SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: AB1/74/R4
Cat No: 1163

Title: Asphalt barrier and burnt tops raked versus scattered

1. Particulars ofthe project:

This crop	: 4th ratoon			
Site	: Cornubia, Natal Estates			
Region	: N. Coast, Coastal			
Soil system	: Berea			
Soil series	: Fernwood			
Design	: Latin square			
Variety	: NCo 376			
Fertilizer/ Ameliorants	:	N	P	K
		141	-	141

Soil analysis:

pH	O.M.%	Clay %	P.D.I.
7,8	-	5	-

ppm

P	K	Ca	Mg	Zn	Al
76	45	1 800	31	1,5	-

Age: 20 months Dates: 5/12/78-22/7/80
Rainfall: 932 mm L.T.M. 1 549 mm
Irrigation: Nil

2. Objectives:

2.1 To measure the effect on yield of the fourth ratoon crop of a 2 mm thick layer of asphalt 400 mm - 500 mm below the surface laid prior to planting on a Fernwood soil.

2.2 To measure the effect on yield of leaving tops scattered compared with raking tops off the plots.

3. Treatments:

Whole plots

3.1 Asphalt barrier

3.2 No barrier

Sub plots

3.3 Burnt and tops left scattered

3.4 Burnt and tops raked off

NOTE: Temik was applied to all plots at 20 kg/ha 15G

1103
19/80

4. Results:

Treatments		Cane (t/ha)	Ers %	Ers (t/ha)	Stalk popn. x 10^{-3}/ha	Stalk length (cm)
Barrier	Tops scattered	71	12,4	8,9	124	154
	Tops raked	61	12,3	7,6	127	145
Mean		66	12,3	8,2	125	149
No barrier	Tops scattered	57	11,7	6,8	116	144
	Tops raked	66	13,1	8,6	125	143
Mean		61	12,4	7,7	120	143
C.V.%		7,1	4,8	8,0	2,8	3
Whole plots						
S.E.		1,8	0,2	0,3	1,4	1,8
L.S.D. (0,05)		6,7	0,9	0,9	5,1	6,5
Sub plots						
S.E.		3,4	0,4	0,5	2,7	2,7
L.S.D. (0,05)		10,7	1,2	1,6	8,5	8,4

Monthly rainfall and long term means (mm) - Mt. Edgecombe

	1978	1979	1980	L.T.M.
Jan		64	71	113
Feb		45	41	114
Mar		53	42	115
Apr		17	49	73
May		31	12	50
Jun		9	9	33
Jul		31	11	25
Aug		51		40
Sep		85		58
Oct		115		85
Nov		29		104
Dec	57	110		108

5. Comments on results

5.1 The asphalt barrier appears to have had some beneficial effect on cane yield but the increase does not attain a level of statistical significance.

5.2 Burning and leaving tops scattered had no consistent effect on yield or quality. Because of the relatively low rainfall recorded during the crop and considering that the burnt unraked tops covered about 80% of the soil surface a response to the burnt tops would be expected.

Comments on results

1. Nitrogen

1. 1 Tons cane: in the presence of K the response curve tends to level off at 160 kg N/ha indicating a kg N : tons cane ratio of 1,25 (the current FAS recommendation). In the absence of K the response to N is inconsistent.

Stalk population was only marginally affected by the rates of N used whilst stalk mass and length were adversely affected only at N levels below 130 kg/ha.

Third leaf N% d.m. dropped dramatically between the ages of 2,2 and 4,0 months and indicated a deficiency at levels of 160 kg N/ha and below. At 5,0 months all levels of N (even 220 kg/ha) were apparently inadequate in terms of third leaf analysis.

3rd leaf N% DM. (Mean of Ko and K1)

Age at sampling (months)		N1	N2	N3	N4	N5	N6
2,2	2.11.76	2,44	2,53	2,50	2,53	2,55	2,47
4,0	21.12.76	1,53	1,62	1,70	1,75	1,88	1,86
5,0	18. 1.77	1,54	1,55	1,52	1,51	1,62	1,59
6,0	14. 2.77	1,36	1,42	1,35	1,38	1,46	1,46
8,6	4. 5.77	1,54	1,54	1,52	1,49	1,54	1,54
9,4	20. 5.77	1,46	1,45	1,44	1,47	1,53	1,48

It is possible that a K deficiency, even at the K1 level, was limiting the potential response to N.

1. 2 Ers%: in the presence of K a decline in cane quality occurred only from the level of 130 kg/ha upwards, whereas there is no clear pattern in the absence of K. The K deficient cane (Ko) had a distinctly lower ers% c at virtually all the nitrogen levels.

1. 3 ters/ha: in the absence of K the response to N was negative except at 100 and 220 kg/ha levels. In the presence of K the peak production was reached at 160 kg/ha nitrogen.

2. Potash

There has been a substantial and highly statistically significant response to potassium at 110 kg/ha in terms of tons cane, ers% cane and ters/ha at all levels of N greater than 100 kg/ha.

Judging by the marginal third leaf K values up to five months of age it is likely that a yield response would have been obtained to levels of K greater than 110 kg/ha.