

SOUTH AFRICAN SUGAR INDUSTRY

Aw

AGRONOMISTS' ASSOCIATION

Code : HW280/84  
Cat. No. : 1505

Title : Phytotoxicity : low volume applicators

1. Particulars of the project

This crop : 2nd Ratoon  
Site : Shakaskraal  
Region : N. Coast Coastal  
Soil system : Umzinto/Coast lowlands  
Soil form/series : Longlands/Waldene  
Design : Random blocks  
Variety : NCo376  
Fertilizer : N    P    K  
Ameliorants    172    34    172

Soil analysis : Date 13.8.84  
pH            Clay %  
5,25            < 30

---

ppm

P	K	Ca	Mg	Zn	Al
32	42	478	100		1

Age : 12,2 m    Dates : 13.8.84 - 20.8.85  
Rainfall : 95,7 mm    L.T.M. : 1020

Application details :  
Date : 16.10.84  
Application : CP<sub>3</sub>/Birky Sprayer  
Nozzle : APM Green/Spinning disc  
Pressure : 1.75 bars/Gravity feed  
Output : 305 l/ha / 41 l/ha

Irrigation :  
Conditions at spray :  
Temperature °C 8 am : 17,0  
   2 pm : 19,2  
Rel. humidity % 8 am : 58  
   2 pm : 62  
Wind : 11 km/h  
Rainfall (mm) : 0  
Soil surface : moist  
General : overcast to hot  
Sunshine hours : 4.5

2. Objectives

To assess the phytotoxic effects of chemicals applied through the Ciba Geigy low volume applicator (Birky Sprayer).

3. Treatments

	<u>Chemical</u>	<u>Rate (Prod/ha)</u>	<u>Applicator</u>	<u>Volume (ℓ/ha)</u>
1.	Control (unsprayed)	-	-	-
2.	Ametryne + Actril DS	4 + 1,25	CP <sub>3</sub> knapsack	305
3.	Ametryne + Actril DS	4 + 1,25	Birky Sprayer	41
4.	Ametryne + Actril DS	8 + 2,5	Birky Sprayer	41

4. Experimental

Treatments were applied when cane shoots had 6 - 8 leaves unfurled and the canopy height was about 550 mm. The CP<sub>3</sub> knapsack lance was fitted with an APM Green floodjet which was held directly over the middle of the cane interrow. Leaves of cane stools on either side were contacted by the spray ( $\pm$  30% on each side). The spinning disc of the Birky Sprayer was in the vertical position and spray was thrown vertically upwards and over the cane foliage.

Visual ratings of cane scorch stunting and weed control were taken 18 days after application and crop measurements at regular intervals.

5. Results :

Table 1. Visual ratings of cane scorch (%), stunting (1-5 where 1 = very poor and 5 = very good) and weed control (%) taken 18 days after spraying.

Treatment	% Cane Scorch	Stunting	% Weed Control
1. Unsprayed control	0	4,9	0
2. Ametryne + Actril DS - CP <sub>3</sub> (X1 Rate)	3,5	4	92
3. Ametryne + Actril DS - Birky (X1 Rate)	10	3,3	91
4. Ametryne + Actril DS - Birky (X2 Rate)	15	2,9	92

Table 2. Crop measurements taken 2 weeks and 3, 4 and 6 months after spraying.

Treatments	Stalk length (m)				Stalk Popln. (1000/ha)			
	2wks	3	4	6	2wks	3	4	6
1. Control (unsprayed)	0,25	0,91	1,26	1,58	161	199	221	120
2. Ametryne + Actril DS CP <sub>3</sub> (X1 Rate)	0,23	0,89	1,27	1,56	154	185	204	118
3. Ametryne + Actril DS Birky (X1 Rate)	0,23	0,87	1,24	1,54	148	185	194	108
4. Ametryne + Actril DS Birky (X1 Rate)	0,22	0,79	1,16	1,50	149	191	220	123

Table 3. Yield data at harvest

Treatment	Yield			Measurements	
	Cane t/ha	Sucrose % Cane	Sucrose t/ha	Stalk length (m)	(1000/ha) popln.
1. Control (unsprayed)	65,7	14,38	9,4	1,84	130
2. Ametryne + Actril DS CP <sub>3</sub> (X1 Rate)	65,6	14,52	9,5	1,79	130
3. Ametryne + Actril DS Birky (X1 Rate)	60,9	13,91	8,4*	1,79	126
4. Ametryne + Actril DS Birky (X1 Rate)	58,3	14,09	8,2*	1,75	134
CV%	14	4,2	13,6		5,5
SE treatment means †	4,36	0,29	0,60		3,6
L.S.D. (0,05)	13,95	0,96	11,93		11,5

Comments :

1. Visual ratings

Ratings of leaf scorch and stunting show a trend to more severe damage from the Birky Sprayer and from increasing rates. Weed control ratings show all treatments to be equally effective.

2. Crop measurements

Shoot length and population differences early in the crop cycle also show a trend towards more severe damage from the Briky Sprayer treatments and from increasing chemical rates. The differences in stalk length persisted until harvest. However, measurements were variable between plots and within the same treatment and relative to measurement date.

3. Yield data

The crop yields in cane and sucrose followed the same pattern as crop measurements, but again variability was high within treatments.

An apparent trend to lower sucrose percent cane for the Birky Sprayer treatments led to statistically significant reductions in sucrose yields (t/ha).

Conclusions

Due to the high variability in this trial these trends should be regarded with caution. However, the evidence of differences may be sufficient to warrant confirmatory experiments.

PETT/1b  
24th April 1986