Ann 7C

SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS' ASSOCIATION

CODE: N26 x Ripening 76/02/Sw/Ubo 'S'

Cat. No. : 2186

CHEMICAL RIPENING OF N26 WITH ETHREL AND FUSILADE SUPER

1. PARTICULARS OF PROJECT

This crop	:	3rd ratoon	**Age**	: 10.7 months
Site	:	Ubombo Sugar	**Dates**	: 29/9/01 – 20/8/02
Field	:	Hollander North		
Region	:	Northern Irrigated (Swd)	**Irrigation**	: Fully irrigated (furrow)
Soil Set	:	'S'	**Fertilizer**	: N P K
Design	:	Randomized blocks, 5 reps	**kg/ha**	160 0 200
Variety	:	N26	**Ripener application details:**	
Plot size	:	5 rows x 1.5m x 10m (gross) 3 rows x 1.5m x 8m (net)		

	Date	Age(m)	Weeks	Purity%
Ethrel	16/4/02	6.5	17.9	81
Fusilade	21/5/02	7.7	13.0	90

2. OBJECTIVE

- To determine the response of variety N262 to Ethrel and Fusilade Super applied either alone or as a combination treatment

3. TREATMENTS

1 Control
2 Ethrel 1.5 l/ha 18 weeks pre-harvest
3 Ethrel 1.5 l/ha at 18 weeks + Fusilade 0.2 l/ha 13 weeks pre harvest
4 Fusilade Super. 0.2 l/ha 13 weeks pre harvest
5 Ethrel 1.5 l/ha at 18 weeks + Fusilade 0.3 l/ha 13 weeks pre harvest
6 Fusilade Super 0.3 l/ha 13 weeks pre harvest
7 Ethrel 1.5 l/ha at 18 weeks + Fusilade S. 0.45 l/ha 13 weeks pre harvest
8 Fusilade Super 0.45 l/ha 13 weeks pre harvest

Ethrel and Fusilade were applied with a CO_2 constant pressure knapsack sprayer and a hand held 'T' boom fitted with two TK 1.5 flood nozzles, delivering ± 52 l/ha over a swath width of 6m at 200kPa.

4. SAMPLING PROCEDURE

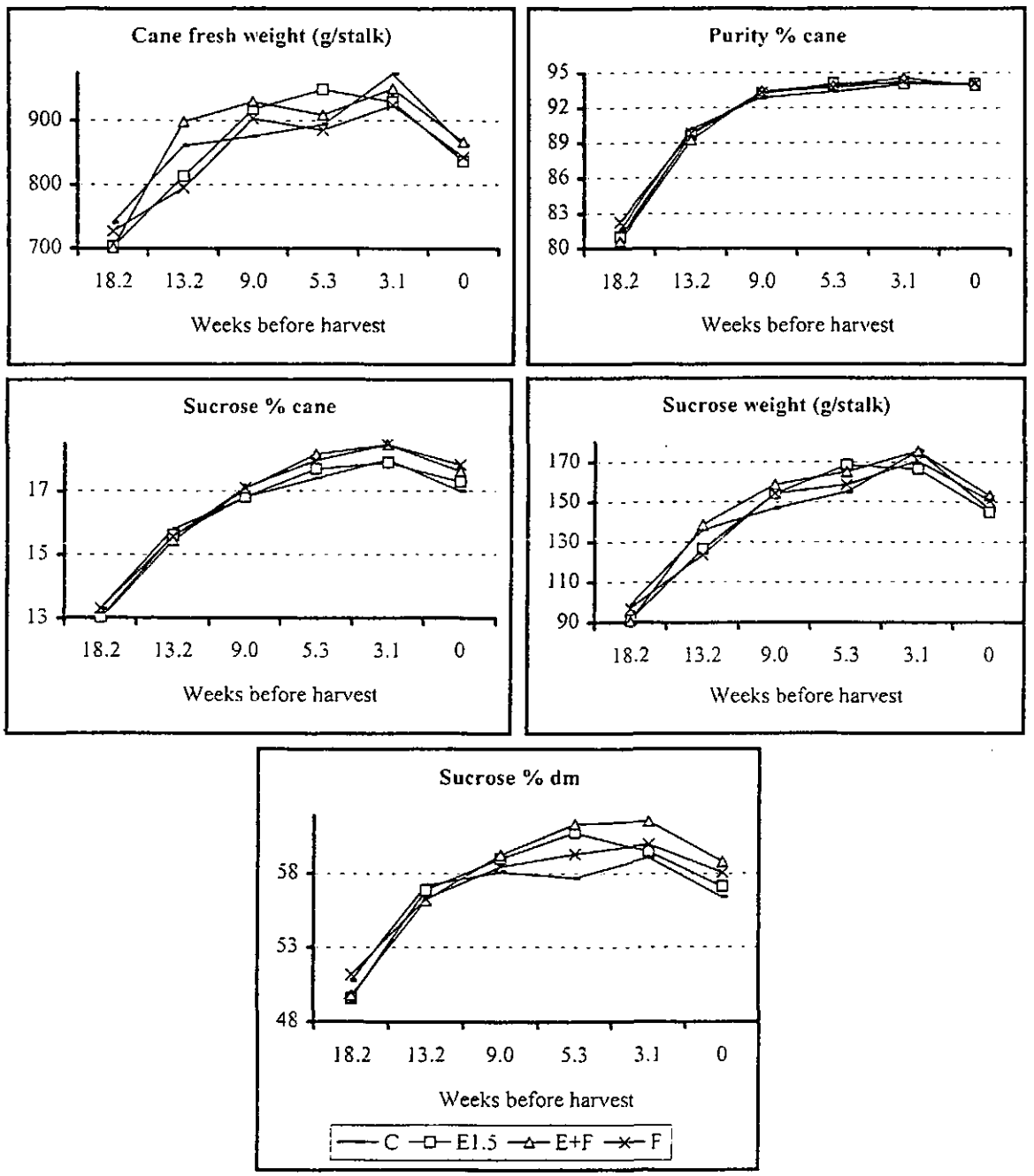
Groups of 4 stalks were taken from the net plot rows in a systematic manner on each sampling occasion to give a total of 16 stalks per plot. On subsequent occasions, sampling started one pace further into the plot and the same sequence of sampling was followed.

5. RESULTS AND DISCUSSION

Sample data

Juice purity averaged 81% when Ethrel was applied in April and 90% when Fusilade was applied in May. The cane was too mature to expect a strong ripening response (Appendix 1, Figure 1).

Figure 1: Sample data (see notes)



Notes: F = mean of all Fusilade treatments
E+F = mean of all Ethrel plus Fusilade treatments

There were small but statistically significant increases in sucrose % cane and erc % cane (cane quality) at harvest, in response to ripener treatments. The most effective treatments were Fusilade applied alone or with Ethrel, with no discernable difference among treatment rates. Ethrel alone did not significantly increase cane quality, indicating that improvements seen in the

combination treatments were due to Fusilade. Treatments had no significant effect on stalk weight, mass of sucrose or erc per stalk, or on sucrose % dry matter.

Stalk mass measurements indicated poor uniformity at the trial site and although CVs were generally low, this may have affected the accuracy of results. It should also be noted that the trial was harvested at the very end of the period in which a response to early season ripeners is normally expected. Furthermore, stalk moisture content was low throughout the spray to harvest interval, suggesting that the crop was under dry-off and not suitable for ripener application.

5.2 Harvest data

Treatments had no statistically significant effect on cane yield (Table 1). Improvements in sucrose and erc % cane were significant in most treatments where Fusilade was applied but the response to Ethrel alone was insignificant (see above).

Ripeners did not significantly increase yields of sucrose or erc.

Table 1: Yield and quality at harvest

Treatment	Tc/ha	Purity	Moist %	S%c*	Ts/ha*	Erc%c	Terc/ha
Control	87.2	94.0	69.8	17.0	14.9	15.9	13.9
Ethrel 1.5 l/ha @ 18w	89.5	94.1	69.6	17.3	15.5	16.2	14.5
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	82.2	94.2	69.8	17.4	14.4	16.3	13.5
Fusilade 0.2 l/ha @ 13w	81.5	93.9	69.5	17.7	14.4	16.5	13.5
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	74.3	93.7	70.0	17.6	13.1	16.4	12.2
Fusilade 0.3 l/ha @ 13w	88.1	94.1	68.9	17.9	15.8	16.8	14.8
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	85.3	93.9	70.1	17.9	15.3	16.7	14.3
Fusilade 0.45 l/ha @ 13w	77.1	94.3	69.3	17.9	13.8	16.8	12.9
Mean	83.2	94.0	69.6	17.6	14.6	16.5	13.7
LSD (P=0.05)	NS	NS	NS	0.6	NS	0.6	NS
LSD (P=0.01)	-	-	-	NS	-	NS	-
CV (%)	10.7	0.8	1.1	2.6	11.0	2.7	11.0

* = Sucrose measured as pol

6 CONCLUSIONS

- The results show that the quality of relatively mature N26 can be increased significantly with Fusilade.
- Sucrose sample data indicated that the crop and the trial site were not in a suitable condition for chemical ripening. Future trials should be conducted at a more uniform site and harvested earlier in the season.
- There were no statistical differences amongst yields of sucrose or erc.

DZ/DB

11/04/2003

7 APPENDICES

Appendix 1: Sample data

Cane fresh weight (g/ stalk)	Date of sample (weeks before harvest)						Incr.
Treatment	15 Apr. (18.2)	20 May (13.2)	19 Jun. (9.0)	15 Jul. (5.3)	30 Jul. (3.1)	21 Aug. (0)	0 - 14.8 wks
Control	741	861	876	894	974	861	120
Ethrel 1.5 l/ha @ 18w	703	813	918	949	930	836	133
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	691	943	883	991	1017	824	133
Fusilade 0.2 l/ha @ 13w	678	842	953	906	901	819	141
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	708	919	908	782	870	874	166
Fusilade 0.3 l/ha @ 13w	796	870	914	897	932	858	62
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	705	834	999	955	963	903	198
Fusilade 0.45 l/ha @ 13w	708	673	842	853	941	853	145
Mean	716	844	911	903	941	854	137
LSD (P=0.05)	NS	136	NS	NS	NS	NS	
LSD (P=0.01)	-	NS	-	-	-	-	
CV (%)	11.6	12.4	12.0	12.3	16.0	11.2	
Moisture % cane							
Control	73.8	72.3	71.1	69.9	69.5	69.8	-4
Ethrel 1.5 l/ha @ 18w	73.8	72.6	71.5	70.8	69.9	69.6	-4
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	74.2	72.5	71.4	70.7	69.9	69.8	-4
Fusilade 0.2 l/ha @ 13w	73.8	72.4	70.5	69.4	69.0	69.5	-4
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	73.5	72.2	70.8	70.0	69.8	70.0	-4
Fusilade 0.3 l/ha @ 13w	74.4	71.9	70.6	70.0	69.1	68.9	-6
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	74.2	72.9	71.4	70.4	70.3	70.1	-4
Fusilade 0.45 l/ha @ 13w	73.7	72.8	71.1	69.7	69.3	69.3	-4
Mean	73.9	72.4	71.1	70.1	69.6	69.6	-4
LSD (P=0.05)	NS	NS	NS	0.9	NS	NS	
LSD (P=0.01)	-	-	-	NS	-	-	
CV (%)	1.1	0.9	0.8	1.0	1.0	1.1	
Cane dry weight (g/ stalk)							
Control	194	238	253	270	298	259	65
Ethrel 1.5 l/ha @ 18w	185	223	261	277	280	254	69
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	178	259	252	290	306	248	70
Fusilade 0.2 l/ha @ 13w	178	232	281	276	279	250	72
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	188	256	265	235	263	263	75
Fusilade 0.3 l/ha @ 13w	204	245	269	269	288	267	63
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	182	226	286	282	285	270	88
Fusilade 0.45 l/ha @ 13w	186	183	243	258	288	262	76
Mean	187	233	264	270	286	259	72
LSD (P=0.05)	NS	38	NS	NS	NS	NS	
	-	51	-	-	-	-	
CV (%)	12.4	12.5	12.4	12.5	16.5	11.7	

Appendix 1: Sample data (cont.)

Purity % cane	Date of sample (weeks before harvest)						Incr.
Treatment	15 Apr. (18.2)	20 May (13.2)	19 Jun. (9.0)	15 Jul. (5.3)	30 Jul. (3.1)	21 Aug. (0)	14.1 - 0 weeks
Control	81.6	90.2	92.9	93.4	94.0	94.0	12.4
Ethrel 1.5 l/ha @ 18w	81.0	89.7	93.2	94.1	94.1	94.1	13.1
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	79.8	89.5	93.3	93.9	94.4	94.2	14.4
Fusilade 0.2 l/ha @ 13w	81.4	90.2	93.8	93.9	94.4	93.9	12.5
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	81.1	89.3	93.4	93.9	94.9	93.7	12.6
Fusilade 0.3 l/ha @ 13w	82.9	90.3	93.1	93.8	94.2	94.1	11.2
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	81.0	89.0	93.6	94.0	94.4	93.9	12.9
Fusilade 0.45 l/ha @ 13w	82.5	89.0	93.1	93.5	94.2	94.3	11.8
Mean	81.4	89.7	93.3	93.8	94.3	94.0	12.6
LSD (P=0.05)	1.7	NS	NS	NS	NS	NS	
LSD (P=0.01)	NS	-	-	-	-	-	
CV (%)	1.6	1.4	0.5	0.5	0.7	0.8	
Sucrose % cane*							
Control	13.3	15.8	16.8	17.4	18.0	17.0	4
Ethrel 1.5 l/ha @ 18w	13.0	15.6	16.8	17.7	17.9	17.3	4
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	12.7	15.3	17.1	18.1	18.4	17.4	5
Fusilade 0.2 l/ha @ 13w	13.1	15.4	17.4	18.2	18.7	17.7	5
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	13.1	15.4	16.8	18.2	18.7	17.6	5
Fusilade 0.3 l/ha @ 13w	13.5	15.7	17.0	17.8	18.3	17.9	4
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	13.1	15.6	17.3	18.2	18.3	17.9	5
Fusilade 0.45 l/ha @ 13w	13.3	15.6	16.9	17.9	18.4	17.9	5
Mean	13.1	15.6	17.0	17.9	18.4	17.6	4
LSD (P=0.05)	NS	NS	NS	NS	0.5	0.6	
LSD (P=0.01)	-	-	-	-	NS	NS	
CV (%)	3.7	3.5	2.5	2.7	2.1	2.6	
Erc % cane							
Control	11.3	14.4	15.6	16.2	16.9	15.9	5
Ethrel 1.5 l/ha @ 18w	11.0	14.2	15.6	16.6	16.8	16.2	5
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	10.6	13.9	15.9	16.9	17.3	16.3	6
Fusilade 0.2 l/ha @ 13w	11.1	14.1	16.3	17.0	17.5	16.5	5
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	11.1	14.0	15.6	17.1	17.6	16.4	5
Fusilade 0.3 l/ha @ 13w	11.6	14.3	15.8	16.6	17.2	16.8	5
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	11.1	14.1	16.2	17.0	17.2	16.7	6
Fusilade 0.45 l/ha @ 13w	11.4	14.1	15.8	16.7	17.3	16.8	5
Mean	11.2	14.1	15.8	16.8	17.2	16.5	5
LSD (P=0.05)	NS	NS	NS	NS	0.5	0.6	
LSD (P=0.01)	-	-	-	-	NS	NS	
CV (%)	4.6	4.2	2.7	2.9	2.3	2.7	

* = Sucrose measured as pol

Appendix 1: Sample data (cont.)

Sucrose weight (g/stalk)*	Date of sample (weeks before harvest)						Incr.
Treatment	15 Apr. (18.2)	20 May (13.2)	19 Jun. (9.0)	15 Jul. (5.3)	30 Jul. (3.1)	21 Aug. (0)	14.1 - 0 weeks
Control	98.8	135.9	147.0	155.0	175.5	146.4	47.6
Ethrel 1.5 l/ha @ 18w	91.6	126.5	154.2	168.5	166.6	144.9	53.3
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	87.7	144.3	151.2	178.8	187.3	144.0	56.3
Fusilade 0.2 l/ha @ 13w	88.9	130.2	165.4	164.6	168.1	145.0	56.1
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	92.9	141.6	152.5	143.0	163.1	154.1	61.2
Fusilade 0.3 l/ha @ 13w	108.2	136.4	155.2	159.1	170.5	153.9	45.7
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	92.0	129.9	172.7	173.7	176.1	161.3	69.3
Fusilade 0.45 l/ha @ 13w	94.4	104.4	142.4	152.4	173.3	153.0	58.6
Mean	94.3	131.2	155.1	161.9	172.6	150.3	56.0
LSD (P=0.05)	NS	21.0	NS	NS	NS	NS	
LSD (P=0.01)	-	NS	-	-	-	-	
CV (%)	13.0	12.4	12.0	12.2	15.9	11.7	
Ere weight (g/stalk)							
Control	84.1	124.0	136.6	144.3	164.2	136.8	52.7
Ethrel 1.5 l/ha @ 18w	77.4	115.0	143.6	157.9	156.1	135.5	58.1
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	73.4	131.0	141.0	167.5	175.9	134.8	61.4
Fusilade 0.2 l/ha @ 13w	75.5	118.7	154.5	154.0	157.7	135.5	60.0
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	78.6	128.3	142.0	133.8	153.7	143.9	65.3
Fusilade 0.3 l/ha @ 13w	93.4	124.6	144.3	148.8	159.8	144.1	50.7
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	77.8	117.7	161.3	162.8	165.2	150.9	73.1
Fusilade 0.45 l/ha @ 13w	81.0	94.4	132.5	142.2	162.4	143.4	62.4
Mean	80.1	119.2	144.5	151.4	161.9	140.6	60.5
LSD (P=0.05)	NS	19.4	NS	NS	NS	NS	
LSD (P=0.01)	-	NS	-	-	-	-	
CV (%)	13.8	12.5	12.0	12.2	15.8	11.7	
Suc % dry weight*							
Control	50.8	57.2	58.1	57.7	59.1	56.4	5.6
Ethrel 1.5 l/ha @ 18w	49.6	56.9	59.0	60.8	59.5	57.1	7.5
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	49.1	55.7	59.8	61.8	61.1	57.9	8.8
Fusilade 0.2 l/ha @ 13w	50.1	56.0	59.1	59.6	60.3	58.0	7.9
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	49.5	55.4	57.6	60.8	61.9	58.6	9.1
Fusilade 0.3 l/ha @ 13w	52.9	55.7	57.7	59.3	59.5	57.7	4.8
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	50.7	57.5	60.4	61.5	61.7	59.9	9.2
Fusilade 0.45 l/ha @ 13w	50.6	57.2	58.6	59.1	60.2	58.5	7.9
Mean	50.4	56.4	58.8	60.1	60.4	58.0	7.6
LSD (P=0.05)	NS	NS	NS	NS	NS	NS	
LSD (P=0.01)	-	-	-	-	-	-	
CV (%)	3.4	2.7	2.9	3.5	3.0	3.0	

* = Sucrose measured as pol

Appendix 2: Growth measurements at various ages

Treatment	Population (' 000/ha)			Height (cm to TVD)		
	Apr. (6.5m)	Jun. (8.4m)	Jul. (10.2m)	Apr. (6.5m)	Jun. (8.4m)	Jul. (10.2m)
Control	89	77	68	184	218	218
Ethrel 1.5 l/ha @ 18w	85	75	66	190	220	219
Ethrel 1.5 l/ha + Fusilade 0.2 l/ha @ 13w	95	75	67	181	215	216
Fusilade 0.2 l/ha @ 13w	90	78	68	184	207	214
Ethrel 1.5 l/ha + Fusilade 0.3 l/ha @ 13w	83	74	69	177	199	198
Fusilade 0.3 l/ha @ 13w	85	74	67	187	221	222
Ethrel 1.5 l/ha + Fusilade 0.45 l/ha @ 13w	100	79	64	183	215	207
Fusilade 0.45 l/ha @ 13w	88	78	77	181	208	205
Mean	89	76	68	183	213	212
LSD (P=0.05)	NS	NS	NS	NS	NS	NS
CV (%)	13.2	6.6	13.9	3.9	7.5	8.3