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SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

8800/2 (b) : POST-EMERGENT TREATMENT WITH ETHREL

TERMINAL REPORT

- Cat: 1498
- Object: To observe the effect on tillering of a post-emergent spray of Ethrel applied to young cane planted late in the season.
- Planted: 6 November, 1984.
- Terminated: 14 November, 1985 after the plant crop. (12,3 months).
- Location: ZSA Experiment Station, Field D10-12.
- Soil type: PE.1 sandy clay loam derived from gneiss.
- Design: 3 x 4 factorial, 3 replications. Two separate trials planted in May, 1984 (8800/2a) and November, 1984 (8800/2b).
- Spacing: 1,5 m between rows.
- Fertiliser:
- | | N | $P_{25}O_5$ | K_{20} |
|-------|-----|-------------|----------|
| kg/ha | 140 | 100 | 60 |
- Irrigation: 1 168 mm Rainfall: 717 mm
- Treatments:
- a) Varieties
 1. NCo 376 (high population)
 2. N 14 (medium population)
 3. B 51129 (low population)
 - b) Level of Ethrel
 1. 0,0 kg/ha a.i. (Control)
 2. 0,5 kg/ha a.i.
 3. 1,0 kg/ha a.i.
 4. 2,0 kg/ha a.i.
- Conduct:
1. The trial was sprayed on 14 January, 1985 when the mean plant height from ground level to the first visible dewlap was approximately 45 cm.
 2. A knapsack sprayer fitted with a "Cosmos" lance and nozzle was used to apply the Ethrel. At a constant pressure of 140 kPa and at a walking speed of 4 km/h, the nozzle delivered 85 l/ha of spray solution.
 3. Tiller numbers in the two central rows were counted before and after spraying, at regular intervals. Counts were stopped in early April (6 months after planting), due to lodging.

RESULTS

- a) Tiller data. At peak tillering, the number of tillers per hectare for NCo 376, N 14 and B 51129 were 331 000, 307 000 and 223 000 respectively (see Figure 1). When counts were stopped in

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early April, these figures had dropped to 171 000, 154 000 and 97 000 respectively. From peak tillering in early January to early April (3 - 6 months after planting) there was little difference in tiller populations between NCo 376 and N 14.

Figure 2 shows that peak tillering occurred 2½ weeks after the trial was sprayed with Ethrel. Ethrel had no effect on tiller numbers, which were the same for all treatments when counting was stopped.

b) Harvest data. (see Table 1). Ethrel had no effect on cane yield, ERC% cane or ERC yield. There was a non-significant trend towards an increase in millable stalk populations with increasing Ethrel rates. The only other apparent effect of Ethrel, was to reduce lodging at the 1,0 and 2,0 kg/ha a.i. rates.

There were distinct varietal differences in cane and sugar yields. N 14 out-yielded NCo 376, which in turn out-yielded B 51129. N 14 had a low ERC% cane value, but a good cane and sugar yield. Conversely, B 51129 had a good ERC% cane value, but a poor cane and sugar yield.

The difference in stalk population between NCo 376 and N 14, though significant, was not as great as that between N 14 and B 51129. B 51129 and N 14 had longer stalks with larger diameters, which lodged more than NCo 376.

DISCUSSION

Ethrel should have been applied when the mean plant height from ground level to the top visible dewlap was 30 cm. Application of Ethrel was delayed due to rain-fall interference, and by the time the trial was sprayed the mean plant height was 45 cm. Rate of tiller initiation at this stage was declining, and within a month of spraying tillers were ying-off. The crop was therefore too advanced physiologically for Ethrel to have had any effect on tillering or yield.

It is worth noting that N 14 out-yielded NCo 376 in a late-season trial. At present N 14 is being considered for release as an early-season variety.

CONCLUSIONS

Post-emergent treatment with Ethrel had no effect on tillering or yield of cane in the late-season. This differs from the early-season trial (8300/1b) where Ethrel increased the number of millable stalks, but reduced stalk sizes, cane yield and sugar yield. The difference in responses between the two trials could have been due to two factors, viz.

- a) More tillers were produced in the early-season than in the late-season trial.
- b) The late-season trial was sprayed at a later physiological stage than the early-season trial.

Despite seasonal differences, there was still no indication that a post-emergent spray of Ethrel would be of any benefit to the grower. Other ways of applying Ethrel to cane to improve germination and tillering will be tested in the near future.

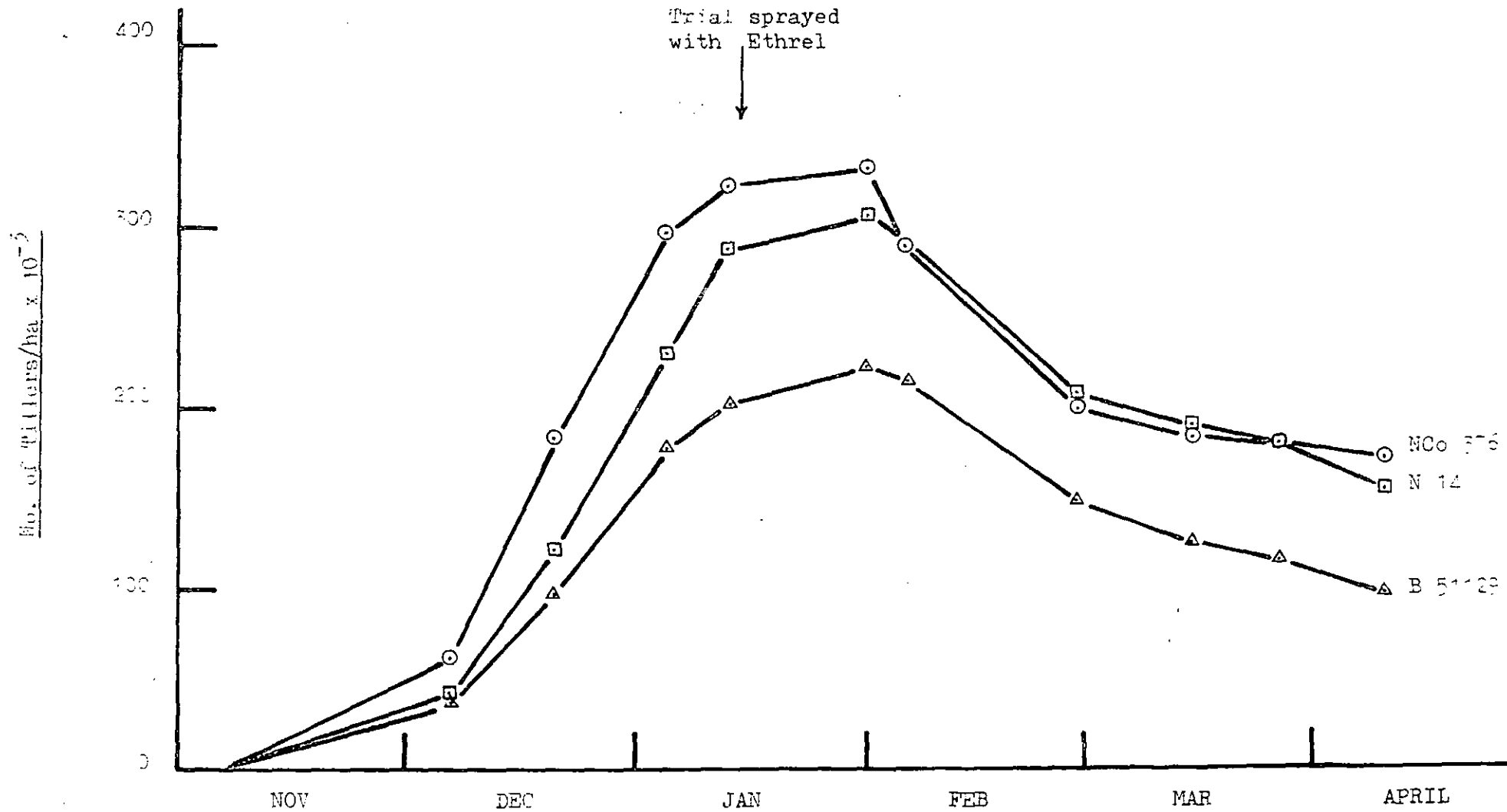


Figure 1 : Varietal difference in Tillering

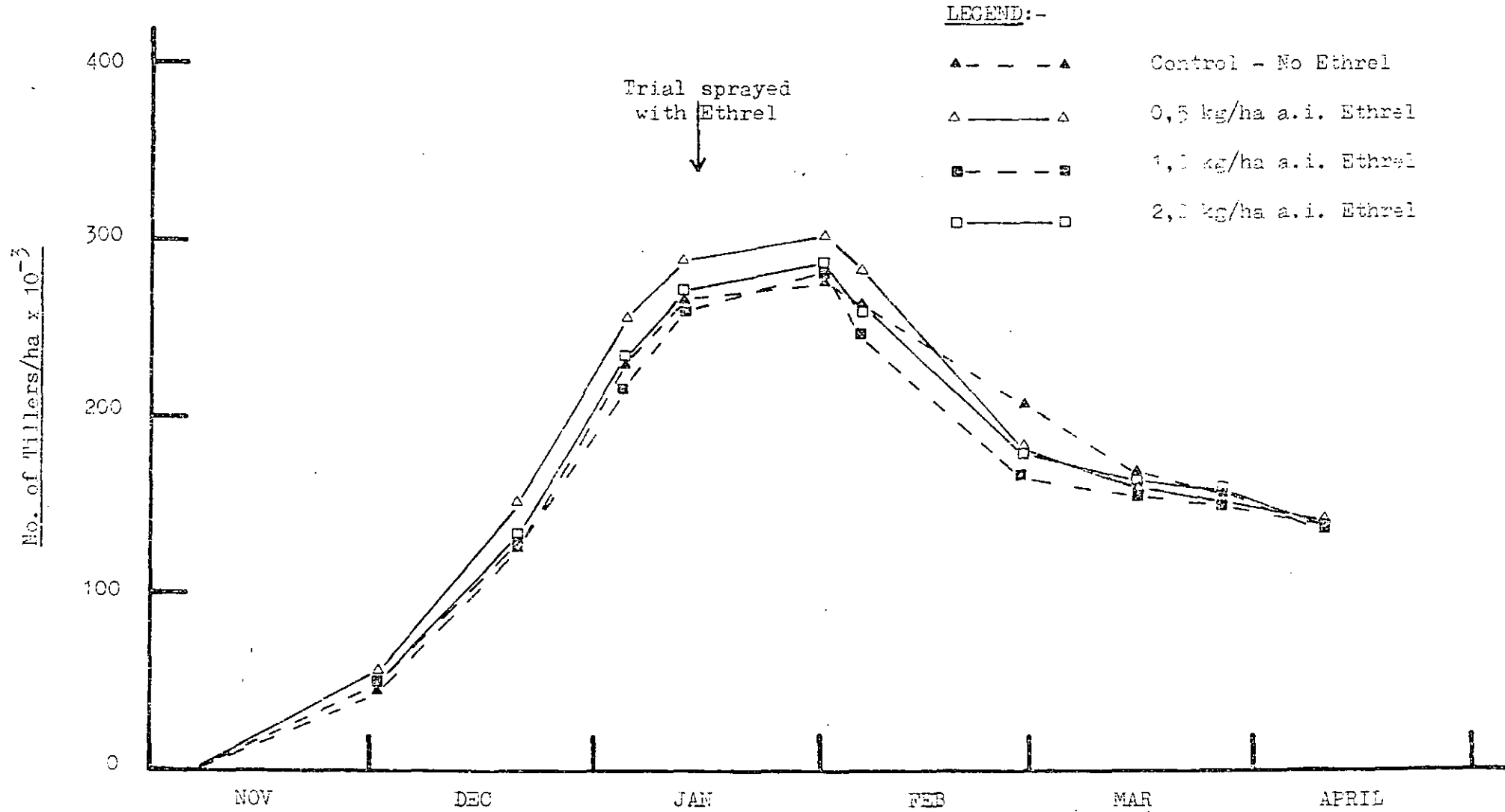


Figure 2 : Effect of Ethrel on Tillering

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TABLE 1 : HARVEST DATA

TREATMENTS	CANE YIELD	ERC% CANE	ERC YIELD t/ha	STALKS/ ha x 10 ⁻³	STALK LENGTH m	CANE DIAMETER cm	LODGING %
<u>VARIETIES</u>							
1. NCo 376	125,72	12,36	15,56	159,02	2,50	2,1	63
2. N 14	156,56	11,30	17,66	132,39	2,62	2,3	71
3. B 51129	106,74	12,95	13,82	76,53	2,54	2,7	86
Significance	***	***	***	***	-	-	-
L.S.D. 5%	6,89	0,50	1,10	8,53	-	-	-
1%	9,37	0,68	1,49	11,60	-	-	-
S.E. Variety mean ±	2,35	0,17	0,37	2,91	-	-	-
<u>LEVELS OF ETHREL kg/a.i.</u>							
1. 0,0 (Control)	126,43	12,17	15,39	116,4	2,56	2,3	81
2. 0,5	133,99	12,00	15,94	120,7	2,58	2,3	92
3. 1,0	127,86	12,49	15,79	124,8	2,56	2,3	51
4. 2,0	130,42	12,15	15,59	128,7	2,51	2,4	69
Significance	N.S.	N.S.	N.S.	N.S.	-	-	-
S.E. Ethrel mean ±	2,71	0,20	0,43	3,36	-	-	-
Variety x Ethrel Interaction	N.S.	N.S.	N.S.	N.S.	-	-	-
Trial Mean	129,67	12,20	15,68	122,6	2,55	2,3	73
S.E. single plot ±	8,14	0,59	1,30	10,08	-	-	-
C.V. %	6,28	4,85	8,28	8,22	-	-	-