SOUTH AFRICAN SUGAR INDUSTRY AGRONOMISTS' ASSOCIATION

7310/15 CHEMICAL RIPENER TRIAL

Cat.: 1598

Object: To compare the effects of spraying Ethrel, Roundup, Fusilade and combinations thereof on early-season NCo376 and N14.

This crop: Plant crop Age: 13,8 months

Planted: 26.3.86 Harvested: 18.5.87

Location: ZSA Experiment Station, Field C8-11.

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

Design: 2 x 6 factorial design with 4 replications.

Spacing: 1,5m between rows.

Fertiliser: (kg/ha)

	N	P_2O_5	K_2O
P	100	100	60

Irrigation: 1 690 mm Rainfall: 487 mm

Treatments:

a) Varieties
1. NCo376
2. N14

b) Ripeners
1. Control - no chemical ripener
2. Ethrel
3. Ethrel + Roundup
4. Ethrel + Fusilade
5. Roundup
6. Fusilade

N.B. i) The rates of the different ripeners were:
Ethrel @ 0,72 kg/ha a.i. (1,5 l/ha product).
Roundup @ 0,25 kg/ha a.i. (0,6 l/ha product).
Fusilade Super @ 0,041 kg/ha a.i. (0,33 l/ha product).

ii) Ethrel was to be applied before juice purities reached 70% and Roundup and Fusilade were to be applied at 10 weeks.

Conduct:

1. Ethrel was applied on 6 January, 1987, (19 weeks before harvest), when the mean juice purity for the trial was 72,3%. Reps. 1 and 2 of the trial were sprayed under calm conditions from 9.30 -10.15 a.m., after the dew had dried off the leaves. Reps. 3 and 4 were sprayed between 6.00 - 6.45 p.m. on the same day, after the wind had died down.
2. Roundup and Fusilade were applied on 10 March, 1987, (10 weeks before harvest) between 5.30 and 7.45 p.m., under calm, dry conditions. N14 plots in Reps. 2 and 4 were badly lodged, thus slowing down the spraying operation.
3. 24-stalk samples for juice quality analysis were taken at 19, 10, 6, 4, 2 and 0 weeks before harvest. A visual assesment of each sprayed treatment was made from one replication at 10, 6, 4 and 2 weeks before harvest.

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4. This trial received its last irrigation on 23 March, 1987, and was dried-off for 8 weeks before harvest.

Spraying details:

1. A carbon dioxide pressurised knapsack sprayer was used, with a T-boom capable of spraying two cane rows at a time.
2. The T-boom had three TK 1,5 nozzles spaced 1,0m apart, spraying down onto the canopy. At a constant pressure of 220 kPa and a walking speed of 1,25 m/s this boom delivered 102 l/ha.
3. The cross-piece of the T-boom was kept approximately 50cm above the canopy when spraying.

RESULTS

a) Yield and stalk data (see Table 1) There were small yield responses of 1,89 t/ha ERC and 0,79 t/ha ERF to ripeners, but these were not significant. Cane yields were variable, affecting all other yield data so that coefficients of variation (C.V.'s) were all above 10%. Ripeners had little effect on stalk characteristics except that most of the Ethrel treatments had longer stalks and Fusilade treatments had shorter stalks than the control. The Ethrel + Roundup treatment had the longest stalks, the highest cane yield and it lodged the most.

N14 outyielded NCo376 due to larger stalks, not higher stalk population, and both varieties had a similar score for lodging.

b) Quality data at harvest are shown in Table 2, which shows a response to ripeners in all parameters except ERF and fibre% cane. All treatments that received Ethrel performed significantly better than the control in terms of ERC and Pol% cane, but Roundup and Fusilade on their own did not.

Figure 1 shows little difference between treatments up until 6 weeks, with the first sucrose response to ripeners appearing at 4 weeks (see Table 3). All treatments except Ethrel + Roundup showed either a decline or a slowing down in their rate of sucrose accumulation between 6 and 2 weeks before harvest.

Purity% juice for the trial showed a clear trend from the start of spraying to harvest, as shown by the data below (extracted from Tables 2, 3 and 4):

Date	Weeks before harvest	Purity% juice (Trial mean)
6. 1.87	19	72,3
9. 3.87	10	85,7
7. 4.87	6	88,5
23. 4.87	4	89,2
5. 5.87	2	87,0
18. 5.87	0	85,2

There was a large increase from 19 to 10 weeks, followed by a peak at 4 weeks, and then a decline from 4 weeks to harvest. Fibre% cane also reached a peak at 4 weeks and was only 11% at harvest, which was low. Ripened

cane generally had less fibre than the control, but differences were not significant.

From 10 weeks up until harvest NCo376 had higher ERC, ERF and Pol% cane than N14. There were no differences in purity% juice between varieties, but N14 had less fibre than NCo376 at harvest.

c) Variety x Ripener Interactions (see Table 5) At 6 weeks there were significant interactions for ERC and Pol% cane because all NCo376 ripener treatments were significantly better than N14, except treatments sprayed with Roundup. N14 showed an improvement in quality with Roundup application while Nco376 showed a decline.

The ERF% cane variety x ripener interaction was significant at 2 weeks and at harvest. At 2 weeks Roundup had depressed quality in NCo376 such that it was the same as Roundup-treated N14, whereas for all other ripeners, NCo376 performed better than N14. At harvest there was an Ethrel response on N14 but not on NCo376, while Fusilade gave the best ripener responses on NCo376 and the worst responses on N14.

d) Visual symptoms observed 2 weeks before harvest are summarised below:

Ripeners	NCo376	N14
Ethrel	No visual symptoms	No visual symptoms
Ethrel + Roundup	Reduced top growth. Dead spindle leaves + side-shoots on some stalks.	Reduced top growth, deformed leaves and start of side-shoots.
Ethrel + Fusilade	Apex tapering to a sharp point. Dead leaves, ring-barking and side-shoots on some stalks.	Dead leaves but no ring-barking.
Roundup	Marginally reduced top growth. Dead leaves.	Dead leaves and withered and wrinkled internodes.
Fusilade	As for Ethrel + Fusilade but no side-shoots.	Dead spindles.

DISCUSSION

The purity% juice of 70% that had been prescribed for Ethrel spraying occurred 19 weeks before harvest, which was very early. It was anticipated that Ethrel would produce a response within 6-8 weeks which would then last for a time, but not up until harvest. However, the Ethrel response took 15 weeks to appear and it did last until harvest, which was unusual considering that there were no visual symptoms.

The sharp rise in purity% juice and its subsequent decline were also unexpected, and purities were high for an early-season plant crop. Purity% juice at 10 weeks was 85,4; which was too high for a good response to either Roundup or Fusilade.

CONCLUSIONS

Cane yields were very variable and quality responses were too small for there to have been any significant yield responses. All treatments sprayed with Ethrel gave an ERC% cane response, but Roundup or Fusilade had little effect when either applied after Ethrel or to untreated cane.

N14 had a higher cane yield than NCo376 but the latter had better quality. Varieties responded similarly to ripeners except that there was no ERF% cane response to Ethrel at harvest on N14 and not on NCo376.

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TABLE 1: Yield and stalk data

	CANE YIELD t/ha	ERC YIELD t/ha	ERF YIELD t/ha	STALKS/ha x 10^{-3}	CANE DIAMETERS cm	STALK LENGTH m	LODGING %
Varieties (V)							
1. NCo376	156,47	20,89	24,29	142,3	2,3	2,71	29
2. N14	178,92	22,16	25,25	118,2	2,6	2,85	23
Significance	***	N.S.	N.S.	-	-	-	-
L.S.D. 5%	10,08	-	-	-	-	-	-
1%	13,55	-	-	-	-	-	-
S.E. V mean ±	3,50	0,66	0,62	-	-	-	-
Ripners (R)							
1. Control	166,91	19,95	24,11	129,2	2,4	2,75	20
Ripening treatments	167,85	21,84	24,90	130,5	2,5	2,78	27
Significance	N.S.	N.S.	N.S.	-	-	-	-
2. Ethrel	169,85	22,40	25,60	132,9	2,5	2,87	20
3. Ethrel + Roundup	172,95	23,09	25,73	131,1	2,4	2,92	58
4. Ethrel + Fusilade	165,93	21,65	25,02	129,5	2,4	2,65	14
5. Roundup	160,71	20,53	23,53	126,9	2,5	2,80	28
6. Fusilade	169,83	21,54	24,63	132,0	2,5	2,68	15
Significance	N.S.	N.S.	N.S.	-	-	-	-
S.E. R mean ±	6,06	1,15	1,07	-	-	-	-
V x R interaction	N.S.	N.S.	N.S.	-	-	-	-
Trial mean	167,70	21,53	24,77	130,3	2,5	2,78	-
S.E. single plot ±	17,15	3,25	3,02	-	-	-	-
C.V.%	10,22	15,10	12,18	-	-	-	-

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TABLE 2: Quality data at 2 weeks and at harvest

	2 WEEKS BEFORE HARVEST (5.5.87)					AT HARVEST (18.5.87)				
	ERC% CANE	ERF% CANE	POL% CANE	PURITY% JUICE	FIBRE% CANE	ERC% CANE	ERF% CANE	POL% CANE	PURITY% JUICE	FIBRE% CANE
Varieties (V)										
1. NCo376	12,63	14,41	14,20	86,7	10,9	13,32	15,55	15,16	84,9	11,7
2. N14	11,94	13,35	13,37	87,3	10,1	12,37	14,11	14,00	85,2	10,3
Significance	***	***	***	N.S.	*	**	***	***	N.S.	***
L.S.D. 5%	0,36	0,30	0,34	-	0,6	0,61	0,46	0,54	-	0,6
1%	0,48	0,40	0,45	-	-	0,82	0,61	0,73	-	-
S.E. V mean ±	0,12	0,10	0,12	0,4	0,2	0,21	0,16	0,19	0,6	0,2
Ripeners (R)										
1. Control	11,81	13,73	13,39	85,7	10,7	11,99	14,58	13,93	82,3	11,6
Ripening treatments	12,38	13,91	13,86	87,3	10,5	13,02	14,88	14,71	85,8	10,9
Significance	*	N.S.	N.S.	*	N.S.	*	N.S.	*	**	N.S.
2. Ethrel	11,96	13,61	13,48	86,4	10,5	13,09	15,06	14,83	85,3	10,5
3. Ethrel + Roundup	12,78	14,16	14,19	88,6	10,2	13,36	14,91	14,91	87,7	10,9
4. Ethrel + Fusilade	12,69	14,20	14,19	87,3	10,2	13,12	15,17	14,90	84,9	10,8
5. Roundup	11,88	13,55	13,42	86,2	10,7	12,79	14,66	14,49	85,6	11,2
6. Fusilade	12,57	14,04	14,04	87,8	10,9	12,73	14,60	14,43	85,4	11,0
Significance	*	*	*	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
L.S.D. R means 5%	0,62	0,51	0,56	1,9	-	1,05	-	0,94	3,1	-
1%	-	-	-	-	-	-	-	-	4,2	-
S.E. R mean ±	0,22	0,18	0,20	0,7	0,4	0,37	0,28	0,33	1,1	0,4
V x R interaction	N.S.	*	N.S.	N.S.	N.S.	1,54	*	N.S.	N.S.	N.S.
Trial mean	12,28	13,88	13,78	87,0	10,5	12,85	14,83	14,58	85,2	11,0
S.E. single plot ±	0,61	0,50	0,57	1,9	1,0	1,03	0,78	0,93	3,0	1,0
C.V.%	4,98	3,62	4,15	2,14	9,5	8,05	5,25	6,36	3,57	9,46

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TABLE 3: Quality data at 6 and 4 weeks before harvest

	6 WEEKS BEFORE HARVEST (7.4.87)					4 WEEKS BEFORE HARVEST (23.4.87)				
	ERC% CANE	ERF% CANE	POL% CANE	PURITY% JUICE	FIBRE% CANE	ERC% CANE	ERF% CANE	POL% CANE	PURITY% JUICE	FIBRE% CANE
Varieties (V)										
1. NCo376	12,25	13,92	13,66	88,3	11,0	12,67	14,35	14,07	89,4	12,1
2. N14	11,16	12,59	12,44	88,6	10,4	11,40	12,85	12,77	89,0	12,9
Significance	**	***	***	N.S.	*	***	***	***	N.S.	N.S.
L.S.D. 5%	0,38	0,33	0,36	-	0,5	0,41	0,37	0,38	-	2,2
1%	0,51	0,44	0,49	-	-	0,55	0,49	0,51	-	-
S.E. V mean ±	0,13	0,11	0,13	0,3	0,2	0,14	0,13	0,13	0,4	0,4
Ripeners (R)										
1. Control	11,52	13,09	12,87	88,6	11,5	11,49	13,27	12,94	88,1	13,2
Ripening treatments	11,74	13,29	13,09	88,4	10,6	12,15	13,67	13,52	89,4	12,4
Significance	N.S.	N.S.	N.S.	N.S.	*	*	N.S.	*	*	N.S.
2. Ethrel	11,55	12,97	12,85	88,7	10,5	12,10	13,60	13,45	90,0	13,0
3. Ethrel + Roundup	11,60	13,25	12,94	88,3	10,4	12,32	13,69	13,64	90,0	11,9
4. Ethrel + Fusilade	12,25	13,64	13,57	89,1	10,3	12,59	14,11	13,91	89,8	10,8
5. Roundup	11,52	13,24	12,94	87,3	10,6	11,85	13,55	13,27	88,3	12,0
6. Fusilade	11,78	13,36	13,12	88,8	11,0	11,88	13,38	13,31	89,2	14,2
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	*
L.S.D. R means 5%	-	-	-	-	0,9	0,71	-	0,66	1,8	2,2
1%	-	-	-	-	-	-	-	0,89	-	-
S.E. R means ±	0,23	0,20	0,22	0,6	0,3	0,25	0,22	0,23	0,6	0,8
V x R interaction	*	N.S.	*	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Trial mean	11,70	13,26	13,05	88,5	10,7	12,04	13,60	13,42	89,2	12,5
S.E. single plot ±	0,65	0,56	0,62	1,6	0,9	0,70	0,62	0,65	1,7	2,2
C.V.%	5,57	4,22	4,75	1,76	8,49	5,78	4,57	4,83	1,93	17,4

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TABLE 4: Quality at spraying

a) ETHREL AT 19 WEEKS (6.1.87) : Day of spraying

	ERC% CANE	ERF% CANE	POL% CANE	PURITY% JUICE	FIBRE% CANE
Variety 1. NCo376	5,92	8,86	7,66	71,8	9,4
2. N14	5,82	8,36	7,46	72,9	9,6
t-test : NCo376 vs. N14	N.S.	*	N.S.	N.S.	N.S.
Trial mean	5,87	8,61	7,56	72,3	9,5
S.E. trial mean	0,12	0,11	0,11	0,5	0,2

b) ROUNDUP AND FUSILADE AT 10 WEEKS (9.3.87)
1 day before spraying

	ERC% CANE	ERF% CANE	POL% CANE	PURITY% JUICE	FIBRE% CANE
a) Variety 1. NCo376	10,50	12,44	11,91	86,1	10,4
2. N14	9,41	11,11	10,74	85,3	9,8
t-test : NCo376 vs. N14	***	***	***	N.S.	*
b) Ripeners 1. Unsprayed	9,82	11,66	11,20	85,4	10,3
2. Ethrel	10,10	11,89	11,45	86,0	9,9
t-test : Unsprayed vs. Ethrel	N.S.	N.S.	N.S.	N.S.	N.S.
Trial mean	9,96	11,78	11,32	85,7	10,1
S.E. Trial mean	0,13	0,13	0,13	0,3	0,11

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TABLE 5: Two-way interaction tables of means

a) ERC% cane at 6 weeks

VARIETIES (V)	RIPENERS (R)						MEAN
	Control	Ethrel	Ethrel+ Roundup	Ethrel + Fusilade	Roundup	Fusilade	
NCo376	12,32	12,09	11,86	13,25	11,39	12,57	12,25
N14	10,71	11,00	11,33	11,26	11,66	11,00	11,16
Mean	11,52	11,55	11,60	12,25	11,52	11,78	11,70

L.S.D. V x R means 5% = 0,94

b) POL% cane at 6 weeks

VARIETIES (V)	RIPENERS (R)						MEAN
	Control	Ethrel	Ethrel+ Roundup	Ethrel + Fusilade	Roundup	Fusilade	
NCo376	13,73	13,47	13,25	14,58	12,90	14,02	13,66
N14	12,01	12,24	12,63	12,57	12,98	12,23	12,44
Mean	12,87	12,85	12,94	13,57	12,94	13,12	13,05

L.S.D. V x R means 5% = 0,89

c) ERF% cane at 2 weeks

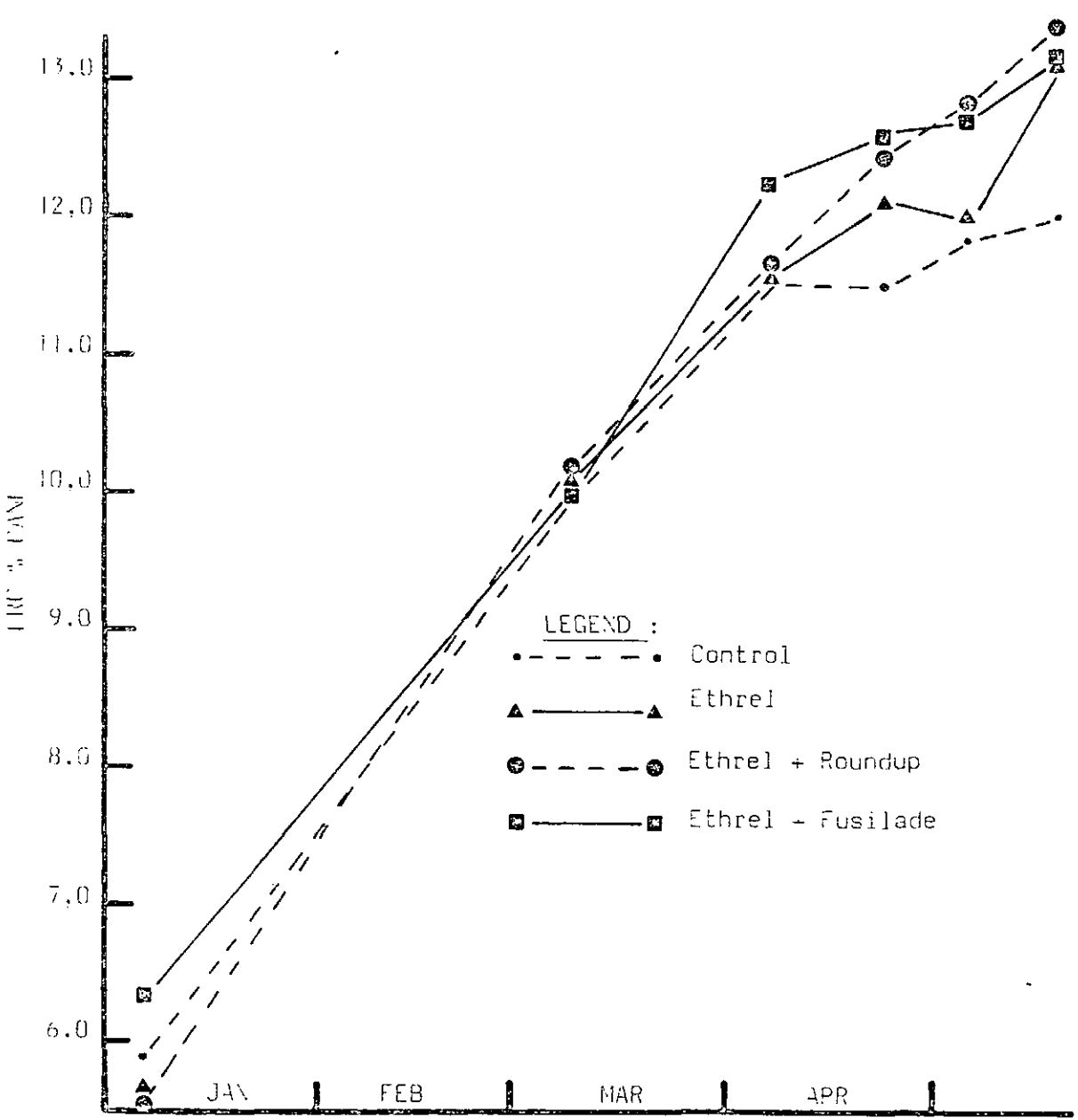
VARIETIES (V)	RIPENERS (R)						MEAN
	Control	Ethrel	Ethrel+ Roundup	Ethrel + Fusilade	Roundup	Fusilade	
NCo376	14,34	14,09	14,60	15,02	13,59	14,84	14,41
N14	13,12	13,13	13,73	13,39	13,51	13,24	13,35
Mean	13,73	13,61	14,16	14,20	13,55	14,04	13,88

L.S.D. V x R means 5% = 0,72
1% = 0,97

d) ERF% cane at Harvest

VARIETIES (V)	RIPENERS (R)						MEAN
	Control	Ethrel	Ethrel+ Roundup	Ethrel + Fusilade	Roundup	Fusilade	
NCo376	15,57	15,15	15,34	16,21	15,16	15,97	15,55
N14	13,60	14,97	14,58	14,12	14,17	13,33	14,11
Mean	14,58	15,06	14,91	15,17	14,66	14,60	14,83

L.S.D. V x R means 5% = 1,12



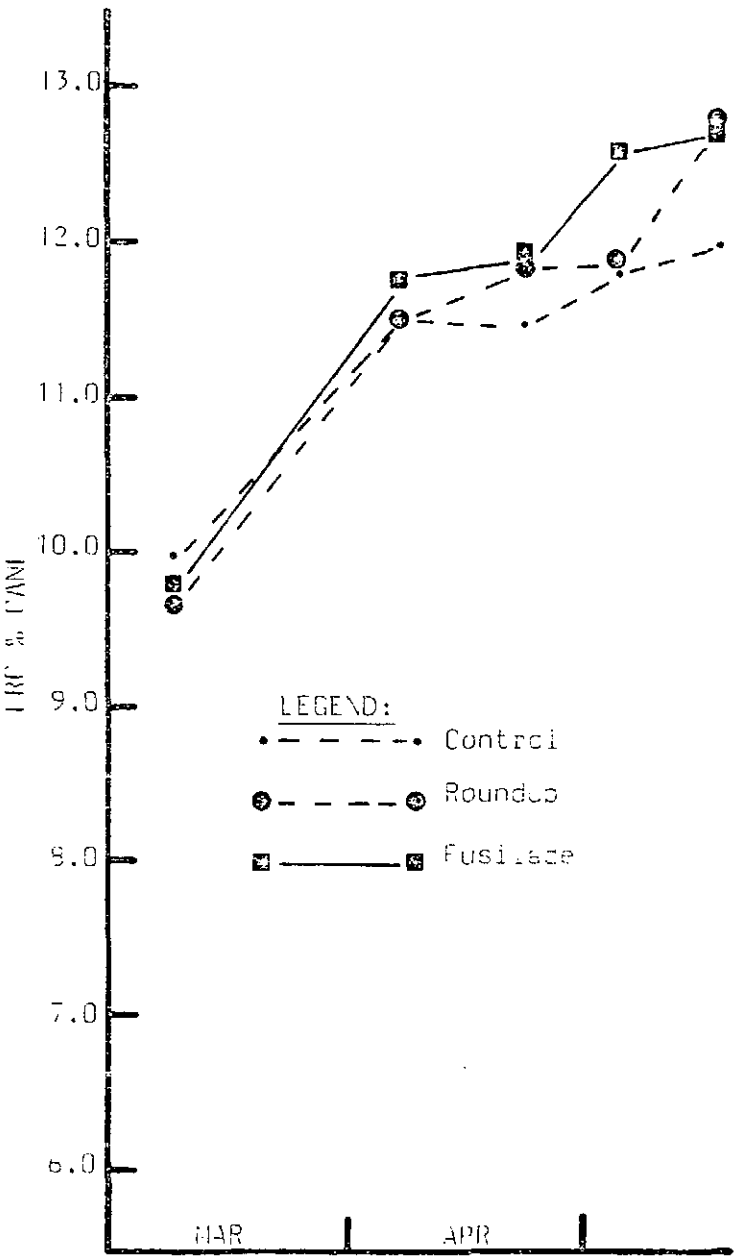


Figure 1: Change in ERC% cane from spraying to harvest with chemical ripening (Ripener treatments are means of both varieties, viz \Co376 and \N14

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7310/15 CHEMICAL RIPENER TRIAL

Cat : 1598

Object: To compare the effect of spraying Ethrel, Roundup, Fusilade Super and combinations thereof on early-season harvested NCo376 and N14.

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

Location: ZSA Experiment Station.

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

Design: 2 x 6 factorial design with 4 replications.

Spacing: 1,5m between rows.

Planted: 26th March, 1986.

Harvested:

	Harvest	Age
P	18.5.87	13,8 months
1R	19.5.88	12,0 months

Fertiliser (kg/ha):

	N	P_2O_5	K_2O
P	100	100	60
1R	160	60	60

Irrigation: 1 430 mm Rainfall: 692 mm

Treatments:

a) Varieties
1. NCo376
2. N14

b) Ripeners
1. Control - no chemical ripener.
2. Ethrel @ 0,72 kg/ha a.i. (1,5l/ha product).
3. Ethrel + Roundup (Ethrel @ 0,72 kg/ha a.i. and Roundup @ 0,25 kg/ha a.i. (0,6 l/ha product)).
4. Ethrel + Fusilade Super (Ethrel @ 0,72 kg/ha a.i. and Fusilade Super @ 0,41 kg/ha a.i. (0,33 l/ha product)).
5. Roundup @ 0,25 kg/ha a.i. (0,6 l/ha product).
6. Fusilade Super @ 0,041 kg/ha a.i. (0,33 l/ha product).

Conduct:

1. Ethrel was applied on 28 December 1987, (20 weeks before harvest), when the mean juice purity was 60,1%. It was sprayed under calm conditions from 9.35 a.m. to 11.15 a.m., after the dew had evaporated from the leaves.
2. Roundup and Fusilade were sprayed on 8 March 1988, (10 weeks before harvest), between 9.30 a.m. and 10.15 a.m. also under calm conditions and purity was 86,6%.
3. Samples of 24 randomly selected cane stalks were taken for juice quality analysis at 20, 19, 14, 10, 6, 4, and 0 weeks before harvest. Visual assesment of each sprayed treatment was made at 10, 6, 4, 2, and 0 weeks before harvest,
4. The trial received its last irrigation on 4 March 1988, but the drying-off schedule was affected by 170mm of rainfall which fell later in 17 days.

Spraying details:

1. A carbon dioxide pressurised knapsack sprayer was used with a T-boom capable of spraying two cane rows at a time.
2. The T-boom had three TK$_{1,5}$ nozzles spaced 1,0m apart spraying down from approximately 50cm above the crop canopy.
3. The boom delivered 102 l/ha of solution at a constant pressure of 220 kPa and a walking speed of 1,25 m/s.

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RESULTS

The first ratoon results are presented together with plant crop data and means for the two crop cycles.

a) Cane yield: Relevant yield data are presented in Table 1. Cane yield responses to ripener treatments were small and non-significant in both plant and first ratoon crops.

b) ERC% cane: Ripener treatments significantly increased ERC% cane in both plant and first ratoon crops (see Table 2). The ERC% cane response was greater in the first ratoon than in the plant crop. Changes in ERC% cane from spraying to harvest are shown in Figures 1 to 4.
Figure 1 shows that both Ethrel and Desiccants increased the ERC% cane. Desiccants however, did better than Ethrel and the highest desiccant effect on ERC% cane was recorded from Roundup (see Figure 2).
The Ethrel + Roundup and Ethrel + Fusilade combinations did better than the control as shown in Figure 3. The highest ERC% cane value was obtained from the Ethrel + Fusilade combination.

c) ERC yield (see Table 1): Although cane yield responses to ripeners were small, sugar yields were significantly increased.

d) Variety x Ripener Interaction: Figure 4 shows that NCo376 had higher ERC% cane than N14, but the latter consistently gave higher sugar yields due to its high cane yields.
The best ripener effect on NCo376 was obtained from the Ethrel + Roundup combination but N14 responded better to Ethrel. Ripeners reduced fibre% cane in NCo376 but their effect on N14 was inconsistent.

e) Stalk data: Relevant stalk data for the first ratoon is presented in Table 2. Ripeners had little effect on stalk characteristics in the plant crop, but they significantly increased stalk diameters in the first ratoon.

f) Visual symptoms: Visual symptoms of ripener effects observed one day before harvest were as follows:
1. Ethrel sprayed alone presented no visual symptoms on both varieties.
2. Ethrel + Roundup treatment reduced plant growth and plants had dead spindle leaves but no side shoots were observed.
3. Ethrel + Fusilade also reduced growth. Plants had dead leaves most of which had dropped off leaving the apex with a sharp point. Some plants had side shoots and NCo376 had longer shoots than N14.
4. Roundup reduced growth and plants had dead leaves. Leaves were still attached to the stalks.
5. Fusilade reduced plant growth and spindle leaves had dropped off in most cases. There were no side shoots but buds were swollen.

DISCUSSION

Purity values monitored on guard areas prior to spraying Ethrel fluctuated resulting in Ethrel being sprayed at 60,1% purity which was earlier than the prescribed 70%.

Ethrel response appeared at 4 weeks before harvest in the absence of any visual symptoms. The response lasted until harvest and results show that there was a significant increase in purity% juice. Ethrel response was similar to that obtained in the previous season indicating that 28,4mm of rainfall which started 2 hours after spraying had little effect on Ethrel.

At the time of spraying desiccants, purity was high at 86,6%, but this did not impede quality responses. Desiccants typically reduced plant growth and increased

quality, but the small increase in cane yield was unusual for desiccant treatments. Differences within desiccant treatments were marginal even where desiccants were applied after Ethrel.

CONCLUSION

Ripener treatments increased cane ERC and ERF yields in both plant and first ratoon crops. Roundup performed better than Fusilade but the latter gave more quality benefit when applied after Ethrel.

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TABLE 1 : YIELD DATA AT HARVEST

TREATMENTS	CANE YIELD t/ha			ERC YIELD t/ha			ERF YIELD t/ha		
	P	1R	MEAN	P	1R	MEAN	P	1R	MEAN
Varieties (V)									
1. NCo376	156,47	124,35	140,41	20,89	17,83	19,38	24,29	19,03	21,66
2. N14	178,92	142,07	160,50	22,16	19,57	20,82	25,25	20,72	22,99
Significance	***	***	-	N.S.	**	-	N.S.	***	-
Ripeners (R)									
1. Control	166,91	130,04	148,48	19,95	17,38	18,67	24,11	18,87	21,49
Ripener treatments	167,85	133,84	150,85	21,84	18,96	20,40	24,90	20,07	22,49
Significance	N.S.	N.S.	-	N.S.	**	-	N.S.	N.S.	-
2. Ethrel	169.85	138,89	154,37	22,40	19,30	20,85	25,60	20,62	23,11
3. Ethrel + Roundup	172,95	134,84	153,90	23,09	19,19	21,14	25,73	20,22	22,98
4. Ethrel + Fusilade	165,93	134,23	150,08	21,65	19,25	20,45	25,02	20,34	22,68
5. Roundup	160,71	128,21	144,46	20,53	18,45	19,49	23,53	19,40	21,47
6. Fusilade	169,83	133,03	151,43	21,54	18,63	20,59	24,63	19,78	22,21
Significance	N.S.	N.S.	-	N.S.	N.S.	-	N.S.	N.S.	-
LSD Ripener means									
5%	-	7,53	-		1,13	-	-	1,22	-
1%	-	10,12	-		1,52	-	-	1,63	-
S.E. Ripener means ±	6,06	6,41		1,15	0,96		1,07	1,03	
V x R Interaction	N.S.	**	-	N.S.	N.S.	-	N.S.	*	
Trial mean	167,70	133,21	150,46	21,53	18,70	20,12	24,77	19,87	22,32
S.E. single plot ±	17,15	12,81	-	3,25	1,93	-	3,02	3,07	-
C.V.%	10,22	9,62	-	15,10	10,28	-	12,18	10,48	-

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TABLE 2 : QUALITY DATA AT HARVEST

TREATMENTS	ERC % CANE			ERF % CANE			PURITY %		
	P	1R	MEANS	P	1R	MEANS	P	1R	MEANS
Varieties (V)									
1. NCo376	13,32	14,34	13,88	15,55	15,30	15,43	84,90	91,64	88,27
2. N14	12,37	13,79	13,07	14,11	14,59	14,35	85,50	91,44	88,47
Significance	**	***	-	***	***	-	N.S.	N.S.	-
Ripeners (R)									
1. Control	11,99	13,42	12,71	14,58	14,55	14,57	82,30	89,80	86,09
Ripener treatments	13,02	14,20	13,61	14,88	15,03	14,96	87,78	91,87	89,83
Significance	*	***	-	N.S.	*	-	**	**	-
2. Ethrel	13,09	13,91	13,50	15,06	14,85	14,96	85,30	91,63	88,47
3. Ethrel + Roundup	13,36	14,26	13,81	14,91	15,03	14,97	87,75	92,16	89,93
4. Ethrel + Fusilade	13,12	14,38	13,75	15,17	15,20	15,19	84,90	91,80	88,35
5. Roundup	12,79	14,39	13,59	14,66	15,14	14,90	85,60	92,36	88,98
6. Fusilade	12,73	14,05	13,39	14,60	14,93	14,77	85,40	91,42	88,41
Significance	N.S.	**	-	N.S.	N.S.	-	N.S.	N.S.	-
LSD Ripener means									
5%	1,05	0,39	-		0,30	-	3,1	1,21	-
1%		0,52	-		0,52	-	4,2	1,63	-
S.E. Ripener means ±	0,37	0,32	-	0,28	0,32	-	1,10	1,02	-
V x R Interaction	N.S.	N.S.	-	*	**	-	N.S.	N.S.	-
Trial mean	12,85	14,07	13,46	14,83	14,85	14,89	85,20	91,54	88,37
S.E. single plot ±	1,03	0,65	-	0,78	0,65	-	3,00	2,06	-
C.V.%	8,05	4,60	-	5,25	4,37	-	3,57	2,25	-

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TABLE 3 : STALK DATA AT HARVEST

TREATMENTS	STALKS/ha x 10^{-3}			STALK LENGTHS (m)			STALK DIAMETERS (cm)		
	P	1R	MEAN	P	1R	MEAN	P	1R	MEAN
Variety (V)									
1. NCo376	142,3	141,16	141,73	2,71	2,63	2,67	2,30	2,20	2,25
2. N14	118,2	123,16	120,68	2,85	2,71	2,78	2,60	2,40	2,50
Significance	-	**	-	-	N.S.	-	-	**	-
Ripeners (R)									
1. Control	129,2	136,48	132,84	2,75	2,73	2,74	2,40	2,19	2,30
Ripener treatments	130,5	132,98	131,74	2,78	2,66	2,72	2,50	2,30	2,40
Significance	-	N.S.	-	-	N.S.	-	-	**	-
2. Ethrel	132,9	136,48	134,69	2,87	2,80	2,84	2,50	2,33	2,42
3. Ethrel + Roundup	131,1	133,91	132,51	2,92	2,75	2,84	2,40	2,31	2,36
4. Ethrel + Fusilade	129,5	134,95	132,23	2,65	2,52	2,59	2,40	2,29	2,35
5. Roundup	126,9	128,90	127,90	2,80	2,61	2,71	2,50	2,25	2,38
6. Fusilade	132,0	130,68	131,34	2,68	2,60	2,64	2,50	2,34	2,42
Significance	-	**	-	-	N.S.	-	-	N.S.	-
LSD Ripener means									
5%	-	4,59	-	-	0,11	-	-	0,07	-
1%	-	6,18	-	-	0,15	-	-	0,09	-
S.E. ripener means ±	-	3,91	-	-	0,09	-	-	0,06	-
V x R Interaction	-	N.S.	-	-	**	-	-	N.S.	-
Trial mean	130,3	132,16	131,73	-	2,67	-	2,50	2,28	2,39
S.E. single plot ±	-	7,82	-	-	0,19	-	-	0,12	-
C.V.%	-	5,92	-	-	7,04	-	-	5,25	-

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TABLE 4 : INTERACTION VARIETY X CHEMICAL RIPENER

a) ERC% cane

RIPENER TREATMENTS	10 WEEKS		6 WEEKS		4 WEEKS		AT HARVEST	
	NCo376	N14	NCo376	N14	NCo376	N14	NCo376	N14
Control	10,61	9,92	11,19	11,20	12,13	12,06	13,73	13,12
Ethrel (E)	9,85	10,80	10,85	11,69	12,25	12,55	13,93	14,43
E + Roundup	9,69	10,51	12,21	11,04	13,97	12,91	14,98	13,55
E + Fusilade	10,95	10,71	12,89	11,07	14,50	12,79	14,81	13,96
Roundup	9,37	10,75	11,56	12,12	13,23	12,56	14,51	14,27
Fusilade	10,13	9,52	11,79	11,11	13,19	12,64	14,65	13,46
Mean	10,10	10,37	11,75	11,64	13,21	12,72	14,35	13,80

b) ERF% cane

RIPENER TREATMENTS	10 WEEKS		6 WEEKS		4 WEEKS		AT HARVEST	
	NCo376	N14	NCo376	N14	NCo376	N14	NCo376	N14
Control	12,33	11,44	12,90	12,68	13,13	13,64	14,81	14,28
Ethrel (E)	11,52	12,13	12,68	13,14	13,31	13,33	14,47	15,23
E + Roundup	11,39	11,72	13,88	13,17	14,75	13,55	15,81	14,24
E + Fusilade	12,62	12,00	14,43	13,30	15,30	13,62	15,68	14,73
Roundup	11,21	12,01	13,35	13,54	14,20	13,30	15,37	14,91
Fusilade	11,86	11,16	13,53	12,66	14,24	13,37	15,70	14,17
Mean	11,82	11,74	13,46	13,08	14,16	13,47	15,31	14,59

c) Fibres% cane

RIPENER TREATMENTS	10 WEEKS		6 WEEKS		4 WEEKS		AT HARVEST	
	NCo376	N14	NCo376	N14	NCo376	N14	NCo376	N14
Control	12,33	10,88	13,80	12,58	14,05	12,20	14,05	11,69
Ethrel (E)	11,55	11,20	12,40	11,65	12,80	12,45	12,83	11,43
E + Roundup	12,20	10,75	13,08	11,50	12,93	12,43	12,43	12,40
E + Fusilade	12,23	10,73	13,18	11,88	12,73	12,20	12,62	11,01
Roundup	12,35	10,63	13,20	12,53	13,53	13,23	13,22	13,21
Fusilade	12,65	10,83	13,63	11,90	12,90	12,38	12,39	12,52
Mean	12,23	10,84	13,23	12,01	13,61	12,50	12,92	12,04

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APPENDIX 1. QUALITY DATA AT 4 WEEKS BEFORE HARVEST AND AT HARVEST

TREATMENTS	4 WEEKS BEFORE HARVEST (22.4.88)					AT HARVEST (19.5.88)				
	ERC% Cane	ERF% cane	Pol% cane	Purity% cane	Fibre% cane	ERC% cane	ERF% cane	Pol% Cane	Purity% cane	Fibre% cane
Varieties (V)										
1. NCo376	13,21	14,20	14,59	90,50	13,01	14,34	15,30	15,71	91,64	12,92
2. N14	12,72	13,46	13,97	91,50	12,49	13,79	14,59	15,11	91,44	12,04
Significance	**	**	*	*	**	***	***	**	N.S.	***
Ripeners (R)										
1. Control	12,49	13,47	13,85	90,70	13,01	13,42	14,55	14,89	89,88	12,87
Ripener treatments	13,06	13,90	14,37	91,18	12,72	14,20	15,03	15,52	91,87	12,41
Significance	*	N.S.	N.S.	*	N.S.	***	*	**	**	-
2. Ethrel	12,40	13,32	13,69	91,80	12,60	13,91	14,85	15,22	91,63	12,13
3. Ethrel + Roundup	13,44	14,22	14,71	91,00	12,60	14,26	15,03	15,56	92,16	12,42
4. Ethrel + Fusilade	13,65	14,45	15,00	91,10	12,50	14,38	15,20	15,70	91,80	11,82
5. Roundup	12,90	13,74	14,23	91,10	13,30	14,30	15,14	15,71	92,36	13,22
6. Fusilade	12,92	13,78	14,23	90,90	12,60	14,05	14,93	15,40	91,42	12,45
Significance	N.S.	N.S.	*	N.S.	N.S.	**	N.S.	N.S.	N.S.	N.S.
LSD Ripener means										
5%	0,49	0,49	0,50	0,72	0,45	0,39	0,38	0,39	1,21	0,52
1%	0,65	0,66	0,68	0,97	0,61	0,52	0,52	0,53	1,63	0,70
S.E. Ripener mean ±	0,47	0,41	0,47	0,50	0,30	0,32	0,32	0,33	1,02	0,45
V x R Interaction	N.S.	N.S.	N.S.	*	N.S.	N.S.	**	***	N.S.	**
Trial mean	12,96	13,83	14,28	90,90	12,70	14,07	14,95	15,41	91,54	12,48
S.E. single plot ±	0,84	0,84	0,86	1,23	0,77	0,65	0,65	0,67	2,06	0,89
C.V.%	6,44	6,04	6,04	1,36	6,08	4,68	4,37	4,34	2,25	7,14

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Appendix 2 : QUALITY DATA AT 10 AND 6 WEEKS BEFORE HARVEST

TREATMENTS	10 WEEKS BEFORE HARVEST (7.3.88)					6 WEEKS BEFORE HARVEST (4.4.88)				
	ERC% cane	ERF% cane	Pol% cane	Purity %	Fibre% Cane	ERC% cane	ERF% cane	Pol% cane	Purity %	Fibre% cane
Varieties (V)										
1. NCo376	10,10	11,82	11,58	85,40	12,20	11,75	13,46	13,19	88,50	13,20
2. N14	10,37	11,74	11,66	87,70	11,00	11,64	13,08	12,95	89,40	12,00
Significance	N.S.	N.S.	N.S.	**	**	N.S.	N.S.	N.S.	***	***
Ripeners (R)										
1. Control	10,26	11,89	11,64	86,70	11,60	11,19	12,79	12,60	88,40	13,20
Ripener treatments	10,23	11,76	11,62	88,84	11,62	11,79	13,37	13,17	89,04	12,50
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	*	*	N.S.	N.S.	N.S.
2. Ethrel	10,33	11,82	11,71	86,60	11,40	11,27	12,91	12,68	87,70	12,00
3. Ethrel + Roundup	10,10	11,56	11,49	86,30	11,50	12,02	13,52	13,36	89,70	12,30
4. Ethrel + Fusilade	10,83	12,31	12,19	87,80	11,50	12,38	13,86	13,76	89,60	12,50
5. Roundup	10,06	11,61	11,46	86,40	12,00	11,84	13,45	13,22	89,20	12,90
6. Fusilade	9,82	11,51	11,24	85,50	11,70	11,45	13,09	12,81	89,00	12,80
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	*	*	*	N.S.	N.S.
LSD Ripener means 5%	-	-	-	-	-	0,43	0,38	0,09	0,84	0,58
1%	-	-	-	-	-	0,58	0,51	0,12	1,13	0,78
SE Ripener means ±	-	-	-	-	-	0,26	0,23	0,25	0,50	0,35
V x R Interaction	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Trial mean	10,24	11,78	11,62	86,06	11,63	11,70	13,27	13,07	89,00	12,61
S.E. single plot ±	0,86	0,82	0,82	2,25	1,09	0,73	0,65	0,72	1,43	0,99
C.V.%	8,41	7,00	7,02	2,60	9,34	6,27	4,88	5,53	1,60	7,83

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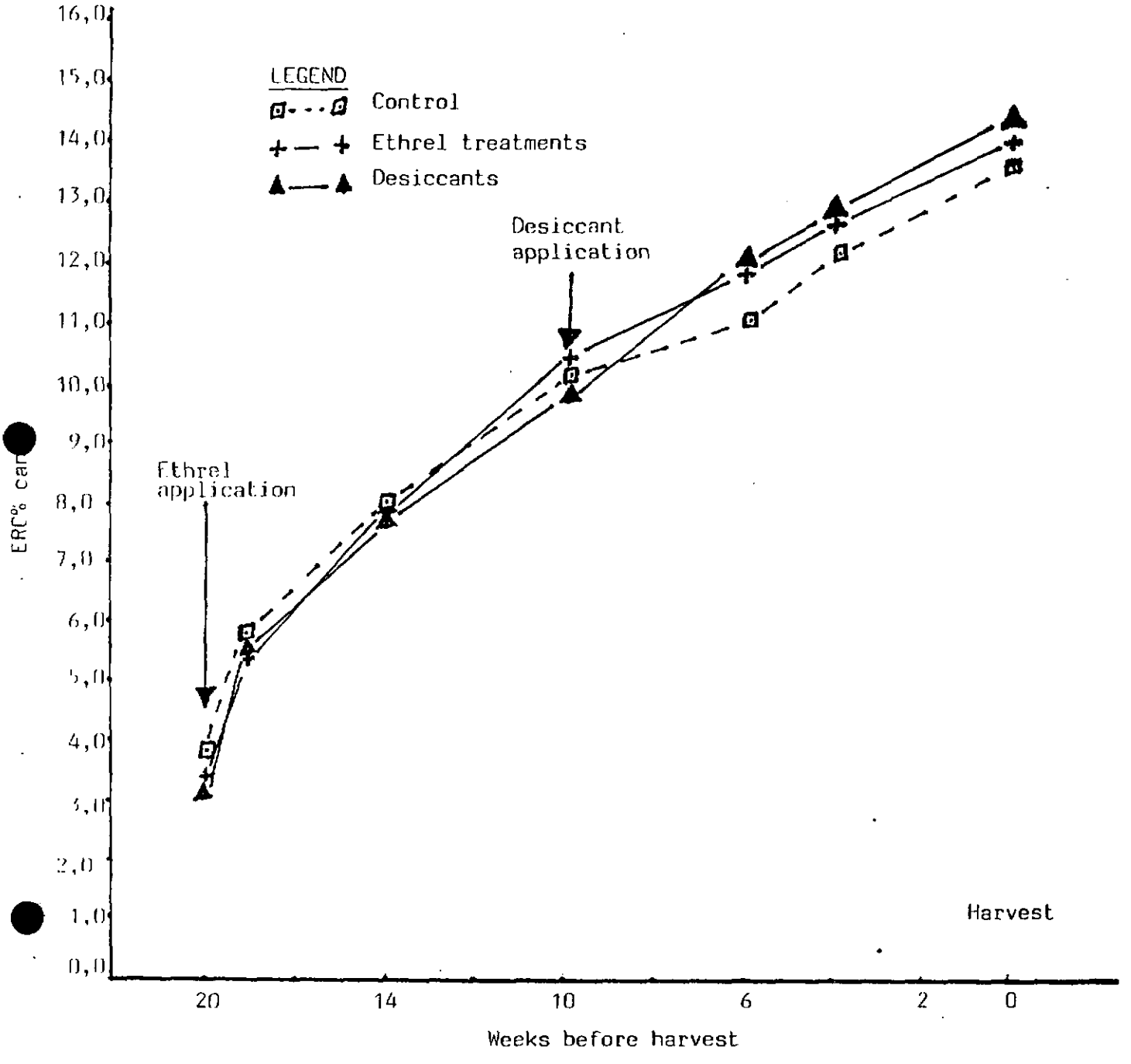

Figure 1 : Change in ERC% cane from spraying to harvest (mean of 2 varieties)

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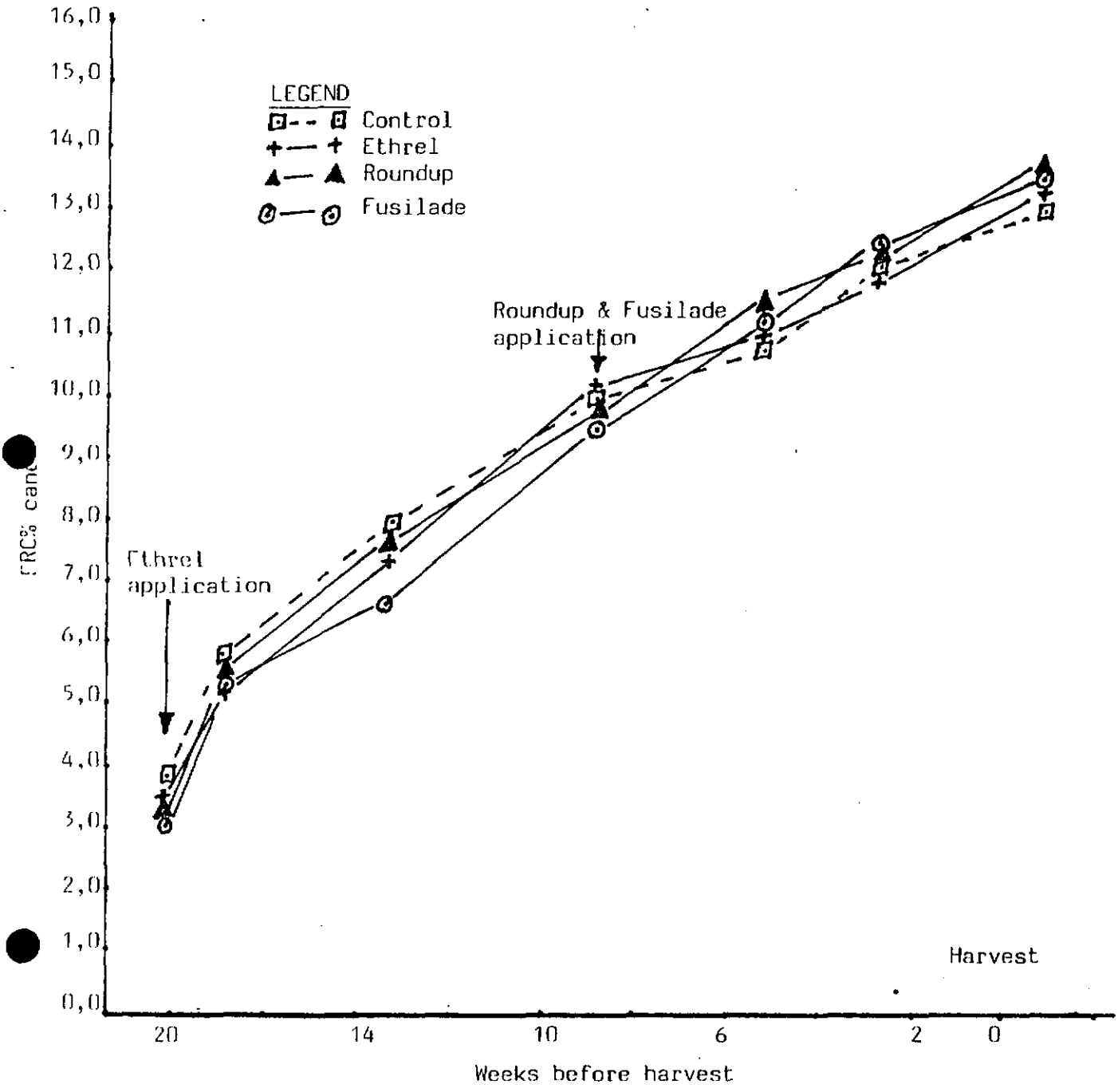

Figure 3 : Effect of Ethrel + Roundup and Ethrel + Fusilade combinations on ERC% cane (mean of 2 varieties)

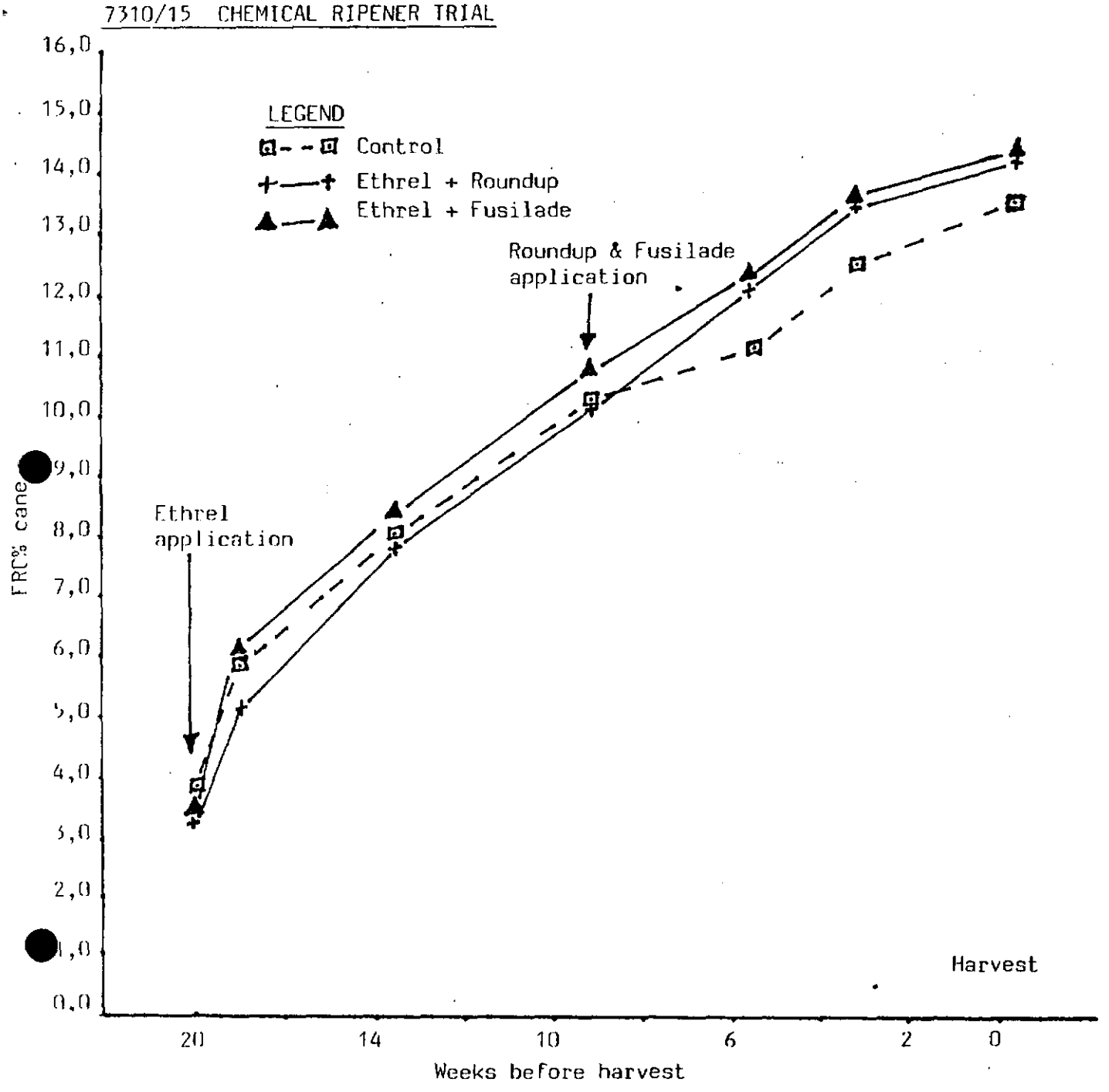

Figure 3 : Effect of Ethrel + Roundup and Ethrel + Fusilade combination on FRC% cane (mean of 2 varieties)

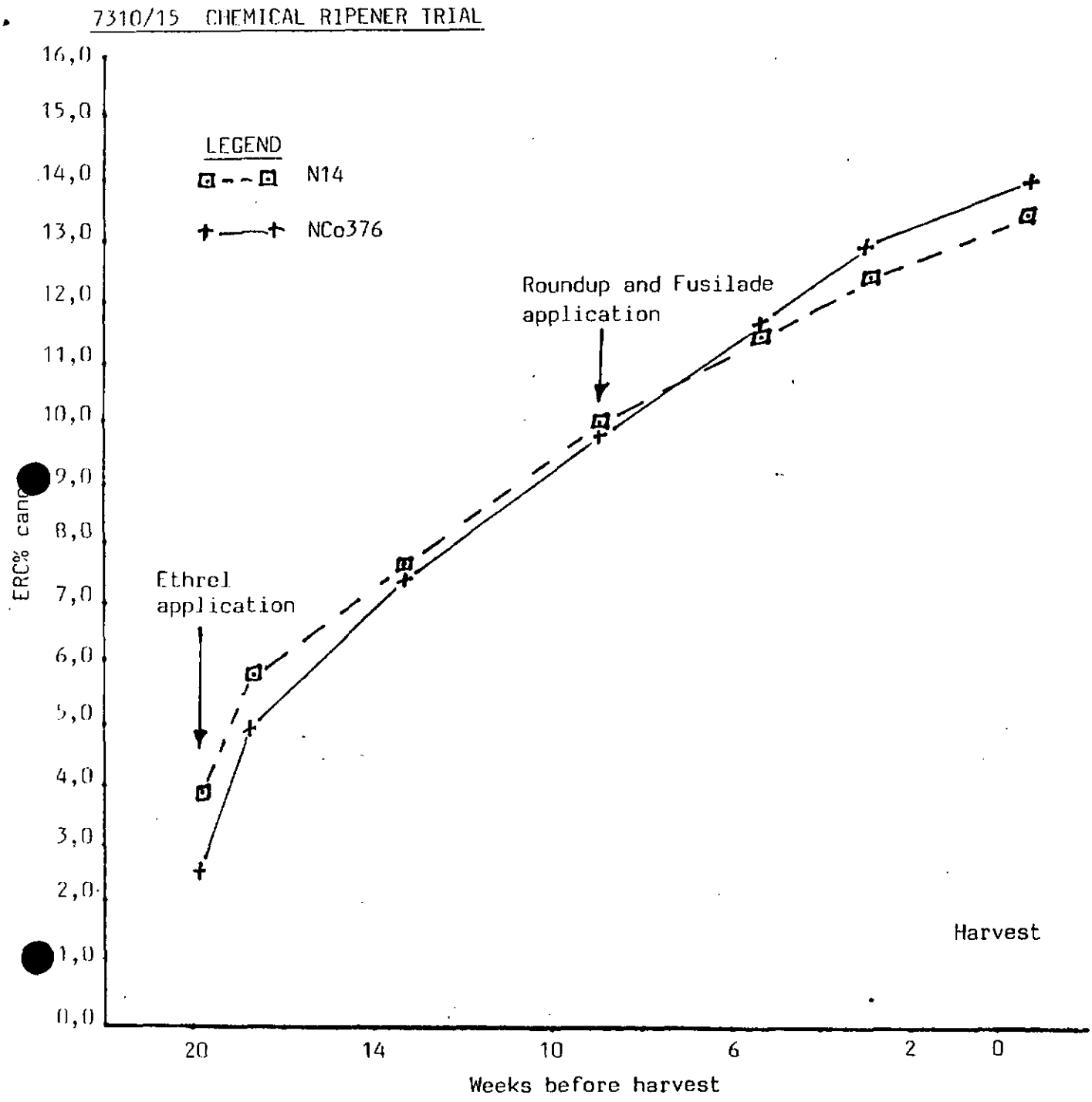

Figure 4 : Change in ERC% cane from spraying to harvest of varieties N14 and NCo376