SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code : HW370/89
Cat. No. : 1665

Title: Post-emergence phytotoxicity trial in pots.

Objectives: To evaluate new products for their phytotoxicity to plant cane grown in pots when sprayed post-emergence.

1. PARTICULARS OF THE PROJECT:

This crop : Plant

Site : Tray site, Exp. Stat. Mount Edgecombe

Region : North Coast Coastal

Soil System : Umzinto Coast Lowlands

Soil form/ Series : Hutton Shorrocks/Clansthal

Design : Randomised blocks x 6 clay and 6 sand reps.

Variety : NCo376

Fertilizer/ Ameliorants : N P K As per FAS

Soil analysis Date: 24.10.88

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

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

Age : 46 days **Dates** : (16.01.89 - 31.03.89)

Irrigation : Daily Irrigation with Drippers

2. **APPLICATION DETAILS :**

Date : 21.02.89
Applicator : Gas operated
Nozzle : 8004-E
Pressure : 1,85 Bars
Time : 06h55 - 08h08

3. CONDITIONS AT SPRAY

Temperature (°C)	
08h00	26,2
14h00	28,5
Relative humidity (%)	
08h00	69
14h00	73
Wind	No wind to slight breeze
Soil surface	Dry to sub-soil moist
General	Clear to overcast and warm
Sunshine hours	9,5
Rainfall (mm)	
Day of spray	Nil
Days to 1st rain	1
Amount of 1st rain	0,4
Total in 2 weeks	35,2

4. CHEMICAL FORMULATION USED :

Product	Formulation	Active ingredient
Actril DS	100 + 600 g/l ec	ioxynil + 2,4-D iso-octyl ester
Classic	250 g/kg df	chlorimuron-ethyl
Diuron	800 g/l sc	diuron
Flotrazine	500 g/l sc	atrazine
Harness	900 g/l ec	acetochlor
ICIA 0051	360 g/l	-
MSMA	720 g/l se	monosodium methanearsonate
Oxytril	200 + 200 g/l ec	ioxynil + bromoxynil
Product Z	350 g/l	-
Pivot	50 g/l	imazapyr
Sencor	480 g/l sc	metribuzin
Velpar	240 g/l sc	hexazinone

5. EXPERIMENTAL :

Clay and sandy soils were fumigated for 48 hours. Pots measuring 270 mm x 300 mm were half filled with the respective soils and fertilizer [5-1-5(45)] was mixed into the soils. Temik was applied to the sandy soil only.

On 21 January 1989 single eyed setts were cut and dipped in Benlate solution and planted at a rate of 8 setts to a pot.

Treatments were applied directly over cane foliage on 21 February 1989 where cane growth was about 400-550 mm in clay soil (at leaf bend) and 300-450 mm in sandy soil.

6. RESULTS

Table 1 - Visual ratings of percent leaf scorch and of stunting (1-5 scale where 1 = very poor and 5 = very good) taken 20 and 38 days after spray

Treatments	Rate in kg or l prod/ha	Leaf Scorch %				Stunting			
		Clay		Sand		Clay		Sand	
		20	38	20	38	20	38	20	38
1 Diuron + Actril DS	2,5 + 1,25	4	21	6	26	4,4	3,6	4,0	3,8
2 Diuron + Actril DS	5 + 2,5	9	25	11	37	3,7	3,3	3,3	3,0
3 Diuron + Velpar	1,5 + 2,5	16	48	13	35	3,3	2,8	3,4	3,3
4 Diuron + Sencor	2 + 2,9	6	17	7	28	4,8	4,0	4,1	3,5
5 Product Z	1,5	3	38	8	50	4,7	3,3	3,7	2,5
6 Product Z	3	4	49	8	58	4,6	3,1	3,2	1,9
7 Pivot + Harness	0,5 + 2	6	39	7	39	4,2	2,5	3,5	2,5
8 Pivot + Harness	1 + 2	8	47	9	41	4,2	2,5	3,3	2,6
9 Pivot + Harness	2 + 4	13	47	9	46	4,0	2,3	3,3	2,3
10 ICIA 0051	4,2	4	13	5	22	4,8	4,2	4,3	4,0
11 ICIA 0051	8,4	5	18	7	28	4,9	3,8	4,6	4,1
12 Harness + atrazine + Actril DS	2,5 + 5 + 1,25	4	19	4	21	4,8	3,8	4,2	3,9
13 Harness + atrazine + Actril DS	4 + 10 + 2,5	8	28	10	37	3,8	3,2	3,1	2,7
14 Classic + MSMA	120g + 4	11	28	9	22	3,7	3,7	3,6	3,8
15 Classic + Velpar	120g + 2,5	9	26	11	34	3,8	3,6	3,3	2,8
16 Oxytril + MSMA	1,25 + 4	9	20	10	27	4,4	3,9	3,7	3,7
17 Classic + MSMA	240g + 8	15	37	12	38	3,3	3,0	3,3	3,3
18 Control		3	5	3	5	5,0	4,9	4,9	5,0

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

Treatments	Rate in kg or l prod/ha	Clay				Sand			
		Length	No. shts	Tillers	Fresh mass	Length	No. shts	Tillers	Fresh mass
1 Diuron + Actril DS	2,5 + 1,25	106	7	93	87	92	7	78	76
2 Diuron + Actril DS	5 + 2,5	98	7	100	69	78	8	94	54
3 Diuron + Velpar	1,5 + 2,5	84	7	40	44	74	8	75	55
4 Diuron + Sencor	2 + 2,9	101	8	88	78	87	8	94	68
5 Product Z	1,5	89	8	123	80	61	7	55	28
6 Product Z	3	84	8	93	52	53	7	15	22
7 Pivot + Harness	0,5 + 2	84	8	159	75	64	8	237	80
8 Pivot + Harness	1 + 2	79	8	173	71	58	6	175	54
9 Pivot + Harness	2 + 4	81	8	151	50	59	8	182	49
10 ICIA 0051	4,2	101	7	102	97	93	8	123	88
11 ICIA 0051	8,4	98	7	94	83	92	7	78	84
12 Harness + atrazine + Actril DS	2,5 + 5 + 1,25	114	7	111	95	93	8	67	77
13 Harness + atrazine + Actril DS	4 + 10 + 2,5	100	6	88	74	71	7	66	45
14 Classic + MSMA	120g + 4	119	8	103	95	87	8	78	73
15 Classic + Velpar	120g + 2,5	90	8	90	65	71	7	49	42
16 Oxytril + MSMA	1,25 + 4	93	8	103	85	96	7	84	73
17 Classic + MSMA	240g + 8	94	8	96	72	91	7	71	64
18 Control		100	8	100	100	100	8	100	100
Control (Actual values)		20 cm	8	20	349 g	23cm	8	16	260g
SED		5,4		16,7	7,7	6,0		19,4	7,2
LSD (0,05)		10,8		33,1	15,3	12,0		38,5	14,2
Significance		S	S	S	S	S	NS	S	S

7. COMMENTS :

Standard diuron + Actril DS

Cane in both sand and clay soils was severely scorched and stunted to some extent. Effects were worse at double rates. Fresh mass was also reduced in both sand and clay and this was associated with shoot height reductions.

Diuron + Velpar and diuron + Sencor

Generally the velpar mixture was worse that diuron + Actril DS particularly in the clay soil while the Sencor mixture was similar to or slightly worse than a single rate of diuron + Actril DS in terms of fresh mass.

Product Z

The rates used caused severe foliar scorch and stunting in clay and sandy soils. Fresh mass was severely affected in both soils and this was worse than the standard treatment except for the low rate in clay soil.

Pivot + Harness

All rates of this mixture caused extremely severe scorch and stunting effects. However only the two higher rates caused severe fresh mass reductions and these were similar to the standard diuron + Actril DS at double rates. Tiller production was significantly increased by this treatment.

ICIA 0051

Visual scorch and stunting effects were generally less severe than the standard diuron + Actril DS while reduction in fresh mass were small and only just statistically significant at the higher rates in both soil types.

Harness + atrazine + Actril DS

Visual scorch and stunting effects as well as fresh mass reductions were severe at the double rate but only moderate at the single rate. In clay soil particularly this mixture appeared to be safer than the standard diuron + Actril DS.

Classic + MSMA

Both rates of this mixture caused marked visual scorch and some stunting as well as fresh mass reductions. Double rates were worse than single rates but were marginally less severe than double rates of the standard diuron + Actril DS.

Classic + Velpar

The single rate of this mixture which was tested was worse than the standard diuron + Actril DS in terms of leaf scorch, stunting and fresh mass reductions. However, it was generally less severe than diuron + Velpar.

Oxytril + MSMA

This mixture caused slight leaf scorch, stunting and fresh mass reductions and was similar to the standard diuron + Actril DS in these effects.

PETT/dlz
1 August 1989