SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

EXPERIMENT RESULT

Code: N19 x Ripener 40/91/Sw SIS 'R'
CAT.NO.: 1834

EARLY SEASON RIPENING OF N19 IN SWAZILAND

1. PARTICULARS OF PROJECT

This crop : 3rd ratoon	
Site : SIS Vuvulane estate, field 8R-20	
Region : Northern irrigated (Swaziland)	
Soil set/ Series : 'R" Rondspring	
Design : Randomised blocks with split plots, 5 replicates	
Variety : N19	
Fertiliser: N P K S kg/ha 150 20 150 -	
Dates : 21/06/90-21/05/91	
Age : 11 months	
Rainfall : 602 mm Irrigation: 975 mm ---------- ------- Total : 1577 mm ---------- -------	

Spray details	Ethrel	Fusilade
Date applied :	20/02/91	18/04/91 26/04/91 04/05/91
Age at spray :	8 m	9.75 m 10.0 m 10.25 m
Weeks pre-harvest :	13	5, 4, 3
Juice purity :	64.0	82.0, 85.5, 84.3

Conditions at spraying :

Ethrel - Afternoon, slight wind
Fusilade - 1) 07.00-08.15, calm
2) 07.00-07.34, calm, with some dew
3) Not recorded

Spray method :

With CO_2 constant pressure sprayer and a hand held 'T' boom fitted with 2 x TK1.5 flood nozzles. Rate of application about 50 l/ha.

2. OBJECTIVES

* To test the efficacy of two rates of Fusilade Super together with varying spray to harvest periods on early harvested N19.

* 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. Fusilade Super 0.3 l/ha applied 5 weeks before harvest
3. Fusilade Super 0.3 l/ha applied 4 weeks before harvest
4. Fusilade Super 0.3 l/ha applied 3 weeks before harvest
5. Fusilade Super 0.5 l/ha applied 5 weeks before harvest
6. Fusilade Super 0.5 l/ha applied 4 weeks before harvest
7. Fusilade Super 0.5 l/ha applied 3 weeks before harvest

3.2 Sub plots

1. Ethrel 1.5 l/ha applied on 16/02/91, 13 weeks pre-harvest
2. No Ethrel

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.

Only plots that were to be sprayed, together with their Ethrel treated sub plot, were sampled on any one occasion, except at harvest when all plots were sampled.

Samples were analysed at the Mhlume agronomy laboratory.

5. RESULTS

5.1 Sample data

Table 1: Cane mass, Ers percent and mass of Ers

Date	13/2/91	7/3	2/4	17/4	25/4	2/5	8/5	21/5	27/5
Weeks	14.5	11.0	8.5	5.5	4.5	3.5	3.0	1.0	Harvest
Treatment *					Ers%				
Control	4.5	6.3	8.4	9.6	10.8	10.5	11.7	11.5	12.4
Ethrel		6.6	9.5	11.0	11.7	11.4	11.9	11.9	13.0
					Cane wt. in kg/stalk				
Control	0.99	1.02	1.23	1.30	1.29	1.29	1.17	1.27	1.24
Ethrel		1.04	1.23	1.32	1.27	1.39	1.24	1.20	1.17
					Ers g/stalk				
Control	45	64	103	125	140	136	137	146	153
Ethrel		68	117	145	149	158	147	143	151

* Note that the same plots were not sampled on each occasion

5.2 Harvest data

Table 2: Cane yield, sucrose percent and sucrose yields

Treatments	Tc/ha			S%C			Ts/ha		
	Subplots Cont.	Subplots Ethrel	Whole plots	Subplots Cont.	Subplots Ethrel	Whole plots	Subplots Cont.	Subplots Ethrel	Whole plots
No Fusilade Super	106	109	108	13.1	13.9	13.5	14.1	15.2	14.6
Fusil. 0.3l 5 week	107	116	112	14.3	15.2	14.7	15.3	17.6	16.4
Fusil. " 4 week	118	116	117	14.5	13.7	14.1	17.1	15.8	16.5
Fusil. " 3 week	99	102	100	12.3	13.4	12.8	12.3	13.8	13.0
Fusil. 0.5l 5 week	118	110	114	14.4	15.3	14.8	17.1	16.8	17.0
Fusil. " 4 week	110	109	110	14.1	14.4	14.2	15.5	15.7	15.6
Fusil. " 3 week	114	116	115	13.7	14.8	14.2	15.6	17.2	16.4
Mean	110	111	111	13.8	14.4	14.1	15.3	16.0	15.6
Whole plot CV %		14.5			11.5			20.0	
Sub plot CV %		11.9			4.6			12.0	
Interaction		NS			NS			NS	
LSD Whole plots (0.05)		14.1			1.49			2.83	
(0.01)		21.4			2.02			3.81	
Significance		NS			NS			NS	
LSD Sub plots (0.05)		6.4			0.32			0.91	
(0.01)		9.4			0.43			1.22	
Significance		NS			**			**	
LSD Sub plots within same whole plot (0.05)		17.0			0.84			2.40	
(0.01)		24.7			1.13			3.24	
LSD Sub plots between diff. whole plots (0.05)		18.9			1.60			3.32	
(0.01)		25.6			2.17			4.49	
Fusilade treatments	0.31	0.51	Mean	0.31	0.51	Mean	0.31	0.51	Mean
No Fusilade Super	-	-	108	-	-	13.5	-	-	14.6
Fusilade S. 5 week	103	114	109	14.7	14.8	14.8	15.2	17.0	16.1
Fusilade S. 4 week	117	110	113	14.1	14.2.	14.2	16.5	15.6	16.0
Fusilade S. 3 week	100	115	108	12.8	14.2	13.5	13.0	16.4	14.7
Fusilade Rates mean	107	113	109	13.9	14.4	14.0	14.9	16.3	15.4
LSD for Fusilade rates (0.05)		8.5			0.9			1.7	
(0.01)		11.6			1.2			2.3	
LSD for Fusilade time of application (0.05)		10.4			1.06			2.01	
(0.01)		14.2			1.44			2.76	

Table 3: Estimated recoverable sugar percent cane and yield

Treatments	Ers%C			Ters/ha		
	Subplots Cont.	Subplots Ethrel	Whole plots	Subplots Cont.	Subplots Ethrel	Whole plots
No Fusilade Super	12.0	12.5	12.2	12.8	13.6	13.2
Fusil. 0.31 5 week	13.1	13.4	13.3	14.0	15.6	14.8
Fusil. " 4 week	13.0	13.0	13.0	15.4	15.0	15.2
Fusil. " 3 week	11.1	11.9	11.5	11.1	12.2	11.7
Fusil. 0.51 5 week	13.0	13.9	13.4	15.4	15.3	15.4
Fusil. " 4 week	12.6	13.0	12.8	13.8	14.2	14.0
Fusil. " 3 week	12.1	13.4	12.7	13.8	15.6	14.7
Mean	12.4	13.0	12.7	13.8	14.5	14.1
Whole plot CV %		11.8			20.0	
Sub plot CV %		5.0			13.3	
Interaction		NS			NS	
LSD Whole plots						
(0.05)		1.38			2.56	
(0.01)		1.86			3.45	
Significance		NS			NS	
LSD Sub plots						
(0.05)		0.31			0.91	
(0.01)		0.42			1.23	
LSD Sub plots within same whole plot						
(0.05)		0.82			2.43	
(0.01)		1.11			3.25	
LSD Sub plots between diff. whole plots						
(0.05)		1.50			3.10	
(0.01)		2.04			4.19	
Fusilade treatments	0.31	0.51	Mean	0.31	0.51	Mean
No Fusilade Super	-	-	12.2	-	-	13.2
Fusilade S. 5 week	13.3	13.4	13.4	13.7	15.4	14.5
Fusilade S. 4 week	13.0	12.8	12.9	15.2	14.0	14.6
Fusilade S. 3 week	11.5	12.7	12.1	11.7	14.7	13.2
Fusilade Rates mean	12.6	13.0	12.7	13.5	14.7	13.9
LSD for Fusilade rates						
(0.05)		0.80			1.49	
(0.01)		1.10			2.04	
LSD for Fusilade time of application						
(0.05)		0.95			1.83	
(0.01)		1.35			2.50	

6. COMMENTS

6.1 Sample data

Although the same plots were not sampled on each occasion sample data presented in Figures 1 and 2 and Table 1 indicate a consistent response to Ethrel from 8 weeks after spraying until just before harvest at 13 weeks. The apparent loss of Ethrel response just before harvest was not confirmed by harvest data, which is more reliable than sample data because all plots were sampled at harvest and statistical analysis was possible.

6.2 Cane yield

None of the treatments had any statistically significant effect on cane yield per hectare (Table 2).

6.3 Cane quality

Ethrel gave statistically significant improvements in both sucrose percent cane (S%c) and estimated recoverable sugar percent cane (Ers%c) at harvest (Tables 2 and 3), confirming the results of earlier sample data. The response to Fusilade Super was significantly better than untreated cane only when a minimum of 5 weeks elapsed between spraying and harvest. There was no statistically significant difference in quality between Fusilade Super rates of 0.3 and 0.5 l/ha but the higher rate gave the best S%c and Ers%c values. There were no statistically significant interactions between any of the treatments.

6.4 Sucrose and estimated sugar yields

Improvements in cane quality resulted in increased sucrose (Ts/ha) and estimated recoverable sugar yields per hectare (Ters/ha) because cane yields were not affected adversely (Tables 2 and 3). The differences were not statistically significant because of the extreme variability of the data but Ethrel applied alone increased sucrose yield by 1 ts/ha and the average of all rates of Fusilade Super improved sucrose yield over unsprayed cane by 1.3 ts/ha. Similar, but smaller, increases in yield of estimated recoverable sugar were also recorded.

7. DISCUSSION

The results reported here show that harvesting variety N19 in May, between 3 and 5 weeks after spraying Fusilade Super at a rate of 0.5 l/ha, does not result in a loss of cane yield. It is not known whether cane yield would have been reduced had the experiment continued longer and further experiments will be needed to examine this aspect and to confirm the results reported here. The results confirm that variety N19 responds well to Ethrel if sprayed when juice purity is low. The results also confirm that Fusilade Super will ripen sugarcane even when juice purity at the time of spraying is between 82 and 85 percent.

8. CONCLUSIONS

* Variety N19 responded well to ripening with Ethrel applied in February, 13 weeks before harvest in May.

* Fusilade Super improved cane quality 5 weeks after spraying and did not reduce cane yields. There is an indication that a rate of 0.5 l/ha is better than 0.3 l/ha. * Further experiments will be needed to confirm these results and to try to determine whether there are significant interactions between Ethrel and Fusilade Super treatments.

HR/vnm

Figure 1
ERS PERCENT CANE - SAMPLE DATA
(R4091SIS)

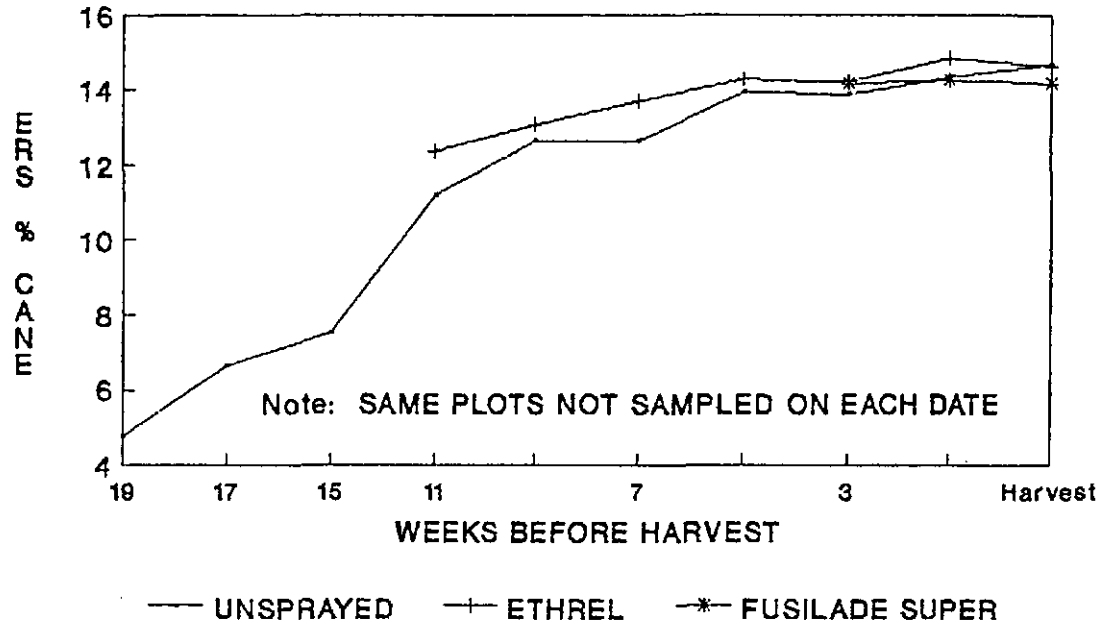

Figure 2
MASS OF ERS - SAMPLE DATA (g/stalk)
(R4091SIS)