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SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: N14 X RIPENER 37/90/Sw SIM 'V'

CAT. NO.: 1772

TITLE: FLOWER CONTROL AND CHEMICAL RIPENING OF LATE HARVESTED N14

1. PARTICULARS OF PROJECT

This Crop : 3rd ratoon	<u>Spray Details</u>	<u>Ethrel</u>	<u>Fusilade</u>
Site : Simunye Estate Field AG 604	Date applied:	22/2/90	22/2/90 12/9/90 (0.075 l/ha) (0.6 l/ha)
Region : Northern Irrigated (Swaziland)	Age at spray:	3.75 m	3.75 m 10.25 m
Soil Set : 'V'	Weeks before harvest :	31	31 5.5
Variety : N14	Juice purity:	23 %	23 % Unsp. : 84 % Ethrel: 85 %
Design : Randomized blocks with 8 replicates	<u>Conditions at spraying</u> 22/2/90 - Early morning, calm and cloudy. 12/9/90 - Early morning, calm.		
Fertilizer: N P K (Kg ha ⁻¹) 170 20 150	<u>Spray method:</u> CO ₂ constant pressure knapsack with hand held "T" boom. Delivery rate +/- 49 l/ha through two T K 1.5 nozzles.		
Dates : 02/11/89 - 21/10/90			
Age at harvest : 11.75 m			
Irrigation: 704 mm			
Rainfall : 593 mm			
Total : 1297 mm			

2. OBJECTIVES

- 2.1 To test the efficacy of standard rates of Ethrel and of a low rate of Fusilade to suppress flowering.
- 2.2 To monitor yield response to these treatments.
- 2.3 To test the effect of a standard rate of Fusilade applied in late season on the ripening of flowered and non flowered cane.

3. TREATMENTS

- 3.1 Control
- 3.2 Ethrel @ 1,50 l/ha.
- 3.3 Ethrel @ 2,50 l/ha.
- 3.4 Fusilade @ 0.075 l/ha.
- 3.5 Fusilade @ 0.6 l/ha.
- 3.6 Ethrel @ 1.50 l/ha + Fusilade @ 0.6 l/ha.
- 3.7 Ethrel @ 2,50 l/ha + Fusilade @ 0,6 l/ha.
- 3.8 Fusilade @ 0.075 l/ha + Fusilade @ 0.06 l/ha.

* Notes on treatments (see page 1)

4. SAMPLING METHODS

- 4.1 Samples for sucrose analysis were taken at the time of Ethrel application and then in April, June, July, September and October.
- 4.2 Sucrose samples comprised 20 stalks per treatment taken from 4 localities in the net lines of each plot.
- 4.3 Flower counts were based on a sample of 4 stalks from each plot which were composited for each treatment. Stalks were cut open and amount of pith development was recorded.

5. RESULTS

5.1 Table 1: Harvest Data

Treatments	Flowering &(Pith) %	Tons Cane/ha	ERS % Cane	Tons ERS/ha	Sucrose % Cane	Tons Sucrose/ha
Control	28 (16)	87	14.16	12.3	15.80	13.7
Ethrel @ 1.5 l/ha	0 (0)	94	13.91	13.1	15.70	14.7
Ethrel @ 2.5 l/ha	3 (1)	84	14.31	12.1	16.05	13.6
Fusilade @ 0.075 l/ha	3 (0)	83	13.64	11.4	15.53	13.0
Fusilade @ 0.6 l/ha	23 (14)	87	14.44	12.6	16.15	14.1
E @ 1.5 + F 0.6 l/ha	0 (0)	87	14.98	13.1	16.48	14.4
E @ 2.5 + F 0.6 l/ha	0 (0)	83	14.58	12.2	16.14	13.5
E @ 0.075 + F 0.6 l/ha	4 (1)	85	14.41	12.2	16.03	13.6
LSD Treatments						
(0.05)	-	10	0.66	1.5	0.52	1.7
(0.01)	-	14	0.88	2.1	0.69	2.3
Significance	-	NS	**	NS	*	NS
Mean	-	87	14.31	12.38	15.99	13.8
CV %	-	12	4.6	12.5	3.2	12.3

Table 2: Mean Differences Between Ripened Treatments and Unripened Controls

Treatments	Tons Cane/Ha	Ers % Cane	Tons Ers/ha	Sucrose % Cane	Sucrose/Ha
Ethrel @ 1.5 l/ha	7	- 0.25	0.7	- 0.10	1.0
Ethrel @ 2.5 l/ha	- 3	0.15	-0.2	0.25	- 0.1
Fusilade @ 0.075 l/ha	- 4	- 0.52	-1.0	- 0.27	- 0.7
Fusilade @ 0.6 l/ha	0	0.28	0.3	0.35	0.4
Ethrel @ 1.5 + F 0.6 l/ha	0	0.82†	0.8	0.68†	0.7
Ethrel @ 2.5 + F 0.6 l/ha	- 4	0.42	-0.1	0.34	- 0.2
F @ 0.075 + F 0.6 l/ha	- 2	0.25	-0.1	0.23	- 0.1

† Significant at P = (0.05)

‡ Significant at P = (0.01)

Table 3: Sample data

TREATMENTS	WEEKS AFTER APPLICATION											
	Ethrel 7			19.5			28.5			31		
	Fusilade @ 0.075 7			19.5			28.5			31		
	Fusilade @ 0.6 -			-			0			4.5		
	g/stalk	% ERC	g ERC stalk	g/stalk	% ERC	g ERC stalk	g/stalk	% ERC	g ERC stalk	g/stalk	% ERC	g ERC stalk
Control	548	3.88	21	773	8.23	63	840	12.28	104	902	14.16	128
Ethrel @1.0 l ha ⁻¹	609	3.95	24	806	8.13	65	903	12.25	110	827	13.91	115
Ethrel @2.5 l ha ⁻¹	627	3.90	24	859	8.77	75	867	12.27	106	966	14.31	138
Fusilade @0.075 l ha ⁻¹	555	4.26	23	731	8.17	59	814	12.22	99	831	13.64	113
Fusilade @0.06 l ha ⁻¹	557	3.60	20	771	8.21	63	879	11.70	102	940	14.44	135
E @1.0 + F @0.6 l ha ⁻¹	607	4.07	25	792	7.51	59	851	12.34	105	950	14.98	142
E @2.5 + F @0.6 l ha ⁻¹	554	4.21	23	791	8.52	66	883	11.93	105	901	14.58	132
E @0.075 + F @0.6 l ha ⁻¹	558	3.94	22	747	7.88	59	760	12.22	93	858	14.41	124
LSD (0.05)	69	0.71	4.5	83	0.95	8	134	0.76	18	127	0.66	20
(0.01)	32	0.95	6	110	1.27	11	179	1.01	24	170	0.88	26
Significance	NS	NS	NS	NS	‡‡	NS	‡‡	NS	NS	NS	‡‡	‡‡
Trial Mean	577	3.98	23	783	8.18	64	849	12.15	103	897	14.31	129
CV%	12.0	17.9	20.0	10.5	11.6	13.0	15.7	6.2	17.1	14.1	4.6	15.3

6. COMMENTS

6.1 Flowering and Flower Control

Flowering was sparse in this trial and averaged 28% in the unsprayed treatment.

Applications of Ethrel and Fusilade on 22nd February (\pm 2 weeks before flower initiation) controlled flower initiations effectively. Ethrel treatments appeared to be somewhat more effective than the low rate of Fusilade.

6.2 Cane Yield

Responses in cane yield were variable and non significant in this trial. The low rate of Ethrel tended to increase yields but the other treatments appeared to have no effect or to marginally reduce yields. The lack of yield response in this trial could be accounted for by the low level of flowering.

The sample data indicated that the low rate of Fusilade reduced cane yields \pm 20 weeks after application (NS) but this trend was not reflected in the harvest data.

6.3 Cane Quality

The responses in sucrose content were variable and were generally non significant especially when compared against the unsprayed control. (Table 2).

The low rate of Fusilade tended to reduce sucrose content at harvest although the reduction was not apparent at previous sampling dates.

Responses to Ethrel were poor in this trial and sample data show that there were no responses to either Ethrel treatment. Fusilade applied as a ripener in September tended to increase sucrose content although the responses were small and were only significant in one of the 'combination' treatments. Harvesting took place \pm 2 weeks earlier than scheduled and this may have accounted for the relatively poor responses to Fusilade.

6.4 Sucrose Yield

Effects of treatments on sucrose yields were non significant and reflected the variable effects on cane yields and sucrose content.

The largest positive response appeared to be associated with the low rate of Ethrel applied alone and reflected the apparently positive effect on cane yield. The largest negative response was associated with the low rate of Fusilade used for flower control and reflected negative effects on cane yield and sucrose content.

7. CONCLUSION

- * Ethrel and the very low rate of Fusilade controlled flowering effectively.
- * The suppression of flowering did not result in increases in cane yields since the level of flowering was low (28%).
- * Fusilade applied as a ripener in September increased sucrose content and responses may have been more significant if the trial had not been harvested 2 weeks earlier than scheduled.
- * This trial has been terminated. Investigations next year will determine the optimum rate and timing of application of Ethrel for flower control.

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