

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code : HW369/88
Cat. No. : 1664

Title: Phytotoxicity screening of new pre-emergent herbicides in pots.

Objectives: To evaluate the phytotoxicity of new pre-emergence herbicides on cane grown in pots.

1. PARTICULARS OF THE PROJECT:

This crop : Plant
 Site : Tray site, Mount Edgembe
 Region : North Coast Coastal
 Soil System : Umzinto Coast Lowlands
 Soil form/ Series : Hutton Shorrocks/Clanshal
 Design : Randomised block x 6 clay and 6 sand reps.
 Variety : NCo376
 Fertilizer/ Ameliorants : $\frac{N}{As}$ $\frac{P}{per}$ $\frac{K}{FAS}$

Soil analysis Date: 24.10.88

pH	Clay %	Sand %	Silt %
Sand 7,90	8	87	5
Clay 7,20	>30	-	-

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P	K	Ca	Mg	Na
ppm	ppm	ppm	ppm	ppm
Sand 64	52	974	45	45
Clay 61	193	>1650	>350	-

Age : 79 days Dates : (17.10.88 - 05.01.89)
 Irrigation : Daily Drip Irrigation

2. APPLICATION DETAILS :

Date : 18.10.88
 Applicator : Gas operated
 Nozzle : APM Green
 Pressure : 1,4 Bars
 Output : 172 l ha⁻¹
 Time : 08h00 - 09h25

3. CONDITIONS AT SPRAY

Temperature (°C)	
08h00	16,8
14h00	19,3
Relative humidity (%)	
08h00	77
14h00	59
Wind	Slight Breeze
General	Overcast
Sunshine hours	0,0
Soil surface	Moist
Rainfall (mm)	
On day of spray	18,4
Days to 1st rain	1
Amount of 1st rain	18,4
Total in 2 weeks	36,3

4. EXPERIMENTAL :

Eight single eyed setts were planted per tray (270 mm x 330 mm) on the 17 October 1988. Fertilizer [5-1-5(45) at 12g in sand and 6g in clay] was mixed in the respective soils at planting. Temik was applied to sand pots only.

5. CHEMICAL FORMULATION USED :

Product	Formulation	Active ingredient
Dual	930 g/l ec	Metolachlor
Diuron	800 g/l sc	diuron
Flotrazine	500 g/l sc	atrazine
Harness	900 g/l ec	acetochlor
ICIA 0179	840 g/kg sp	-
Lasso	384 g/l ec	alachlor
Pivot	50 g/l	imazapyr
Product Z	350 g/l	-
Sencor	480 g/l	metribuzin

6. RESULTS

Table 1 - Visual ratings of germination 15 days after spraying and % leaf scorch and stunting 54 days after spraying

Treatments	Rate in kg or l prod/ha	Germination*		Leaf Scorch %		Stunting**	
		Sand	Clay	Sand	Clay	Sand	Clay
1 Pivot	1,5	0,2	2,3	31	30	2,7	2,2
2 Pivot + Harness	1,5 + 2,8	0,3	2,3	39	42	2,4	1,4
3 Pivot + Harness	3 + 5,6	0,2	0,3	30	33	2,1	1,4
4 Pivot + Harness + diuron	3 + 5,6 + 3,6	0,0	0,5	34	32	2,2	0,9
5 Pivot + Harness + atrazine	3 + 5,6 + 4	0,0	0,0	36	23	1,6	1,4
6 Pivot	3	0,0	1,3	36	33	2,2	1,9
7 Dual + Sencor	1,5 + 2,2	4,5	4,7	4	2	4,0	5,0
8 Dual + Sencor	3 + 4,5	5,8	4,8	8	3	3,9	4,5
9 ICIA 0179	240 g	6,2	4,7	41	58	2,4	2,7
10 Product Z	4	1,2	0,0	-	40	-	1,0
11 Lasso + atrazine	5 + 2	5,5	5,5	3	6	4,3	4,3
12 Lasso + atrazine	10 + 4	5,5	5,2	1	7	4,1	4,5
13 Lasso + atrazine	10 + 8	5,8	5,0	14	1	3,5	4,5
14 Harness + atrazine	2 + 2	4,8	4,7	5	3	3,9	4,4
15 Harness + atrazine	4 + 4	4,2	4,5	12	3	3,5	3,8
16 Harness + atrazine	4 + 8	4,0	5,7	9	6	3,4	3,6
17 Control unsprayed	-	4,5	5,8	13	7	4,1	4,3
18 Control unsprayed	-	4,5	4,8	8	3	3,9	4,5

* 1-7 1 = poor, 7 = excellent

** 1- 5 1 = very poor, 5 = very good

Table 2 : Main shoot length, tiller counts and fresh mass expressed as a percent of unsprayed control values at harvest and primary shoot counts at harvest

Treatments	Rate in kg or l prod/ha	Sand				Clay			
		Len-gth	No.	Til-lers	Fresh mass	Len-gth	No.	Til-lers	Fresh mass
1 Pivot	1,5	91	7,3	103	79	70	5,0	85	29
2 Pivot + Harness	1,5 + 2,8	84	6,2	103	54	57	6,8	57	22
3 Pivot + Harness	3 + 5,6	78	5,3	111	34	46	6,0	46	12
4 Pivot + Harness + diuron	3 + 5,6 + 3,6	82	5,7	99	33	40	4,2	44	6
5 Pivot + Harness + atrazine	3 + 5,6 + 4	78	4,0	135	26	63	5,5	76	19
6 Pivot	3	81	5,2	155	53	70	4,0	74	24
7 Dual + Sencor	1,5 + 2,2	102	7,3	104	104	101	6,3	119	107
8 Dual + Sencor	3 + 4,5	98	7,0	86	99	98	7,2	130	121
9 ICIA 0179	240 g	78	6,8	47	52	68	6,8	47	35
10 Product Z	4	12	0,2	3	1	17	2,3	0	1
11 Lasso + atrazine	5 + 2	110	7,2	123	106	106	6,7	118	112
12 Lasso + atrazine	10 + 4	107	7,3	101	95	105	7,0	99	96
13 Lasso + atrazine	10 + 8	98	7,5	66	83	99	8,0	88	94
14 Harness + atrazine	2 + 2	103	7,5	102	96	103	6,8	88	89
15 Harness + atrazine	4 + 4	106	7,0	68	84	95	6,8	90	75
16 Harness + atrazine	4 + 8	100	7,0	46	78	92	7,0	63	68
17 Control unsprayed	-	102	7,2	106	102	100	6,3	98	95
18 Control unsprayed	-	99	7,5	94	98	100	6,7	102	105
Actual values (Control T18)		16,2	7,5	12,7	152	18	6,7	15,8	214
CV%		13,1	15,9	39,6	18,3	15,4	18,8	36,5	31,2
SED		6,7	7,8	20,9	7,5	7,1	10,2	16,7	11,1
LSD (0,05)		13,4	15,7	41,8	14,9	14,1	20,3	33,4	22,1

7. COMMENTS :

Lasso + atrazine

The standard rates and double the standard rates showed no greater leaf scorch or stunting than cane in untreated pots and fresh mass was not reduced. The very high rate of atrazine (8 l) caused slightly greater leaf symptoms, stunting, reduction in tillers and an indication of fresh mass reduction in sandy soil only.

Harness + atrazine

Standard rates caused no effects but double standard and the high atrazine rate combination tended to cause stunting at an early stage, and to reduce tiller numbers and fresh mass in both soil types at harvest.

Pivot, Pivot + Harness, Pivot + Harness + diuron, Pivot + Harness + atrazine

Pivot alone caused severe leaf chlorosis stunting and fresh mass reductions in sand and clay soils. Early symptoms were similar at both rates but the higher rate was more severe in terms of fresh mass reduction in sandy soils. The addition of Harness caused greater negative effects on fresh mass and this was even more severe with diuron or atrazine additions.

Dual + Sencor

There was no evidence of any adverse effects of single or double rates of this mixture on cane growth.

Product Z

Extremely severe effects were produced by this chemical which prevented germination of most buds.

ICIA 0179

This product caused very severe leaf symptoms in both sand and clay soils, severe stunting, and large reductions in tiller numbers and fresh mass.