

**SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION**

Cat.No. : 1792
Project No. :
Code No. : HW 409/90/P

Title : Post-emergence phytotoxicity on plant N14.

Objectives : Standard phytotoxicity programme.

1. Particulars of project :

This crop : Plant cane Site : Pongola farm Block 312 Region : Northern area Soil System : Komatipoort Soil form / series: Hutton/ Shorrocks Design : Randomised block Variety : N14 Fertilizer (kg/ha): N P K 140 86 122	Soil analysis Date : 20/10/1990 <hr/> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">pH</td> <td style="text-align: center;">OM%</td> <td style="text-align: center;">Clay%</td> <td style="text-align: center;">PDI</td> </tr> <tr> <td style="text-align: center;">6.6</td> <td style="text-align: center;">-</td> <td style="text-align: center;">>40</td> <td style="text-align: center;">-</td> </tr> </table> <hr/> <p style="text-align: center;">ppm</p> <table style="width: 100%; border-collapse: collapse;"> <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;">27</td> <td style="text-align: center;">224</td> <td style="text-align: center;">787</td> <td style="text-align: center;">332</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> </tr> </table> <hr/> Age : 11.8 months Dates : 22/10/90 - 15/10/91 Rainfall : 703 mm Irrigation : 854 mm Total : 1557 mm	pH	OM%	Clay%	PDI	6.6	-	>40	-	P	K	Ca	Mg	Zn	Al	27	224	787	332	-	-
pH	OM%	Clay%	PDI																		
6.6	-	>40	-																		
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2. Objectives

Standard phytotoxicity programme.

3. Treatments

	Rates (l product/ha)
T1 Control	Handweeded
T2 Actril + diuron	1.25 + 2.5
T3 Spotaxe + diuron	3.13 + 2.5
T4 Spotaxe + diuron	6.26 + 5
T5 Duplosan DP + diuron	3 + 2.5
T6 Duplosan DP + diuron	6 + 5
T7 Impi	3.33
T8 Impi	6.67

4. Design

Design : Randomised block
No replications : 4
Whole plot size : 6 rows * 8m * 1.4m = 67.2 m²
Net plot size : 4 rows * 6m * 1.4m = 33.6 m²
Row spacing : 1.4m

5. Chemical formulations used

Product	Formulation	Active ingredient
Actril DS	100 + 600 g/l (EC)	ioxynil + 2,4-D iso-octyl ester
diuron	800 g/l (SC)	diuron
Spotaxe	80 + 240 g/l	dicamba + 2,4-D (APM salts)
Duplosan DP	600 g/l	dichlorprop - P
Impi	150 + 300 g/l	sulcotrione + diuron

6. Application details

Treatment date : 12/12/90
Time : 10.20am - 12.00am
Applicator : CP3
Nozzle : APM (green)
Pressure : 150 kpa
Output : 38,3 ml/sec
Output : 27,36 ml/m²
Method : Over the row

7. Weather conditions

Treatment date : 12/12/90
General : Overcast becoming clear
Dew : Slight
Soil surface : Very wet
Wind : Slight (N)
Sunshine hours : 3.9
Temperature (°C)
 08h00 : 20.4
 14h00 : 27.6
Relative humidity (%)
 08h00 : 85
 14h00 : 56
Rainfall (mm)
 On day of spray : Nil
 No. days to first rain : 2
 At first rain : 8
 In first 14 days : 24
 Total for duration of trial : 703

8. Results

Table 1 : Visual ratings of stunting (where 1 = very poor and 5 = no stunting) recorded at 49 days after spraying

— Treatment —		Rate (l product/ha)	Stunting
T1	Control	-	4.7
T2	Actril DS + diuron	1.25 + 2.5	4.0
T3	Spotaxe + diuron	3.13 + 2.5	4.7
T4	Spotaxe + diuron	6.26 + 5	4.5
T5	Duplosan DP + diuron	3 + 2.5	4.1
T6	Duplosan DP + diuron	6 + 5	3.9
T7	Impi	3.33	4.5
T8	Impi	6.67	4.2

Table 2 : The effects of herbicide treatments on stalk heights and populations at 119 and 339 days after spraying

— Treatment —		Rate (l product/ha)	Stalk heights (cm to TVD)		Populations (* 1000/ha)	
			119	339	119	339
T1	Control	-	130	285	155	83
T2	Actril DS + diuron	1.25 + 2.5	107	266	151	89
T3	Spotaxe + diuron	3.13 + 2.5	119	277	155	96
T4	Spotaxe + diuron	6.26 + 5	115	272	148	108
T5	Duplosan DP + diuron	3 + 2.5	113	267	148	111
T6	Duplosan DP + diuron	6 + 5	106	252	139	98
T7	Impi	3.33	126	263	152	101
T8	Impi	6.67	116	270	155	106

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

— Treatment —	Rate (l product/ha)	Cane yield (tons/ha)	Sucrose% cane	Sucrose (tons/ha)
T1 Control	-	157	13.3	21.0
T2 Actril DS + diuron	1.25 + 2.5	146	12.6	18.3
T3 Spotaxe + diuron	3.13 + 2.5	156	12.8	20.0
T4 Spotaxe + diuron	6.26 + 5	156	12.6	19.6
T5 Duplosan DP + diuron	3 + 2.5	151	11.9	17.9
T6 Duplosan DP + diuron	6 + 5	151	11.8	17.8
T7 Impi	3.33	155	13.2	20.4
T8 Impi	6.67	152	11.8	17.8
CV %		5	8.2	9.1
Standard error - Treatment means +/-		3.1	0.4	1
LSD (0,05)		9	1.2	2.0
LSD (0,01)		12	1.6	2.7

9. Comments

Actril DS + diuron

The standard treatment caused stalk stunting that persisted up to harvest. Cane and sucrose yield were both significantly effected by the treatment.

Spotaxe + diuron

Although this mixture appeared to stunt growth (Table 2), neither rate influenced yield significantly.

Duplosan DP + diuron

Cane growth was severely retarded particularly at the higher rate of this mixture (see Tables 1 & 2). Both rates reduced cane yield by approximately 4% (ns) but suppressed cane quality and sucrose yields significantly (P=0.05 and P=0.01 respectively).

Impi

Both rates of this product caused some loss of growth which was not sufficient to lower cane yield significantly. There was however a significant effect on cane quality at the higher rate, that resulted in a highly significant reduction in sucrose yield. There was no such loss in cane quality or sucrose yield at the recommended rate of this product.

10. Conclusions

- * Actril DS + diuron had the greatest effect on cane yield.
- * The standard rates of Spotaxe + diuron and Impi appear to be safe on cane.
- * Both rates of Duplosan DP + diuron severely effected the performance of the crop particularly with regard to cane quality and sucrose yield. Duplosan DP + diuron and the Actril DS + diuron standard treatment proved to be the most phytotoxic of the products tested.

NBL/dlz
2/1/1992