SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: A/Min Till 1/83

Cat. No.: 1399

TITLE: Pre-harvest minimum tillage

This crop	:	Ratoon
Site	:	Umzimbete
Region	:	Zululand
Soil system	:	Umzinto river valley
Soil form/series	:	Dundee
Design	:	Extended latin square six replications
Plot size	:	10 m x 6 rows x 1,4 m
Variety	:	NCo 310
Date and age at spraying	:	26 September 1983
	:	c 12 months
Date and age at harvest	:	20 October 1983
	:	c 13 months
Sampling dates	:	23 September 1983 07 October 1983 20 October 1983
Irrigation	:	Nil
Rainfall	:	912 mm (76% of LTM)

Spray method: CO_2 operated overhead boom with two TK 1,0 floodjets

Pressure: 200 kPa

Volume/ha: 76 ℓ

Weather at spraying: Sunny and calm

Condition of cane at spraying: 7-8 green leaves, about 1,25 m tall.

Soil moisture at spraying: 0-20 cm: 27% 20-40 cm: 21%

Sampling technique: Four stalks were selected from four predetermined points in the net rows. Sampling points were advanced by 1 m at each sampling occasion.

2. Objectives

2.1 To determine whether Roundup and Fusilade applied at high rates as pre-harvest treatments will effectively kill the following ratooning crop.

2.2 To determine whether high rates of Roundup and Fusilade have any effects on cane quality within four weeks of application.

3. Treatments

3.1 Control - unsprayed
3.2 Roundup 8 ℓ/ha applied 3,5 weeks before harvesting
3.3 Roundup 12 ℓ/ha applied 3,5 weeks before harvesting
3.4 Fusilade 5 ℓ/ha applied 3,5 weeks before harvesting
3.5 Roundup 8 ℓ/ha + Frigate applied 3,5 weeks before harvesting

4. Results

4.1 Results from samples taken

Dates and weeks after spraying / Treatments	ers % cane			Purity %		
	23/9 0	7/10 2	20/10 3,5	23/9 0	7/10 2	20/10 3,5
Control	11,0	11,2	10,4	92	92	90
Roundup 8 ℓ	10,9	11,3	10,9	91	93	90
Roundup 12 ℓ	10,9	10,7	10,3	92	91	90
Fusilade 5 ℓ	10,7	11,3	1,8**	91	93	93
Roundup 8 ℓ + Frigate	10,9	11,0	11,2	91	91	91
Mean	10,9	11,1	10,9	92	92	91
CV %	5.4	6.7	6.6	1,5	1,7	1,9
LSD (P=0,05)*	0,7	0,9	0,9	1,7	2,0	2,1
LSD (P=0,01)**	1,0	1,2	1,2	2,3	2,7	2,6
	Mass ers (g/stalk)			Stalk mass (g/stalk)		
		Changes from spraying date			Changes from spraying date	
Control	42,1	+14,0	+14,6	379	+113	+161
Roundup 8 ℓ	45,4	+ 9,0	+15,6	414	+ 68	+132
Roundup 12 ℓ	43,2	- 0,6*	+ 5,9	398	+ 4*	+ 72
Fusilade 5 ℓ	47,6	+ 2,1	+13,4	441	0*	+ 71
Roundup 8 ℓ + Frigate	44,1	+ 6,5	+15,3	401	+ 56	+126
Mean	44,5	+ 6,2	+13,0	407	+ 48	+112
CV %	29,5	23,3	21,4	26,0	18,4	17,0
LSD (P=0,05)*	16,0	14,5	15,1	129,4	102	108
LSD (P=0,01)**	22,1	19,9	20,7	178,0	140	149

4.2 Results at harvest (3,5 weeks after spraying)

Treatment	Cane t/ha	Sucrose % cane	Sucrose t/ha	Stalk population x 1 000/ha	Stalk heights (cm)
Control	58	11,9	6,9	83	137
Roundup 8 ℓ	54	12,5	6,9	73	138
Roundup 12 ℓ	52	11,8	6,2	72	123
Fusilade 5 ℓ	56	13,3**	7,5	82	136
Roundup 8 ℓ + Frigate	60	12,6	7,7	79	141
Mean	56	12,4	7,0	78	135
CV %	15,7	5,3	19,0	9,6	13,0
LSD (P=0,05)*	10,8	0,9	1,6	9,2	21,5
LSD (P=0,01)**	14,8	1,1	2,2	12,6	29,5

4.3 Effects on regrowth 6 weeks and 11,5 weeks after harvesting the treated crop

Treatment	% surviving stools	Stalk heights (cm)	Stalk population x 1 000/ha	% surviving stools	Stalks heights (cm)	Stalk population x 1 000/ha
Control	81	24,3	217	88	43	327
Roundup 8 ℓ	59	8,5	140	70	18	265
Roundup 12 ℓ	55	7,7	100	59	15	188
Fusilade 5 ℓ	78	14,6	242	83	31	354
Roundup + Frigate	61	9,1	136	67	18	257

5. Comments

5.1 Pre-harvest effects

Fusilade improved cane quality significantly (P=0,01) 3,5 weeks after spraying. Because variation in cane yield was high the severe reduction

in stalk mass from Fusilade measured in samples taken 2 and 3,5 weeks after spraying was not evident in the cane yields at the time of harvesting. Fusilade increased sucrose yields by 0,6 tons^{-ha} (ns)

Unlike the 12 ℓ^{-ha} rate of Roundup the 8 ℓ^{-ha} of Roundup had little effect on stalk mass. There appeared to be little difference in the response to 8 ℓ Roundup where Frigate was added to it. Roundup at 8 ℓ^{-ha} + Frigate increased sucrose yields by 0,8 tons^{-ha} (ns).

5.2 Post-harvest effects

6 weeks after spraying

The surviving stools were reduced by 26% and 22% by Roundup at 12 ℓ^{-ha} and 8 ℓ^{-ha} respectively. The addition of Frigate did not improve the effects of Roundup at 8 ℓ^{-ha}. The total stalk population was reduced on average by 42% from the Roundup treatments.

Fusilade reduced the number of surviving stools by only 3% and appeared to increase the total number of stalks^{-ha} slightly.

11,5 weeks after spraying

The residual effects of the treatments measured six weeks after harvesting had diminished slightly.

RAD/VSJ
6 March 1984