

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code : HW286/84/R2

Cat. No.: 1582

Title: Ratoon cane phytotoxicity at Pongola

1. Particulars of the project

This crop	: 4th ratoon	Soil analysis:	
Site	: Pongola Field Stn	Clay%	
Region	: Northern Area		30
Soil system	: Komatipoort	Age: 11,1 mnths	Dates: 24.10.84-26.9.85
Soil form/series:	Hutton/Shorrocks	Rainfall: 565	L.T.M: 600
Design	: Random blocks	Irrigation: <u>976</u> mm	
Variety	: NCo376	Total	<u>1541</u> mm
Fertilizer	: N P K		
Top dressing	: 144 28 144		

2. Objectives

1. Standard phytotoxicity programme.
2. To study the effect of mechanical cultivation on sugarcane yield.

3. Experimental

Treatments were applied either over the cane row or as a directed interrow spray when the cane was about 50 cm high. Details are given below.

Date of spray: 4.12.84

Applicator : CP₃

Nozzle : Floodjet

Output : 310 l ha⁻¹

Method : Over the row/Directed interrow for treatment 6

Conditions : Overcast and warm to clear and hot.

Rainfall (mm) : On the day of spray : 0
 Days to first rain : 5
 Amount of first rain: 1,2

Temperature °C: 8am: 23,0
 2pm: 31,0

Rel.humidity %: 8am: 88
 2pm: 59

Sunshine hours: 10,8

4. Treatments

			<u>Rate kg or ℓ prod ha⁻¹</u>
1.	Unsprayed control	(tops left scattered)	Handweeded
2.	Diuron(80)+Sencor(70)	(Over the row)	4+4
3.	Bimate(75)+surfactant(S)	(Over the row)	5
4.	Bimate+ametryne(50)+S	(Over the row)	4,5 + 2
5.	Bimate+ametryne+S	(Over the row)	9 + 4
6.	Bimate+ametryne+S	(directed interrow)	4,5 + 2
7.	Cultivation x 2	(tops removed)	-
8.	Unsprayed control	(tops removed) Unweeded	-

Note on treatments

The previous crop was cut back and the green material left in the field. This was then removed from plots to be cultivated and from those plots to be left as unsprayed controls with no weeding.

Two cultivations were carried out using a tractor drawn three tine cultivator disturbing the soil to a depth of 10-15 cm. These were carried out on 4.12.84 at the time of spraying herbicide treatments and one month later when the cane was ± 20 cm in stalk height.

5. Results

Table 1 Visual ratings of leaf scorch and stunting taken 14 days after spraying and crop measurements taken 1,5, 3 and 5,5 months after spraying.

Treatments	leaf scorch %	stunting*1	stalk length *2			Stalk population *3		
			1,5	3	5,5	1,5	3	5,5
Unsprayed control (hand weeded)	0,7	5	69	198	242	288	188	143
Diuron+Sencor 4+4	23	3,3	58	193	233	305	207	158
Bimate+S 5	15	3,2	59	195	238	287	18	143
Bimate+ametryne+S 4,5+2	23	3,2	58	193	228	302	193	157
Bimate+ametryne+S 9+4	35	2,7	59	192	229	288	189	161
Bimate+ametryne+S(D) 4,5+2	9,5	4	63	199	241	296	175	146
Cultivation x 2	0	5	69	203	251	286	171	151
Unsprayed control (unweeded)	0	4,9	67	199	248	282	195	153

*1 Stunting 1-5 where 1= very poor 5 = very good

*2 Stalk length - cm

*3 Stalk population - 1000 ha⁻¹

Table 2 Yield and crop characteristics at harvest

Treatment	Yield			Stalk length (cm)	Stalk population x1000 ha ⁻¹
	Cane ₁ t ha ⁻¹	Sucrose % cane	Sucrose ₁ t ha ⁻¹		
Unsprayed control (handweeded)	122	14,11	17,2	259	167
Diuron+Sencor 4+4	117	13,73	16,0	249	169
Bimate+S 5	122	13,60	16,6	252	172
Bimate+ametryne+S 4,5+2	116	13,81	16,0	251	173
Bimate+ametryne+S 9+4	112	13,79	15,4	248	178
Bimate+ametryne+S (directed) 4,5+2	118	13,99	16,5	256	164
Cultivation x 2	127	13,89	17,6	262	167
Unsprayed control (unweeded)	123	13,98	17,2	258	164
CV%	5,6	3,0	6,0	2,7	7,4
SE of difference +	3,85	0,24	0,57	4,0	7,20
L.S.D. (0,05) -	7,81	0,48	1,16	8,13	14,62

6. Comments

Visual symptoms

1. Obvious and severe leaf scorch occurred from all herbicide treatments including diuron + Sencor. Double rates were worse than single rates and directed sprays less severe than those applied over the cane row.
2. The time of year was conducive to showing up these effects but all symptoms disappeared in time.
3. Stunting was also obvious from all treated cane and this was manifest in crop measurements at least until five months after spraying.

Crop measurements

1. Early stalk length measurements showed a similar degree of stunting from all treatments except the directed spray of Bimate + ametryne which was less severe. However, ultimately treatments with double rates of herbicide were marginally worse than those with single rates.
2. Stalk populations were variable with a tendency towards higher populations in treated plots. No statistically significant differences were apparent at harvest.

Yield

1. The trend in yields of cane and sucrose followed that of stalk length measurements and treated plots tended to be lower than untreated. This only reached a level of statistical significance in cane yield after treatment with the double rate of Bimate + ametryne + S over the cane row. However sucrose yields of most treatments were statistically significantly reduced.
2. No effects were apparent from cultivation or from leaving control plots unweeded. This is perhaps not surprising as these fields have been treated repeatedly with herbicides and the rate of canopy formation at this time of the year is such that little competition would have occurred from weeds.

Conclusions

This trial confirms the trend towards lower yields from herbicide treated sugarcane with single rates and directed sprays being less severe than double rates and treatments applied onto cane foliage.

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19 May 1987