SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Cat No : 1808
Project No.. 3967
Code No : HW 411/91/P

Title: Post-emergence phytotoxicity trial in pots.

1. Particulars of project

This crop : Plant
Site : Mount Edgecombe Tray site
Region : North Coast - Coastal
Soil System : Berea
Soil form/series : Hutton/Shorrocks Clansthal
Design : Randomised block
Variety : NCo376

Fertilizer (kg/ha):	N	P	K
(planting)	151	30	151
(top dress)	177	-	177

Soil analysis Date: 15.4.91

	pH	O.M.%	Clay%	P.D.I.
Sand	>8,3	1,4	5	-
Clay	6,8	2,3	61	-

ppm

	P	K	Ca	Mg	Zn	Al
Sand	>80	35	1594	40	1,3	-
Clay	15	73	2050	1020	1,1	-

Age : 6 months

Dates : 11.4.1991 - 3.10.1991

Rainfall : 270 mm

Irrigation : Daily with drippers

2. Objectives:

To evaluate new products and mixtures for their phytotoxicity on plant cane grown in pots and sprayed post-emergence.

2. Treatments:

		Rates (l product/ha)
T1	Control	Handweeded
T2	Actril DS + diuron	1,25 + 2,5
T3	Velpar + Gramoxone	2 + 1
T4	Velpar + Gramoxone	4 + 2
T5	Velpar + Tronic	2 + 0,6
T6	Velpar + Tronic	4 + 0,6
T7	Terbo	2
T8	Terbo	4
T9	Spotaxe	2
T10	Spotaxe	4
T11	Spotaxe + diuron	2 + 2,5
T12	Spotaxe + diuron	4 + 5
T13	Duplosan DP	3
T14	Duplosan DP	6
T15	Duplosan DP + diuron	3 + 2,5
T16	Duplosan DP + diuron	6 + 5
T17	Racer	2
T18	Racer	4
T19	Amigan	6
T20	Amigan	12
T21	Extrazine	4
T22	Extrazine	8
T23	ICIA 0051/ametryne	2,78
T24	ICIA 0051/ametryne	5,56
T25	ICIA 0051/Velpar	2
T26	ICIA 0051/Velpar	4

4. Design:

Design : Randomised block
No. replications : 6 sandy loam and 6 clay loam
Pot size : 27 cm x 30 cm = 810 cm^2

5. Chemical formulation used:

Product	Formulation	Active ingredient
Actril DS	600 + 100 g/l (EC)	2,4-D + ioxynil
Diuron	800 g/l (SC)	diuron
Velpar	240 g/l	hexazinone
Gramoxone	200 g/l	paraquat
Tronic	-	surfactant
Terbo	150 + 333 g/l (SC)	bromoxynil + terbuthylazine
Spotaxe	80 + 240 g/l	dicamba + 2,4-D
Duplosan DP	600 g/l	dichlorprop - P
Racer	250 g/l	flurochloridone
Amigan	310 + 120 g/l	ametryn + terbutryn
Extrazine	167 + 333 g/l (SC)	cyanazine + atrazine
ICIA 0051/ametryn	90 + 360 g/l	sulcotrione + amteryn
ICIA 0051/Velpar	125 + 125 g/l	sulcotrione + hexazinone

6. Application details:

Treatment date	:	2.8.1991
Time	:	6.30 am - 8.00 am
Applicator	:	CP3
Nozzle	:	APM (Green)
Pressure	:	150 kPa
Output	:	37,8 ml/sec
Output	:	27 ml/m^2
Method	:	Directed over the pots

7. Weather conditions:

Treatment date	:	2.8.1991
General	:	Clear and cool
Dew	:	Nil
Soil surface	:	Very damp
Wind	:	Nil
Sunshine hours	:	8
Temperature (℃)		
08h00	:	13
14h00	:	18,6
Relative humidity (%)		
08h00	:	45
14h00	:	46
Rainfall (mm)		
On day of spray	:	Nil
No. days to first rain	:	5
At first rain	:	1,5
In first 14 days	:	1,5
Total for duration of trial	:	270

8. **Results:**

Table 1: **Visual ratings of percentage leaf scorch and stunting (where 1 = very poor and 5 = no stunting) recorded 34 days after spraying**

Treatment		Rate (l product/ha)	% leaf scorch		Stunting	
			Clay	Sand	Clay	Sand
T1	Control	-	10,6	4,4	4,4	4,5
T2	Actril DS + diuron	1,25 + 2,5	12,8	10,3	3,8	3,5
T3	Velpar + Gramoxone	2 + 1	34,2	30,8	2,8	2,8
T4	Velpar + Gramoxone	4 + 2	44,2	46,7	2,2	1,5
T5	Velpar + Tronic	2 + 0,6	15,0	16,5	4,0	3,4
T6	Velpar + Tronic	4 + 0,6	18,0	13,7	3,1	3,1
T7	Terbo	2	9,8	6,3	4,3	3,9
T8	Terbo	4	10,7	6,5	4,1	4,6
T9	Spotaxe	2	9,8	7,8	4,1	4,2
T10	Spotaxe	4	18,3	12,7	2,8	3,7
T11	Spotaxe + diuron	2 + 2,5	10,0	14,0	3,9	3,8
T12	Spotaxe + diuron	4 + 5	12,0	8,7	3,6	3,8
T13	Duplosan DP	3	15,0	16,0	3,3	3,3
T14	Duplosan DP	6	21,0	19,0	2,8	3,1
T15	Duplosan DP + diuron	3 + 2,5	22,0	17,0	2,7	3,1
T16	Duplosan DP + diuron	6 + 5	26,0	23,0	2,5	2,1
T17	Racer	2	14,0	19,0	3,8	3,4
T18	Racer	4	17,0	15,0	3,7	3,7
T19	Amigan	6	9,0	20,0	3,6	2,9
T20	Amigan	12	20,0	20,0	2,8	3,4
T21	Extrazine	4	8,0	12,0	4,4	3,2
T22	Extrazine	8	8,0	12,0	4,3	3,4
T23	ICIA 0051/ametryne	2,78	14,0	12,0	4,6	3,2
T24	ICIA 0051/ametryne	5,56	11,0	16,0	3,8	3,5
T25	ICIA 0051/Velpar	2	10,0	14,0	4,2	3,8
T26	ICIA 0051/Velpar	4	7,0	12,0	4,6	3,1

Table 2: **Main shoot length (Ms len), tiller counts (Til No) and fresh mass (Fr Ma) taken at harvest and expressed as a percentage of unsprayed control values, and main shoot counts (Sh No)**

Treatment		Rate (l product/ha)	Clay				Sand			
			Ms len	Sh No	Til No	Fr Ma	Ms len	Sh No	Til No	Fr Ma
T1	Control	-	100	6,3	100	100	100	6,2	100	100
T2	Actril DS + diuron	1,25 + 2,5	101	6,0	122	93	105	6,3	132	137
T3	Velpar + Gramoxone	2 + 1	86	6,7	102	70	92	5,2	85	75
T4	Velpar + Gramoxone	4 + 2	85	5,8	100	49	79	5,2	80	45
T5	Velpar + Tronic	2 + 0,6	93	6,7	116	94	90	5,8	90	95
T6	Velpar + Tronic	4 + 0,6	92	6,3	146	84	93	5,5	113	101
T7	Terbo	2	108	6,7	98	104	108	4,2	125	102
T8	Terbo	4	100	6,7	154	98	108	5,7	130	121
T9	Spotaxe	2	102	6,8	127	96	115	5,2	137	127
T10	Spotaxe	4	94	6,3	110	82	103	4,7	97	94
T11	Spotaxe + diuron	2 + 2,5	99	6,7	109	97	98	5,7	116	104
T12	Spotaxe + diuron	4 + 5	95	6,5	117	90	101	5,5	75	110
T13	Duplosan DP	3	92	6,0	99	76	93	5,7	108	107
T14	Duplosan DP	6	81	6,7	95	68	89	5,0	80	84
T15	Duplosan DP + diuron	3 + 2,5	83	6,5	93	62	93	5,5	120	94
T16	Duplosan DP + diuron	6 + 5	86	6,0	86	56	85	5,3	73	69
T17	Racer	2	101	6,0	119	89	94	5,0	123	96
T18	Racer	4	100	6,5	103	89	99	5,3	124	114
T19	Amigan	6	100	5,8	89	72	89	5,3	97	86
T20	Amigan	12	99	5,7	109	78	93	4,3	90	75
T21	Extrazine	4	99	6,5	112	99	106	5,7	111	112
T22	Extrazine	8	105	5,3	109	93	95	5,5	118	97
T23	ICIA 0051/ametryne	2,78	105	5,5	137	111	92	5,7	101	80
T24	ICIA 0051/ametryne	5,56	98	6,5	144	99	92	5,7	106	90
T25	ICIA 0051/Velpar	2	103	6,2	123	102	100	5,8	116	107
T26	ICIA 0051/Velpar	4	105	6,2	119	98	86	5,3	52	72
Control (actual values)			23	6,3	12	487	19	6,3	7	207
CV%			10	19	27	19	14	27	46	32
SED			1,3	0,7	2,1	47	1,4	0,8	1,9	36
LSD (0,05)			2,7	1,4	4,1	92	2,8	1,7	3,8	72
Significance			S	NS	S	S	S	S	NS	S

9. **Comments:**

All new products or mixtures were tested at the recommended and twice the recommended rates.

Actril DS + diuron

The standard treatment appeared to boost tiller numbers that increased fresh mass yield significantly in the sandy soil.

Velpar + Gramoxone and Velpar + Tronic

The mixture with Gramoxone caused excessive leaf scorch and stunting that resulted in significantly reduced fresh mass yield at harvest. The recommended rates were very damaging and reduced both primary shoot length and fresh mass yield significantly in the clay soil.

Tiller numbers seemed to have improved where Tronic was added to Velpar and yields were not effected significantly for this mixture.

Terbo

Both rates of this product had very little influence on growth and yield of cane in pots. The higher rate improved tillering particularly in the clay soil.

Spotaxe and Spotaxe + diuron

Although there was definite stunting at the higher rate of Spotaxe applied to cane on the clay soil, neither rate of the two treatments caused significant growth or yield losses at harvest.

Duplosan DP and Duplosan DP + diuron

Twice the recommended rate of the single product and both rates of the mixture resulted in severe leaf scorch and stunting and a significant fresh mass yield loss for cane in the clay soil. Yield losses were also recorded in the sandy soil but were not statistically significant. 3 l/ha of the product alone reduced fresh mass yield (NS) in the clay soil but did not appear to effect yields for cane grown in sandy soil conditions.

Racer

The two rates of this product resulted in some minor leaf scorch which was not severe enough to effect yields significantly. Results for fresh mass yield indicate slightly higher phytotoxic effects for cane in the clay soil but reductions were not great enough to be significant.

Amigan

Leaf scorch and stunting were higher at the recommended rate in the sandy soil, but scorch was equal in both soil mediums at the higher rate. Fresh mass yield was reduced for both rates under both soil conditions but only reached levels of significance at the recommended rate on the clay soil.

Extrazine

Neither rate of this product caused significant growth or yield effects to cane grown in pots.

ICIA 0051/ametryn

Both rates of this formulation increased tiller numbers in the clay soil but effects on yield were non-significant. There appeared to be no effect on cane in the sandy loam for both the rates applied.

ICIA 0051/Velpar

The recommended rate of this formulation had a positive influence on tillering and a non-significant effect on yield. The higher rate was more phytotoxic in the sandier soil and had a negative effect on tiller numbers (NS).

NBL/1b
27 April 1992