SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Cat. No. : 1723
Project No. : 3676
Code No. : HW360/88/R2

Title: Phytotoxicity of Bimate applied early post-emergence on ratoon cane.

Objectives: To assess the phytotoxicity of Bimate on N19.

1. **PARTICULARS OF PROJECT :**

This crop	: 2nd Ratoon
Site	: Pongola Sub-Station
Region	: Northern Area
Soil System	: Komatipoort
Soil form/ Series	: Hutton/Shorrocks
Variety	: N14, N17, N19
Age	: 8,9 months
Dates	: (20.09.88-16.6.89)
Rainfall	: 692,3 mm
Irrigation	: 488 mm
Total (mm)	: 1180,3 mm

Soil analysis Date: (not taken)

pH	Clay (%)	OM (%)

ppm

P	K	Ca	Mg

Fertilizer (Kg ha^{-1})

N	P	K
123	24	123

2. **DESIGN :**

Design : Randomised blocks
Replication : 4
Plot size : 6 m x 4 rows x 1,4 m = 33,6 m^2

3. EXPERIMENTAL

Cane was well grown. Height of cane 25-30 cm at the leaf bend, and about 5 leaves per shoot.

Rainfall, irrigation and LTM (mm) at Pongola

Months	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total±
1988-89	1	135	50	123	19	202	82	21	10	50	692.3
Irrigation	-	-	61	61	122	61	61	61	61	-	488,0
LTM	13	66	97	77	117	86	74	42	20	5	596,9

4. TREATMENTS

	Rate (kg or ℓ product ha^{-1})
T1 Bimate WP + Surfactant (0,2%)	5
T2 Bimate WP + Surfactant (0,2%)	10
T3 Sencor + Diuron	6 + 5
T4 Control (Unsprayed)	Nil

5. CHEMICAL FORMULATIONS USED:

Product	Formulation	Active Ingredient
Sencor	480 g/ ℓ (SC)	Metribuzin
Diuron	800 g/ ℓ (SC)	Diuron
Bimate WP	250 g/500 g/kg	Tebuthiuron + Diuron
Agrowett	-	Surfactant

6. APPLICATION DETAILS

Treatment date : 25.10.88
Time : 05.45 - 06.45
Applicator : CP3
Nozzle : APM Green
Pressure : 130 Kpa
Output : 33,08 ml/sec
Output : 236,3 ℓ ha^{-1}
Method : Over the row
Timing : Early post-emergence

7. WEATHER CONDITIONS AT SPRAYING

General		: Clear
Dew		: Slight
Soil surface		: Moist
Wind		: Calm
Sunshine hours		: 0.0
Temperature (°C)	08.00	: 18,0
	14.00	: 32,8
Relative humidity %	08.00	: 80
	14.00	: 27
Rainfall (mm) on day of spray		: Nil
No of days to first rain		: 9
Amount of first rain		: 2,5
Total in first 14 days		: 7,1
Total duration of trial		: 692,3

8. RESULTS

Table 1 Visual rating of percent scorch and stunting 26 days after treatment

Treatments	Kg or ℓ product ha^{-1}	N14		N17		N19	
		% Scorch	Stunt	% Scorch	Stunt	% Scorch	Stunt
T1 Bimate WP + S	5	4,5	3,5	4,0	4,0	1,5	4,6
T2 Bimate WP + S	10	7,8	3,3	3,5	3,6	4,3	4,1
T3 Sencor + Diuron	6 + 5	11,5	3,1	9,5	3,4	7,8	3,6
T4 Control	Nil	2,5	4,9	0	4,5	0	5,0

Stunting 1 = Severe 5 = No stunting

Table 2 Yield and other crop characteristics at harvest

Variety	Treatments	Kg or ℓ product ha^{-1}	Cane t ha^{-1}	Sucrose % cane	Sucrose t ha^{-1}	Stalk counts x 10^3 ha^{-1}	Stalk length (CM)
N14	T1 Bimate WP + S	5	146	10,52	15,4	136	297
	T2 Bimate WP + S	10	138	9,92	13,7	135	312
	T3 Sencor + Diuron S	6 + 5	136	10,24	13,9	128	309
	T4 Control	Nil	154	10,72	16,5	142	302
N17	T1 Bimate WP + S	5	127	12,48	15,8	135	314
	T2 Bimate WP + S	10	124	12,20	15,1	133	314
	T3 Sencor + Diuron S	6 + 5	124	12,63	15,6	145	313
	T4 Control	Nil	133	12,40	16,4	140	317
N19	T1 Bimate WP + S	5	121	12,07	14,6	138	315
	T2 Bimate WP + S	10	126	11,79	14,9	146	317
	T3 Sencor + Diuron S	6 + 5	120	12,26	14,7	130	302
	T4 Control	Nil	131	11,53	15,0	132	316
	C.V. %		6,3	6,8	9,9	9,1	
	S.E. of treatment mean	±	4,12	0,39	0,75	6,19	
	L.S.D. (0,05)		11,82	1,13	2,15	17,76	
	(0,01)		15,86	1,51	2,89	23,81	

Table 3 : Herbicide effects on yield

Treatments	kg or ℓ Prod ha^{-1}	Cane t ha^{-1}	Sucrose % cane	Sucrose t ha^{-1}	Stalk counts x 10^3 ha^{-1}	Stalk length (CM)
T1 Bimate WP + S	5	131	11,69	15,3	136	308
T2 Bimate WP + S	10	129	11,30	14,6	138	314
T3 Sencor + Diuron	6 + 5	127	11,71	14,7	134	308
T4 Control	Nil	139	11,55	16,0	138	312
S.E. herbicide 12 plots mean	±	2,38	0,23	0,43	3,58	
S.E. Diff	±	3,37	0,32	0,61	5,06	
L.S.D. (0,05)		6,83	0,65	1,24	10,25	
(0,01)		9,16	0,87	1,67	13,75	

2. Comments

The standard treatment was applied at approximately twice the recommended rate while Bimate was sprayed at the standard and double the standard rate.

Sencor + Diuron

The standard treatment at double the recommended rate produced leaf scorch and stunting which was slightly more severe for N14. N14 stalk populations were also reduced to a greater extent. Cane and sucrose yields were reduced for all three varieties but only reached significance for N14. Cane quality was not influenced by this treatment (Table 2).

Bimate + S

Leaf scorch and stunting showed N19 to be slightly more tolerant to Bimate compared to N14 and N17 (Table 1). Both rates caused cane and sucrose yield reductions for all three varieties with significant losses recorded at double the standard rate on N14 only. The overall effect of Bimate on all varieties was a significant ($P = 0,05$) reduction in cane yield at the standard and double the standard rate, while sucrose yields were significantly ($P = 0,05$) reduced at double the standard rate only (Table 3).

NBL/pw
July 11, 1990