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**SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION**

Code No : HW 374/89/R2
Cat No : 1736

Title: Post-emergence herbicide phytotoxicity trial.

1. Particulars of project

<p>This crop : 2nd ratoon Site : Field 37D Shakaskraal Region : North coast-coastal Soil system : Umzinto/Coast Lowlands Soil form/series: Westleigh/Westleigh Design : Randomised blocks Variety : NCo376 Fertilizer kg/ha:</p> <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td style="text-align: center;">N</td> <td style="text-align: center;">P</td> <td style="text-align: center;">K</td> </tr> <tr> <td style="text-align: center;">168</td> <td style="text-align: center;">32</td> <td style="text-align: center;">168</td> </tr> </table>	N	P	K	168	32	168	<p>Soil analysis Date: 25.10.89</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">pH</td> <td style="text-align: center;">O.M.%</td> <td style="text-align: center;">Clay%</td> <td style="text-align: center;">P.D.I.</td> </tr> <tr> <td style="text-align: center;">5,35</td> <td style="text-align: center;">2,10</td> <td style="text-align: center;">18</td> <td style="text-align: center;">-</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="6" style="text-align: center;">ppm</td> </tr> <tr> <td style="text-align: center;">P</td> <td style="text-align: center;">K</td> <td style="text-align: center;">Ca</td> <td style="text-align: center;">Mg</td> <td style="text-align: center;">Zn</td> <td style="text-align: center;">Al</td> </tr> <tr> <td style="text-align: center;">29</td> <td style="text-align: center;">73</td> <td style="text-align: center;">467</td> <td style="text-align: center;">126</td> <td style="text-align: center;">2,0</td> <td style="text-align: center;">-</td> </tr> </table> <p>Age: 11,7 mnths Dates: 25.10.89-16.10.90</p> <p>Rainfall: 672,4 mm</p> <p>Irrigation: Nil</p>	pH	O.M.%	Clay%	P.D.I.	5,35	2,10	18	-	ppm						P	K	Ca	Mg	Zn	Al	29	73	467	126	2,0	-
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2. Objectives:

To assess the phytotoxic effects of post-emergence herbicide treatments on rainfed ratoon cane.

3. Treatments:

	Rate (1 product/ha)
T1 Control	-
T2 Sencor + diuron	3 + 2
T3 Oxytril + diuron + MCPA	0,5 + 2,5 + 3
T4 Oxytril + diuron + MCPA	1 + 5 + 6
T5 Oxytril + ametryn + MCPA	0,5 + 4 + 3
T6 Oxytril + ametryn + MCPA	1 + 8 + 6
T7 Falcon + Sencor + MCPA	1,15 + 1,79 + 3,5
T8 Falcon + Sencor + MCPA	2,3 + 3,6 + 7

4. Chemical formulations used

Product	Formulation	Active ingredient
Sencor	480 g/l (sc)	metribuzin
Diuron	800 g/l (sc)	diuron
Oxytril	200 + 200 g/l (ec)	ioxynil + bromozynil
MCPA	400 g/l (sol)	MCPA
Gesapax	500 g/l (sc)	Ametryn
Falcon	960 g/l (ec)	metolachlor

5. Weather conditions at time of spraying

Treatment dates : 8.12.1989
 General : Clear and warm
 Dew : Nil
 Soil Surface : Dry
 Wind : Slight
 Sunshine hours : 7,3
 Temperature (°C)
 08h00 : 22,2
 14h00 : 26,2
 Relative humidity (%)
 08h00 : 86
 14h00 : 71
 Rainfall (mm)
 On day of spraying : Nil
 No. days to first rain : 5
 mm of first rain : 0,2
 mm in first 14 days : 42,2

6. Results

Table 1: Visual ratings of percentage leaf scorch and stunting (where 1 = very poor and 5 = no stunting) recorded at 27, 51, 76 and 122 days after spraying

Treatment	Rate (l product/ha)	% leaf scorch, stunting (1-5)					
		27	76	27	51	76	122
T1 Control (unsprayed)	-	0,3	0,7	4,9	4,8	4,8	4,8
T2 Sencor+diuron	3+2	6,2	3,6	4,5	4,5	4,3	4,8
T3 Oxytril+diuron+MCPA	0,5+2,5+3	5,2	1,3	3,8	4,8	4,4	5,0
T4 Oxytril+diuron+MCPA	1+5+6	13,5	1,8	2,8	4,4	4,0	4,8
T5 Oxytril+ametryn+MCPA	0,5+4+3	4,5	2,2	3,6	4,5	4,3	4,8
T6 Oxytril+ametryn+MCPA	1+8+6	9,2	1,8	2,9	4,3	3,8	4,6
T7 Falcon+Sencor+MCPA	1,15+1,79+3,5	0,2	1,2	5,0	4,9	4,8	4,9
T8 Falcon+Sencor+MCPA	2,3+3,6+7	2,5	1,7	4,6	4,8	4,6	4,8

Table 2: The effects of various hecicide treatments on stalk heights and populations at 52, 108 and 187 days after spraying

Treatment	Rates (l product/ha)	Stalk heights (cm)			Plant populations (x 1000/ha)		
		52	108	187	52	108	187
T1 Control (unsprayed)	-	68	142	187	226	152	162
T2 Sencor+diuron	3+2	59	134	174	224	151	152
T3 Oxytril+diuron+MCPA	0,5+2,5+3	63	137	173	221	162	168
T4 Oxytril+diuron+MCPA	1+5+6	55	130	172	218	152	157
T5 Oxytril+ametryn+MCPA	0,5+4+3	60	132	167	208	157	164
T6 Oxytril+ametryn+MCPA	1+8+6	60	133	167	238	174	162
T7 Falcon+Sencor+MCPA	1,15+1,79+3,5	70	142	180	227	165	152
T8 Falcon+Sencor+MCPA	2,3+3,6+7	66	139	179	232	167	157

Table 3: Treatment effects on cane yield (tons/ha)
sucrose % cane and sucrose yield (tons/ha)

Treatment	Rates (l product/ha)	Cane (tons/ha)	Sucrose % cane	Sucrose (tons/ha)
T1 Control (unsprayed)	-	87	13,1	11,4
T2 Sencor + diuron	3 + 2	79	13,2	10,4
T3 Oxytril + diuron + MCPA	0,5 + 2,5 + 3	86	13,1	11,2
T4 Oxytril + diuron + MCPA	1 + 5 + 6	79	12,7	10,1
T5 Oxytril + ametryn + MCPA	0,5 + 4 + 3	79	13,1	10,2
T6 Oxytril + ametryn + MCPA	1 + 8 + 6	81	13,1	10,6
T7 Falcon + Sencor + MCPA	1,15 + 1,79 + 3,5	87	13,1	11,3
T8 Falcon + Sencor + MCPA	2,3 + 3,6 + 7	88	13,2	11,6
CV%		9,4	4,4	9,2
SE treatment means ±		4,5	0,2	0,4
LSD (0,05)		9	0,7	1,2
(0,01)		12	0,9	1,6

7. Comments

Treatments other than the standard were tested at the recommended and twice the recommended rates.

Sencor + diuron

The standard treatment caused minimal stunting and a slight (NS) loss in cane and sucrose yield.

Oxytril + diuron + MCPA and Oxytril + ametryn + MCPA

The mixture with diuron caused temporary stunting but a more severe stalk growth loss at both rates tested. There was a greater reduction in cane yield for the higher rate which resulted in a significant loss in sucrose yield for this treatment. Populations did not appear to be effected.

Cane stunting was again only temporary where ametryn replaced diuron in these mixtures. Cane growth however appeared to be more seriously effected (Table 2) with both rates of Oxytril + ametryn + MCPA causing similar reductions. This was also evident in the cane yields for both rates although sucrose yields at the standard rate was significantly lower than that of the control.

Falcon + Sencor + MCPA

Both rates of this mixture resulted in very little leaf scorch, stunting and effect on cane and sucrose yield. The double rate treatment only slightly increased the phytotoxic effect on the cane.

8. Conclusions

The standard Oxytril + diuron + MCPA mixture appears to be safer on ratoon cane than in the mixture where ametryn replaces diuron. The suppression of cane yield for the higher rates was similar for both mixtures used. The Falcon + Sencor + MCPA mixture was exceptionally safe on ratoon NCo376 at both rates tested. None of these mixtures reduced cane yields below that achieved by the standard Sencor + diuron treatment.

NBL/lb
22 November 1990