

Atv

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code : HW 225/83/R3

Cat. No.: 1450

TITLE: Phytotoxicity trial on ratoon cane at Shakaskraal

1. Particulars of trial

This crop : 3rd Ratoon
Site : Shakaskraal F Stn
Region : N Coast Coastal
Soil system : Umzinto/Coast low-lands
Soil form/series : Longlands/Waldene
Design : Random blocks
Variety : NCo 376
Fertilizer : N P K
Top-dressing 165 - 165

Soil analysis: Date: 21 November 1983
pH Clay %
 5,64 30

 ppm
P K Ca Mg
 28 84 458 116
Age: 9,9 m Dates: 21.11.83 - 19.09.84
Rainfall: 1 205 mm LTM: 784 mm
Irrigation: 76 mm
Total: 1 281 mm

2. Objectives

To assess the damage to cane from applying possible treatments for problem weed control in such a way as to avoid cane contact as far as possible.

3. Treatments

Chemicals (% ai)	Rate in kg or l (product/ha)	Nozzle	Output (t/ha)
1. Control (unsprayed)	-	-	285
2. Dalapon (85) + S	8	APM Green floodjet	285
3. Roundup (36) -	5	APM Green floodjet	285
4. Tordon 101 (50) + S	4	APM Green floodjet	285
5. MSMA (72) + ametryn (50)	3+3	APM Green floodjet	285
6. Diuron (80) + paraquat (20)	2+2,5	APM Green floodjet	285
7. Roundup	5	ICI Green Polijet	139
8. Roundup	5	APM Green floodjet	287

Note on treatments

Treatments 1-7 were applied eight weeks after harvesting when the cane was 83 cm

in canopy height, 28 cm in stalk length and had on average 6,7 leaves unfurled per shoot. The nozzle was held approximately 20 cm high over the centre of the interrow in an attempt to obtain coverage of weeds that might be in the interrow and row by means of the wide angle of spray. Some contact occurred with lower leaves and new shoots in the row.

Treatment 8 was applied when the cane canopy was approximately 1,77 m high and the nozzle was held so as to direct the spray away from cane foliage as far as possible. Again some contact occurred with a few leaves and with small shoots in the cane rows.

Treatment 7 was applied using an ICI green polijet with a narrower angle of spray and swath width of ± 1 m to establish any advantage compared with the wide angle APM Green floodjet used in treatment 3.

Application details and weather conditions were:

Applicator	:	CP ₃ knapsack sprayer	
Weather conditions at spraying		1 January 1984	1 March 1984
General	:	Warm, humid and clear to overcast	Warm to hot and clear
Temperature °C			
	8 pm	: 24,5	19,9
	2 pm	: 31,2	27,8
W. humidity %			
	8 am	: 79	84
	2 pm	: 59	70
Sunshine hours	:	6,6	9,9
Rainfall (mm) - day of spray:		0	0
Wind km/hr	:	Strong for treatments 3 and 7	Slight breeze
Time applied	:	7-9.20 am	7.00 am

4. Results

Table 1 Leaf scorch effects taken 19 days after spraying and crop measurements taken at spray and at approximately 2,5 and 4,5 months after spray

Treatments	Visual ratings		Crop measurements					
	Chlorosis %	Necrosis %	Stalk length (m)			Stalk popu. ('000/ha)		
			At spray	2,5 m	4,5 m	At spray	2,5 m	4,5 m
1 Control (unsprayed)	12	5	,31	1,22	1,65	350	183	168
2 Dalapon + S	10	9	,33	1,05	1,56	327	186	174
3 Roundup	21	19	,30	0,70	1,18	342	185	161
4 Tordon 101	13	7	,32	1,23	1,67	318	193	170
5 MSMA + ametryn	13	10	,34	1,20	1,66	323	193	162
6 Diuron + paraquat	6	29	,34	1,12	1,59	285	189	160
7 Roundup - (ICI Green f/jet)	12	11	,33	0,98	1,49	324	165	140
8 Roundup - (later spray)	12	7	,33	1,03	1,55	352	174	149

Comments

Some chlorosis was apparent in unsprayed plots due to the late top-dressing. However treatment effects were still apparent particularly in terms of necrosis of the leaves.

Diuron + paraquat caused the greatest leaf necrosis. Roundup treatments showed less effect in T 7 where the narrow swath ICI polijet had been used.

Stalk length

Dalapon caused severe stunting and malformation of some stalks.

Very little effect on heights was caused by Tordon 101 and MSMA + ametryn treatments while diuron + paraquat was fairly severe.

Roundup caused very severe effects on cane stalk length in all treatments. However, the later spray was markedly safer than the early sprays, and the ICI polijet was much safer than the APM Green floodjet.

Stalk populations

Some small shoots were killed by Roundup treatments and populations in these treatments were affected.

Table 2 Yield and crop characteristics at harvest

Treatments	Rate kg or ℓ product /ha	Yield			Crop measurements	
		Cane t/ha	Sucrose % cane	Sucrose t/ha	Stalk length (m)	Stalk popu. (1 000/ha)
1 Control (unsprayed)	-	62	12,09	7,5	1,58	188
2 Dalapon + S	8	53**	12,00	6,4**	1,51	179
3 Roundup	5	34**	10,71**	3,6**	1,22**	143**
4 Tordon 101 + S	4	62	11,75	7,3	1,57	190
5 MSMA + ametryn	3+3	62	11,97	7,4	1,58	193
6 Diuron + paraquat	2+2,5	51**	11,98	6,1**	1,52	183
7 Roundup	5	47**	11,78	5,5**	1,45	169*
8 Roundup	5	42**	12,21	5,1**	1,43*	142**
CV %		10,1	5,5	11,2	7,5	7,8
LSD (0,05)*		6,12	0,77	0,81	0,1307	15,87
LSD (0,01)**		8,21	1,03	1,08	0,1754	21,29

Comments

Crop measurements

Roundup treatments and to a lesser extent Dalapon and diuron + paraquat, reduced stalk length at harvest. Populations were lower in all Roundup-treated plots with the early and late treatments. The wide-angled APM Green floodjet was more damaging than the early spray with a narrower swath width.

Yield

Statistically significant yield reductions were caused by all treatments except ametryn + MSMA and Tordon 101. Roundup treatments were extremely severe with later sprays or narrower spray swaths being much safer (although still unacceptable) than early wide-angle sprays.

Surprisingly severe damage was caused by diuron + paraquat.

5. General comments

The trial was heavily infested with eldana and was pre-trashed on two occasions. Eldana infestation was not monitored in different treatments.

6. Conclusions

Roundup, Dalapon and even paraquat + diuron were not suitable for directed interrow weed control at the stage of cane growth present in this trial, due to their severe effects on cane.

MSMA + ametryn showed no yield reduction and appears therefore to be a much safer treatment for pre-canopy spot spraying treatments.

Tordon 101 caused no damage to cane yields which confirms its relative safety to cane.