

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

Code: N19 x Ripener 42/91/Sw SIS 'T'

Cat.No.: 1836

EARLY SEASON RIPENING OF N19 IN SWAZILAND

1. PARTICULARS OF PROJECT

<p>This crop : 3rd ratoon</p> <p>Site : SIS Vuvulane estate, field P3-11</p> <p>Region : Northern irrigated (Swaziland)</p> <p>Soil set/ Series : 'T' Tambankulu</p> <p>Design : Randomised blocks with 5 replicates</p> <p>Variety : N19</p> <p>Fertiliser: N P K S kg/ha 170 30 100 -</p> <p>Dates : 03/07/90-18/07/91</p> <p>Age : 12 months</p> <p>Rainfall : 670 mm</p> <p>Irrigation: 733 mm</p> <p>-----</p> <p>Total : 1403 mm</p> <p>-----</p>	<table border="0"> <thead> <tr> <th><u>Spray details</u></th> <th>Date app.</th> <th>Age (m)</th> <th>Weeks pre spray</th> <th>Purity at spray</th> </tr> </thead> <tbody> <tr> <td colspan="5"><b>Ethrel:</b></td> </tr> <tr> <td></td> <td>26 Feb.</td> <td>7</td> <td>19</td> <td>65.3</td> </tr> <tr> <td></td> <td>13 Mar.</td> <td>7.5</td> <td>17</td> <td>73.1</td> </tr> <tr> <td></td> <td>26 Mar.</td> <td>8</td> <td>15</td> <td>75.5</td> </tr> <tr> <td colspan="5"><b>Fusilade:</b></td> </tr> <tr> <td></td> <td>31 May</td> <td>9</td> <td>7</td> <td>90.6</td> </tr> <tr> <td></td> <td>17 June</td> <td>9.5</td> <td>5</td> <td>92.1</td> </tr> <tr> <td colspan="5"><b>Conditions at spraying :</b></td> </tr> <tr> <td></td> <td>26 Feb.</td> <td colspan="3">Calm, slight wind later</td> </tr> <tr> <td></td> <td>13 Mar.</td> <td colspan="3">Fine, warm, slight wind</td> </tr> <tr> <td></td> <td>26 Mar.</td> <td colspan="3">Fine and calm</td> </tr> <tr> <td></td> <td>31 May</td> <td colspan="3">Not recorded</td> </tr> <tr> <td></td> <td>17 June</td> <td colspan="3">Fine and calm</td> </tr> <tr> <td colspan="5"><b>Spray method :</b></td> </tr> <tr> <td colspan="5">With CO<sub>2</sub> constant pressure sprayer and a hand held 'T' boom fitted with 2 x TK1.5 flood nozzles. Rate of application about 50 l/ha.</td> </tr> </tbody> </table>	<u>Spray details</u>	Date app.	Age (m)	Weeks pre spray	Purity at spray	<b>Ethrel:</b>						26 Feb.	7	19	65.3		13 Mar.	7.5	17	73.1		26 Mar.	8	15	75.5	<b>Fusilade:</b>						31 May	9	7	90.6		17 June	9.5	5	92.1	<b>Conditions at spraying :</b>						26 Feb.	Calm, slight wind later				13 Mar.	Fine, warm, slight wind				26 Mar.	Fine and calm				31 May	Not recorded				17 June	Fine and calm			<b>Spray method :</b>					With CO <sub>2</sub> constant pressure sprayer and a hand held 'T' boom fitted with 2 x TK1.5 flood nozzles. Rate of application about 50 l/ha.				
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2. OBJECTIVES

- \* To test the optimum spray to harvest period for Ethrel and Fusilade Super either alone, or in combination on variety N19 harvested early in the season.
- \* To compare the efficacy of Ethrel and Fusilade Super when applied either alone or in combination.

### 3. TREATMENTS

#### 3.1 Whole plots

1. Control
2. Ethrel 1.5 l/ha applied 19 weeks before harvest
3. Ethrel 1.5 l/ha at 19 weeks + Fusilade Super 0.45 l/ha 7 weeks before harvest.
4. Ethrel 1.5 l/ha at 19 weeks + Fusilade Super 0.45 l/ha 5 weeks before harvest.
5. Ethrel 1.5 l/ha applied 17 weeks before harvest
6. Ethrel 1.5 l/ha at 17 weeks + Fusilade Super 0.45 l/ha 7 weeks before harvest.
7. Ethrel 1.5 l/ha at 17 weeks + Fusilade Super 0.45 l/ha 5 weeks before harvest.
8. Ethrel 1.5 l/ha applied 15 weeks before harvest
9. Ethrel 1.5 l/ha at 15 weeks + Fusilade Super 0.45 l/ha 7 weeks before harvest.
10. Ethrel 1.5 l/ha at 15 weeks + Fusilade Super 0.45 l/ha 5 weeks before harvest.
11. Fusilade Super 0.45 l/ha applied 7 weeks before harvest.
12. Fusilade Super 0.45 l/ha applied 5 weeks before harvest.

### 4. SAMPLING METHODS

Samples from a plot comprised 4 lots of 5 stalks taken at random in the two nett plot rows, to give a total of 20 stalks per plot.

All plots were not sampled on any one occasion, except at harvest, so that statistical analysis was possible only on harvest data.

Samples were analysed at the Mhlume agronomy laboratory.

### 5. RESULTS

#### 5.1 Sample data

Table 1: Ers percent cane

Treatment	Weeks before harvest								Harvest
	19	17	15	11	9	7	5	3	
Ers % cane									
Unsprayed cane	4.8	6.7	7.5	11.2	12.6	12.6	13.9	13.9	14.7
Ethrel 19 weeks				12.5	12.7	14.0	14.3		14.6
Eth.19 + Fusil.7								14.8	14.5
Eth.19 + Fusil.5							14.3		14.0
Ethrel 17 weeks				12.4	13.5	13.7	14.3	14.5	14.6
Eth.17 + Fusil.7								14.5	14.8
Eth.17 + Fusil.5							14.3		14.9
Ethrel 15 weeks				12.3		13.4			14.7
Eth.15 + Fusil.7						13.4		13.9	14.3
Eth.15 +Fusil.5							14.3		14.6
Fusilade 7 wks.				11.2		12.6		14.2	13.8
Fusilade 5 wks.					12.6		13.9		14.6
Means									
Fusilade S. only							13.9	14.2	14.2
Ethrel only				12.4	13.1	13.7	14.3	14.5	14.6

Table 2: Mass of Ers

Treatment	Weeks before harvest								
	19	17	15	11	9	7	5	3	Harvest
Mass ers (g/stalk)									
Unsprayed cane	0.9	1.4	1.7	2.9	3.0	3.2	3.6	4.0	4.3
Ethrel 19 weeks				3.6	3.4	3.7	4.0		4.2
Eth.19 + Fusil.7								3.7	3.9
Eth.19 + Fusil.5							4.0		4.0
Ethrel 17 weeks				3.3	3.1	3.6	3.7	3.8	3.7
Eth.17 + Fusil.7								3.8	3.6
Eth.17 + Fusil.5							3.7		3.8
Ethrel 15 weeks				3.4		3.5			3.8
Eth.15 + Fusil.7						3.5		4.1	3.4
Eth.15 + Fusil.5							3.7		3.9
Fusilade S. 7 wks.				2.9		3.2		3.9	3.4
Fusilade S. 5 wks.					3.0		3.6		3.1
Means									
Fusilade S only							3.6	3.9	3.3
Ethrel only				3.4	3.3	3.6	3.8	3.8	3.9

\* Note that all plots were sampled only at harvest

## 5.2 Harvest data

Table 3: Cane yield and quality

Treatment	Tc/ha	Purity	S% <sub>c</sub>	Ts/ha	Ers% <sub>c</sub>	Terc/ha
Control	134.1	93.5	15.8	21.2	14.7	19.7
Ethrel 19 weeks	129.7	92.9	15.8	20.5	14.6	18.9
Eth.19 + Fusil.7 weeks	127.4	92.6	15.7	20.0	14.5	18.5
Eth.19 + Fusil.5 weeks	135.3	92.8	15.1	20.5	14.0	18.9
Ethrel 17 weeks	127.1	92.8	15.8	20.1	14.6	18.5
Eth.17 + Fusil.7 weeks	123.0	93.2	16.0	19.7	14.8	18.2
Eth.17 + Fusil.5 weeks	127.1	93.3	16.1	20.5	14.9	19.0
Ethrel 15 weeks	133.2	92.9	15.8	21.1	14.7	19.5
Eth.15 + Fusil.7 weeks	124.5	92.5	15.5	19.2	14.3	17.7
Eth.15 + Fusil.5 weeks	128.1	92.8	15.8	20.2	14.6	18.7
Fusilade 7 weeks	123.9	91.7	15.0	18.6	13.8	17.1
Fusilade 5 weeks	123.2	93.1	15.8	19.4	14.6	17.9
LSD						
(P=0.05)	13.7	1.45	0.64	2.18	0.69	2.08
(P=0.01)	18.2	1.94	0.85	2.91	0.92	2.78
Significance	NS	NS	NS	NS	NS	NS
Mean	128.0	92.8	15.7	20.1	14.5	18.6
CV (%)	8.4	-	3.2	8.8	3.8	9.0

## 6. COMMENTS

### 6.1 Sample data

None of the treatments appeared to have any effect on sample cane mass. There was a small but consistent improvement in cane quality following treatment with Ethrel which resulted in small and consistent improvements in estimated recoverable sugar percent cane (ers%) and mass of ers (Table 1 and Figures 1 and 2). Statistical analysis was not possible due to incomplete sampling but there appeared to be no difference in response at the 11 week sampling whether the Ethrel had been applied 4, 6 or 8 weeks previously. Ethrel (and Fusilade Super) treatments have been meaned in Figures 1 and 2. The response to Ethrel had been lost by the time the experiment was harvested and Fusilade Super appeared to have no positive ripening effect.

### 6.2 Cane yield and cane quality

There were no statistically significant differences in either cane yield or quality and there was no consistent pattern of differences amongst Ethrel treatments. Both Fusilade Super treatments appeared to reduce cane yield and the 7 week application appeared to reduce cane quality as well.

### 6.3 Sucrose yields

Yields of sucrose and estimated recoverable sugar reflected differences in cane yield and quality. There was an indication that Fusilade Super may have reduced yield, especially when applied 7 weeks before harvest.

## 7. DISCUSSION

Ripening responses are dependent on the growth potential and the quality of the crop when treated. In the case of Ethrel, cane quality measured as juice purity was low, ranging from 65 to 75%, and a ripening response could be expected. Sample data indicate that there may have been a response initially but if there was it was eventually lost before the experiment was harvested. Other experiments have shown that variety N19 responds positively to Ethrel if it is applied when the cane is immature.

At the time of treatment with Fusilade Super juice purities ranged from 90 to 92 indicating that a positive ripening response was unlikely. Whether the apparent adverse effect of Fusilade Super applied alone 7 weeks before harvest is a real one is not known. Other experiments have shown that this chemical can reduce cane yield significantly but further work is necessary to determine whether such results can be confirmed conclusively and to what extent they are related to cane condition at the time of spraying, rate of chemical and to the time interval between spraying and harvest.

## 8. CONCLUSION

- \* The results appear to confirm that variety N19 responds to ripening with Ethrel but an interval of 17 to 19 weeks between spraying and harvest may be too long for the response to be maintained.
- \* There was an indication that Fusilade Super may reduce cane and sucrose yields of variety N19 but more experiments are required to determine whether this effect is a true one and under exactly what conditions it occurs.