

SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

CODE: N14 x RIPENER 23/88/Bw B18 R

CAT. NO.: 1653

TITLE: RIPENER FOR LATE SEASON RIPENING OF N14 IN SWAZILAND

1. PARTICULARS OF PROJECT

This crop : 3rd ratoon  
Site : IYSIS (Vuvulane)  
Field 10 R No. 11  
Region : Northern Irrigated (Swaziland)  
Soil Set : 'R'  
Design : Randomised blocks - 6 replications  
Variety : N14  
Fertilizer : N P K  
Total kg/ha : 150 25 125  
Spray dates : Ethrel - 17/2/1988  
26/2/1988  
Fusilade - 15/8/1988  
Spray method : CO2 constant pressure knapsack with hand held 'T' boom  
Delivery rate +/- 49 l/ha through two TK 1,5 nozzles.  
Conditions at : 1st Ethrel spraying  
spraying : Early morning and calm  
2nd Ethrel spraying  
Early morning - calm with heavy dew  
Fusilade spraying  
Early morning - calm  
Age : 11,5 months  
Dates : 26/10/87 - 10/10/1988  
Irrigation : 1457 mm (4 day cycle)  
Rainfall : 521 mm  
Total : 1978 mm

2. OBJECTIVES

- 2.1 To determine the ripening effects of varying rates of Ethrel, a standard rate of Fusilade Super and combinations of the two for late season N14.
- 2.2 To establish Ethrel's potential to control flowering in N14 as well as to determine it's ripening ability on this variety over an extended period (>30 weeks).

## 5.4 Eldana

Table 6. Eldana damage at harvest (% internodes damaged)

TREATMENT	% DAMAGED INTERNODES
Control	7,2
E1(E)	9,9
E1(L)	6,2
E2(E)	12,4
E2(L)	8,6
F	6,7
E1(E)F	8,2
E1(L)F	13,0
E2(E)F	6,0
E2(L)F	7,0
Mean	8,6

## 6. COMMENTS

- 6.1 Cane yields appear low but were due to the high sampling intensity from the net rows of each plot. CV% were on the high side.
- 6.2 None of the treatments affected cane yields significantly although cane heights showed some variation.
- 6.3 Cane quality was significantly increased in the treatments where Fusilade was used alone and in combination with Ethrel, while Ethrel alone failed to influence sucrose % cane or ers % cane significantly for the two rates tested. (Tables II and III). These findings are in accordance with previous trial results (see trial CODE: N14 x Ripener 8/86/Sw SIM R) where significant ripening responses were attributed to Fusilade Super only. Results from Table III indicate that Ethrel at both rates improved cane quality temporarily 7,3 weeks after spraying which could have been expected owing to the low juice purity in February.
- 6.4 The gms ers/stalk differences between treatments from spraying to harvest were extremely variable and inconclusive although some significantly better levels were achieved where Fusilade had been applied (Table IV).
- 6.5 These apparent responses did not carry through to harvest as sucrose and ers tons/ha yield differences between treatments were statistically insignificant (Table II).

- 6.6 Flower initiation recordings carried out in May proved that conditions during and before flower induction were ideal and heavy flowering was expected. Ethrel responses were variable but generally only retarded or slowed flower development as floral emergence was similar for these treatments and the control by July. Treatments that received Fusilade did not flower as the developing inflorescence was arrested in the sheath soon after the chemical was applied. The first signs of "island pithiness" was noticed in March before flower emergence, and was controlled largely by the combination treatments (see also trial CODE: N14 x Ripener 14/87/Sw SIS 2). This observation was supported by the fact that fibre % cane decreased slightly for these treatments as well (table V).
- 6.7 Eldana damage at harvest did not follow trends that could be related to treatment.

## 7. CONCLUSIONS

- 7.1 The effects of flowering on early cut N14 yields could not be assessed in this trial as none of the treatments suppressed flower initiation significantly. In addition, the concept of better ripening responses for Fusilade when sprayed onto non-flowered cane could not be tested.
- 7.2 The fact that Fusilade increased cane quality significantly for cane in the process of flowering is encouraging.
- 7.3 There are indications from this trial however that flowering of N14, up to the mid-season is beneficial to natural ripening which could counter artificial ripening responses.
- 7.4 Pith formation in the upper stalk does not appear to have a strong influence on any of the yield parameters for this variety when cut early to mid-season.
- 7.5 From these and other N14 trial results, Ethrel should generally be discontinued as a ripener on this variety and replaced with selective use of Fusilade Super instead. Further work is required with Ethrel on N14 to investigate fully the problem of poor ripening response for the early season and flower suppression for the late season on this variety.

2.3 To determine to what extent the timing and rate of Ethrel will effect it's use as both a flower suppressant and ripener.

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

### 3. TREATMENTS

C	-	Control
E1(E)	-	Ethrel @ 1,5 l/ha applied on 17/2/88
E1(L)	-	Ethrel @ 1,5 l/ha applied on 26/2/88
E2(E)	-	Ethrel @ 2,5 l/ha applied on 17/2/88
E2(L)	-	Ethrel @ 2,5 l/ha applied on 26/2/88
F	-	Fusilade @ 0,6 l/ha applied 8 weeks before cutting
E1(E)F	-	Ethrel @ 1,5 l/ha + Fusilade @ 0,6 l/ha (Spray dates as for E1(E) and F)
E1(L)F	-	Ethrel @ 1,5 l/ha + Fusilade @ 0,6 l/ha (Spray dates as for E1(L) and F)
E2(E)F	-	Ethrel @ 2,5 l/ha + Fusilade @ 0,6 l/ha (Spray dates as for E2(E) and F)
E2(L)F	-	Ethrel @ 2,5 l/ha + Fusilade @ 0,6 l/ha (Spray dates as for E2(L) and F)

#### Notes on Treatments

- \* Ethrel was sprayed when the cane was 3,6 or 3,9 months of age.
- \* Fusilade was sprayed when the cane was 9,6 months of age.
- \* Juice purity %, moisture % and sucrose % cane at initial Ethrel spraying was 46%, 83% and 3.9% respectively.

### 4. SAMPLING METHODS

- \* Plot samples were taken at 0,9 ; 15,7 ; 23,8 ; 25,9 ; 30,7 and 33 weeks after the first Ethrel spraying.
- \* Each sampling was carried out in the net lines of each plot and samples were comprised of 20 stalks.
- \* 5 stalks were cut from 4 localities in the two net lines (ie two on each side of the row and one from the middle).

## 5. RESULTS

5.1 Table 1. Harvest data

TREATMENT	TONS CANE/HA	ERS % CANE	TONS ERS/HA
C	114	12,9	14,7
E1(E)	117	13,3	15,6
E1(L)	120	13,4	16,1
E2(E)	113	13,4	15,1
E2(L)	110	12,9	14,2
F	120	13,0	15,6
E1(E)F	115	13,9	16,0
E1(L)F	119	13,6	16,2
E2(E)F	120	13,7	16,4
E2(L)F	114	13,9	15,8
LSD TREATMENT MEANS (0,05)*	13	0,8	2,2
(0,01)**	18	1,0	2,9
SIGNIFICANCE	N.S	*/**	N.S
LSD ETHREL MEANS (0,05)*	10	0,5	1,5
(0,01)**	13	0,7	2,1
SIGNIFICANCE	N.S	*/**	N.S
LSD FUS MEANS (0,05)*	6	0,3	1,0
(0,01)**	8	0,5	1,3
SIGNIFICANCE	N.S	**	N.S
TRIAL MEAN	116	13,4	15,6
S E	11,6	0,7	1,9
CV %	10,0	4,9	11,9

6. FLOWERING AND ISLAND PITHINESS

Table 2. Treatment effects on % flowers initiated by early May and associated pith development from May to August 1988.

TREATMENT	% FLOWERS INITIATED		% PITHY INTERNODES/STALK	
	BY MAY		MAY	AUGUST
C	100		42	43
E1(E)	76		23	34
E1(L)	57		15	32
E2(E)	61		16	25
E2(L)	33		9	25
F	As for control			
E1(E)F	)			37
E1(L)F		As for Ethrel		29
E2(E)F	)	Treatments		26
E2(L)F				16

7. SIDESHOOTS

Table 3. Treatment effects on sideshoot development by October

TREATMENT	AVE NO. SIDESHOOOTS/STALK	AVE MASS/SIDESHOOT (gms)
C	2,00	60
E1(E)	1,10	48
E1(L)	1,00	33
E2(E)	0,90	45
E2(L)	0,52	38
F	1,60	43
E1(E)F	1,00	24
E1(L)F	0,37	36
E2(E)F	0,68	22
E2(L)F	0,56	24

8. ELDANA

Table 4. Treatment effects on Eldana damage at harvest.

TREATMENT	% DAMAGED INTERNODES
C	8,0
E1(E)	8,5
E1(L)	8,7
E2(E)	4,2
E2(L)	8,4
F	6,0
E1(E)F	5,3
E1(L)F	7,0
E2(E)F	6,0
E2(L)F	7,0

9. COMMENTS

9.1 The cane was very immature at the time of the first Ethrel application with juice purities at +/- 40% and average moisture of 83% cane.

9.2 Flowering

Flower initiation levels and related pith development were reduced significantly where Ethrel was sprayed, particularly at the higher rate when applied closer to the critical flower induction period (Table 2).

9.3 Ripening response

\* The seven sucrose samples taken from 0 to 33 weeks after Ethrel application showed very poor ripening responses for 0,6 l/ha Fusilade Super (Fig 1b) and for both rates of Ethrel (Fig 1a) when the products were used alone. Fig 1c shows the results of the combination treatments that increased Ers% cane significantly ( $P=0.05$ ) soon after the Fusilade was applied. It appears that the early Ethrel application maintained the cane in a suitable condition for further ripening with Fusilade, but alone was incapable of increasing cane quality significantly. The cane treated with Fusilade alone had by this stage deteriorated to such an extent that further chemical ripening was ineffective.

\* The chemical ripening treatments had little effect on cane yields despite the distinct treatment effects on pith in the upper stalks. The apparent cane yield increases for certain treatments (Table 1) are due to field variability and should be ignored.

- \* Ers % cane at harvest was increased significantly for certain Ethrel treatments and particularly so for the combination treatments. Response differences between the combination treatments were insignificant.
- \* The Ethrel/Fusilade combinations were the only treatments to increase Ers tons/ha significantly (Table 1) but differences between them were small and the lower rate of Ethrel appears to be sufficient should this treatment be adopted for late cut N14.

#### 9.4 Sideshooting

- \* Sideshooting developed early due to a widespread abortion of flowers and was excessive for all non-Ethrel treatments (Table 3).
- \* Separate analyses comparing sideshooting and non-sideshooting cane showed sideshoots to have had a dilution effect on cane quality but an overall positive effect on t.ers/ha yield due to their mass. Under normal conditions this may not be the case as they would have developed later and had lower mass at harvest.

#### 9.5 Eldana

Although spray to harvest delays were up to +/- 33 weeks for some treatments none seemed to have any influence on eldana damage (Table 4).

9.6 This trial has been terminated.