SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code : HW 274/84/R1
Cat. No. : 1581

Title: Ratoon cane phytotoxicity

1. Particulars of the project

This crop: 1st Ratoon
Site: Pongola Sub-Station
Region: Northern Area
Soil system: Komatipoort
Soil form/series: Hutton/Shorrocks
Design: Random blocks x 6 reps.
Variety: NCo376
Fertilizer:

N	P	K
138	-	-

Soil analysis: Date: 18.9.85

pH	O.M.%	Clay %	P.D.I.
6,68	-	>30	-

ppm

P	K	Ca	Mg	Zn	Al
19	170	839	>220	-	-

Age: 12,0 months Dates: (12.9.84 - 12.9.85)
Rainfall: 615 mm L.T.M.: 653 mm
Effective: 554 mm
Irrigation: 793 mm Effective: 784 mm
61 mm irrigation on a minimum 25 day cycle

Application details:

Date	:	22/10/1984
Application	:	CP3 Knapsack
Nozzle	:	APM Green Floodjet
Output	:	298 ℓ ha^{-1}
Time	:	Start $\pm$ 15h00

Conditions at spray

Temperature	°C 8 am	: 18,2
	2 pm	: 24,6
Relative Humidity	% 8 am	: 90
	2 pm	: 64
Wind		: Gentle breeze at times
Rainfall		: Nil
Soil surface		: Dry
General		: Overcast, mild and warm
Sunshine hours		: 3,8

2. Objectives

Standard phytotoxicity programme.

3. Treatments

	Herbicides	Kg or ℓ Product ha^{-1}
T_1	Control (unsprayed)	-
T_2	Lasso + Ametryne + S	6 + 6
T_3	Lasso + Ametryne + S	12 + 12
T_4	Lasso + Diuron + S	12 + 6
T_5	Mon 097 + Ametryne + S	6 + 12
T_6	Mon 097 + Diuron + S	6 + 6
T_7	Butisan S + Ametryne + S	5 + 12
T_8	Butisan S + Diuron + S	5 + 6

4. Experimental

Treatments were applied directly over the cane rows when cane stalks were 120 mm (TVD) and the height at the natural bend of the leaf 340 mm.

Rainfall before and after spraying was: 7 mm 3 days before spray
1,7 mm 3 days after spray
37 mm 7 days after spray

Conditions were therefore very satisfactory for herbicide uptake.

5. Results

Table 1 : Visual ratings of % leaf scorch and stunting on 20.11.84 (28 days after spraying) and stalk measurements at 0.9, 2.3 and 3.4 months after spraying

Treatments	Product ha^{-1} kg or ℓ	Ratings (28 days) % Leaf Scorch	Ratings (28 days) * Stunting	Measurements: Stalk length (cm) 0.9	2.3	3.4	Counts X10^3 ha^{-1} 0,9	2.3	3.4
T_1 Control (Unsprayed)	-	2,3	5,0	32	66	121	308	245	233
T_2 Lasso+Ametryne+S	6 + 6	10,3	3,7	26	60	120	302	283	271
T_3 Lasso+Ametryne+S	12 + 12	8,7	3,3	24	58	120	301	254	243
T_4 Lasso+Diuron+S	12 + 6	12,0	3,8	29	57	120	264	260	252
T_5 Mon097+Ametryne+S	6 + 12	13,0	3,5	24	55	114	245	238	236
T_6 Mon097+Diuron+S	6 + 6	11,0	3,7	26	59	118	260	251	246
T_7 Butisan+Ametryne+S	5 + 12	6,3	3,3	26	58	119	298	269	255
T_8 Butisan+Diuron+S	5 + 6	4,7	4,0	27	59	117	323	267	252

* 1 = severe 5 = no stunting

Comments

All treatments caused obvious leaf scorch and stunting of sugarcane. These symptoms did not persist and 3,4 months after spraying stalk length differences were generally very small.

Table 2 Yield and crop characteristics at harvest

Treatments	kg or ℓ Product ha^{-1}	t ha^{-1} cane	Sucrose % cane	t ha^{-1} sucrose	Stalk counts X10^3 ha^{-1}	Stalk length (cm)
T_1 Control Unsprayed	Nil	140	13,55	19,0	154	284
T_2 Lasso+Ametryne+S	6 + 6	139	13,56	18,8	158	283
T_3 Lasso+Ametryne+S	12 + 12	138	13,44	18,6	160	281
T_4 Lasso+Diuron+S	12 + 6	132	13,22	17,5	165	283
T_5 Mon097+Ametryne+S	6 + 12	136	13,64	18,6	154	281
T_6 Mon097+Diuron+S	6 + 6	143	13,23	18,9	165	280
T_7 Butisan S+Ametryne+S	5 + 12	133	13,48	17.9	162	280
T_8 Butisan S+Diuron+S	5 + 6	143	13,68	19,5	162	281
MEAN		138	13,47	18,6	160	282
C.V. %		5,0	4,0	6,0	5,7	
S.E. of difference ±		4,02	0,31	0.64	5,25	2,2
L.S.D. (0.05)		8,16	0,63	1.30	10,65	4,52
(0.01)		10,94	0.84	1,75	14,29	6,07

Table 3 Interaction table

Chemcials		Tons Sucrose ha^{-1}			
		Lasso	Mon 097	Butisan S	Mean
Ametryne		18,6	18,6	17,9	18,37
Diuron		17,5	18,9	19,5	18,63
	Mean	18,05	18,75	18,70	18,50
	Difference	-1,1	0,3	1,6	0,27
		SE = ± 0,45			

Comments

Yield

Yield differences were small except in the case of Lasso + diuron + S and Butisan + ametryne + S where differences approached a level of statistical significance for cane and reached significance for sucrose yield (Lasso + diuron + S).

Interaction

There is evidence of an interaction between products and it appears that Lasso is more severe in combination with diuron while Butisan was more severe in combination with ametryne. Mon 097 appeared to be similar in its action in either combination.

Conclusions

These results follow expected trends where on average yields of cane treated with herbicides are lower than cane in untreated areas. However, it is noteworthy that these double rates of herbicides applied over the sugarcane rows did not cause severe yield reductions.

The interaction effects are not supported by previous trials in which Lasso + ametryne was similar to or worse than Mon 097 + ametryne or Butisan + ametryne.

PETT/1b
14 May 1987