SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: HW 269/83
Cat. No.: 1416

TITLE: Post-emergence phytotoxicity trial 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, Clansthal
Design: Random blocks
Variety: NCo 376
Fertilizer:

	N	P	K
Light soil a)	254	50	254
Heavy soil b)	127	25	127

Temik: 20 kg/ha

Soil analysis: Date: 1.2.84

	pH	OM%	CEC	Clay%	Silt%	Sand% F.	M.	C
a)	5,10	0,50	0,20	3	18	65	28	1
b)	6,30	0,90	20,30	33	10	30	13	14

ppm

	P	K	Ca	Mg	Al
a)	15	40	45	12	1
b)	51	98	>1800	>220	

Age: Dates: 12.12.83-6.3.84
Irrigation: Drip irrigated fully

2. Objectives: To test the effects of new herbicides and mixtures applied onto the foliage of plant cane growth in pots.

3. Treatments: See results.

4. Experimental

Single eyed cane setts were chopped, dipped in Benlate fungicide and planted in trays. The number of setts per tray was reduced from the original 15 to 8 of the most robust plants.

When cane shoots were about 14 cm long in heavy soil and 11 cm in light soil, the treatments were applied. This was done by means of a gas operated knapsack sprayer fitted with a spraying systems 8004-E fanjet. Date sprayed: 6.2.84

Conditions at spraying were:-

Temperature °C 8 am : 24,2
2 pm : 27,0

Rel. humidity % 8 am : 77
2 pm : 72

Sunshine hours : 12,0

Rainfall (mm) on the day of spray : 0

5. Results

Table 1. Foliar scorch symptoms and crop measurements in heavy soil taken 10 days before spraying and 11 days after spryaing.

Treatments	Rate in kg or ℓ prod/ha	Leaf chlorosis & necrosis (%) at harvest	Crop measurements					
			Shoot length cm		Shoot no.		Tiller no.	
			T- 10	T+ 11	T-10	T+ 11	T-10	T+11
1. Control (unsprayed)	-	7	13	18	8	8	8	19
2. Diuron + Sencor	2 + 2	11	14	19	7	7	7	19
3. Butisan S	6	7	13	18	7	7	11	23
4. Butisan S + ametryne	4 + 6	13	14	18	8	8	9	20
5. Butisan S + am + par	4 + 6 + 2	24	13	17	7	7	9	18
6. Modown	7,5	10	14	19	7	7	9	20
7. Modown	15	14	14	19	8	8	9	20
8. Modown + Actril DS	10 + 2	11	14	19	7	8	8	21
9. Mon 097	3	9	14	18	8	8	10	20
10. Mon 097	6	9	14	18	6	6	9	19
11. Mon 097 + ametryne	6 + 12	18	14	16	7	8	9	18
12. Mon 097 + am + par	3 + 3 + 1,5	20	15	19	8	6	8	17
13. UC 77179	2,8	12	14	18	7	7	6	15
14. UC 77179	5,6	21	13	18	8	8	7	18
15. Lasso + diuron	12 + 6	13	14	18	6	8	9	18
16. Sencor 70WP	6	15	13	18	9	9	9	20
17. Sencor 48SC	8,75	14	14	18	8	6	9	19
18. Control (unsprayed)	-	7	12	18	7	7	8	21

Table 2. Foliar scorch symptoms and crop measurements in light soil.

Treatments	Rate in kg or ℓ prod/ha	Chlorosis & necrosis (%) at harvest	Crop measurements					
			Shoot length cm		Shoot No.		Tiller No.	
			T+ 0	T+11	T+ 0	T+11	T+ 0	T+11
1. Control (unsprayed)	-	6	10	17	8	7	7	20
2. Diuron + Sencor	2 + 2	13	12	18	7	7	5	19
3. Butisan S	6	7	11	17	8	8	4	21
4. Butisan S + ametryne	4 + 6	17	11	16	8	7	7	18
5. Butisan S + am + par	4 + 6 + 2	23	11	15	8	8	6	15
6. Modown	7,5	10	12	19	8	7	7	21
7. Modown	15	14	11	18	8	9	5	20
8. Modown + Actril DS	10 + 2	11	12	19	8	7	11	21
9. Mon 097	3	6	11	18	8	8	7	19
10. Mon 097	6	6	12	19	7	7	6	21
11. Mon 097 + ametryne	6 + 12	19	12	17	7	8	7	19
12. Mon 097 + am + par	3 + 3 + 1,5	24	12	16	8	7	7	15
13. UC 77179	2,8	16	12	17	8	8	7	16
14. UC 77179	5,6	23	12	17	7	7	5	16
15. Lasso + diuron	12 + 6	16	12	16	7	7	5	17
16. Sencor 70WP	6	13	12	17	7	7	5	18
17. Sencor 48SC	8,75	12	10	18	8	7	5	19
18. Control (unsprayed)	-	7	11	18	7	7	5	20

Table 3. Yield data at harvest expressed as a percent of unsprayed control.

Treatments	Rate	Clay soil				Sandy soil			
		Fresh mass	Shoot length	Shoot No.	Tiller No.	Fresh mass	Shoot length	Shoot No.	Tiller No.
1. Control (unsprayed)	-	390	22,5	7,3	19,8	381	23,5	7,3	20,8
2. Diuron + Sencor	2 + 2	101	106	90	97	97	101	92	95
3. Butisan S	6	88	87*	99	117	97	88	108	112
4. Butisan S + ametryne	4 + 6	97	94	106	102	82	82*	104	93
5. Butisan S + am + par	4 + 6 + 2	67**	91	97	95	50**	80**	106	76
6. Modown	7,5	107	106	99	103	120	109	104	105
7. Modown	15	114	109	103	100	109	105	108	101
8. Modown + Actril DS	10 + 2	118	111	99	107	112	116	94	107
9. Mon 097	3	110	103	106	98	108	104	101	95
10. Mon 097	6	104	104	85	92	95	107	92	103
11. Mon 097 + ametryne	6 + 12	90	101	106	89	71*	94	106	98
12. Mon 097 + am + par	3 + 3 + 1,5	86*	107	99	88	65**	91	104	69
13. UC 77179	2,8	95	107	94	81	86	90	106	79
14. UC 77179	5,6	61**	89*	106	89	50**	80**	97	84
15. Lasso + diuron	12 + 6	101	102	108	91	75*	85*	104	87
16. Sencor 70WP	6	107	100	112	103	92	100	97	87
17. Sencor 48SC	8,75	91	100	85	95	91	104	85	97
18. Control (unsprayed)	-	390	22	7,5	20,5	371	23,8	6,8	19,5
C.V.%		12,1	9,1	21,5	21,4	24,6	12,8	23,9	24,8
LSD(0,05)		13,35	10,56	24,62	23,83	25,05	14,16	27,44	26,66
LSD(0,01)		17,74	14.03	32,72	31,66	33,30	18,82	36,45	35,44

Comments on Tables 1 and 2

1. Most treatments caused some visible effects on cane and these could be summarised as:-

2. All Sencor and ametryne treatments caused development of fine orange spots referred to as "bronzing". Generally this was not severe and was not associated with stunting or other phytotoxic symptoms.

3. Butisan S alone at high rates caused distinct stunting but no leaf scorch symptoms.

4. Mon 097 caused a pale chlorosis in plants grown in sand but not in heavy soil (Table 2) but had virtually no effect on growth.

5. Modown caused development of dark red blotches but these were not extensive and growth did not appear to be affected.

6. UC 77179 caused severe "bronzing", chlorosis and necrosis as well as stunting and decrease in tillering in cane in sandy soil particularly.

7. All treatments with paraquat caused severe scorching of foliage.

8. Lasso + diuron caused stunting of cane in sandy soil.

Comments on Table 3

1. The standard diuron + Sencor caused no effect on yield parameters in either sand or clay soils.

2. Butisan S stunted cane in both sand and clay soils but this only resulted in a reduction in foliage mass in heavy soils. However, in mixture with ametryne at lower Butisan rates this effect was reversed and cane in sandy soils was affected and not cane in heavy soils. With paraquat added foliage mass was reduced in both soils.

3. Modown either alone or in mixture with Actril DS caused no damage at all to cane in either soil.

4. Mon 097 alone caused no effect on cane growth but in combination with ametryne or ametryne with paraquat, foliage mass reductions were caused.

5. UC 77179 at single rates tended to depress yields in sandy soil only while higher rates affected cane in both soils very severely.

6. Lasso + diuron was safe in heavy soils but at these high rates caused severe damage to cane in light soils.

7. The new Sencor formulation appeared on average to be slightly more damaging than the old formulation but in neither case did statistically significant reductions occur. Rates used were twice those normally recommended.

PETT/SN
26 April 1984