A IV

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code : HW 211/81/R3

Cat. No.: 1451

TITLE: Phytotoxicity trial on ratoon cane

1. Particulars of the project

This crop	:	3rd Ratoon
Site	:	Shakaskraal F Stn
Region	:	N Coast Coastal
Soil system		Umzinto/Coast lowlands
Soil form/series	:	Longlands/Waldene
Design	:	Random blocks
Variety	:	NCo 376
Fertilizer	:	N P K
Top-dressing (kg/ha)		165 - 165

Soil analysis: Date: 12 July 1983

pH	Clay %	Silt %	Sand %
5,84	19	11	70

ppm

P	K	Ca	Mg	Zn	Al
21	72	721	165	-	-

Age: 12,2 m Dates: 12.07.83-19.07.84

Rainfall: 1 363 mm LTM: 987 mm

Irrigation: 152 mm

Total: 1 515 mm

2. Objectives

To evaluate herbicide treatments for phytotoxic effects on ratoon cane.

3. Treatments

	Chemicals (% ai)	Rate (kg or ℓ prod/ha)
1.	Control (unsprayed)	-
2.	Diuron (80) + Sencor (70)	2 + 2
3.	Diuron + Sencor + Actril DS (70)	2 + 2 + 1
4.	Lasso (38)(+paraquat (20))+ametryn (80)+Actril DS	6 + 4 + 1,25
5.	Lasso (+ paraquat) + ametryn + Actril DS	12 + 8 + 2,5
6.	Lasso (+ paraquat) + diuron + S	6 + 3
7.	Lasso (+ paraquat) + diuron + S	12 + 6
8.	Lasso (+ paraquat) + ametryn + S	6 + 6
9.	Lasso (+ paraquat) + ametryn + S	12 + 12

Note on treatments:

These were applied directly over the cane row. The Lasso used in the trial had been contaminated with an unknown quantity of paraquat.

The diuron in treatments 6 and 7 mixed very poorly.

4. Experimental

Application details were:

Date	:	5 October 1983
Time	:	06h45 - 09h19
Applicator	:	CP_3 knapsack sprayer
Nozzle	:	APM Green floodjet
Pressure	:	1,5 bars
Output	:	261 ℓ/ha
Weather conditions at spraying:		
General	:	Overcast to clear and mild
Temperature °C 8 am	:	17,8
2 pm	:	21,5
Relative humidity % 8 am	:	71
2 pm	:	64
Sunshine hours	:	4,9
Rainfall (mm) on the day of spray	:	0
Days to first rain	:	1
Amount of first rain	:	20
Cane growth stage:		
Leaf height (cm)	:	50
Stalk height (cm)	:	-
Leaf number per shoot	:	5 - 7
Soil surface	:	Dry
Dew	:	Slight during treatment 2.
Wind	:	Moderate ± 7 km/hr

5. Results

a) Foliar scorch ratings (% leaf scorch) and rating of stunting taken 20 and 46 days after spraying

Treatments	Rate (prod/ha)	% leaf scorch		Stunting 1-5*	
		20	46	20	46
1 Control	-	0,8	0	4,8	5
2 Diuron+Sencor	2+2	0,7	0	4,2	4,5
3 Diuron+Sencor+Actril DS	2+2+1	0,8	0	4,2	4,3
4 Lass(+para)+ametryn+Actril DS	6+4+1,25	16	10	2,7	2,8
5 Lasso(+para)+ametryn+Actril DS	12+8+2,5	32	12	2	2,2
6 Lasso(+para)+diuron+S	6+3	17	9	3,3	3,5
7 Lasso(+para)+diuron+S	12+6	17	7	3	2,8
8 Lasso(+para)+ametryn+S	6+6	17	10	2,8	3,3
9 Lasso(+para)+ametryn+S	12+12	19	8	2,3	2,8

* 1 = very poor 5 = good

Comments

Severe scorch occurred from all treatments except diuron + Sencor + Actril DS. This is likely to have been related to the paraquat contamination in the Lasso; symptoms decreased and eventually disappeared.

Stunting was obvious from the same treatments and was more severe at higher rates in each combination. Generally all Lasso treatments at equivalent rates were similar in their effects.

b) Crop measurements taken 2,5, 6,5 and 8,5 months after spray application

Treatments	Rate (prod/ha)	Stalk length (m)			Stalk popu ('000/ha)		
		2,5	6,5	8,5	2,5	6,5	8,5
1 Control (unsprayed)	-	0,72	1,85	2,13	177	146	163
2 Diuron+Sencor	2+2	0,67	1,75	2,07	187	146	165
3 Diuron+Sencor+Actril DS	2+2+1	0,68	1,78	2,07	194	145	163
4 Lasso(+para)+ametryn+Actril DS	6+4+1,25	0,53	1,57	1,88	206	146	146
5 Lasso(+para)+ametryn+Actril DS	12+8+2,5	0,50	1,59	1,91	207	148	154
6 Lasso(+para)+diuron+S	6+3	0,63	1,68	2,01	200	155	157
7 Lasso(+para)+diuron+S	12+6	0,54	1,64	1,94	211	145	158
8 Lasso(+para)+ametryn+S	6+6	0,58	1,70	2,02	199	158	158
9 Lasso(+para)+ametryn+S	12+12	0,54	1,60	1,93	200	148	149

Comments

Slight stunting of growth was caused by diuron + Sencor with and without Actril DS, whereas extremely severe effects were apparent on stalk length from most other treatments.

Differences between standard and twice standard rates of herbicides were apparent.

Stalk populations were increased by most treatments at 2,5 months after treatment, but no evidence of this effect was present 8,5 months after treatment.

c) Yield and crop characteristics at harvest

Treatments	Rate (prod/ha)	Cane t/ha	Sucrose % cane	Sucrose t/ha	Stalk length (cm)	Stalk population (1 000/ha)
1 Control (unsprayed)	-	94	13,07	12,2	2,21	153
2 Diuron+Sencor	2+2	88	13,14	11,5	2,13	148
3 Diuron+Sencor+Actril DS	2+2+1	87	12,97	11,3	2,14	139*
4 Lasso(+para)+ametryn+Actril DS	6+4+1,25	68**	12,47	8,5**	1,91**	145
5 Lasso(+para)+ametryn+Actril DS	12+8+2,5	74**	12,46	9,2**	1,97**	146
6 Lasso(+para)+diuron+S	6+3	83*	13,16	10,9*	2,11	150
7 Lasso(+para)+diuron+S	12+6	74**	12,76	9,3**	2,00**	145
8 Lasso(+para)+ametryn+S	6+6	79**	12,68	10,0**	2,04	153
9 Lasso(+para)+ametryn+S	12+12	72**	12,35	8,9**	2,00**	147
CV%		11,0	5,0	10,5	4,8	7,1
LSD (0,05)		10,27	0,74	1,25	0,115	12,29
LSD (0,01)		13,75	0,99	1,68	0,154	16,45
SE		3,6	0,26	0,44	0,004	4,3

* Statistically significant at the 5% level

** Statistically significant at the 1% level

Comments

Crop measurements

Stalk heights were low in all treated plots while generally no effect was apparent on stalk populations.

Yield - cane t/ha

This was reduced substantially by all Lasso (+paraquat) treatments and to a slight (NS) extent by diuron + Sencor treatments. In the case of Lasso + ametryn + Actril DS the higher rate was no more severe than the lower rate whereas with Lasso + diuron and Lasso + ametryn alone higher rates were more severe than lower rates.

Sucrose % cane

Only very slight effects on sucrose % were apparent; however all treated plots except those treated with Sencor + diuron were lower in sucrose % cane than cane in untreated plots.

Sucrose t/ha

Similarly severe effects on sucrose yield were caused by treatments containing Lasso (+ paraquat).

6. Conclusions

Severe yield reductions (27%) can be caused by treatments which contact cane foliage at this late stage of cane growth (50 cm leaf height).

PETT/VJ
28 January 1985