SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code No.: HW235
Cat. No.: 1420

TITLE: Phytotoxicity trial (pre-emergence) in trays

1. Particulars of the project

This crop	: Plant cane
Site	: Mt Edgecombe
Region	: N. Coast Coastal
Soil system	: Umzinto/ Coast lowlands
Soil form/series	: Hutton/Shorrocks and Clansthal
Design	: Random blocks
Variety	: NCo 376

Fertilizer/	: N	P	K
Light soil (a)	: 254	50	254
Heavy soil (b)	: 127	25	127

Temik in light soil: 20 kg/ha

Soil analysis: Date:

	pH	O.M.%	Clay%	Silt%	Sand%
(a)	5,2	0,60	5	3	92
(b)	6,35	1,30	43	13	44

ppm

	P	K	Ca	Mg	Zn	Al
(a)	13	65	91	20	1,5	1
(b)	38	130	>1800	>220	1,6	

Age: 2,9 months Dates: 12.9.83 - 8.12.83

Irrigation: Fully irrigated with drip system

2. Objectives

To test new herbicides for their effects on pot-grown NCo 376 when applied pre-emergence of the crop.

3. Treatments

See results

4. Experimental

Single-eyed setts of cane were chopped dipped in Benlate fungicide, and then planted in trays (12 per tray). Seven days later setts were examined and those with buds which had not swollen were discarded to leave 10 setts per tray. Pre-emergence treatments were then applied three days later.

Details of application and weather conditions:

Applicator	:	Gas operated knapsack
Nozzle	:	Spraying systems 8003-E
Pressure	:	1,75 Bar
Output	:	768 ℓ/ha
Date of spraying	:	22.9.83
Temperature °C	:	8 am: 20,2
		2 pm: 21,0
Rel Humidity %	:	8 am: 80
		2 pm: 80
Sunshine hours	:	1,4
Rainfall (mm)	:	9,5

5. Results

Table 1. Foliar symptoms of herbicide damage (chlorosis %) and crop measurements in clay soils

Treatments (% ai)	Rate in kg or ℓ prod/ha	Chlorosis %	Crop measurements: Shoot length (cm)			Tiller+shoot Numbers		
		T+30	T+22	T+36	T+64	T+22	T+36	T+64
1 Control (unsprayed)	-	5	6	9	15	8	9	20
2 Lasso (38,4)+atrazine (50)	12 + 6	5	6	8	16	8	8	20
3 Butisan S (50)	3	6	6	7	14	8	8	19
4 Butisan S	6	3	5	6	14	8	8	19
5 Butisan S+diuron (80)	4 + 6	7	6	7	13	9	10	19
6 Butisan S+atrazine	2 + 3	6	6	7	15	9	9	19
7 Butisan S+atrazine	4 + 6	5	5	6	13	9	9	17
8 Butisan S+ametryne (50)	4 + 6	4	6	7	14	9	9	19
9 Modown (48)	7,5	7	7	9	17	8	8	20
10 Modown	15	6	6	9	16	9	9	23
11 Modown+Lasso	10 + 10	7	6	8	14	9	9	19
12 Mon 097 (96)	3	7	6	8	15	8	8	17
13 Mon 097	6	5	6	8	15	8	8	17
14 Mon 097+diuron	6 + 6	6	5	7	14	8	9	18
15 UC77179 (80)	2,8	18	6	7	11	9	9	11
16 UC77179	5,6	26	6	7	9	8	8	11
17 Lasso+diuron	12 + 6	5	6	9	16	8	8	23

Comments:

1. Butisan S combinations, particularly high rates tended to depress shoot elongation slightly.

2. Modown alone tended to increase rather than decrease shoot elongation.

3. Mon 097 only affected shoot elongation when mixed with diuron although conversely tiller counts tended to be lower from Mon 097 alone.

4. UC77179 at both rates reduced both shoot length and tillering substantially.

5. Leaf cholorosis became pronounced from UC77179 treatments only.

Table 2: Foliar symptoms of chlorosis % and crop measurements in sandy soil

	Treatments	Rate in kg or ℓ prod/ha	Chlorosis %	Crop measurements					
				Shoot length (cm)			Tiller+shoot Numbers		
			T+30	T+22	T+36	T+64	T+22	T+36	T+6
1	Control (unsprayed)	-	6	6	9	16	9	8	17
2	Lasso + atrazine	12 + 6	7	6	8	15	9	8	19
3	Butisan S	3	7	6	7	15	8	9	21
4	Butisan S	6	6	5	6	15	8	8	20
5	Butisan S + diuron	4 + 6	7	6	7	15	6	8	17
6	Buisan S + atrazine	2 + 3	9	6	8	15	8	8	20
7	Butisan S + atrazine	4 + 6	5	5	6	13	8	8	17
8	Butisan S + Ametryne	4 + 6	7	5	7	14	9	9	22
9	Modown	7,5	6	6	9	16	8	8	19
10	Modown	15	7	6	9	16	8	8	20
11	Modown + Lasso	10 + 10	7	5	8	15	8	7	20
12	Mon 097	3	5	6	8	16	8	8	19
13	Mon 097	6	7	5	7	15	8	8	19
14	Mon 097 + diuron	6 + 6	8	5	7	14	8	10	20
15	UC77179	2,8	10	6	7	13	7	8	13
16	UC77179	5,6	24	5	7	12	8	8	13
17	Lasso + diuron	12 + 6	13	5	7	14	6	7	15

Comments:

1. Similar trends were apparent in light soils eg Butisan S + atrazine and ametryne at high rate, mixtures with diuron at high rates and also all rates of UC77179 reduced shoot elongation and the latter also effected tillering.

2. Although some pale colouration occurred on all cane the effects were marked in UC77179 treated cane.

Table 3. Fresh mass and crop measurements at harvest expressed as a percent of those from untreated control pots

	Treatments	Rate	Heavy soil				Light soil			
			Fresh mass	Shoot length	Shoot no	Tiller no	Fresh mass	Shoot length	Shoot no	Tiller no
1	Control (untreated)		238	19	9	12,3	229	21	7,5	12,2
2	Lasso+atrazine	12+ 6	100	103	80	96	96	94	110	101
3	Butisan S	3	79*	93	87	81	94	94	107	121
4	Butisan S	6	68**	89**	93	96	104	93	107	110
5	Butisan S+diuron	4+ 6	77*	90**	94	77	89	95	91	97
6	Butisan S+atrazine	2+ 3	90	99	93	103	94	94	111	107
7	Butisan S+atrazine	4+ 6	74**	89**	91	58	79	90*	100	101
8	Butisan S+ametryne	4+ 6	80*	90**	93	82	88	92	104	97
9	Modown	7,5	110	104	87	107	115	102	102	97
10	Modown	15	103	101	102	104	106	105	100	89
11	Modown+Lasso	10+10	92	97	98	74	93	101	91	106
12	Mon 097	3	88	97	91	76	99	97	100	103
13	Mon 097	6	87	100	91	76	96	96	100	89
14	Mon 097+diuron	6+ 6	86	97	93	100	83	89*	111	118
15	UC77179	28	50**	79**	93	23**	66*	87*	98	69
16	UC77179	5,6	26**	66**	85	8**	66*	85**	107	59
17	Lasso+diuron	12+ 6	99	101	85	126	72*	89*	89	80
	CV%		18,7	6,8	14,7	36,1	25,1	9,1	18,7	37,8
	L.S.D. (0,05)		17,78	7,29	15,48	33,89	26.15	9,84	21,83	42,07
	L.S.D. (0,01)		23,64	9,70	20,57	45,07	34,76	13.08	29,01	55,93

Comments:

1. Inspite of high co-efficients of variations statistically significant differences were obtained and are considered real

2. Lasso+atrazine the standard treatment at double recommended rates had no effect on cane in heavy soil or in light soil.

3. Butisan S alone at both low and high rates depressed growth in clay soil but not in sandy soil. However in combination with atrazine,

diuron or ametryne some effect appeared to be evident in light soils as well. (ns)

4. Modown was no worse than unsprayed control even at high rates of 15 ℓ/ha.

5. Mon 097 appeared to depress growth (ns) in clay soils but not in light soils except in combination with diuron.

6. UC77179 was extremely severe in its effects on cane in both soil types and at both rates of application.

7. Lasso+diuron depressed growth severely on light soils but not in heavy soils.

PETT/IS
27 April 1984