

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: N14 \* RIPENER 29/89/SW SIS 'R'  
CAT.NO.: 1716

TITLE: LATE SEASON CHEMICAL RIPENING OF N14 IN SWAZILAND

1. PARTICULARS OF PROJECT

This Crop : 3rd ratoon	Spray dates: Ethrel 20/2/89 Fusilade 4/9/89
Site : Swaziland Irrigation Scheme. Field Mananga A8	<u>Spray method:</u> CO <sub>2</sub> constant pressure knapsack with hand held "T" boom. Delivery rate +/- 49 l/ha through two T.K. 1,5 nozzles.
Region : Northern Irrigated Swaziland	<u>Conditions at spraying:</u> Ethrel - Mid-afternoon, calm to gusty Fusilade - Early morning, calm
Soil Set : R	Age at spraying: 5 months (E) 11.2 months (F)
Design : Randomised blocks 6 replications	Age at harvest : 13 months
Variety : N14	Dates : 24/9/88 - 20/10/89
Fertiliser: N P K (kg/ha) 140 - -	Irrigation : 738 mm
	Rainfall : 671 mm
	Total : 1409 mm

2. OBJECTIVES

- 1.1 To determine the ripening effects of varying rates of Ethrel, a standard rate of Fusilade and a combination of the two on late cut N14.
- 1.2 To establish Ethrel's potential to control flowering on N14 as well as to determine its ripening ability over an extended period (+/- 30 weeks).

- 1.3 To investigate whether the ripening effect of late applied Fusilade Super is significantly increased on non-flowered, non pithy cane previously treated with Ethrel.

### 3. TREATMENTS

- 3.1 Control
- 3.2 Ethrel @ 1.5 l/ha
- 3.3 Ethrel @ 2.50 l/ha
- 3.4 Fusilade @ 0.60 l/ha
- 3.5 Ethrel @ 1.5 l/ha + Fusilade @ 0.60 l/ ha
- 3.6 Ethrel @ 2.5 l/ ha + Fusilade @ 0.60 l/ ha

#### Notes on Treatments

- \* Ethrel was applied when the crop was 5 months old, 8 months before harvest.
- \* Fusilade was applied when the crop was 11.25 months old, 6 weeks before harvest.
- \* At spraying Ethrel and Fusilade the juice purity was 40 % and 91 % respectively.

### 4. SAMPLING METHODS

- 4.1 Plot samples were taken at 4, 8, 12, 16, 20, 26, 30, and 32 weeks after spraying with Ethrel.
- 4.2 Each sampling was carried out in the two nett rows and consisted of 20 stalks per plot. 5 stalks were taken from 4 localities with 3 cut from the centre and two from the side of the row at each position.

5. RESULTS5.1 HARVEST DATATable 1: Cane Yields, Sucrose % Cane and Sucrose Yield

Treatments	Tons Cane /Ha	Ers % Cane	Tons Ers Cane	Sucrose % Cane	Tons Sucrose
Control	93	13.5	12.5	14.9	13.8
E @ 1.5 l/Ha (E1)	97	13.5	13.1	14.9	14.5
E @ 2.5 l/Ha (E2)	98	13.2	13.0	14.6	14.3
F @ 0.6 l/Ha (F)	85	13.8	11.9	15.2	13.1
E @ 1.5 l/Ha + F @ 0.6 l/Ha (E1 + F)	97	13.2	12.8	14.7	14.3
E @ 2.5 l/Ha + F @ 0.6 l/Ha (E2 + F)	98	13.6	13.3	15.0	14.7
LSD Treatments (0.05)*	8	0.8	1.5	0.7	1.5
(0.01)**	11	1.1	2.1	1.0	2.1
Significance	NS	NS	NS	NS	NS
Mean	95	13.5	12.8	14.5	14.1
CV %	6.9	5.1	9.9	4.0	9.1

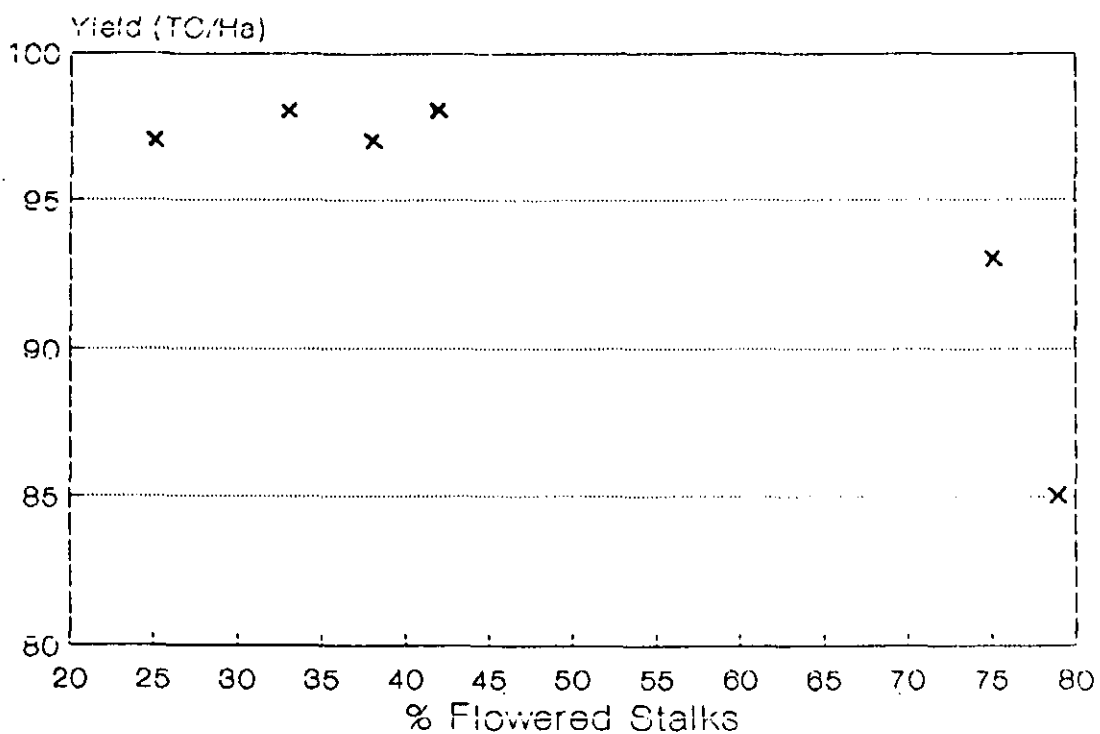
Table 2: Mean Differences Between Ripened Treatments and Unripened Controls

TREATMENTS	TONS CANE/HA	ERS %	T ERS/HA
E1	+ 4.2	+ 0.02	+ 0.6
E2	+ 5.4	- 0.27	+ 0.4
F	- 7.7	+ 0.36	- 0.7
E1 + F	+ 3.7	- 0.23	+ 0.3
E2 + F	+ 5.2	+ 0.10	+ 0.8

\* Significant at (P = 0.05)

\*\* Highly Significant at (P = 0.01)

**Fig 1: Relationship Between Yield of Cane (T C/Ha) and % of Flowered Stalks**



## 5.2 FLOWERING

**Table 3: Effects on Flowering and Pith Development at Harvest**

TREATMENTS	% FLOWERING	% PITH
CONTROL	75	45
E1	38	22
E2	42	20
F	79	46
E1 + F	25	13
E2 + F	33	23

**Table 4: Treatment effects on Sucrose % Cane from Time of Spraying Ethrel and Fusilade to Harvest**

Treatments	Feb Mar Apr May June July Aug Sept Oct									
	E	0	4 <sup>a</sup>	8	12	16	20	26	30	32
	F	-	-	-	-	-	-	0	4 <sup>b</sup>	6
Control		2.9	4.5	8.3	11.1	13.1	13.9	15.4	15.7	14.9
E1		3.0 <sub>5</sub>	5.6	8.6	11.5	13.0	13.9	14.9	15.6	14.9
E2		2.9	5.1	8.7	11.3	12.9	13.7	14.9	15.2	14.6
F		3.1	4.6	8.0	11.0	13.1	13.7	15.5	16.2	15.2
E1 + F		3.0	5.2	8.5	11.7	12.9	13.8	14.8	15.6	14.7
E2 + F		2.9 <sub>5</sub>	5.3	8.6	11.4	13.0	14.0	14.9	15.9	15.0
LSD Treatments (0.05)*		0.4	0.5	0.7	0.7	0.5	0.6	0.5	0.5	0.8
(0.01)**		0.5 <sub>5</sub>	0.7	1.0	0.9 <sub>5</sub>	0.6	0.8	0.6	0.7	1.1
Significance		NS	*	NS	NS	NS	NS	*	*	NS
Mean		3.0	5.0	8.4	11.2	13.0	14.0	15.1	15.7	14.9
CV %		11.5	8.6	7.2	5.3	3.1	3.8	2.6	2.9	4.5

<sup>a</sup>. Weeks after spraying Ethrel

<sup>b</sup>. Weeks after spraying Fusilade

### 5.3 ELDANA LEVELS

**Table 5: Treatment effects on Eldana Damage**

TREATMENTS	% DAMAGED OF INTERNODES
Control	0.66
E1	1.76
E2	1.20
F	2.76
E1 + F	2.15
E2 + F	2.01

## 6. COMMENTS

### 6.1 Flowering and Flower Control

- \* Flowering was heavy in this trial and averaged 75 % in control treatments.
- \* Applications of Ethrel on 20 February ( $\pm 1 \frac{1}{2}$  weeks before the start of the initiation period) were partially effective in preventing flower initiation. Level of control was  $\pm 50$  % and there was little difference between the two rates of Ethrel applied.

### 6.2 Cane Yield

- \* Cane yields were higher in all those treatments which received Ethrel although in relation to the control this response was not significant. Fusilade used alone resulted in lower yields than in the control but the difference was not quite significant ( $P = 0.05$ ) (Table 1).
- \* Cane yields were reasonably well correlated with the amount of flowering (Fig 1).

### 6.3 Cane Quality

- \* A significant increase in Sucrose % cane was evident 4 weeks after application of Ethrel. Although some response was still evident in the 8 and 12 week samplings, the differences were no longer significant.
- \* By August the converse was true and it was clear that those treatments which had received Ethrel had significantly lower cane quality than the controls. This is indicative of either a growth stimulation caused by Ethrel or, perhaps more likely, a reflection of the effects of flower control in these treatments.
- \* Responses to Fusilade were generally poor. There were some differences in response at 4 weeks after application but these were relatively small and had disappeared by harvest.
- \* The response to Fusilade was disappointing in this trial. Where it was applied alone this can probably be accounted for by the fact that the cane in the control plots was too mature (Juice Purity  $\pm 91$  %) as a result of flowering. The response where Ethrel had been applied is more difficult to explain since 60 % of stalks were unflowered and some response would have been expected.

- \* Sucrose levels apparently reached a peak in this trial in September and then declined in all treatments. Examination of the meteorological records show that this may have been caused by some heavy rainfall that fell 12 days before harvest.

#### 6.4 Sucrose Yield

- \* Sucrose yields were marginally higher in these treatments which received Ethrel although the responses were not significant. Sucrose yields were lowest where Fusilade had been applied alone and were associated with apparent reductions in cane yields.

#### 6.5 Eldana Count

- \* A higher percentage of internodes were damaged where ripener had been applied especially in those treatment which include Fusilade

### 7. CONCLUSION

- \* Ethrel significantly reduced flowering in this trial and the optimum rate of application appeared to be 1.5 l/ha. The level of flower control only averaged 50 %, however, and might be improved by earlier applications of Ethrel.
- \* The suppression of flowering did not result in a substantial improvement in cane yields. The trends to higher yields where Ethrel had been applied indicated that the response may have been greater had flower control been more successful or had the trial harvested later in the season.
- \* From this trial it is also unclear whether there is any advantage in using Fusilade to improve the cane quality of N14 that has flowered or that has been treated with Ethrel.
- \* This trial has been terminated after harvest but investigation of the above trends will continue at another site.

PCH/aw/ynm  
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