

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code : SUL 1/84/Sw UB0 Win
Cat. No.: 1497

TERMINAL REPORT

TITLE : SULPHUR FOR RATOON CANE ON A 'W' SET SOIL

1. PARTICULARS OF PROJECT

<p>This crop : 1st ratoon</p> <p>Site : Ubombo Ranches Field Dairy 1</p> <p>Region : Northern Irrigated Swaziland</p> <p>Soil set/series : 'W'/Winn</p> <p>Design : Randomised blocks 6 replications with 8 controls</p> <p>Variety : NCo 376</p> <p>Fertilizer : Whole trial received 235 kg Amm. Nit./ha 81 kg N/ha (See treatments for ad- ditional applications)</p>	<p>Soil analysis : Date 13/12/1984</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: left;">pH</td> <td style="text-align: left;">OM%</td> <td style="text-align: left;">Clay %</td> <td style="text-align: left;">PDI</td> </tr> <tr> <td>6,61</td> <td>-</td> <td>-</td> <td>-</td> </tr> </table> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="5" style="text-align: center;">ppm</td> </tr> <tr> <td style="text-align: left;"><u>P</u></td> <td style="text-align: left;"><u>K</u></td> <td style="text-align: left;"><u>Ca</u></td> <td style="text-align: left;"><u>Mg</u></td> <td style="text-align: left;"><u>S</u></td> </tr> <tr> <td>43</td> <td>88</td> <td>1465</td> <td>220</td> <td>22</td> </tr> </table> <p>Age : 10,8 months</p> <p>Dates : 14/11/84 - 3/10/85</p> <p>Rainfall : 355 mm (net)</p> <p>Irrigation : 1072 mm (net)</p> <p>Total : 1427 mm</p>	pH	OM%	Clay %	PDI	6,61	-	-	-	ppm					<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>	<u>S</u>	43	88	1465	220	22
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2. OBJECTIVES

- * To determine the effect on yield by applying sulphur to a ratoon crop with a history of low 3rd leaf S values on a red alluvial soil.
- * To establish whether ratoon chlorosis can be adequately overcome by the acidifying effect of sulphur.
- * To test a number of S carriers to decide on the most practical and economical product.

3. TREATMENTS

	<u>Nitrogen (kg/ha)</u>	<u>Sulphur (kg/ha)</u>
T1 (control)	81,0 (Amm. Nit.) 43,7 (Urea)	Nil
T2	As above	50 (elemental sulphur)
T3	As above	200 (elemental sulphur)
T4	As above	50 (Gypsum)
T5	81,0 (Amm. Nit.) 43,7 (Amm. Sul.)	50 (Amm. Sul.)

Notes on Treatments

- * 235 kg/ha Ammonium Nitrate (81 kg N/ha) was applied to the whole trial site soon after cutting.
- * Ammonium Sulphate was applied to treatment 5 at a rate of 208,3 kg/ha (43,7 kg N/ha and 50 kg S/ha).
- * Treatments 1, 2, 3 and 4 received 95 kg/ha Urea (43,7 kg N/ha) to bring the total nitrogen for all plots up to 124,7 kg N/ha.
- * Elemental Sulphur (90 % S) was applied to the inter-row of treatments 2 and 3 at a rate of 50 and 200 kg S/ha respectively.
- * Gypsum (16,5 % S) was broadcast in the inter-rows of treatment 4 at a rate of 50 kg S/ha.
- * All treatments were applied 4 weeks after harvesting.

4. RESULTS

4.1 Harvest Data

TABLE I Cane yield, cane quality and sucrose yield

TREATMENT	CANE YIELD Tc/ha	SUCROSE % CANE	SUCROSE YIELD Ts/ha
T1 Control	76	12,3	9,3
T2 Sulphur (50 kg/ha)	68*	12,5	8,4
T3 Sulphur (200 kg/ha)	69	12,5	8,6
T4 Gypsum (50 kg S/ha)	71	12,5	8,9
T5 Amm. Sul. (50 kg S/ha)	70	12,3	8,6
CV %	9,3	4,3	9,5
LSD Treatment Means (P=0,05) *	8	0,6	1,0
LSD Treatment Means (P=0,01) **	11	0,9	1,4

4.2 Third Leaf Analysis

TABLE II Third leaf N (% dm), S (% dm) and Nitrogen/Sulphur ratios

TREATMENT	NITROGEN (% dm)				SULPHUR (% dm)				NIT./SUL. RATIO			
	DEC 1,0M	JAN 2,1M	FEB 3,3M	MAR 4,3M	DEC 1,0M	JAN 2,1M	FEB 3,3M	MAR 4,3M	DEC 1,0M	JAN 2,1M	FEB 3,3M	MAR 4,3M
T1 Control	2,81	2,26	1,84	1,66	0,16	0,14	0,14	0,14	17,6	15,9	12,8	11,9
T2 Sulphur (50 kg/ha)	2,79	2,29	1,86	1,65	0,16	0,15	0,15	0,14	18,0	15,1	12,2	11,8
T3 Sulphur (200 kg/ha)	2,84	2,29	1,86	1,66	0,16	0,16	0,16	0,14	17,3	14,1	11,6	11,8
T4 Gypsum (50 kg S/ha)	2,73	2,27	1,81	1,62	0,16	0,17	0,16	0,14	17,6	13,5	11,8	11,4
T5 Amm. Sul(50 kg S/ha)	2,82	2,28	1,82	1,66	0,16	0,16	0,16	0,14	18,2	14,7	11,1	11,6

5. COMMENTS

5.1 This trial was badly damaged by a severe hail storm during March 1985. It was decided to continue the investigation but yields on this high potential alluvial soil were reduced considerably due to storm damage.

5.2 *Initial soil S levels indicated sufficient sulphur reserves at this site (\pm 50 kg S/ha) which has in the past produced chlorotic cane and low foliar S values.

*Sulphur applied as elemental sulphur at 200 kg S/ha, or as elemental sulphur, gypsum or ammonium sulphate at 50 kg S/ha appeared to have little effect on cane yields. The slight reduction in yield between the control and T2 treatment is only just significant at the lower level and probably not attributed to additional sulphur.

*Cane quality and sucrose yields were unaffected by the two S rates or any of the sulphur carriers.

*Third leaf N:(% dm) values were very high during the early growth stage but diminished with age. Third leaf S (% dm) values were adequate for all treatments but were slightly higher for the S treatments between 2 and 3,5 months of age. The nitrogen/sulphur ratios were above the acceptable level of 17 at one month of age but were reduced to below this level thereafter. Storm damage prevented further leaf samplings or growth measurements being taken.

5.3 This trial has been terminated and further S investigatory work is being conducted on duplex soils of known low sulphur reserves.