	0
101	138	181	5.9	5.9	0	1	0	5.9	0	.8	.8	0
104	249	152	7.4	0	7.4	0	0	7.4	0	.91	0	.91
233	375	42	6.2	0	6.2	0	6.2	0	1	.73	0	.73
111	199	106	5.6	5.6	0	1	0	5.6	0	.57	.57	0
234	305	56	5.7	0	5.7	0	5.7	0	1	.52	0	.52
235	312	71	5.8	0	5.8	0	5.8	0	1	.59	0	.59
226.2	364	88	6.3	0	6.3	0	0	6.3	0	.71	0	.71
226.1	384	150	5.7	0	5.7	0	0	5.7	0	.7	0	.7
219	321	78	5.9	0	5.9	0	5.9	0	1	.78	0	.78
225	273	169	6	0	6	0	0	6	0	.66	0	.66
205	425	181	5.7	0	5.7	0	0	5.7	0	.62	0	.62
242	488	143	7	0	7	0	0	7	0	.84	0	.84
64	294	42	5.5	0	5.5	0	5.5	0	1	.62	0	.62
48	560	105	5.5	0	5.5	0	0	5.5	0	.64	0	.64
47	430	181	5	0	5	0	0	5	0	.55	0	.55
1	136	167	7.1	7.1	0	1	0	7.1	0	.77	.77	0
54	221	107	5	0	5	0	0	5	0	.51	0	.51
55	294	96	7.4	0	7.4	0	0	7.4	0	.75	0	.75
52	231	120	6.8	0	6.8	0	0	6.8	0	.71	0	.71
61	253	103	8.1	0	8.1	0	0	8.1	0	.88	0	.88
				23		5	23		5		23	
				18			18				18	
			T/H/M >>>	5.94	6.21		5.82	6.24		S/H/M >>>	0.62	0.69

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

FIELD & RECORDS PROCESSING ON WINDERMERE & SHEPLEY FARMS

by

Chris Chance

Computer print-out schedules are attached as examples of what is used.

RAINFALL RECORD FOR WINDERMERE (WIND.)& W.J.F.C(SHED) & SHEPLEY (DAM)

YEAR:	JAN 146	FEB 163	MAR 143	APR 121	MAY 93	JUNE 62	JULY 56	AUG 71	SEPT 117	OCT 128	NOV 140	DEC 132	HOUSE 1078	SHED 1122	DAM 1038	WIND. 1141	SEPT. TO APRIL 1895	FARM AV.
1957	76	232	144	171	44	31	65	49	202	193	108	119	1431					1431
1958	185	224	38	271	19	91	15	16	229	94	77	97	1355				1339	1355
1959	109	83	26	20	151	10	42	32	216	138	83	246	1154				734	1154
1960	59	258	174	200	86	62	29	94	86	75	244	418	1785				1373	1785
1961	200	283	111	256	60	204	66	48	128	145	147	103	1733				1672	1733
1962	105	80	120	84	53	1	60	75	54	110	168	121	1030				904	1030
1963	155	64	182	79	0	302	199	17	24	151	139	125	1437				932	1437
1964	186	133	59	167	31	43	70	43	64	206	117	152	1271	1222			984	1246
1965	52	78	41	91	48	182	66	127	116	198	161	80	1223	1114	995		881	1111
1966	164	127	36	88	74	96	13	108	88	88	117	109	1100	1032	928		961	1020
1967	118	172	274	401	29	15	89	49	25	113	128	48	1468	1177	1177		1360	1271
1968	131	117	222	46	30	59	9	115	96	91	153	187	1254	1068	1060		828	1125
1969	81	70	302	83	96	52	22	10	124	186	122	105	1251	1153	1013		1062	1139
1970	113	79	74	79	117	38	16	58	94	289	242	68	1169	1009	936		879	1038
1971	185	106	177	140	598	12	125	64	98	118	57	127	1807	1533	1467		1213	1609
1972	86	405	242	99	214	51	45	64	23	80	182	224	1714	1295	1282		1232	1438
1973	126	182	127	115	47	8	25	215	288	114	242	130	1618	1402	1194	1485	1059	1425
1974	228	154	70	78	101	48	47	34	6	38	205	92	1092	794	774	914	1295	893
1975	209	200	89	82	25	57	60	56	192	100	128	126	1323	1025	1025	1146	920	1130
1976	205	268	507	140	78	3	86	103	96	179	138	172	1967	1648	1557	1735	1666	1727
1977	215	303	182	49	41	28	42	56	163	135	144	115	1472	1179	1037	1183	1326	1218
1978	289	109	205	187	35	58	97	89	119	268	138	88	1674	1269	1215	1364	1346	1381
1979	175	50	101	48	138	52	58	69	126	98	86	149	1143	931	950	956	980	995
1980	167	26	32	93	35	41	16	42	236	41	127	109	963	807	737	745	776	813
1981	139	370	71	124	225	98	36	94	136	67	95	76	1532	1405	1030	1542	1217	1377
1982	129	144	181	36	115	4	25	25	112	113	97	70	1050	834	826	919	863	907
1983	57	81	80	56	41	37	88	175	31				645	936	523	566	666	567

PRODUCTION 1983/84 SEASON WINDERMERE DATE: 17/10/83

FIELD NO.	TOTAL AREA	AREA CUT	VARIETY	RATOON	DATE CUT	AGE	TONS	SEED	YIELD TONS/HA	YIELD TON/HA/M	UNITS	TONS/UNIT
WINDERMERE												
**********												
101	1.1	0	N12	0					0.00	0.00	0	0.00
102	5.2	0	376	2					0.00	0.00	0	0.00
201	8.4	8.4	376	2	1/10	13	798.25	25	98.01	7.54	110	7.26
202	4.2	0	376	6					0.00	0.00	0	0.00
301	6.6	0	N13	2					0.00	0.00	0	0.00
302	6.6	0	376	2					0.00	0.00	0	0.00
303	3.1	0	376	2					0.00	0.00	0	0.00
304	2.4	0	376	1					0.00	0.00	0	0.00
401	2	2	376	2	4/7	13	185.45		92.73	7.13	28	6.62
402	3.4	2.4	376	2	6/7	13	220.35	48	111.81	8.60	33	6.68
501	7.2	7.2	376	2	9/10	13	698.52		97.02	7.46	99	7.06
502	4.3	0	376	2					0.00	0.00	0	0.00
503	6.6	0	376	2					0.00	0.00	0	0.00
504	8.1	0	376	1					0.00	0.00	0	0.00
601	8.8	0	376	1					0.00	0.00	0	0.00
602	6.6	0	376	1					0.00	0.00	0	0.00
603	2.4	0	376	3					0.00	0.00	0	0.00
700	3.7	3.7	376	2	10/6	16	385.35		104.15	6.51	61	6.32
800	9.4	0	N14	0					0.00	0.00	0	0.00
801	8.7	0	376	6					0.00	0.00	0	0.00
802	1.6	0	376	1					0.00	0.00	0	0.00
803	3.6	0	376	2					0.00	0.00	0	0.00
804	2.4	0	376	1					0.00	0.00	0	0.00
805	5.8	0	376	1					0.00	0.00	0	0.00
901	7.4	6	376	2	28/4	17	625.28		104.21	6.13	98	6.38
902	3.6	0	376	1					0.00	0.00	0	0.00
903	1.6	0	N12	0					0.00	0.00	0	0.00
904	6.2	0	N12	0					0.00	0.00	0	0.00
905	1.8	0	376	3					0.00	0.00	0	0.00
AVERAGE	142.8	29.7		2		14.17	2913.2	73	100.55	6.92	429	6.79
% CUT:		20.80										
% LEFT:		79.20										

DIESEL AND PETROL STOCK CONTROL MONTH: SEPT.

DIESEL

DAY!		01-07	08-14	15-21	22-28	29-31	TOTAL
NO.1!	LT.	40.4	50.1	61.4	123.9		275.8
4600!	HRS.	12.4	14.3	14.8	25.4		66.9
LT/HR		3.26	3.50	4.15	4.88	0.00	4.12
NO.2!	LT.	15	52.9	26.8	41.2		135.9
4000!	HRS.	5	16.7	5.4	9.2		36.3
LT/HR		3.00	3.17	4.96	4.48	0.00	3.74
NO.3!	LT.	16.4	55.8	21.2	33		126.4
3600!	HRS.	5.2	18.8	7.6	9.3		40.9
LT/HR.		3.15	2.97	2.79	3.55	0.00	3.09
NO.4!	LT.	0					0
B.M.C.!	HRS.	0					0
LT/HR.		0.00	0.00	0.00	0.00	0.00	0.00
NO.5!	LT.	152.4	139	68	138.7		498.1
5000!	HRS.	30	25	12	26.5		93.5
LT/HR.		5.08	5.56	5.67	5.23	0.00	5.33
NO.6!	LT.	112.4	47.4	65.3	83.8		308.9
4100!	HRS.	26.6	11.9	20.6	26.2		85.3
LT/HR.		4.23	3.98	3.17	3.20	0.00	3.62
NO.7!	LT.	49.6	48.4	0			98
4600!	HRS.	10	11.1	0			21.1
LT/HR.		4.96	4.36	0.00	0.00	0.00	4.64
NO.8!	LT.			35.9	12.2		48.1
354!	HRS.			16.6	5.1		21.7
LT/HR.		0.00	0.00	2.16	2.39	0.00	2.22
NO.9!	LT.		83.8	22.6	0		106.4
COUNTY!	HRS.		8	3	0		11
LT/HR.		0.00	10.48	7.53	0.00	0.00	9.67
OTHER !	LT.	26	151	231.2	10.2		418.4
TRUCK!	LT.	100.8	195.1	263.5	211.5		770.9
ISUZU!	KM.	731.3	861.1	1116.5	1120		3828.9
LT/KM.		13.78	22.66	23.60	18.88	0.00	20.13
STOCK BAL B/F		250	3737	2913.5	2117.6	1463.1	1463.1
PURCHASE		4000					4000
WEEKLY	USAGE	513	823.5	795.9	654.5	0	2786.9
	BALANCE	3737	2913.5	2117.6	1463.1	1463.1	1463.1

FIELD USAGE AND STOCK CONTROL FOR SHEPLEY AND WINDERMERE DATE: 30/09/83

FIELD NO.	AREA	BAGS OF FERTILIZER 1.0.1	3.1.5	C.A.N.	2.3.4.	KG/HA	LT/DOPAX	HERBICIDE LT/HA	KG/VELPAR	GRAMS/HA	NEMATICIDE KG/TEMIK	LT/VYDATE	/HA	GRAMURON
WINDERMERE														
101	1.1	12				545		0.00		0			0	5
102	5.2					0		0.00		0			0	
201	8.4					0		0.00		0			0	
202	4.2					0		0.00		0			0	
301	6.6			39		295		0.00		0			0	
302	6.6			40		303		0.00		0			0	
303	3.6	10		19		403	28	5.56		0			0	
304	2.4					0		0.00		0			0	
401	2	17				425		0.00	1	500			0	
402	3.4	26				382		0.00	1.75	515			0	
501	7.2					0		0.00		0			0	
W.J.F.C.														
101	3.1					0		0.00		0			0	
102	3.9					0		0.00		0			0	
103	2.1					0		0.00		0			0	
104	8.7					0		0.00		0			0	
105	1.8					0		0.00		0			0	
201	8.9					0		0.00		0			0	
301	8.1					0		0.00		0			0	
302	4.5	35				389		0.00	2	444			0	
SHEPLEY														
603	4.3					0		0.00		0			0	
604	3.3					0		0.00		0			0	
701	3.2				32	500	24	7.50		0	86.25		27	
702	1.6					0		0.00		0			0	
703	3.7					0		0.00		0			0	
704	8.5					0		0.00		0			0	
705	3.9				23	295	24	6.15		0	52.5		13	
706	3.4			24		353		0.00		0			0	
707	5	18		30		400		0.00		0			0	
801	5.9					0		0.00		0			0	
909	2.1	23				548	15	7.14	.75	357			0	
910	1.8					0		0.00		0			0	
803	5.1					0		0.00		0			0	
804	6					0		0.00		0			0	
TOWNLANDS	40	140	60			250		0.00		0			0	
GERBERA	1.1					0		0.00					0	
STOCK CONTROL														
OPENING STOCK		212	0	316	593		49	34.25		95	15		24	
SEASON PURCHASES		400	800	400	0		220	20		720	0		45	
BALANCE ON HAND		24	728	180	472		17	32.75		500	15		52	

MONTH: SEPTEMBER 1983 WAGES SHEPLEY AND WINDERMERE

NAME	DAYS WORKED	RATE	WAGES EARNED	TICKETS DOCTOR	ADVANCES CASH	ADVANCES B/F	TOTAL DEDUCTIONS	ADVANCES WORKED OFF	PAID	ADVANCES C/F
SAMUEL	12	5.70	68.40	3.00			3.00	3.00	65.40	0.00
ABELL	30	5.50	165.00	2.00		49.00	51.00	51.00	114.00	0.00
VICTOR	30	5.50	165.00		120.00		120.00	120.00	45.00	0.00
MKHONJWA	30	5.45	163.50	7.00	50.00		57.00	57.00	106.50	0.00
MSUSWA	26	5.90	153.40	4.00	60.00		64.00	64.00	89.40	0.00
SPONONO	25	5.90	147.50	7.00	164.71		171.71	100.00	47.50	71.71
BOKINKOSI	25	5.50	137.50				0.00	0.00	137.50	0.00
JOHAN	30	5.50	165.00	30.00			30.00	30.00	135.00	0.00
JOSEPH	30	5.50	165.00				0.00	0.00	165.00	0.00
LUKA	30	4.50	135.00	6.00			6.00	6.00	129.00	0.00
MISHACK	0	5.50	0.00			367.60	367.60	0.00	0.00	367.60
JOSIA	30	3.20	96.00	28.00			28.00	28.00	68.00	0.00
PATRICK	16	6.75	108.00	10.00	150.00		160.00	108.00	0.00	52.00

CASH FLOW FOR 1983/4 SEASON

DATE:

MONTH	MAY	JUNE	JULY	AUGUST	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	TOTAL	1982/3
INCOME														
*********														
CANE													0	
CITRUS													0	
EQUILISAT													0	
RET.INT													0	
TRANSPORT													0	
VEGETABLE													0	
RENT													0	
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURE														
**********														
GENERAL														
ELECTRICI													0	
FERTILIZE													0	
DRAINAGE													0	
FUEL/LUB													0	
LABOUR EX													0	
RAILAGE													0	
RATIONS													0	
MAINTENAN														
BUILD.													0	
[illegible]RIG.													0	
[illegible]/VEH.													0	
-TRAILERS													0	
-IMPLEMEN													0	
-WORKSHOP													0	
-TRACTORS													0	
WAGES													0	
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CITRUS														
FERTILIZE													0	
INSECTICI													0	
ORCH.EXP													0	
PACK.MAT.													0	
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CANE													0	
													0	
FERTILIZE													0	
HERBICIDE													0	
LEVIES													0	
LOADING													0	
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VEGETABLE														
[illegible]ILIZE													0	
[illegible]ECTICI													0	
SEED													0	
PACK.MAT.													0	
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADMIN.														
ACCOUNTAN													0	
BANK CHGS													0	
O/D INT.													0	
BOND INT.													0	
INSURANCE													0	
LICENCES													0	
LEVIES													0	
MEDICAL													0	
STATIONAR													0	
RAILAGE													0	
SALARIES													0	
SUBS.													0	
TELEPHONE													0	
WK/COMPEN													0	
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GRAND TOT														
INCOME	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITU	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CASHFLOW	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

INTERPRETING FIELD RECORDS - M.G. Murdoch

This note concerns the interpretation of the analyses of field records with a view to determining cause and effect relationships.

In general, there are two sources or types of information that are used to establish relationships:

- data obtained from experiments
- observations collected in the form of surveys

The contrast between these two types of information is as follows:

EXPERIMENTS

An experiment is carried out to "manufacture" information. If it is properly designed and conducted then a cause and effect relation will be assured.

Judgement, however, may be needed in deciding to which conditions in the real world the results will be applicable.

SURVEYS

With surveys information that already exists is collected. Associations between the various factors may be demonstrated, but there is no guarantee that these represent cause and effect.

FIELD RECORDS

Field records are survey type information. Careful judgement is needed in interpreting any of the associations found as representing cause and effect.

It would be incorrect to regard the collection of large amounts of field records information as the equivalent of a "grand experiment".

In commercial situations decisions on what variety to plant in a field, at what age to harvest, when to replant, whether to burn or trash a field, etc., etc., are made to suit particular conditions and are not done at random.

COMBINING/

COMBINING SETS OF RECORDS

Yields from one season to the next and from one farm to another can vary considerably.

When combining data, care must be taken to avoid confounding the effects of other factors with differences between seasons or farms.

For example, a comparison between varieties A and B would be affected if a higher proportion of fields of variety B was harvested in, say, a low yield season.

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

RESPONSES TO NITROGEN FOR RATOON CANE GROWN IN VARIOUS SWAZILAND SOILS

by NB Leibbrandt

1. Introduction

A programme of nutritional trials was initiated between 1980 and 1983 in Swaziland with one of the objectives being to determine optimum N rates for ratoon NCo 376 grown in the most predominant soils of the lowveld. The question on whether present FAS nitrogen recommendations are applicable or not to this region of widely varying soil forms needs investigation. Hopefully results obtained after a number of seasons will enable a more precise nitrogen recommendation to be made for the soils involved.

2. The soils

The soils being tested range from light grey sandy alluvium to heavy black clays and vary in depth (Table I) nutritional values and yield potential. These soils are mainly derived from Swazi basic rocks, basalts, alluvium and Middle Ecca sandstones and shales and represent those most commonly found in the Swaziland sugar industry.

TABLE I SOILS

Soil form	Clay %	Depth (cm)
Dundee	20	>100
Estcourt	20	60
Bonheim (light)	33	100
Tambankulu	37	60
Shortlands	40	60
Mayo	40	55
Bonheim (heavy)	52	80
Arcadia	52	70

3. Responses to nitrogen

Rates of nitrogen applied to each soil ranged from nil to 240 kg N/ha with 40 kg N/ha intervals. Applications were made by hand and were split on soils with <30% clay and on sites that were harvested before August. The nitrogen carrier used in these trials was either Urea (46 % N) or ammonium nitrate (34,5 % N).

Table II shows the yield response of each soil to the low level of nitrogen (80 kg N/ha) with the greatest being on the Tambankulu, Estcourt and Arcadia soil forms. The Shortlands form responded to a far lesser

degree to applied N due to its higher nitrogen mineralization potential. Poor drainage and waterlogged conditions that are common in the heavy clay soils were responsible for poor N utilization in the Bonheim soil forms.

Table II Yield responses to 80 kg nitrogen/ha

Soil form	kg N/ha		Increase	
	Nil	80	tc/ha	%
Tambankulu	82	114	32	39
Estcourt	55	75	20	36
Arcadia	92	124	32	35
Dundee	84	104	20	24
Mayo	82	100	18	22
Bonheim (heavy)	78	88	10	13
Shortlands	142	150	8	6
Bonheim (light)	75	79	4	5

Results have indicated that the requirements of nitrogen for optimum yields differ markedly between these soils (Table III) with some responding best to low levels of N while others produced peak yields at far higher rates.

Table III Optimum N levels (kg/ha)

Soil form	1st crop	2nd crop	Mean response tc/ha
Shortlands	80	-	+ 9
Mayo	80	120	+ 29
Bonheim (light)	-	160	+ 14
Bonheim (heavy)	120	160	+ 25
Estcourt	140	180	+ 30
Arcadia	160	160	+ 48
Dundee	200	-	+ 34
Tambankulu	240	200	+ 66

From these results it is possible to group the soils according to their nitrogen requirements:

A. Those soils that require minimal amounts of N for optimum yields ie. the red to dark brown free draining aggregated soils of the Shortlands and Mayo forms (80 - 120 kg N/ha). These soils are capable of mineralizing substantial amounts of nitrogen and care should be taken not to over apply the nutrient.

B. The soils that produce optimum yields at the intermediate levels of nitrogen (120-180 kg N/ha) ie. the dark brown to black clays of the Bonheim and Arcadia forms, and the duplex soils represented by the Estcourt form. The responses on these soils to applied N varies according to soil conditions and poor N utilization can be expected with inadequate drainage.

C. Those soils that require high rates of nitrogen (200-240 kg N/ha) for optimum yields ie. the grey alluvial Dundee form soil and the dark grey/ brown Tambankulu form soil.

4. Conclusion

The nitrogen response curves for the soil forms selected for investigation have shown sufficient evidence that the soil should be considered when assessing the amount of nitrogen to be applied for optimum yields.

NBL/PMO
11.10.83

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

N RECOMMENDATIONS BASED ON SOIL TYPE

by RA Wood and JH Meyer

- Effective utilization of N by the cane grower depends on a basic understanding of the transformations which N undergoes in the soil. It is important to realise that soil type can greatly influence the response of cane to fertilizer N, not only in the plant crop but also in the subsequent ratoons.

- Sugarbelt soils vary significantly in their capacity to release N mineralization. **This is the process by which the N in organic matter is converted into inorganic N as a result of microbial decomposition.**

- The three main steps in N mineralization are shown below.

1.	ORGANIC N (organic matter)	Ammonification by Soil micro-organisms →	AMMONIUM N(NH_4^+)
2.	AMMONIUM N(NH_4^+)	Oxidation by Nitrosomonas →	NITRITE N(NO_2^-)
3.	NITRITE N(NO_2^-)	Oxidation by Nitrobacter →	NITRATE N(NO_3^-)

(Steps 2 and 3 are referred to as NITRIFICATION)
MINERAL NITROGEN = AMMONIUM N + NITRATE N

- Following incubation for two weeks in the laboratory the quantities of mineral N released by sugarbelt soils derived from various parent materials ranged from 30 ppm in the sandy TMS soils to 111 ppm in highly fertile alluvial soils (ie 68-250 kg N/ha equivalent).

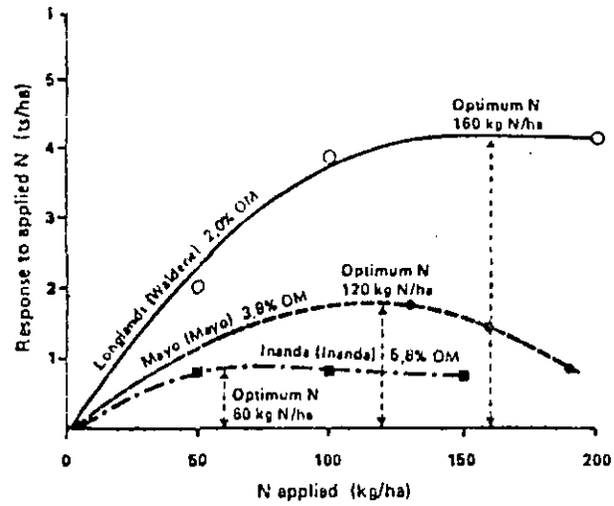
- Until recently N recommendations for **plant cane** took these differences in mineralizing capacity of the soil into account only to the extent that 90 kg N/ha was recommended for all soils except those derived from Dwyka tillite and sandy TMS, where 125 kg N/ha was recommended.

- For **ratoon cane** estimated cane yield was used as the main criterion for advisory purposes (1,25 kg N/ton expected cane yield per hectare) and variable release of N from different soils was largely ignored.

- Additional fertilizer trials have therefore been conducted to establish more accurately the average amount of N required by the cane crop to supplement that not met by each of the major soil types. These trials have confirmed that the N requirement for ratoon cane is substantially higher on the poorly drained, low organic matter soils of the Longlands and Kroonstad forms (140-180

kg N/ha) than on the heavier, humic well drained Inanda form soils (50-80 kg N/ha). On many soils (Shortlands, Mayo, Bonheim and Arcadia forms) the N requirement falls between these two extremes (110-140 kg N/ha) as shown in the graph below:

Response to applied N in relation to soil organic matter content and soil form (rainfed cane)



- The results of the fertilizer trials together with additional laboratory data have shown that the N requirement of both ratoon and plant cane can be more reliably estimated from a knowledge of soil form and organic matter content of the soil. Soils with low (<2%), moderate (2 to 4%) and high (>4%) organic matter contents have been associated with average relative responses of about 50%, 23% and 10% to applied N respectively.

- The new system that is being used for recommending N for plant and ratoon cane according to diagnostic horizon, parent material, associated soil form and organic matter is shown in the table below:

Soil group	Main diagnostic A horizon(s)	Organic matter status	Estimated N mineral capacity (kg/ha)	Parent material	Soil form	N recommendations	
						Plant (kg/ha)	Ratoon (kg N/t cane)
I	Orthic (weak)	Low <2	Low <70	Recent Sand	Fernwood	120	1,6:1 (e g 160 kg N /100 t)
				TMS (ordinary)	Cartref		
				Dwyka tillite	Longlands Glenrosa		
				Granite	Glenrosa		
				Alluvium	Katspruit		
II	Melanic Vertic Orthic (good)	Medium 2-4	Medium 70-140	Lower Ecca shale	Milkwood	90	1,25:1 (e g 125 kg N /100 t)
				Middle Ecca sedt.	Swartland		
				Granite	Mayo		
				Dolerite	Shortlands		
					Arcadia		
				Alluvium	Hutton		
				TMS (ordinary)	Hutton		
III	Humic Orthic (Humic phase)	High >4	High >140	Dolerite	Hutton	60	0,8:1 (e g 80 kg N /100 t)
					Inanda		
				TMS (mist)	Inanda		
					Nomanci		
				Middle Ecca	Clovelly		
				Dwyka tillite	Griffin		

- This system will help to rationalise the use of N fertilizer ensuring increased application on the poorer less fertile soils (eg many grey soils of the Cartref, Kroonstad and Longlands forms). Equally there will be a reduction in the rates of N fertilizer applied to soils with a good N mineralizing capacity and high organic matter content.

- For advisory purposes we are now planning to categorise soils into three or four classes based on the nature of the diagnostic topsoil horizon, soil form, structure and organic matter content. This will be determined by a visual examination of each soil sample as it is received in the FAS laboratory.

- Properties such as colour, structure, texture and consistency will be used to estimate whether a soil has a low, moderate or high N mineralizing capacity. The requirements for each class is given in Table 2.

- Class I soils comprise mainly grey non-structured sands to loamy sands which may be associated with mottling and nodules of ironstone (plinthite). Diagnostic horizons that are equivalent to this class are grey orthic A (light), E, soft to hard plinthite and gleycutanic B horizons.

- Class II soils are generally heavier textured, red to dark grey and black in colour and may show moderate to strong blocky structure. Diagnostic horizons that fall into this category include dark grey orthic loams, red orthic sands to loams, red structured B clays, melanic A and vertic A clays. Unfortunately this class covers a wide range of soil material and the merits of dividing this class into two sub-divisions is presently under consideration.

- Class III soils occur mainly in the Natal Midlands (Nottingham soil system, >300 m in altitude) and are characterised by their dark brown colour and light, fluffy nature (rich in humus). This class includes humic A and brown orthic A (humic phase) topsoils.

- Information on the parent material of a field as supplied by some growers on the soil label may also be helpful in rating the soil into its appropriate class. The various parent materials associated with each class is shown in Table 2.

- In time, once all farms have been mapped on a soil form basis, it is hoped that N recommendations will be based solely on soil form. The system envisaged is shown in Table 3.

RAW/JHM/HDN
7/10/83

Table 2: GUIDE FOR ESTIMATING NITROGEN REQUIREMENT BASED ON SOIL PROPERTIES

Detail	Soil N mineralization class		
	Low I	Moderate II	High III
Colour	Grey with mottling	Red to black	Dark brown
Texture	Usually below 15% clay	Usually above 15% clay*	Usually above 25% clay
Structure	Nil - May cap	Moderate to strong*	Fine granular non-structured
Organic matter	<2%	2 - 4%*	4%
Drainage	Usually restricted*	Usually free draining	Free draining
Plant (kg/ha)	120	90	60
Ratoon (kg N/tc)	1,6:1	1,25:1	0,8:1
From label	Grey Recent Sands Pre-Granite Quartzite Alluvium (light) Granite (light) Dwyka Tillite Middle Ecca Sandstone TMS (ordinary)	Red Recent Sands Granite (heavy) Lower Ecca Shale Middle Ecca Shale Alluvium (heavy) Tugela Schist Dolerite	TMS (mistbelt) Dolerite (humic)

* excludes Recent Sands

Table 3: TENTATIVE GUIDE FOR ESTIMATING NITROGEN REQUIREMENT OF RAINFED CANE ACCORDING TO SOIL FORM

SOIL MINERALIZATION POTENTIAL				
LOW I		MODERATE II	HIGH III	VERY HIGH IV
FERNWOOD CARTREF LONGLANDS WESTLEIGH KROONSTAD KATSPRUIT GLENROSA (LIGHT) ESTCOURT STERKSPRUIT		GLENROSA (HEAVY) CLOVELLY (LIGHT) HUTTON (LIGHT) OAKLEAF SWARTLAND BONHEIM VALSRIVIER TAMBANKULU WILLOWBROOK RENSBURG	MILKWOOD MAYO INHOEK ARCADIA HUTTON (MODERATE) SHORTLANDS	CHAMPAGNE INANDA NOMANCI KRANSKOP MAGWA HUTTON (HUMIC PHASE) CLOVELLY (HUMIC PHASE) GRIFFIN (HUMIC PHASE)
N REQUIREMENT (kg/ha)				
PLANT	120	100	80	60
RATOON*	160 - 140	140 - 120	120 - 100	100 - 90

* The highest rate in each range applies to cane grown in deep and/or where supplementary irrigation is practised.

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

PRETRASHING FOR ELDANA CONTROL AND THE EFFECT OF N ON THE INCIDENCE OF ELDANA

by JG Lewis

Pretrashing for eldana control

Pretrashing trials were started in 1979 as the result of the observation in an insectary trial that eldana moths laid a large proportion of their eggs out of sight among dry cane leaves in preference to other plant material which was offered to them. Five small plot trials were laid down and results were encouraging when there was an average decrease in eldana numbers of 39%. Yield appeared to be marginally reduced in some cases as a result of pretrashing. The one instance where yield was increased was in droughted cane.

A further six non-replicated trials were surveyed approximately two months after treatment and, in pretrashed plots, showed a reduction of 66% in eldana numbers per 100 stalks and 9% stalks bored.

A subsequent series included 43 non-replicated observation trials, thoroughness of pretrashing trials and frequency trials.

Thoroughness trials

Four replicated trials in which trash was removed in three different ways were conducted. The treatments were

1. quick and superficial
2. full or very thorough
3. an extra full or very thorough stripping with trash moved away from the rows.

Whilst full, and extra full pretrashing were marginally better than a quick pretrashing, there was little to be gained from doing other than a quick pretrashing.

Table 1: Mean results of four trials to test thoroughness of pretrashing

Treatment	Eldana per 100 stalks	% stalks bored	ers g/stalk
Control	60	81	49
Quick pretrash	40	74	50
Full pretrash	35	75	47
Full pretrash and removed from rows	36	73	50

Frequency trials

Cane was pretrashed once, twice or three times in one trial, and once or twice in four other trials. Numbers of eldana were shown to decrease with a second pretrashing, but the reductions over the five trials suggested there was no practical value to be gained from more than one operation.

Observation trials

Results of 43 non-replicated trials surveyed four months after treatment showed that, for all levels of infestation, pretrashing had on average kept eldana numbers 34% below those of control plots. The pretrashing also resulted in an overall yield saving of 6%.

Results were also grouped into three categories:

1. trials having control plots with 40 or more eldana/100 stalks
2. trials having control plots with 25-39 eldana/100 stalks
3. trials having control plots with 0-24 eldana/100 stalks.

Table 2: Effects of pretrashing at different levels of eldana

Treatment	E/100 stalks	% stalks bored	Ers g/stalk	Ers % cane
40 and over E/100 stalks - 16 trials				
Control	67	86	40	7,3
Pretrashed	42	82	44	7,7
Difference	-37%	- 5%	+ 8%	+6,5
25 to 39 E/100 stalks - 12 trials				
Control	31	73	45	8,8
Pretrashed	21	64	44	8,7
Difference	-32%	-12%	-2,4%	-1,3
0 to 24 E/100 stalks - 15 trials				
Control	13	48	68	11,8
Pretrashed	10	48	74	12,0
Difference	-23%	0%	+ 9%	+ 2,5

These results indicated that the greater the number of eldana, the greater was the reduction in eldana numbers. Yield results did not relate clearly to eldana numbers nor to damage levels; but yield savings were indicated for the group having 40 and more eldana/100 stalks.

It should be noted that all yield results for the above trials were based on sub-samples taken from the plots. No trials were harvested for cane yield.

Variety trials

Entomology have been pretrashing sub-plots of Agronomy variety trials to see if varieties are affected differently by pretrashing. So far five trials have been treated but no trends have been detected.

Another useful aspect is that Agronomy trials are weighed at harvest, so more reliable results can be obtained for the effect of pretrashing on yield.

Yields

In 1974 in one eldana-free Agronomy variety trial, it was found that pretrashing significantly reduced ers % cane and it is possible that yields of recoverable sugar might be reduced as a result of pretrashing.

Three harvestings of one Agronomy variety trial, RVT(CZ)3/80, gave increased overall yields as a result of pretrashing. The same trend was usually followed for the individual varieties within the trials. The trials in all three cases were very heavily damaged and infested with eldana. One trial in which eldana numbers and damage were low, showed a decreased yield. The last trial with heavy eldana damage (74% stalks damaged) in the control plots, but low eldana numbers, showed no yield differences.

Table 3: Mean yield and eldana details from five Agronomy variety trials

Trial/ date	Age (months)	Treatment	Ers % cane	Cane t/ha	Ers t/ha	% SD*	E/100 stalks
RVT(CZ)1/77 11/11/81	13,6	Control	11,1	66	7,3	74	9,9
		Pretrashed	11,4	64	7,3	69	6,7
RVT(CN)1/77 13/10/82	16,4	Control	12,6	40	5,0	18	5,3
		Pretrashed	12,0	40	4,7	16	2,7
RVT(CZ)3/80 10/12/81	13,6	Control	9,2	83	7,6	93	65,4
		Pretrashed	9,8	86	8,4	86	39,9
RVT(CZ3/80 16/2/82	15,8	Control	5,0	75	3,8	99	53,2
		Pretrashed	7,0	80	5,6	97	34,3
RVT(CZ)3/80 17/5/83	15,0	Control	7,9	52	4,2	98	99
		Pretrashed	8,9	62	5,5	86	41

* stalks damaged

The results of the above variety and observation trials suggest that at high infestation levels, the yield savings due to reduced eldana more than offset the cost of pretrashing.

Agronomic and other factors

Agronomic aspects of pretrashing are very closely linked to yield.

Not all areas are suitable for pretrashing and therefore there is no suggestion that all fields should be pretrashed.

Pretrashing provides a trash blanket for about four months before harvest, which in these dry times could be an advantage, as was demonstrated in a pretrashed variety trial which was recently harvested and which had previously been burnt. It was felt that the higher yields from pretrashed treatments may not have been due to eldana reduction alone. The cane had not canopied and the trash blanket may have conserved moisture from the occasional rainfall.

One criticism has been that pretrashing has, in some instances, been followed by poor ratooning. Perhaps one should not pretrash where burning is normally considered advisable at harvest.

Some advantages of pretrashing which mostly apply to normal trashing at harvest are:

1. Conservation of soil moisture.
2. Weed control. This could also apply later in the crop if the cane has not canopied properly.
3. More efficient cane cutting. Cutting pretrashed cane is easier than cutting unburnt cane. This will reduce harvesting costs.

Another possible advantage in pretrashing cane is that cut stalks are not so likely to be buried under the trash as may occur in normal green cane harvesting. However care must be taken to ensure that stalks are not cut too high above ground level.

Costs

It seems that for medium sized cane about 500 metres of cane row is the amount that can be pretrashed by one labourer in a day. If the cane is taller, the labourer is able to pretash about 450 metres/man/day and for short cane the task is about 550 metres/man/day.

The cost will vary depending upon row width. For example, there are 8 333 metres of cane in one hectare when the row width is 1,2 metres, and 7 143 metres at a row width of 1,4 metres.

For pretrashing, female labourers seem to be preferred and a quick pretrashing operation is adequate.

The cost is approximately R50/ha. One grower calculated that it cost him R90/ha to pretrash a field, but he had his labourers doing an unnecessarily thorough job.

Effect of N on the incidence of eldana

It has been known for many years that higher levels of nitrogen fertilizer can produce higher levels of pests in the host crop. Following the first evidence of this effect in an Agronomy variety trial in 1975, eleven trials involving different rates of application of nitrogen have been surveyed for eldana since 1979. Nine of these trials have shown a positive relationship between increasing rates of nitrogen and increasing levels of eldana.

A summary of the results obtained from these trials is given below.

Trials E/Eld/78/P1 and P2

These two trials, which were the first to be laid down to test eldana and nitrogen, had rates of nitrogen application from 0 to 300 kg/ha. Both trials showed increasing levels of damage and eldana numbers with increasing rates of nitrogen. Trial P2 had higher numbers of eldana and a more rapid increase in eldana numbers.

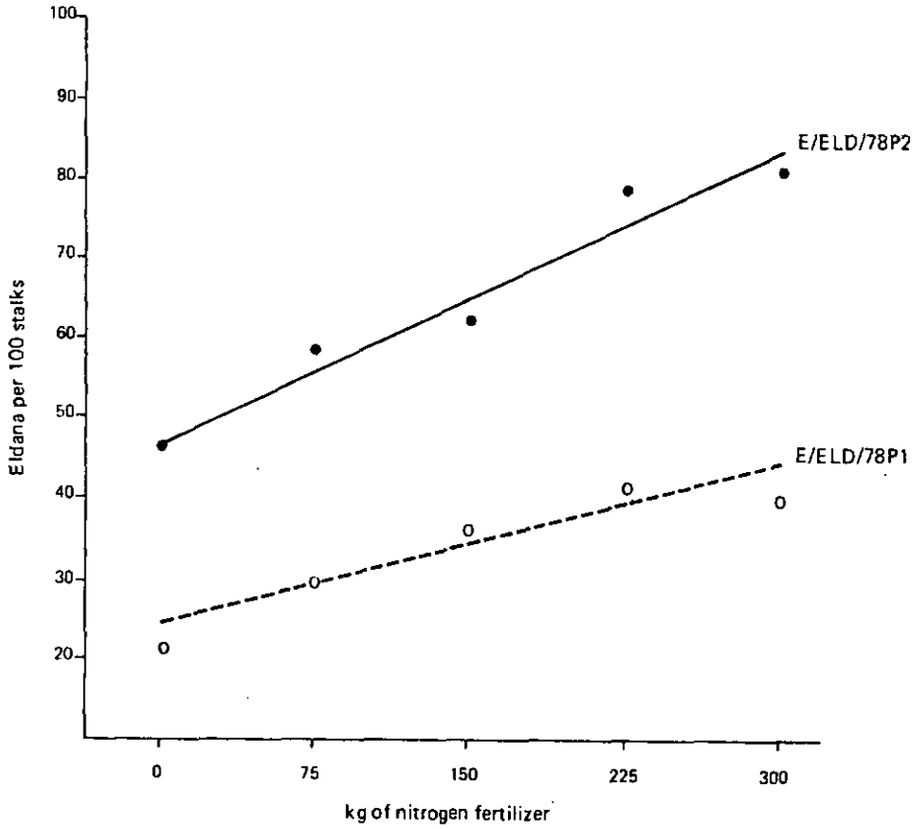


Figure 1: Eldana per 100 stalks and nitrogen fertilizer for trials E/Eld/78P1 and E/Eld/78P2

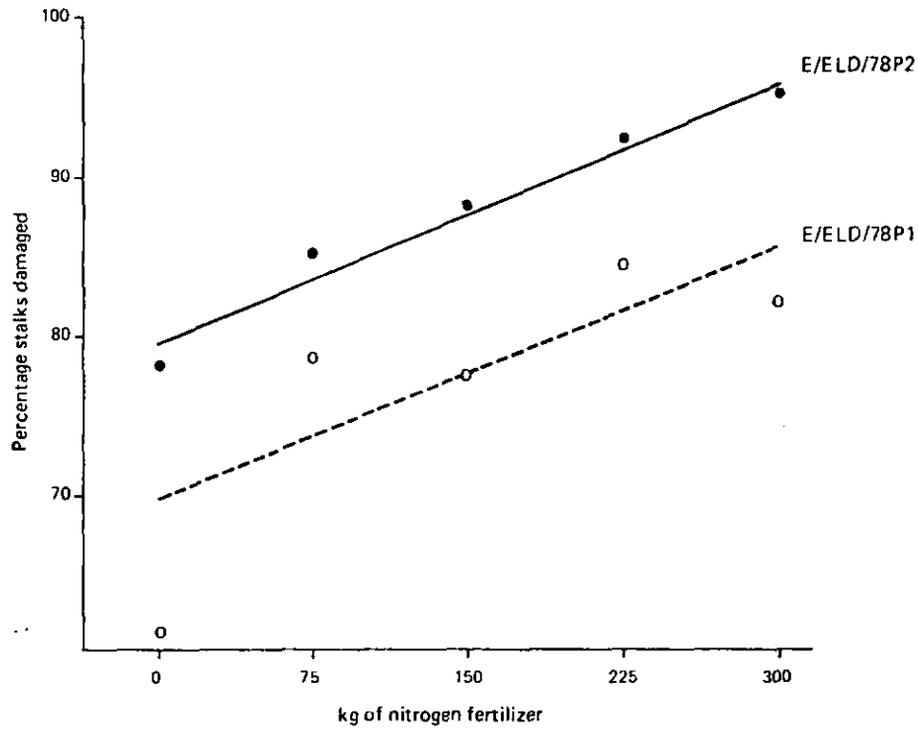


Figure 2: Stalks damaged and nitrogen fertilizer for trials E/Eld/78P1 and E/Eld/78P2

Trials Eld/N1/80, Eld/N2/80 and Eld/N3/80

These three trials were laid down, each on a different soil type, as a follow-up to the above two trials. Again nitrogen was applied at rates from 0 to 300 kg/ha. One trial showed increasing numbers of eldana and levels of damage with increasing rates of nitrogen. Another of the trials showed only a marginal response. In the last of this series of trials, eldana numbers fluctuated erratically over the range of nitrogen applications. However there was some indication of increase in damage with increasing amounts of nitrogen. The soil type is known to influence the shape of the nitrogen response curve.

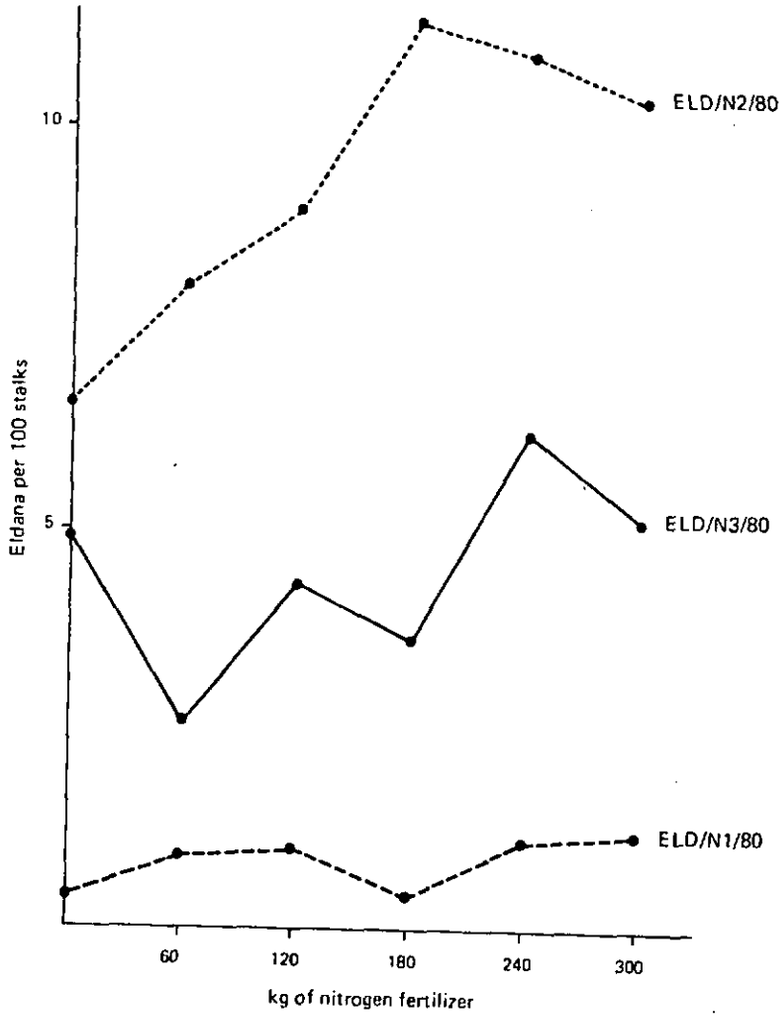


Figure 3: Eldana per 100 stalks and nitrogen fertilizer for trials Eld/N1/80, Eld/N2/80 and Eld/N3/80

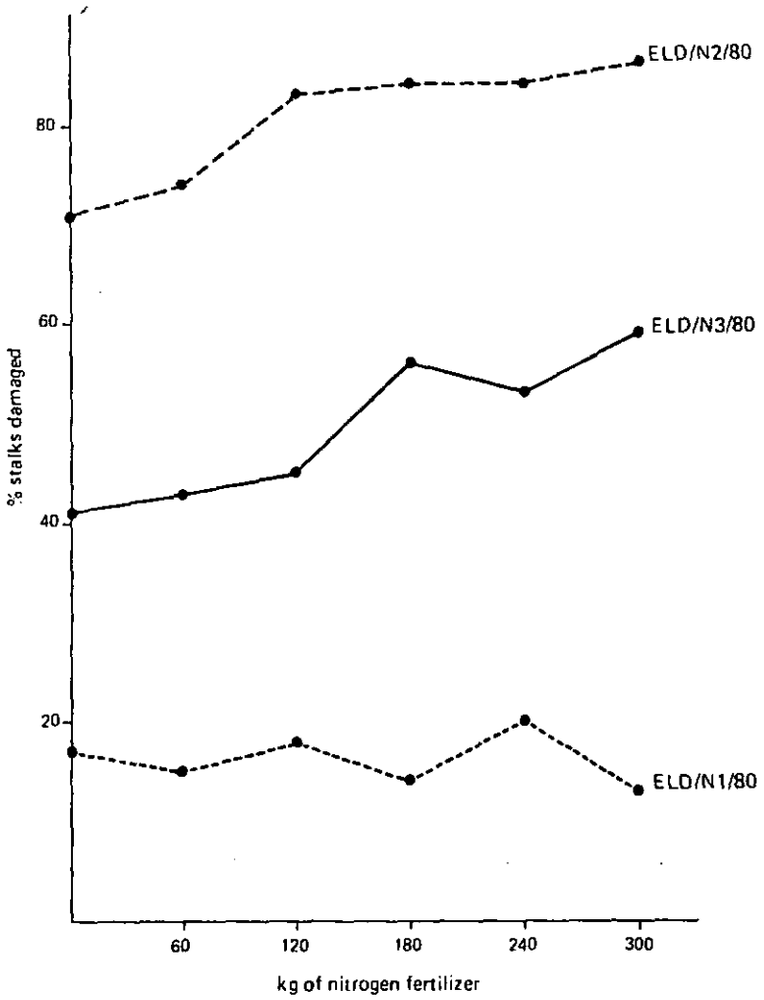


Figure 4: Stalks damaged and nitrogen fertilizer for trials Eld/N1/80, Eld/N2/80 and Eld/N3/80

Trials FT15N/78 and FT16N/79

These are two Agronomy nitrogen trials which were assessed for eldana infestation by Entomology this year. The highest rate of nitrogen applied was 200 kg/ha. Again, both trials showed increasing levels of damage and eldana numbers with increasing rates of nitrogen.

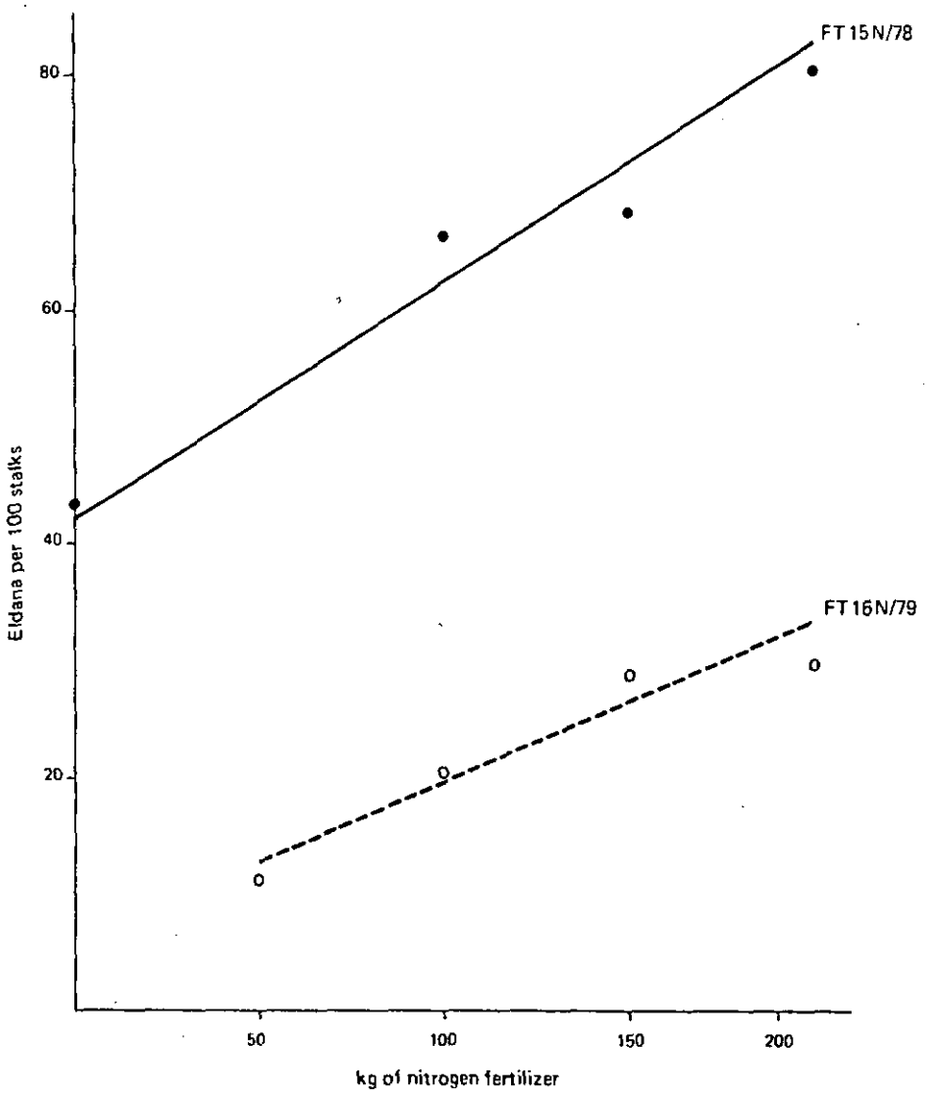


Figure 5: Eldana per 100 stalks and nitrogen fertilizer for trials FT15N/78 and FT16N/79

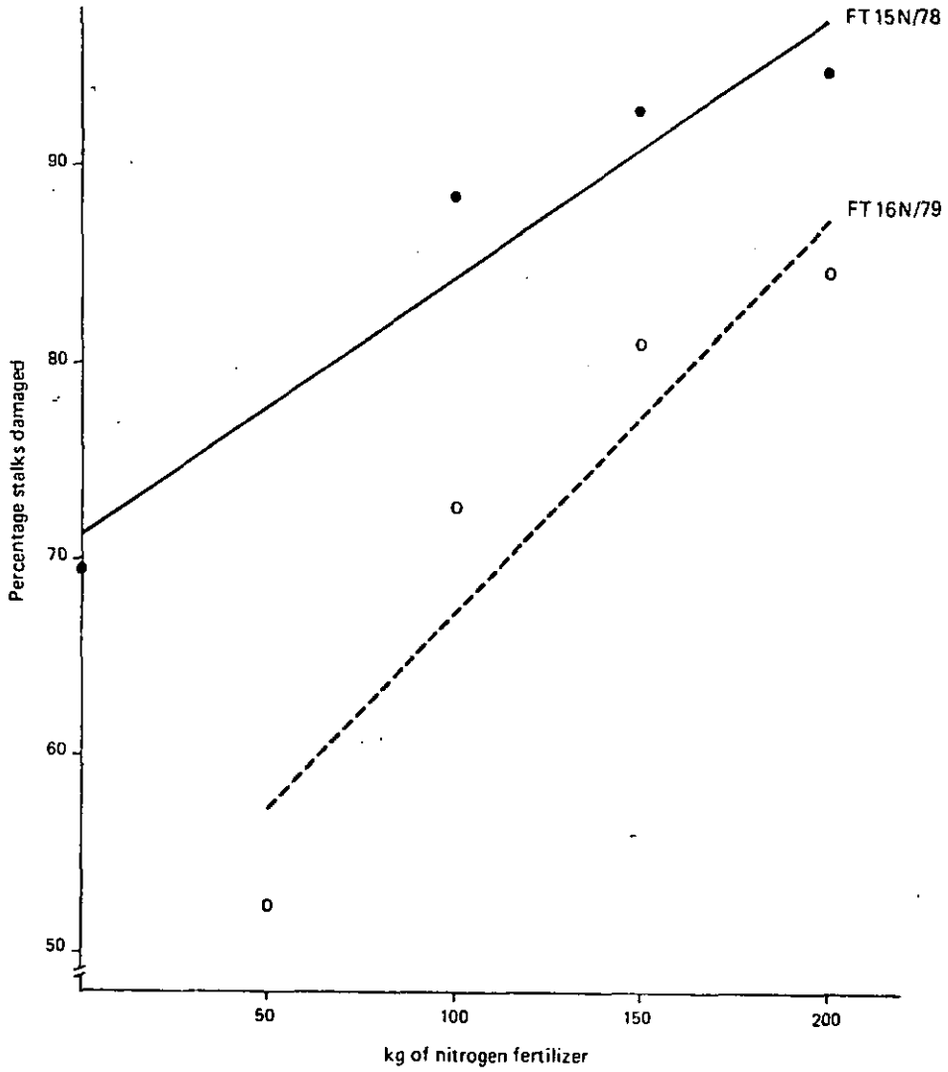


Figure 6: Stalks damaged and nitrogen fertilizer for trials FT15N/78 and FT16N/79

Discussion

There are three aspects that need to be mentioned.

1. The economic interest. Do the increased levels of eldana and damage due to higher amounts of applied nitrogen decrease the yield more than the expected yield increase due to higher levels of N? The level of eldana present is also important. If very low levels of eldana are present, then crop loss should be minimal. However if very high levels of eldana are present, then the loss due to higher applications of nitrogen could be significant.

2. The threat of further re-infestation. Does an increased level of eldana due to high levels of applied nitrogen constitute a threat to surrounding cane? It may be that a higher output of moths only marginally affects the general eldana population which is governed by other more important factors.

3. The results of the survey of more than 1 500 commercial fields affected by eldana did not show any consistent relationship between numbers of eldana and amount of N fertilizer applied per hectare.

JGL/HDN
18/10/83