

SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

Code: RIP X DRY OFF 1/88/Sw SIS 'R'
Cat. No.: 1681

TITLE: PRE HARVESTING DRYING OFF AND CHEMICAL RIPENING OF EARLY SEASON
NCo376 IN SWAZILAND.

1. PARTICULARS OF PROJECT

This crop : 3rd Ratoon
Site : IYSIS Field SR9B
Region : Northern area
(Swaziland)
Soil Set/Series: 'R'/Rathbone
Design : Randomised Blocks
with split plots
Variety : NCo376
Fertilizer : N P K S
(kg/ha) 150 25 125 -

Soil Analysis:
pH OM% Clay % PDI
- - - -
PPM
P K Ca Mg S Zn
- - - - - -
Age : 11,1
Dates : 9/8/87 - 21/7/88
Rainfall :
Irrigation :
Total :

2. OBJECTIVES

- 2.1 To determine the effects of 4 levels of pre-harvest drying off on the responses to the three standard ripener treatments viz, Ethrel, Fusilade and the combination treatment.
- 2.2 To assess the effects of chemical ripeners on soil moisture depletion during drying off.
- 2.3 To assess the effects of severe pre-harvest drying off on the growth of the subsequent ratoon.

3. TREATMENTS

3.1 Drying Off : Last irrigation applied :

- A. 4 wks before harvest - predicted evap. prior to harvest = 120 mm
ie (1 x TAM)
- B. 8 wks before harvest - predicted evap. prior to harvest = 240 mm
ie (2 x TAM)
- C. 12 wks before harvest - predicted evap. prior to harvest = 360
mm ie (3 x TAM)
- D. 16 wks before harvest - predicted evap. prior to harvest = 480
mm ie (4 x TAM)

3.2 Ripeners:

- 1. Control - no ripener
- 2. Ethrel @ 1,35 l/ha applied 25/3/88 + 18 wks before harvest
- 3. Fusilade @ 0,4 l/ha applied 17/5/88 + 10 wks before harvest
- 4. Ethrel + Fusilade - see rates and timing above

3.3 Notes on Treatments

The actual cumulative pan evaporation deficits during the drying off periods are shown below.

TREATMENT	PREDICTED PAN DEFICIT (mm)	DATE LAST IRRIGATION	ACTUAL PAN DEFICIT (mm)	RAINFALL AFTER START OF DRY OFF
A	120	27 June	100	41 mm
B	240	2 June	185	41 mm
C	360	29 April	302	49 mm
D	480	29 March	440	84 mm

Rainfall was below average for the drying off period with 84 mm (+ 80% LTM) falling between the end of March and harvest on 21/7/88.

4. RESULTS

4.1. Harvest Data

TREATMENTS	TONS CANE. ha ⁻¹	ERS % C	TONS ERS/HA
<u>Main plots</u>			
A. 120 mm DEFICIT	113,0	11,05	15,86
B. 240 mm "	100,9	14,34	14,47
C. 360 mm "	108,1	14,18	15,22
D. 480 mm "	111,1	14,04	15,55
Significance	NS	NS	NS
SE Mean \pm \pm	3,7	0,19	0,12
CV %	8,3	3,4	6,8
<u>Sub-plots</u>			
1. Control	110,0	13,66	14,98
2. Ethrel	106,8	14,31	15,24
3. Fusilade	111,1	13,76	15,29
4. Combination	105,0	14,08	15,58
LSD (0,05)*	4,1	0,39	NS
(0,01)**	5,9	0,52	NS
SE Mean \pm \pm	1,6	0,14	0,25
CV %	7,1	4,8	8,0
Interaction	NS	NS	NS
Trial mean	108,3	11,15	15,28

4.2 Eldana Counts at Harvest

TREATMENT	% INTERNODES DAMAGED
<u>Main Plots</u>	
A. 120 mm Deficit	2,4
B. 240 mm "	1,2
C. 360 mm "	2,1
D. 480 mm "	2,3
<u>Sub-plots</u>	
1. Control	1,7
2. Ethrel	2,1
3. Fusilade	2,0
4. Combination	2,1

MEASUREMENTS

4.3 Flowering and Pith measurements

* May (17/5/88) just before flower emergence

TREATMENT	% FLOWERED	AV. FLOWER SIZE	% < 300mm	% PITH
Control	87,3	426 mm	8,7	30,0
Ethrel	81,5	320 mm	29,4	1,0

* July (19/7/88) at harvest

TREATMENT	% FLOWERED	% PITH
Control	83,3	36,6
Ethrel	80,8	10,1
Fusilade	79,2	32,6
Combination	79,2	1,0

4.4 Responses to Chemical ripening treatments

TREATMENT	19/5/1988		21/7/1988	
	ERS % C	RESPONSE	ERS % C	RESPONSE
Control	9,59	-	13,66	-
Ethrel	11,03	+ 1,44	14,31	+ 0,65
Fusilade	9,74	+ 0,15	13,76	+ 0,10
Combination	11,11	+ 1,52	14,88	+ 1,22

* Note : 19/5/88 - 8 wks after Ethrel application
21/7/88 - 18 wks after Ethrel application and 10 wks after Fusilade application,

5. COMMENTS5.1 General

- * Irrigation management at this trial was unsatisfactory and leaking spile caps and lateral movement of water over low ridges caused problems with the imposition of dry-off treatments. The effects of ripeners on soil moisture depletion and the effects of dry-off on the subsequent ratoon regrowth were therefore difficult to interpret and have not been reported.
- * Flowering was very heavy in the trial, averaging + 80 - 90% and undoubtedly affected responses to ripeners. Ethrel application took place + 3 weeks after the initiation period and Fusilade application took place just before flower emergence.

5.2 Dry-off treatments

There were no significant effects of the drying-off treatments on either cane yield or on cane quality. There were significant falls of rain in mid-April and towards the end of June and this together with the problems in irrigation management may have obscured the main treatments effects.

5.3 Chemical Ethrel treatments

5.3.1 TONE CANE/ha

There was evidence of a reduction in yield in cane that had been treated with Ethrel but this was only significant where subsequent applications of Fusilade took place (ie combination treatment). Sample data did not confirm these results however, and indicated that differences in topping height may have accounted for the apparent differences in cane yield.

5.3.2 ERS % cane

Cane quality was significantly increased by Ethrel and also by the combination treatment which was approximately twice as effective as Ethrel alone. Cane quality was not increased by application of Fusilade. Fibre content was significantly reduced where Ethrel had been applied and pith development was considerably less advanced in these treatments.

5.3.3 ERS/ha

The combination treatment produced marginally more recoverable sucrose than the other treatments but the difference was not significant. It was apparent that the benefits in terms of cane quality were nullified by the reductions in cane yield. Once again, these trends were not apparent in the sample data where an analysis of ERS g/stalk showed that the combination treatment was significantly better than the other treatments.

5.3.4 Flowering

Ethrel was applied after the initiation period and therefore did not inhibit flower initiation. Measurements in May however, indicated that flower development (and associated pith development) had been considerably delayed although most of the flowers had emerged + 10 weeks later at harvest.

Fusilade applications (which took place just before flower emergence) inhibited further development of the flower. This effect was more noticeable in the combination treatments where floral development had already been delayed.

6. SUMMARY

While the dry-off treatments were not successful in this trial, useful information had been obtained on interactions between chemical ripening and flowering.

INTERACTIONS

- * Applications of Fusilade by itself do not appear to be warranted after early May in heavy flowering years.
- * Ethrel delays floral development and produces a ripening response even when applied after initiation. The increased efficiency of the combination treatments presumably results from this delay in floral development.

It remains to be seen if the inhibition of flowering by applications of Ethrel prior to the initiation period would improve the efficiency of the combination treatment.

AGK

AJK/cg

June 1989