

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code : HW 177/78
Cat.No.: ~~4132~~
1200

Title : PHYTOTOXICITY TRIAL : RATOON CANE - POST-EMERGENCE

1. Particulars of the project :

This crop : 1st ratoon
Site : Pongola Field Station
Region : Northern area
Soil system : Komatipoort
Soil form/series : Hutton/Makatini
Design : Randomized blocks
Variety : NCo 376
Fertilizer/Top dressing : N P K
(kg/ha) 161 - -

Soil analysis :

<u>pH</u>	<u>O.M. %</u>	<u>Clay %</u>	<u>P.D.I.</u>
6,38		27	
ppm			
<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u> <u>Zn</u> <u>AT</u>
47	149	751	200 2,5
<u>Age: 12 mths</u>		<u>Dates: 24.10.78-23.10.79</u>	
<u>Rainfall:</u>		503 mm	<u>L.T.M.:</u> 647 mm
<u>Irrigation:</u>		671 mm	
<u>Total pre-cipitation:</u> 1174 mm			

2. Objective :

To evaluate post-emergence herbicides for their effect on ratoon cane at Pongola.

3. Treatments :

	<u>Herbicides</u>	<u>Rate in kg or ℓ</u> <u>ai or ae/ha</u>
1.	Control	-
2.	Diuron + 2,4-D + S	4,0 + 2,88
3.	Daconate 6 + diuron + S	4,68 + 2,0
4.	Daconate 6 + diuron + S	9,36 + 4,0
5.	EL 6003 + S	3,75
6.	EL 6003 + S	7,5
7.	Velpar + diuron	1,35 + 1,0
8.	Velpar + diuron	1,8 + 1,0

Note on Treatments :

Surfactant (S) was added to the treatments indicated at a rate of 0,2% of total volume.

Conditions at spraying were :-
Temperature : 24 °C (8.00 am)
Soil surface : Thoroughly wet
Wind : 13 km/hour
Rainfall : 0 mm

4. Experimental :

Plots consisted of six rows x eight metres with the two outer rows being discarded at harvest. Six replications were used.

Treatments were applied by means of a lever-operated knapsack sprayer fitted with a TK5 floodjet. The nozzle was held directly over the cane rows. The cane was 300-400 mm tall (leaf height) at the time of spraying and some plots showed poor growth.

Ratings of phytotoxicity to cane were based on the European Weed Research Society 1-9 scale where 1 = no effect and 9 = dead.

Growth measurements were recorded at intervals throughout the crop cycle.

5. Results :

1. Growth vigour ratings at spraying and ratings of leaf scorch and stunting taken 18 and 35 days after spraying are presented in Table 1.
2. Stalk height measurements taken 5 days and 2,6 and 10 months after spraying are presented in Table 2.
3. Yield data at harvest are presented in Table 3.

TABLE 1 : Growth at spraying and leaf scorch ratings
18 and 35 days after spraying

Treatments	*1 Vigour at spraying	EWRS Ratings		*2 Stunting	
		18	35	18	35
1. Control	2,7	1	1	5	5
2. Diuron + 2,4-D + S	2,7	2	1,5	2,7	3,2
3. Daconate 6 + diuron + S	2,7	3,7	1,8	3,3	3,8
4. Daconate 6 + diuron + S	2,3	4,0	1,8	2,5	3,2
5. EL 6003 + S	2	2,0	1,3	3,7	4,2
6. EL 6003 + S	2,3	2,7	2,0	3,3	4,0
7. Velpar + diuron	2,7	2,2	2,2	3,8	4,0
8. Velpar + diuron	2,3	2,8	2,8	3,7	3,8

*1 : 1 = poor growth 3 = fine

*2 : 1 = very poor 5 = same as control

TABLE 2 : Stalk height measurements taken 5 days and 2,6 and 10 months after spraying

Treatments	Stalk measurements			
	Heights (cm)			
	5 days	2	6	10
1. Control	11	65	225	265
2. Diuron + 2,4-D + S	11	55	215	253
3. Daconate 6 + diuron + S	11	57	218	259
4. Daconate 6 + diuron + S	11	55	216	260
5. EL 6003 + S	11	57	221	260
6. EL 6003 + S	11	57	223	260
7. Velpar + diuron	11	59	214	260
8. Velpar + diuron	11	56	213	251

TABLE 3 : Yield data at harvest

Treatments	Rate in kg or l ai or ae/ha	Yield			Stalk measurements	
		Cane t/ha	% cane	ers t/ha	Height (cm)	Popln ($\times 1000$ /ha)
1. Control	-	142	13,0	18,5	268	137
2. Diuron + 2,4-D + S	4,0 + 2,88	137	13,0	17,9	255	*147
3. Daconate 6+diuron+S	4,68 + 2,0	140	13,0	18,2	264	145
4. Daconate 6+diuron+S	9,36 + 4,0	142	12,9	18,3	258	*147
5. EL 6003 + S	3,75	142	13,3	18,9	260	**160
6. EL 6003 + S	7,5	140	13,2	18,5	263	141
7. Velpar + diuron	1,35 + 1,0	135	12,8	*17,2	258	*149
8. Velpar + diuron	1,8 + 1,0	**127	13,1	**16,6	256	134
CV %		5,3	3,0	6,0		5,6
LSD (0,05)		8,63	0,46	1,26		9,59
LSD (0,01)		11,58	0,61	1,69		12,87

* significant at the 5% level

** significant at the 1% level

6. Comments :

1. Leaf scorch symptoms were produced by all treatments although that from diuron + 2,4-D + S and the lower rate of EL 6003 + S were very slight. Daconate 6 + diuron + S caused necrosis and chlorosis of leaves where contact was made with the foliage. The visual effects of Velpar + diuron and EL 6003 + S treatments were similar, being fine orange brown speckles on the leaves but Velpar + diuron was more severe.
2. Symptoms from all treatments disappeared in time.
3. Stunting of cane growth was evident from all treatments and this persisted in the case of Velpar + diuron and diuron + 2,4-D + S right up until harvest.
4. Only Velpar + diuron produced statistically significant reductions in yield at harvest.
5. Reduction in height of stalks was compensated for by a greater number of stalks in other treatments.

PET/HDN
14 May 1980