

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Cat No : 1670
Project No : 3665
Code No : HW 353/88/R3

Title : Phytotoxicity of alternatives to Actril DS

OBJECTIVES : To compare the phytotoxicity of diuron + Actril DS to alternatives to 2,4-D on N17

1. PARTICULARS OF PROJECT

This crop	: 3rd ratoon	Soil analysis			Date: 19/8/88
Site	: Pongola Block 301	pH	Clay	OM	
Region	: Northern area	(water)	(%)	(%)	
Soil system	: Komatipoort	6,2	> 30	-	
Soil form/series	: Hutton/Shorrocks				
Variety	: N17	ppm			
Age (mths)	: 11,9 months	P	K	Ca	Mg
Dates	: 21.7.88 - 18.7.89	58	146	975	> 350
Rainfall (mm)	: 745 mm	Fertilizer (kg/ha)			
Irrigation (mm)	: 671 mm	N	P	K	
Total (mm)	: 1416 mm	139	28	139	

2. DESIGN

Design : Randomised blocks
Replication : 4
Whole plot size : 8 m x 6 rows x 1,4 m = 67,2 m²
Net plot size : 6 m x 4 rows x 1,4 m = 33,6 m²
Row spacing : 1,4 m

3. TREATMENTS

See results.

4. CHEMICAL FORMULATIONS USED

	Product	Formulation	Active ingredient
P1	Diuron	800g/l (sc)	diuron
P2	ICIA 0051	360g/l	-
P3	Classic	250g/kg(df)	Chlorimuron-ethyl
P4	Oxytril	200 + 200 g/l (ec)	Ioxynil + Bromoxynil
P5	Actril DS	600g+100g/l (ec)	2,4-D + Ioxynil
P6	Paraquat	20g/l (soln)	Paraquat

5. APPLICATION DETAILS

Treatment dates	: 20.9.1988
Time of application	: 06h00 - 07h08
Applicator	: CP3
Nozzle	: APM Green
Height of cane	: 35 cm (to leaf bend)
Method	: Over cane row
Output	: 36 ml/sec
Output	: 25,7 ml/m ²

6. WEATHER CONDITIONS AT TIME OF SPRAYING

Treatment dates	: 20.9.1988
General	: Clear
Dew	: Very slight
Soil surface	: Moist
Wind	: Nil
Sunshine hours	: 10,1
Temperature (°C) 08h00	: 15,8
14h00	: 30,2
Relative humidity (%) 08h00	: 81
14h00	: 42
Rainfall: On day of spray (mm)	: Nil
No days to first rain:	7
At first rain (mm)	: 1,2
On first 14 days (mm):	1,4

7. RESULTS

Table 1 : Treatment effects on percentage leaf scorch, stunting and growth measurements

Treatment	Rate (ℓ or kg) Product/ha	Leaf scorch %		Stunting*		Populations (x1000/ha)		Heights (cm to TVD)	
		5.10.88	21.11.88	5.10.88	21.11.88	14.11.88	6.4.89	14.11.88	18.7.89
Diuron + ICIA0051	5 + 10	10,3	0	4,7	4,5	414	229	40	270
Diuron + Classic	5 + 0,24	2,8	0	4,6	4,5	393	219	41	269
Diuron + Oxytril	5 + 2,5	8,0	0	4,6	4,3	367	227	38	266
Diuron + Actril	5 + 2,5	2,0	0	4,8	4,3	395	235	43	271
Diuron + Paraquat	5 + 3	30,8	0	4,1	3,5	438	222	39	263
Control	-	0	0	5,0	4,8	387	224	44	279

*Stunting Ratings 5 = no visual stunting
1 = severe stunting

Table 2 : Treatment effects on cane yield (tons/ha), sucrose % cane and sucrose yield (tons/ha)

Treatment	Rate (ℓ or kg) Product/ha	Cane (t/ha)	Sucrose % cane	Sucrose (t/ha)
Diuron + ICIA0051	5 + 10	132	12,9	17,1
Diuron + Classic	5 + 0,24	134	12,6	16,8
Diuron + Oxytril	5 + 2,5	123	13,8	17,0
Diuron + Actril DS	5 + 2,5	126	13,2	16,5
Diuron + Paraquat	5 + 3	123	12,8	15,8
Control	-	135	13,4	18,0
CV%		5,7	5,7	7,7
SE Treatment means	±	3,7	0,4	0,6
LSD (0,05)		11	1,1	1,9
(0,01)		15	1,6	2,7

8. COMMENTS

Treatments included double rates intended for registration.

Diuron + Paraquat and diuron + Actril DS

Severe leaf scorch was recorded in cane treated with diuron and Paraquat at these high rates. Visual symptoms were temporary as no damage was recorded at 9 weeks after spraying (Table 1). However, stalk heights were reduced which resulted in a significant cane and sucrose yield depression at harvest (Table 2). A degree of stunting was recorded in the diuron + Actril DS treated cane, but was not severe enough to influence yield significantly.

Diuron + ICIA 0051

This mixture resulted in temporary leaf scorch and slightly reduced cane heights. The effect on cane and sucrose yields were minimal.

Diuron + Classic

High rates of these products resulted in little leaf scorch with insignificant effects on yields.

Diuron + Oxytril

This combination resulted in leaf scorch which stunted growth particularly at around 2 months after spraying. As a result, cane yields were reduced significantly at harvest (Table 2).