

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code : HW 198/81

Cat. No : 1222

Title: Phytotoxicity trial in ratoon cane

1. Particulars of the project

This crop : 2nd ratoon
Site : Shakaskraal
 Field Station
Region : N.Coast Coastal
Soil system : Umzinto/Coast
 lowlands
Soil form/series : Longlands/
 Waldene
Design : Randomised blocks
Variety : NCo 376
Fertilizer : N P K
 134 26 134

Dates sprayed : 30.8.79
 21.9.79
 13.11.79

Soil analysis: Date: 24.8.79

pH	O.M.%	Clay %	P.D.I.
5,59		16	0,47

ppm

P	K	Ca	Mg	Zn	Al
28	38	472	93	0,80	

Age: 13,3 months Dates: 23.8.79 -
 1.10.80

Rainfall: 892 mm L.T.M. 1098 mm

Irrigation: 305 mm

2. Objectives:

To assess the phytotoxic effects of standard weed control procedures on ratoon cane in a sandy soil

3. Treatments:

Rate in kg or ℓ ai or ae/ha

- | | |
|---|-----------------|
| 1. Hand weeding only | - |
| 2. Alachlor + atrazine (pre-emergence) | 1,92 + 1,0 |
| Diuron + Actril DS (post-emergence) | 2,0 + 0,875 |
| 3. Diuron + Actril DS (post-emergence) | 2,0 + 0,875 |
| Diuron + Actril DS (post-emergence) | 2,0 + 0,875 |
| 4. Dual + ametryne + paraquat
(E-post-emergence) | 2,0 + 1,2 + 0,3 |
| 5. Diuron + Sencor (E-post-emergence) | 1,6 + 1,4 |
| 6. Diuron + Velpar (E-post-emergence) | 2,0 + 0,45 |
| 7. Bimate + S (E-post-emergence) | 3,0 |
| 8. Bladex Plus + S (E-post-emergence) | 4,5 |

Note on treatments:

Agrowett surfactant was added to treatment 7 at the rate of 0,2% v/v and Tronic was added to treatment 8 at a rate of 0,25 ℓ/ha.

Conditions during and after spraying at each spraying date were:

Date	Temp °C at 8 am	Soil surface	Sunshine hours	Wind	General	Rainfall (mm)	
						On day of spray	Within one week of spray
30. 8.79	17,8	Dry	8,8	Mild	Clear	0	34,4
21. 9.79	21,9	Moist	6,7	Fair	Clear to overcast	0	2,8
13.11.79	23,4	Dry	8,9	Fair	Clear	0	29,8

Cane and weed growth stages at the time of each spray application were:

30. 8.79 Very few developing shoots of from 20-50 mm height.
No weeds present
21. 9.79 Stalk height 70 mm, canopy height 250 mm, 60-80% coverage of
cane foliage with spray material.

Cyperus esculentus : sparse <100 mm in height

Digitaria sanguinalis : sparse 2-3 leaf stage

Ageratum conyzoides : sparse 2-20 mm in height

- 13.11.79 Stalk height 250 mm, canopy height 600 mm

30-40% coverage of cane with spray material

Cyperus esculentus - fair infestation >100 mm flowering

Eleusine indica - fair to heavy infestation - tillering
to pre-tillering 20-50 mm high.

Treatments were applied by means of a lever-operated knapsack sprayer fitted with a TK5 floodjet delivering 275, 298 and 330 l/ha on the three spraying dates. The nozzle was held directly over the centre of the interrow and in all cases overlap of spray material occurred in the row with varying amounts of cane contact occurring.

4. Experimental:

Whole plot size : 6 rows x 8 m x 1,4 m = 67,2 m²

Net plot size : 4 rows x 6 m x 1,4 m = 33,6 m²

Design : Randomised blocks

Replications : 6

5. Results:

1. Mean ratings of weed control based on a 1-9 scale where 1 = complete control and 9 = no control and taken at intervals after spray application are presented in Table 1.
2. Mean stalk height and population counts taken at 4, 6 and 9 months of age are presented in Table 2.
3. Mean yields at harvest are presented in Table 3.

TABLE 1

Mean visual ratings of weed control taken at intervals after the first spray treatment

Assessment dates Treatment	C. esculentus			Grasses			Broadleaf		
	8 Oct	25 Oct	13 Dec	8 Oct	25 Oct	13 Dec	8 Oct	25 Oct	13 Dec
Hand weeded	4	3,2	8,6	2,8	4,5	8,3	5,7	4,7	9
¹ Alachlor + atrazine ³ Diuron + Actril	3,3	3,8	2	1	4,2	2,3	1,8	4,8	1
² Diuron + Actril ³ Diuron + Actril	2,8	4	1,8	1	3	1,3	1	2	1
² Diuron + ametryne + paraquat	1,2	3	3,3	1	2	2,2	1	2	4,8
² Diuron + Sencor	2,5	3	3,1	1	1,4	3,5	1	1,5	2
² Diuron + Velpar	3	3	3,3	1	3	3,1	1	2,8	1,5
² Bimate + Surfactant	2,8	3,6	2,8	1	2,6	2,3	1	2	1,5
² Bladex Plus + Surfactant	2,8	4,5	3,8	1	2	4,8	1	2,2	1,1

¹ These treatments were applied on 30 August

² These treatments were applied on 21 September

³ These treatments were applied on 13 November

Table 2

Crop growth measurements taken at 4, 6 and 9 months of age

Treatments	Stalk length (m)			Stalk popln (000/ha)		
	4	6	9	4	6	9
Control	0,64	1,11	1,27	179	124	113
Alachlor + atrazine Diuron + Actril DS	0,66	1,17	1,34	179	138	119
Diuron + Actril DS Diuron + Actril DS	0,61	1,10	1,26	183	123	113
Dual + ametryne + paraquat	0,60	1,12	1,29	194	130	116
Diuron + Sencor	0,62	1,16	1,31	194	134	116
Diuron + Velpar	0,64	1,10	1,22	188	135	112
Bimate + Surfactant	0,65	1,23	1,37	193	132	123
Bladex Plus + Surfactant	0,66	1,14	1,31	193	133	124

Table 3
Mean yield and crop measurements at harvest

Treatment	Rate in kg or l ai or ae/ha	Mean yield			Harvested crop characteristics	
		Cane t/ha	ers % cane	ers t/ha	Stalk heights (m)	Stalk popln (000/ha)
Hand weeded control	-	56	12,2	6,9	1,41	116
Lasso + atrazine pre-emergence Diuron + Actril DS post-emergence	1,92 + 1,0 2,0 + 0,875	58	12,7	7,3	1,46	121
Diuron + Actril DS post emergence Diuron + Actril DS post emergence	2,0 + 0,875 2,0 + 0,875	55	12,1	6,7	1,38	120
Dual + ametryne + paraquat	2,0+1,2+0,3	55	12,5	6,9	1,43	118
Diuron + Sencor	1,6 + 1,4	60	11,9	7,2	1,45	125
Diuron + Velpar	2,0 + 0,45	51	11,5	5,9	1,36	118
Bimate + Surfactant	3,0	64	12,5	8,1	1,49	131
Blades Plus + Surfactant	4,5	62	11,9	7,4	1,45	124
CV %		14,2	5,8	16,6	5,8	6,5
L.S.D. (0,05)		9,57	0,83	1,37	9,66	9,33
L.S.D. (0,01)		12,84	1,12	1,83	12,96	12,52

Comments:

1. All weed control programmes provided adequate control although some differences were apparent. Dual + ametryne + paraquat provided the best control for the longest period of Cyperus esculentus and grasses but its broadleaf control was short-lived. Ageratum conyzoides was common in these plots at the final assessment. There was little difference between the other early post-emergence treatments. All were breaking down on grass control at the final assessment, and Bladex Plus appeared slightly weaker than the others.

The initial pre-emergence treatment of alachlor + atrazine took some time to show effects and was no better for weed control than was the repeated treatment of diuron + Actril DS.

2. Visual observations indicated very slight stunting effects from Dual + ametryne + paraquat, diuron + Actril DS (repeated) and diuron + Velpar, but variation within the trial was high.
3. No differences in yield (tons cane/ha) between treatments and hand-weeded control reached a level of statistical significance.

CONCLUSIONS

Standard rates of commonly used herbicide combinations caused no marked effects on cane growth or yield when applied according to commercial practice to a ratoon crop of NCo 376 grown at Shakaskraal.

PETT/PMO
27.5.81