

**SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION**

Cat No : 1702  
Project No: 3757  
Code No : HM382/89/p

**Title:** Pre-emergence phytotoxicity trial in pots.

**2. Objectives:**

To evaluate new products for their phytotoxicity on plant cane grown in pots when sprayed pre-emergence.

**2. Particulars of project**

<p><b>This crop</b> : Plant <b>Site</b> : Tray site Mount Edgecombe <b>Region</b> : North coast-coastal <b>Soil system</b> : Berea <b>Soil form/series</b>: Hutton/Shorrocks and Clansthal <b>Variety</b> : NCo376 <b>Age (mths)</b> : 2,5 <b>Dates</b> : 13/9/89-27/11/89 <b>Rainfall (mm)</b> : 285,3 <b>Irrigation</b> : Daily irrigation with drippers</p>	<p style="text-align: right;"><b>Soil analysis Date: 13/9/1989</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">pH (water)</th> <th style="text-align: center;">Clay (%)</th> <th style="text-align: center;">O.M. (%)</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">6,45</td> <td style="text-align: center;">46</td> <td style="text-align: center;">1,50</td> <td>Clay soil</td> </tr> <tr> <td style="text-align: center;">8,10</td> <td style="text-align: center;">8</td> <td style="text-align: center;">1,30</td> <td>Sandy soil</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">ppm</th> </tr> <tr> <th style="text-align: center;">P</th> <th style="text-align: center;">K</th> <th style="text-align: center;">Ca</th> <th style="text-align: center;">Mg</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">39</td> <td style="text-align: center;">79</td> <td style="text-align: center;">2930</td> <td style="text-align: center;">1600</td> </tr> <tr> <td style="text-align: center;">38</td> <td style="text-align: center;">98</td> <td style="text-align: center;">785</td> <td style="text-align: center;">28</td> </tr> </tbody> </table>	pH (water)	Clay (%)	O.M. (%)		6,45	46	1,50	Clay soil	8,10	8	1,30	Sandy soil	ppm				P	K	Ca	Mg	39	79	2930	1600	38	98	785	28
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**3. Design:**

Design : Randomised blocks  
Replication : 6 clay soil and 6 sandy soil  
Pot size : 27 cm x 30 cm

**4. Application details**

Date : 15/9/1989  
Applicator : Gas operated knapsack  
Nozzle : T Jet 8003  
Pressure : 115 Kpa  
Time : 7.30 am

5. Conditions at spraying

Temperature (°C)  
                   08h00                 : 20,3  
                   14h00                 : 25,2

Relative humidity (%)  
                   08h00                 : 86  
                   14h00                 : 70

Wind                                         : Nil

Soil surface                                 : Damp

General                                      : Fine and hot

Sunshine hours                              : 9,0

Rainfall (mm)

On day of spray                             : Nil

Days to 1st rain                            : 2

Amount at 1st rain                         : 0,3 mm

Total for 2 weeks after spray : 51,8 mm

6. Chemical formulations used

Product	Formulation	Active ingredient
Sencor	480	Metribuzin
Diuron	800	Diuron
Falcon	960	Metolachlor
MCPA	400	Methyl-chlorophenoxyacetic acid
ICIA 0051 (with atrazine)	125 + 300	-
ICIA 0051 (with diuron)	300 + 800	-
ICIA 0179	500	-
Extrazine	167 + 333	Cyanazine + atrazine
Lasso	384	Alachlor
Flotrazine	500	Atrazine
Farm Ag III	286 + 334	Ametryne + alachlor

7. Experimental

Pots measuring 270 x 300 mm were half filled with either the clay or the sandy loam soil. 12 gm 5:1:5 (45) was placed into the pots containing the sandy soil and 6 gm 5:1:5 (45) was placed into the clay soil and incorporated. A small quantity of Temik was placed into the pots containing the sandy soil only.

On the 13th September 1989 single eyed setts were cut and dipped in a Benlate solution and planted at a rate of 8 setts to a pot.

Treatments were applied two days after planting with herbicide applied directly over the pots.

## 8. Results

**Table 1: Visual ratings of percentage leaf scorch and stunting (1-5 scale where 1 = very poor and 5 = very good) taken at 34 and 49 days after spraying**

Treatments	Rate kg or l product/ha	Leaf scorch %				Stunting			
		Clay		Sand		Clay		Sand	
		34	49	34	49	34	49	34	49
T1 Control	-	-	0	-	0	4,8	5	4,6	5
T2 Sencor+Diuron	3+2	-	0	-	0	4	4,8	4,3	5
T3 Sencor+Diuron	6+4	-	0	-	0	4,3	4,3	3	5
T4 Falcon+Sencor+MCPA	1,15+1,79+3,5	-	0	-	0,8	4,2	5	3,6	5
T5 ICIA 0051(+atrazine)	4	-	0	-	1,7	4	5	4,2	5
T6 ICIA 0051(+atrazine)	8	-	0	-	0	4,3	5	4	5
T7 ICIA 0051+Diuron	1,67+1,25	-	0	-	0	4,2	5	4,2	4,8
T8 ICIA 0051+Diuron	1,67+1,88	-	1	-	2,5	4	4,8	3,8	4,8
T9 ICIA 0179	1	-	0,8	-	10	3,2	4,8	3,8	4,5
T10 ICIA 0179	1,2	-	5,8	-	12,6	2,7	5	4,2	4,3
T11 Extrazine+Lasso	4+6	-	0	-	0	2,8	5	3,5	4
T12 Farm Ag III	6	-	0,3	-	0	4	4,7	3,8	5

**Table 2: Main shoot length, counts and tiller numbers and fresh mass taken at harvest expressed as a percentage of the unsprayed control**

Treatments	Rate kg or l product/ha	Clay				Sand			
		Length	Counts	Tillers	Fresh mass	Length	Counts	Tillers	Fresh mass
T1 Control	-	100	100	100	100	100	100	100	100
T2 Sencor+Diuron	3+2	96	94	94	93	94	99	86	92
T3 Sencor+Diuron	6+4	97	101	101	96	92 *	96	75	82
T4 Falcon+Sencor+MCPA	1,15+1,79+3,5	100	90	90	85 *	94	103	87	97
T5 ICIA 0051(+atrazine)	4	103	94	94	105	97	96	88	99
T6 ICIA 0051(+atrazine)	8	101	92	92	93	98	100	91	96
T7 ICIA 0051+Diuron	1,67+1,25	102	99	99	105	98	100	96	98
T8 ICIA 0051+Diuron	1,67+1,88	104	109	110	98	96	99	82	89
T9 ICIA 0179	1	94	76	76	75 **	97	93	78	90
T10 ICIA 0179	1,2	91 **	65	65 **	66 **	98	99 *	71	93
T11 Extrazine+Lasso	4+6	85 **	61	61 **	63 **	89**	107 **	58	83
T12 Farm Ag III	6	98	85	85	92	95	93 *	69	85

\* = (LSD 0,05)

\*\* = (LSD 0,01)

## 9. Comments

### Sencor + diuron

No leaf scorch was recorded from either of the two rates of this mixture, but double the standard rate caused temporary stunting in the sandy soil 4 weeks after spraying. Tiller and fresh mass reduction was greatest on the sandy soil and was more severe at the higher rate.

### Falcon + Sencor + MCPA

This mixture caused minimal visual effect on the crop and stunting recorded one month after spraying was short lived. Tiller and main shoot numbers were reduced sufficiently in the clay soil to result in a significant reduction in fresh mass.

### ICIA 0051 (formulated with atrazine) and ICIA 0051 + diuron

Neither of these treatments caused significant leaf scorch, stunting or severe effects on the other measurements taken. It is worth noting that the ICIA 0051 with atrazine formulation appears safe on cane even at double the intended rate. Reduction in fresh mass was non-significant for both rates of these treatments but appeared to be greater where the diuron rate was increased for the sandy soil.

### ICIA 0179

This product caused leaf scorch which increased at the higher rate and was more severe for cane on the sandy soil. The stunting effect of the treatment was short lived. Despite more severe leaf scorch on the sandy soil, fresh mass reduction was greatest on the clay soil and was significantly reduced at both rates.

### Extrazine + Lasso

This mixture resulted in severe reduction in stalk length, tiller formation and fresh mass for cane growing in the clay soil. Fresh mass was also reduced under sandy soil conditions, but was less severe possibly due to greater leaching under these conditions.

### Farm Ag III

There was a significant reduction in main shoot counts for cane treated with this product on the sandy soil. Although the other measurements appeared to be influenced by the treatment, none were affected significantly.