

**SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION**

Code: Su1 2/85/Sw SIS Hab Zwd  
Cat.No: 1542

**Title:           SULPHUR APPLIED TO RATOON CANE ON A DUPLEX SOIL**

**1. Particulars of the project:**

<p><b>This crop</b>           : 6th ratoon</p> <p><b>Site</b>                : SIS Field S6-4 (Ricelands)</p> <p><b>Region</b>             : Northern irrigated (Swaziland)</p> <p><b>Soil set/system</b> : H-Z/Habelo-Zwide</p> <p><b>Design</b>            : Randomized blocks (6 replications)</p> <p><b>Variety</b>            : NCo 376</p> <p><b>Fertilizer</b>         : See Treatments for N and S. All plots 100 kg K/ha as KCl</p>	<p><b>Soil analysis:</b></p> <table 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 style="text-align: left;">5,5</td> <td style="text-align: left;">1,3</td> <td style="text-align: left;">&lt; 29</td> <td style="text-align: left;">-</td> </tr> <tr> <td colspan="4" style="text-align: center;">ppm</td> </tr> <tr> <td style="border-top: 1px solid black; text-align: left;">P</td> <td style="border-top: 1px solid black; text-align: left;">K</td> <td style="border-top: 1px solid black; text-align: left;">Ca</td> <td style="border-top: 1px solid black; text-align: left;">Mg</td> <td style="border-top: 1px solid black; text-align: left;">S</td> </tr> <tr> <td style="text-align: left;">14</td> <td style="text-align: left;">90</td> <td style="text-align: left;">1130</td> <td style="text-align: left;">&gt; 220</td> <td style="text-align: left;">18</td> </tr> </table> <p>Age                : 10 months</p> <p>Dates             : 8/7/85 to 7/5/86</p> <p>Rainfall          : 500 mm</p> <p>Effective         : <u>1 260</u> mm</p> <p><b>Total</b>          : 1 850 mm</p>	pH	OM%	CLAY %	PDI	5,5	1,3	< 29	-	ppm				P	K	Ca	Mg	S	14	90	1130	> 220	18
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**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 duplex soil of moderate S status.
- To test a number of S carriers to decide on the most practical and economical product.

**Treatments**

	Nitrogen (kg/ha)	Sulphur (kg/ha)
1. Control	160 urea	Nil
2.	160 urea	50 (elemental sulphur)
3.	160 urea	200 (elemental sulphur)
4.	160 urea	50 (gypsum)
5.	160 urea + amm sulphate	50 (ammonium sulphate)

**Notes on treatments**

- Nitrogen was split at 3 and 12 weeks after harvesting. Urea was the N carrier for all treatments except T5 which also received ammonium sulphate to supply 50 kg S/ha.
- Elemental sulphur and gypsum was applied 3 weeks after harvest.
- All fertilizer was applied by hand over the cane row.

Results

• Harvest data

Table 1: Cane yield, cane quality and sucrose yield

Treatment	Cane yield (tc/ha)	Sucrose % cane	Sucrose yield (ts/ha)
1. Control	68	13,0	8,7
2. 50 kg S/ha as elemental S	74	13,6	10,0
3. 200 kg S/ha as elemental S	67	14,0	9,3
4. 50 kg S/ha as gypsum	65	14,4	9,2
5. 50 kg S/ha as ammonium sulphate	70	13,5	9,4
CV %	15,4	6,9	12,4
LSD treatment means (0,05)*	13,0	1,1	1,4
(0,01)**	17,0	1,6	1,9
Significance	-	*	-

• Third leaf analysis

Table 2: Third leaf N (% dm) and S (% dm)

Treatment	Nitrogen (% dm)					Sulphur (% dm)				
	Sep 2,5 m	Oct 3,8 m	Nov 4,8 m	Dec 5,8 m	Jan 6,0 m	Sep 2,5 m	Oct 3,8 m	Nov 4,8 m	Dec 5,8 m	Jan 6,0 m
1. Control	2,16	*1,61	*1,78	*1,48	*1,44	0,28	0,16	0,15	*0,14	*0,13
2. 50 kg S/ha-elemental S	2,18	*1,64	1,85	*1,55	*1,46	0,27	0,16	0,16	*0,14	*0,14
3. 200 kg S/ha-elemental S	2,25	*1,69	*1,77	*1,46	*1,47	0,27	0,16	0,16	0,15	*0,14
4. 50 kg S/ha-gypsum	2,15	*1,67	*1,80	*1,52	*1,42	0,28	0,17	0,17	*0,14	*0,14
5. 50 kg S/ha-amm sulphate	1,08	*1,69	*1,85	*1,54	*1,48	0,29	0,17	0,16	*0,14	0,15

\* Marginal to low

Comments

CV percentages were high due to variable soil characteristics. Soil S values before topdressing were below the current threshold of 20 ppm and cane yield increases in the sulphur treatments were expected. Yields for the 6th ratoon were low for all treatments and the expected yield increase due to sulphur did not occur.

The addition of sulphur did however induce a slight increase in cane quality that reached significance (P = 0,05) for the gypsum treatment only.

Sucrose yields increased in response to cane quality but none of the treatments reached statistical significance.

Third leaf S (% dm) values declined dramatically with age and became largely deficient from December at 5,8 months of age (Table 2). The sulphur treatments had little influence on third leaf S (% dm) values.

Although fertilized according to current recommended rates, the crop nitrogen status was low and may have prevented possible S responses due to an overall N deficiency as reflected in third leaf N (% dm) values.

This trial has been terminated.

NEL/HDN  
18 November 1986