

7310/16(c) TIMING OF ROUNDUP AND FUSILADE RIPENER APPLICATIONS

TERMINAL REPORT

CAT.: 1600

Object: To find the best time for applying Roundup and Fusilade as chemical ripeners to cane harvested in June. This trial was one of three trials designed to verify the hypothesis that the earlier the harvest, the more vigorous the cane growth, hence less time is required for ripeners to be effective and vice-versa. (The other two trials on Hippo Valley Estates, Section 6, Field 17 and Section 7, Field 8B, harvested in April and May have been reported separately).

Duration of Investigation: This trial was super-imposed on 7-month old fourth ratoon cane which was harvested at 11,2 months of age (8.6.86 - 15.5.87).

Location: Hippo Valley Estates, Section 7, Field 14.

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

Design: Randomised blocks, 4 replications.

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

<u>Fertiliser:</u> (kg/ha)	N	P ₂ O ₅	K ₂ O
P	114	90	120
1R	238	37	60
2R	159	37	-
3R	159	37	-
4R	145	37	-

<u>Field History:</u>	<u>Planting/harvest date(s)</u>	<u>Cane yield</u> t/ha	<u>Cane yield</u> t/ha/month
-	12. 4.82	-	-
P	22. 7.83	184,48	12,64
1R	10. 8.84	149,39	11,86
2R	23. 6.85	143,67	13,68
3R	8. 6.86	147,55	12,29
4R	15. 5.87	127,74	11,38

<u>Irrigation/Rainfall:</u> (mm)	<u>Irrigation</u>	<u>Rainfall</u>	<u>Total</u>
P	*	261	*
1R	758	*	*
2R	*	337	*
3R	913	545	1 458
4R	1 158	234	1 392

* Records were not available

Treatments: Treatments consisted of two controls and 8 ripening treatments as follows:

a) Times (T) of application: (Weeks before harvest)

1. 12 weeks
2. 10 weeks
3. 8 weeks
4. 6 weeks

b) Desiccants (D)

1. Roundup @ 0,25 kg/ha a.i. (0,6 l/ha product).
2. Fusilade @ 0,041 kg/ha a.i. (0,33 l/ha product).

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.

Conduct:

1. Before spraying, 2,0m-paths were cut out between replications to facilitate access to plots.
2. This trial was burnt by mistake on 15 May, 1987, after which it was decided to harvest the trial, three weeks before the scheduled harvest date. This affected times of ripener application in relation to harvest as follows:

<u>Date of spraying</u>	<u>Prescribed no. of weeks before harvest</u>	<u>Actual no. of weeks before harvest</u>
17. 3.87	12	9
30. 3.87	10	7
13. 4.87	8	5
27. 4.87	6	3

From this point onwards, timing of spray applications will be referred to by the actual number of weeks before harvest.

3. Times of spraying and weather conditions at spraying are shown below:

<u>Weeks before harvest</u>	<u>Time of spraying</u>	<u>Weather conditions</u>
9	4.50-5.30 pm	calm and dry
7	5.50-6.30 pm	calm and dry
5	5.00-6.00 pm	calm and dry
3	5.30-6.30 pm	slight breeze

RESULTS

- a) Yield data (see Table 1) There were no significant yield differences between ripeners and the control or between ripening treatments themselves. The best yield response was from cane sprayed at 7 weeks, which yielded 1,35 and 1,21 t/ha ERC and ERF more than the control. Although the 9-week application gave the best quality response, it did not give the best yield response because it caused an 8% decline in cane yield. There were no yield differences between Roundup and Fusilade applications.
- b) Quality data (see Tables 1 and 2) There were no ERC or ERF% cane ripening benefit over the control at harvest because the 3 and 5-week applications did not give a response. The 9-week application gave better ERC and ERF% cane responses than the 3-week and 5-week applications, hence the significant difference between times of application.

Table 2 shows quality data at spraying from 9 to 3 weeks before harvest, with treatment differences analysed by t-test, using the mean of all unsprayed treatments as the control. The change in ERC% cane from spraying to harvest is shown in Figure 1, where the 3 and 5-week applications were excluded due to similarity to the control. The 7 and 9-week applications took 4 weeks to show a response which then lasted until harvest. All treatments were still rapidly accumulating sucrose at harvest, there being no signs of a decline in quality.

c) Stalk data are shown below:

	<u>Stalks/ha x</u> <u>10⁻³</u>	<u>Cane diameters</u> <u>cm</u>	<u>Stalk lengths</u> <u>m</u>
Control - no chemicals	173,9	2,1	2,15
Ripening treatments	172,2	2,0	2,14
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<u>Times (T)</u>			
9 weeks	173,0	2,1	2,03
7 weeks	173,1	2,0	2,17
5 weeks	169,5	2,0	2,18
3 weeks	173,3	2,1	2,17
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<u>Desiccants (D)</u>			
Roundup	170,5	2,0	2,18
Fusilade	173,9	2,1	2,10
Trial mean	172,6	2,1	2,14

Cane stalks treated with desiccants at 9 weeks were shorter than stalks from other treatments, which were all similar to the control. There were no other major differences between stalks, neither was there any lodging nor flowering in this trial.

d) Visual symptoms were not very marked when they were last assessed on 27 April, 1987, 3 weeks before harvest. Roundup reduced growth of the cane tops while Fusilade killed the spindle leaves and caused ring-barking and side-shooting on some of the stalks.

DISCUSSION

There was not enough time between spraying and harvest for the 3 and 5-week applications to produce a response. On the contrary, spraying at 9 weeks proved to be too early because this application caused a decline in cane yield.

CONCLUSION

It was not possible to determine the best time to apply Roundup and Fusilade to June-harvested cane because this trial was harvested prematurely. Results from this 11-month crop harvested in mid-May suggest that the best time to have applied Roundup or Fusilade was 7 weeks before harvest. There were no differences between Roundup or Fusilade in their ripening effect.

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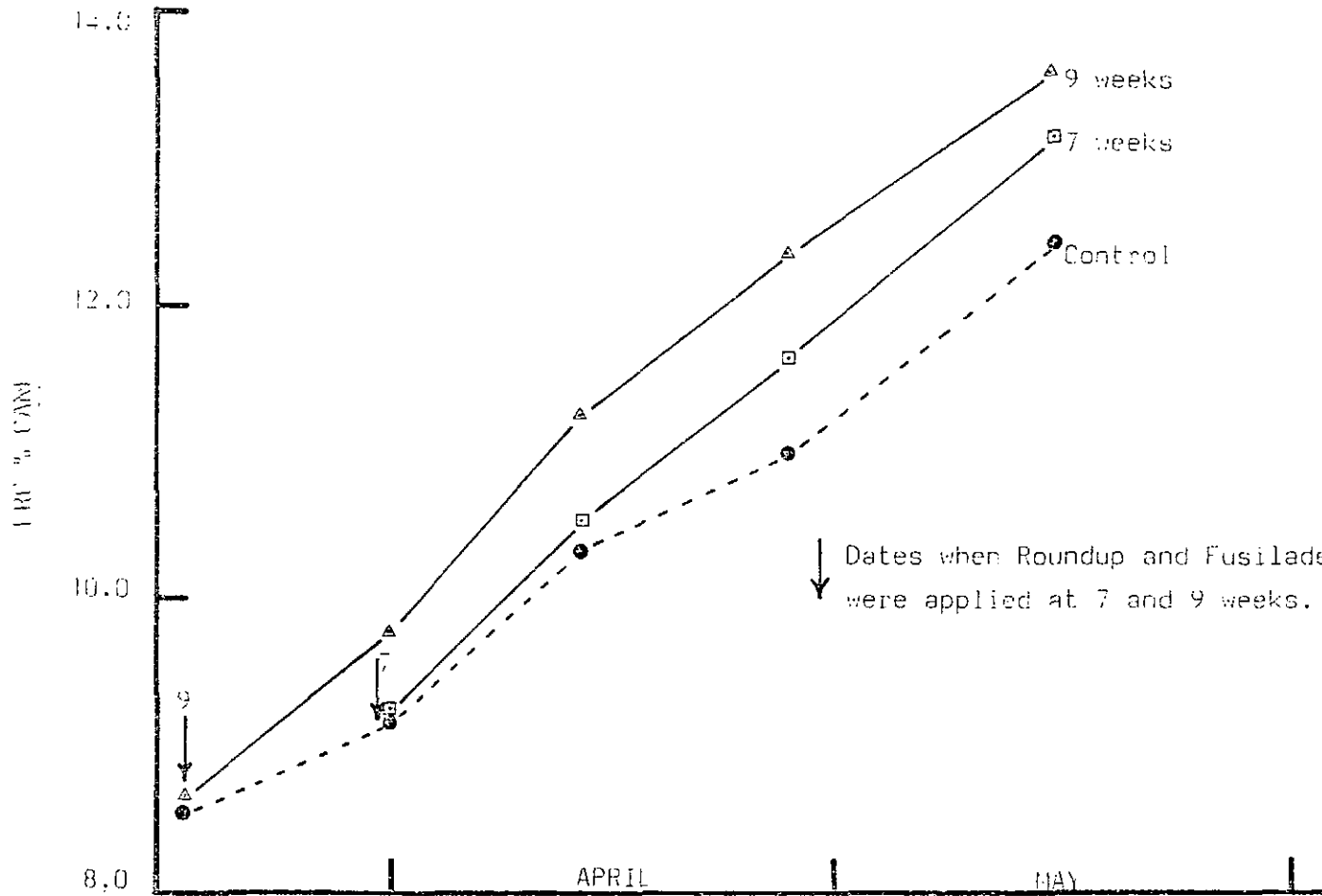


Figure 1: Effect of timing of Roundup and Fusilade applications
(in weeks before harvest) on juice quality, with the approach of
harvest

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TABLE 1: YIELD AND QUALITY DATA AT HARVEST

	YIELD DATA			QUALITY DATA				
	YIELD t/ha	ERC t/ha	ERF t/ha	ERC% CANE	ERF% CANE	POL% CANE	PURITY% JUICE	FIBRE% CANE
Controls - no chemical	128,47	15,89	18,34	12,40	14,31	14,13	85,3	12,5
Ripening treatments	127,56	16,45	18,75	12,93	14,74	14,69	85,8	13,4
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	*	N.S.	N.S.
<u>Times of application (T)</u>								
9 weeks	118,17	16,07	18,06	13,59	15,28	15,30	87,1	-
7 weeks	131,63	17,24	19,55	13,13	14,89	14,91	85,9	-
5 weeks	129,32	16,06	18,57	12,45	14,40	14,25	84,7	-
3 weeks	131,14	16,41	18,83	12,54	14,38	14,29	85,6	-
Significance	N.S.	N.S.	N.S.	**	*	*	N.S.	-
L.S.D. 5%	-	-	-	0,72	0,63	0,69	-	-
1%	-	-	-	0,97	-	-	-	-
S.E. T means ±	3,89	0,49	0,51	0,25	0,22	0,24	0,6	-
<u>Desiccants (D)</u>								
Roundup	129,71	16,47	18,90	12,71	14,60	14,50	85,2	-
Fusilade	125,42	16,43	18,60	13,14	14,87	14,88	86,5	-
Significance	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	-
S.E. D means ±	2,75	0,35	0,36	0,18	0,15	0,17	0,4	-
D x T interaction	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.	-
Trial mean	127,74	16,33	18,67	12,82	14,65	14,58	85,7	12,9
S.E. single plot ±	10,99	1,40	1,46	0,70	0,62	0,67	1,6	1,2
C.V.%	8,60	8,57	7,80	5,49	4,21	4,62	1,89	9,3

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TABLE 2: QUALITY DATA AT 9, 7, 5 and 3 WEEKS BEFORE HARVEST

	ERC% CANE	ERF% CANE	POL% CANE	PURITY% JUICE	FIBRE% CANE
<u>9 WEEKS 17. 3.87</u> (Day of spraying)					
Trial mean	8,46	10,96	10,13	79,7	11,2
S.E. trial mean ±	0,14	0,10	0,13	0,5	0,2
<u>7 WEEKS 31. 3.87</u> (1 day after spraying)					
Unsprayed treatments	9,25	11,64	11,06	79,3	11,2
Treatments sprayed @ 9 weeks	9,77	12,08	11,57	80,0	10,7
Significance (t-test)	N.S.	N.S.	N.S.	N.S.	N.S.
Trial mean	9,36	11,73	11,17	79,5	11,1
S.E. trial mean ±	0,12	0,12	0,13	0,3	0,2
<u>5 WEEKS 13. 4.87</u> (Day of spraying)					
Unsprayed treatments	10,39	12,14	12,05	83,6	12,7
Treatments sprayed @ 9 weeks	11,24	12,95	12,88	84,9	12,2
Treatments sprayed @ 7 weeks	10,51	12,22	12,16	83,9	12,4
Significance (t-tests)					
Unsprayed vs. 9 weeks	*	**	*	N.S.	N.S.
Unsprayed vs. 7 weeks	N.S.	N.S.	N.S.	N.S.	N.S.
9 weeks vs. 7 weeks	N.S.	*	N.S.	N.S.	N.S.
Trial mean	10,59	12,32	12,24	84,0	12,6
S.E. Trial mean	0,15	0,12	0,25	0,4	0,2
<u>3 WEEKS 27. 4.87</u> (Day of spraying)					
Unsprayed treatments	10,92	12,42	12,40	87,0	13,3
Treatments sprayed @ 8 weeks	12,36	13,74	13,83	88,9	13,6
Treatments sprayed @ 6 weeks	11,64	13,12	13,10	88,0	12,9
Treatments sprayed @ 4 weeks	10,85	12,22	12,23	87,0	14,0
Significance (t-tests)					
Unsprayed vs. 9 weeks	***	***	***	N.S.	N.S.
Unsprayed vs. 7 weeks	*	*	*	N.S.	N.S.
Unsprayed vs. 5 weeks	N.S.	N.S.	N.S.	N.S.	N.S.
9 weeks vs. 7 weeks	N.S.	N.S.	**	N.S.	N.S.
7 weeks vs. 5 weeks	N.S.	*	*	N.S.	N.S.
9 weeks vs. 5 weeks	**	***	N.S.	N.S.	N.S.
Trial mean	11,32	12,78	12,79	87,6	13,5
S.E. trial mean ±	0,19	0,13	0,15	0,4	0,2