

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

7310/22 OFF-STATION CHEMICAL RIPENER TRIAL

Cat. No.: 1698

Object: To compare the effect of spraying Fusilade Super, Ethokem and Fusilade Super + Ethokem on mid-season sugarcane.

This crop: Fourth ratoon Age: 12,0 months.

Location: Hippo Valley Estates, Section 7, Field 7b.

Soil type: Predominantly PE.1 sandy clay loam derived from gneiss.

Design: Randomised blocks with 4 replications.

Variety/Spacing: NCo376, 1,5m between rows.

Planted: 23 June, 1984.

Harvested: 20 June, 1989. Last crop: 20 June, 1988.

Treatments:

1. Control - no chemical applied.
2. Control - no chemical applied.
3. Fusilade @ 0,41 kg a.i. (0,33 l/ha product).
4. Fusilade @ 0,21 kg a.i. (0,17 l/ha product).
5. Ethokem @ 0,44 kg a.i. (0,5 l/ha product).
6. Ethokem @ 0,87 kg a.i. (1,0 l/ha product).
7. Fusilade + Ethokem @ 0,33 l/ha and 0,5 l/ha respectively.
8. Fusilade + Ethokem @ 0,17 l/ha and 0,5 l/ha respectively.
9. Fusilade + Ethokem @ 0,33 l/ha and 1,0 l/ha respectively.
10. Fusilade + Ethokem @ 0,17 l/ha and 1,0 l/ha respectively.

Conduct:

1. This trial was superimposed on 9 month old fourth ratoon cane. Fertiliser application and irrigation was done by HVE according to the standard estate practices.
2. Before spraying the ripeners, 2m paths were cut in the field to facilitate access to plots.
3. Both Ethokem and Fusilade were applied on 22 March 1989, between 3.00 and 6.05 p.m. when conditions were calm and dry. The purity at spraying was 79,2%.
4. Samples for quality analysis before and after application were taken at 15, 13, 10, 8, 5, and 0 weeks before harvest.

Spraying details: A carbon dioxide pressurised knapsack sprayer was used with a T-boom capable of spraying two cane rows at a time. The T-boom was fitted with 3 TK 1,5 nozzles spaced 1,0m apart spraying downwards from about 0,50 cm above crop canopy. The solution was delivered at 102 l/ha at a constant pressure of 220 kPa and a walking speed of 1,25m/s.

RESULTS AND DISCUSSIONS

Relevant yield and quality data are presented in Table 1 and the stalk data in Table 2.

a) Quality effects: Figure 1 shows that Fusilade treatments increased ERCZ cans and that there were no differences between the standard (0,33 l/ha product) and half the standard (0,17 l/ha product) rates. Fusilade applied 13 weeks before harvest increased ERCZ cane starting from about 11 weeks before harvest up until harvest.

Ethokem applied alone at either 1,0 l/ha or 0,5 l/ha product did not increase ERCZ cane. The combination of Fusilade + Ethokem did not increase ERCZ cane significantly, and Figure 2 shows ERCZ cane differences between the combination treatments. The increase in ERCZ cane was greatly attributed to the Fusilade application, hence Ethokem alone had little effect on ERCZ cane.

The small ERCZ cane rise in Ethokem treatments 5 weeks before harvest (Figure 1) was attributed to sampling error. There were small differences between the standard rate of Fusilade and the Fusilade + Ethokem combinations indicating that Ethokem was not effective in enhancing the Fusilade effects. More quality data is presented in Appendix 1.

- b) Yield effects: Table 1 shows that cane yield was variable (C.V. = 10,68%), and that ripener treatments tended to reduce cane yield. Figure 3 shows that there were greater cane yield losses when Fusilade was applied in combination with Ethokem, regardless of the rates applied. ERC yield responses presented in Figure 4 show that both the Fusilade rates increased ERC yield, and that these responses were reduced in the presence of Ethokem.
- c) Stalk data: Table 2 shows that ripener treatments had no significant effects on stalk data.
- d) Visual symptoms: Characteristic Fusilade symptoms were observed during the ripening period. There was no marked symptoms of Ethokem effects. The combination treatments did not show any increase in leaf or stalk symptoms.

CONCLUSIONS

Fusilade rates gave a marginal cane yield decline, but this was compensated by enhanced ripening, with the result that both rates gave high ERC yield responses. The two rates of Ethokem did not affect quality and there was no evidence to suggest that Ethokem enhanced the Fusilade effects.

Ethokem had been reported elsewhere as having enhanced the Roundup effect. In this trial only the Fusilade + Ethokem combinations were tested. The Ethokem treatment will be tested in future using Roundup and the present trial will be terminated after next season's results.

Table 1 : Yield and Quality data

Treatments	Cane Yield (t/ha)	ERC % cane	ERC Yield (t/ha)	ERF % cane	ERF Yield (t/ha)
Controls	108,77	11,74	12,77	13,07	14,23
Ripener treatments	101,85	13,25	13,46	14,32	14,56
Fusilade std. rate	105,46	13,70	14,46	14,67	15,49
Fusilade @ $\frac{1}{2}$ std. rate	105,67	13,63	14,40	14,70	15,53
Ethokem @ 0,5 l/ha product	111,43	11,84	13,19	13,16	14,65
Ethokem @ 1l/ha product	103,92	11,76	12,15	12,99	13,47
Fusilade std. + Ethokem @ 0,5 l/ha	90,59	13,82	12,53	14,82	13,44
Fusilade @ $\frac{1}{2}$ std. + Ethokem @ 0,5 l/ha	98,11	13,59	13,34	14,54	14,27
Fusilade @ std. + Ethokem @ 1l/ha	96,69	14,16	13,70	15,11	14,62
Significance	N.S.	***	N.S.	***	N.S.
L.S.D. treat means 5%	16,00	0,50	2,09	0,48	2,38
1%	21,61	0,68	2,83	0,65	3,22
Trial mean	103,20	12,95	13,32	14,07	14,49
S.E. single plot \pm	11,03	0,35	1,44	0,33	1,64
S.E. treat means \pm	5,51	0,17	0,72	0,17	0,82
C.V.%	10,68	2,67	10,84	2,37	11,34

Table 2 : Stalk data at harvest

Treatments	Stalk numbers /ha x 1000	Stalk length (m)	Stalk diameters (cm)
Controls	156,80	2,61	2,12
Ripening treatment	157,86	2,25	2,11
Fusilade std. rate	160,80	2,06	2,16
Fusilade @ $\frac{1}{2}$ std. rate	153,65	2,23	2,18
Ethokem @ 0,5 l/ha product	159,45	2,57	2,15
Ethokem @ 1,0 l/ha product	155,65	2,53	2,13
Fusilade std. + Ethokem @ 0,5 l/ha	160,30	2,03	2,10
Fusilade @ $\frac{1}{2}$ std. + Ethokem @ 0,5 l/ha	159,28	2,20	2,13
Fusilade std. + Ethokem @ 1,0 l/ha	159,78	2,07	2,02
Fusilade @ $\frac{1}{2}$ std. + Ethokem @ 1,0 l/ha	154,00	2,28	2,04
Significance	N.S.	N.S.	N.S.
L.S.D. treat means 5%	12,94	0,31	0,21
1%	17,47	0,42	0,28
Trial mean	157,65	2,32	2,11
S.E. single plot \pm	8,92	0,21	0,14
S.E. treat means \pm	4,46	0,11	0,07
C.V.%	5,65	9,10	6,66

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APPENDIX 1 : Maturity test sampling before and at harvest

a) ERCZ cane

Treatments	Weeks before harvest					
	15	13	10	8	5	0
1. Controls	7,35	7,29	8,42	9,47	10,44	11,74
2. Ripening treatments	7,30	7,91	9,64	10,66	12,49	13,25
3. Fusilade std. rate	7,14	7,68	9,89	11,16	12,87	13,70
4. Fusilade @ ½ std. rate	7,03	7,93	9,94	11,23	12,89	13,63
5. Ethokem @ 0,5 l/ha product	7,52	8,05	9,31	9,29	10,88	11,84
6. Ethokem @ 1,0 l/ha product	7,02	7,90	8,87	9,57	10,98	11,76
7. Fusilade @ std. + Ethokem 0,5 l/ha	7,82	7,72	9,96	11,19	13,19	13,82
8. Fusilade @ ½ std. + Ethokem 0,5 l/ha	7,80	8,68	9,75	11,13	12,98	13,59
9. Fusilade @ std. + Ethokem 1,0 l/ha	7,10	7,66	9,80	10,99	13,24	14,16
10. Fusilade @ ½ std. + Ethokem 1,0 l/ha	6,98	7,66	9,63	10,71	12,90	13,52

b) BRFZ cane

Treatments	Weeks before harvest					
	15	13	10	8	5	0
1. Controls	10,19	9,79	10,43	11,21	12,04	13,07
2. Ripening treatments	10,06	10,21	11,42	12,24	13,76	14,32
3. Fusilade @ std. rate	9,95	9,90	11,69	12,69	14,10	14,67
4. Fusilade @ ½ std. rate	9,81	10,22	11,70	12,66	14,16	14,70
5. Ethokem @ 0,5 l/ha product	10,15	10,38	11,03	11,19	12,52	13,16
6. Ethokem @ 1,0 l/ha product	9,87	10,15	10,74	11,25	12,53	12,99
7. Fusilade @ std. + Ethokem 0,5 l/ha	10,47	10,23	11,61	12,67	14,24	14,82
8. Fusilade @ ½ std. + Ethokem 0,5 l/ha	10,44	10,58	11,51	12,62	14,08	14,54
9. Fusilade @ std. + Ethokem 1,0 l/ha	9,92	10,08	11,57	12,58	14,36	15,14
10. Fusilade @ ½ std. + Ethokem 1,0 l/ha	9,90	10,14	11,48	12,29	14,10	14,56

c) PurityZ juice

Treatments	Weeks before harvest					
	15	13	10	8	5	0
1. Controls	75,43	77,45	81,22	84,62	87,37	89,73
2. Ripening treatments	76,11	79,59	83,59	85,95	90,20	91,67
3. Fusilade @ std. rate	76,05	79,69	83,65	86,52	90,30	91,84
4. Fusilade @ ½ std. rate	74,75	79,85	83,32	87,01	90,04	91,70
5. Ethokem @ 0,5 l/ha product	76,96	79,62	83,76	83,73	87,43	90,10
6. Ethokem @ 1,0 l/ha product	75,21	79,71	82,59	84,71	88,12	90,35
7. Fusilade std.+ Ethokem 0,5 l/ha	77,55	78,01	84,51	86,54	91,63	92,74
8. Fusilade @ ½ std.+ Ethokem 0,5 l/ha	77,87	82,80	83,65	86,62	92,06	92,19
9. Fusilade @ std.+ Ethokem 1,0 l/ha	74,99	78,65	83,66	86,18	91,32	92,47
10. Fusilade @ ½ std.+ Ethokem 1,0 l/ha	75,49	78,42	83,57	86,28	90,66	91,96

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Fig 1: CHANGES IN ERC % CANE BETWEEN RIPENER TREATMENTS.

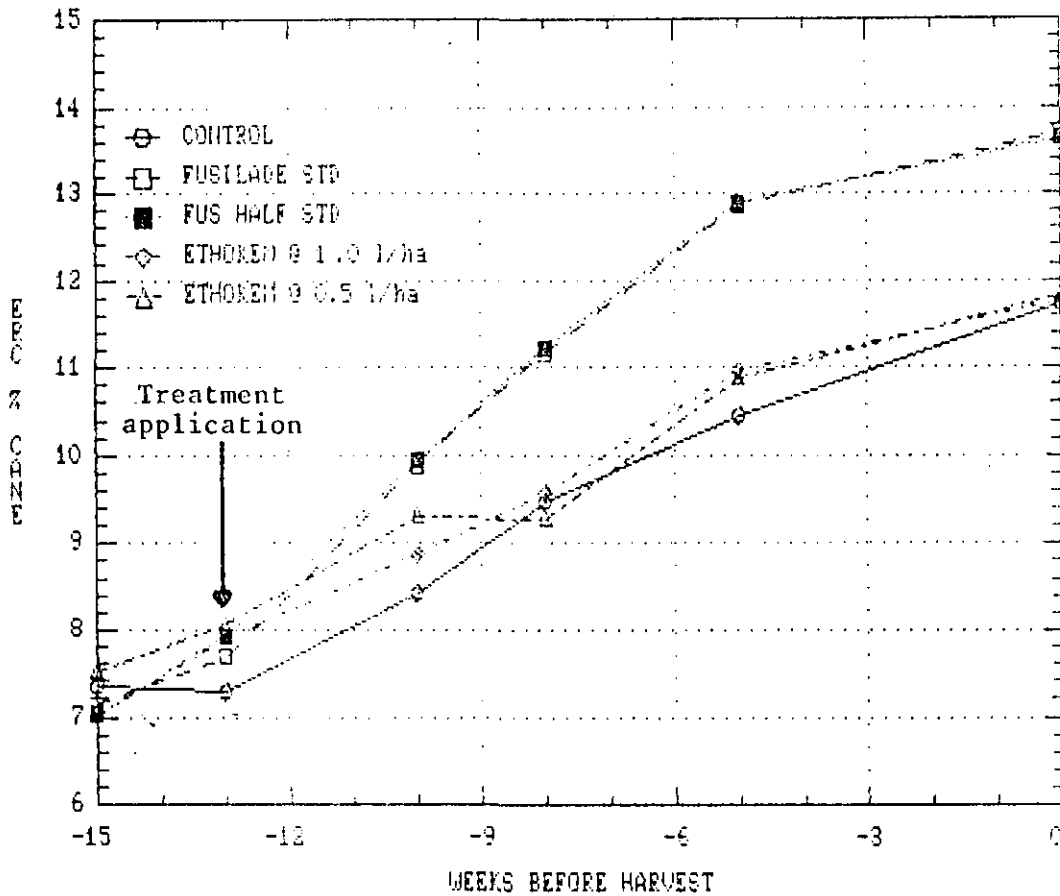
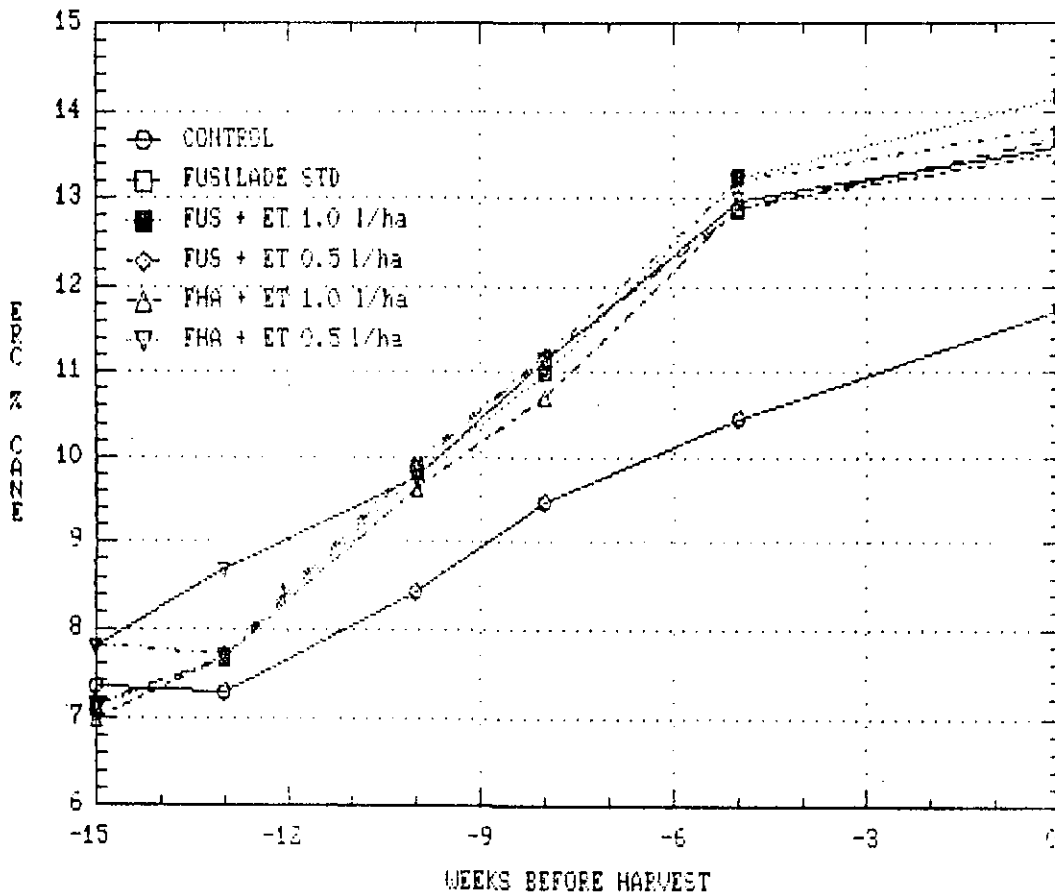


Fig 2: FUSILADE vs ETHOKEN + FUSILADE COMBINATIONS.



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Fig 3: EFFECTS OF FUSILADE, ETHOXYM AND COMBINATIONS ON CANE YIELD.

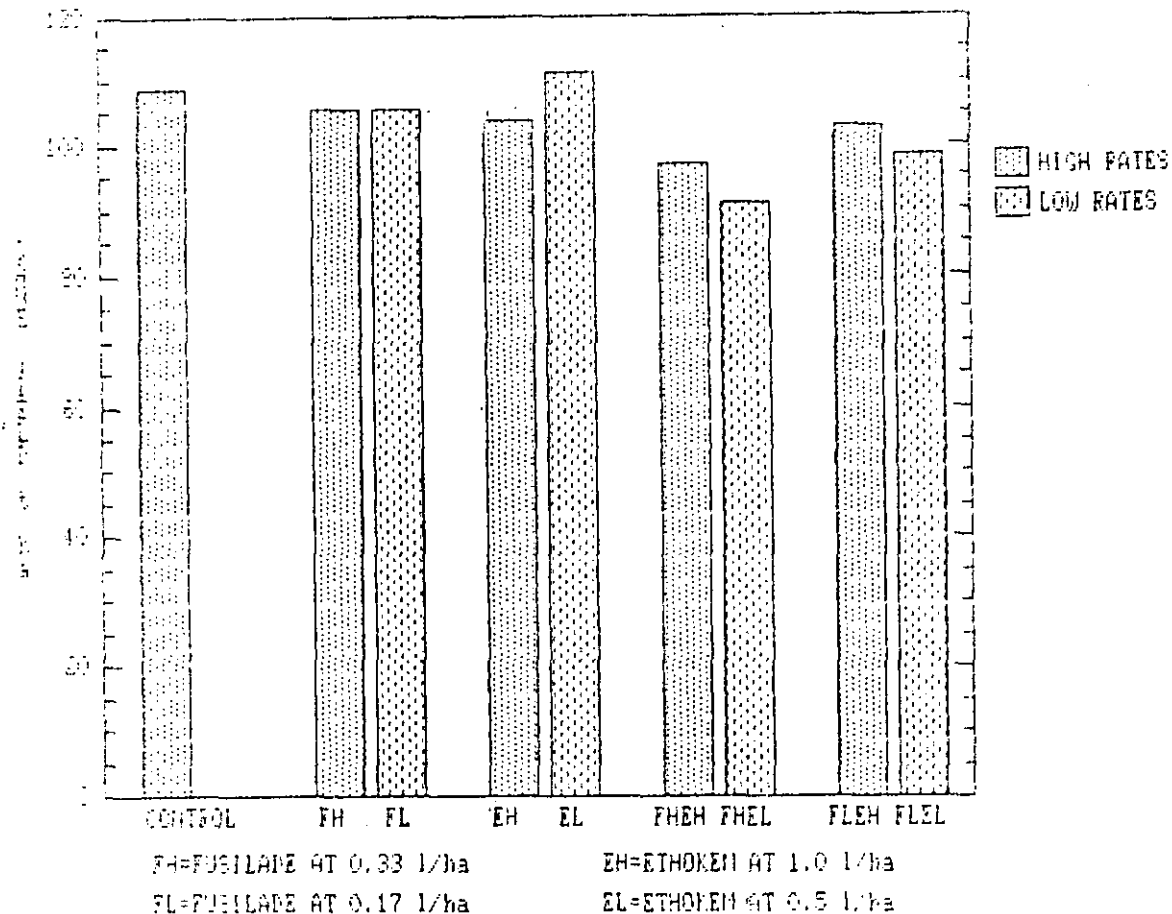


Fig 4: EFFECTS OF FUSILADE, ETHOXYM AND COMBINATIONS ON ERC YIELD.

