

THE EFFECTS OF ETHREL AS A FLOWERING INHIBITOR IN SUGARCANE

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Background

- Flowering stimulus - received end June – July
- Heavy flowering varieties (D15841) – usually planted about Aug in the 2nd crop to allow for harvest by Sept the following year
- Later reaping – loss in cane quality and yield
- Selection programme – selects against flowering in varieties

Objectives

- To assess the potential for improving the flexibility of the planting time for varieties that flower
- To examine the possible impact of Ethrel application on the flowering intensity, yield and quality of sugarcane

Methodology

- Two different studies were initiated during 2007
 - ◆ Timing of Ethrel application on different flowering varieties
 - ◆ A single application time of Ethrel on a single variety

- 1st study–small-plot conducted at ARC, LBI
- Ethrel applied at 940 mls/ha with Knapsack
- Design - split-plot
 - ◆ 3 cane varieties (D 15841, D 93409 and WI79463)
 - ◆ 3 application times at one week intervals starting July 12th 2007
 - ◆ 3 replications

- growth parameters measured from 36 weeks to emergence of panicle
- Field Brix values were determined fortnightly up until anthesis
- Flower intensity was assessed just prior to harvest.

- 2nd study - consisted of one variety (D 15841) planted in a single field (no replication)
- Conducted at all 8 estate locations
- 3 Treatments
 - ◆ Control – no Ethrel or Evergreen applied
 - ◆ Ethrel at 940 mls/ha applied by aircraft mid June to early July (14 – 18 wks old)
 - ◆ Ethrel (940 mls/ha) + Evergreen (PGR with 7-7-7) at 2.0 L/Ha with knapsack sprayer

- Plant growth measurements commenced at 4 months
- Flower counts were done fortnightly from the time of flower emergence to harvest
- Brix measurements commenced at 40 weeks and were repeated at 2 week intervals up to harvest
- Gross cane yields (t/ha.) were determined at harvest.

Results – 1st Study

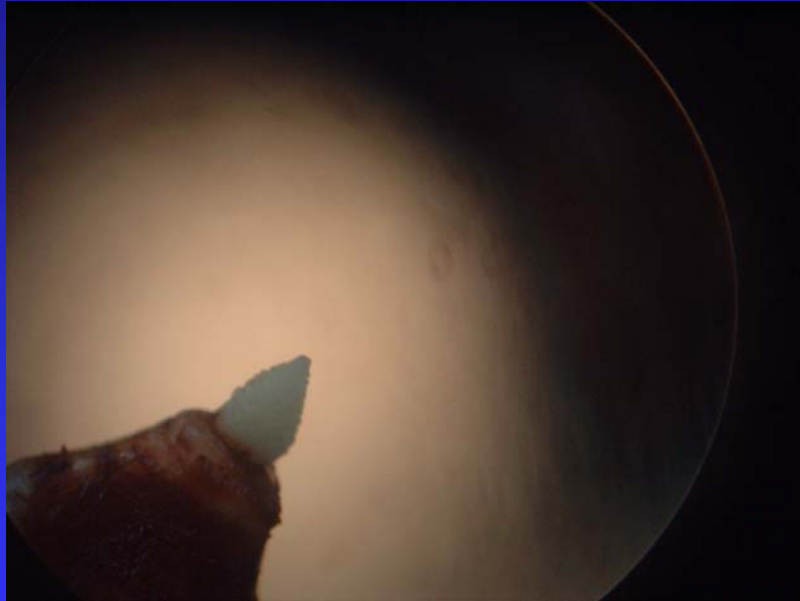
- No significant ($P > 0.05$) interaction effect in flowering intensity between cane variety and timing of application of Ethrel
- Significant differences in flowering intensity (averaged over varieties) for the different Ethrel application timings. Ethrel applied on the 19th and 26th July gave 32 and 15 percent reductions in flowering respectively
- Flowering intensity values for the various varieties (averaged over all application times) were not significantly different

Date of Ethrel application	Flowering Intensity (%)	Flower reduction (%)
Control	62.6	-
12 th July	42.5	32.1
19 th July	53.3	14.9
26 th July	64.4	+2.9

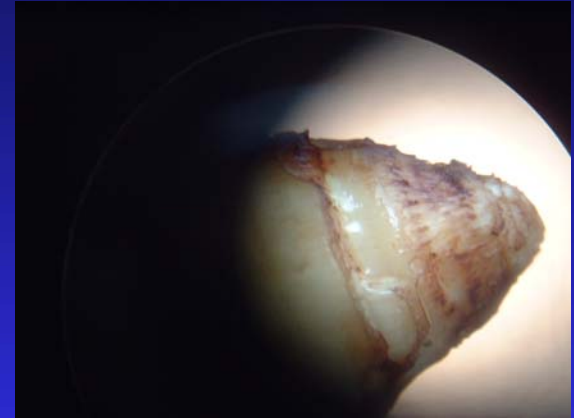
Cane Variety	Flowering intensity (%)	Flower inhibition (%)
D 93409	48.4	21.0
D15841	45.1	0.0
WI 79463	73.5	+18.2

Images of apical meristem preceding Ethrel application

WI79463

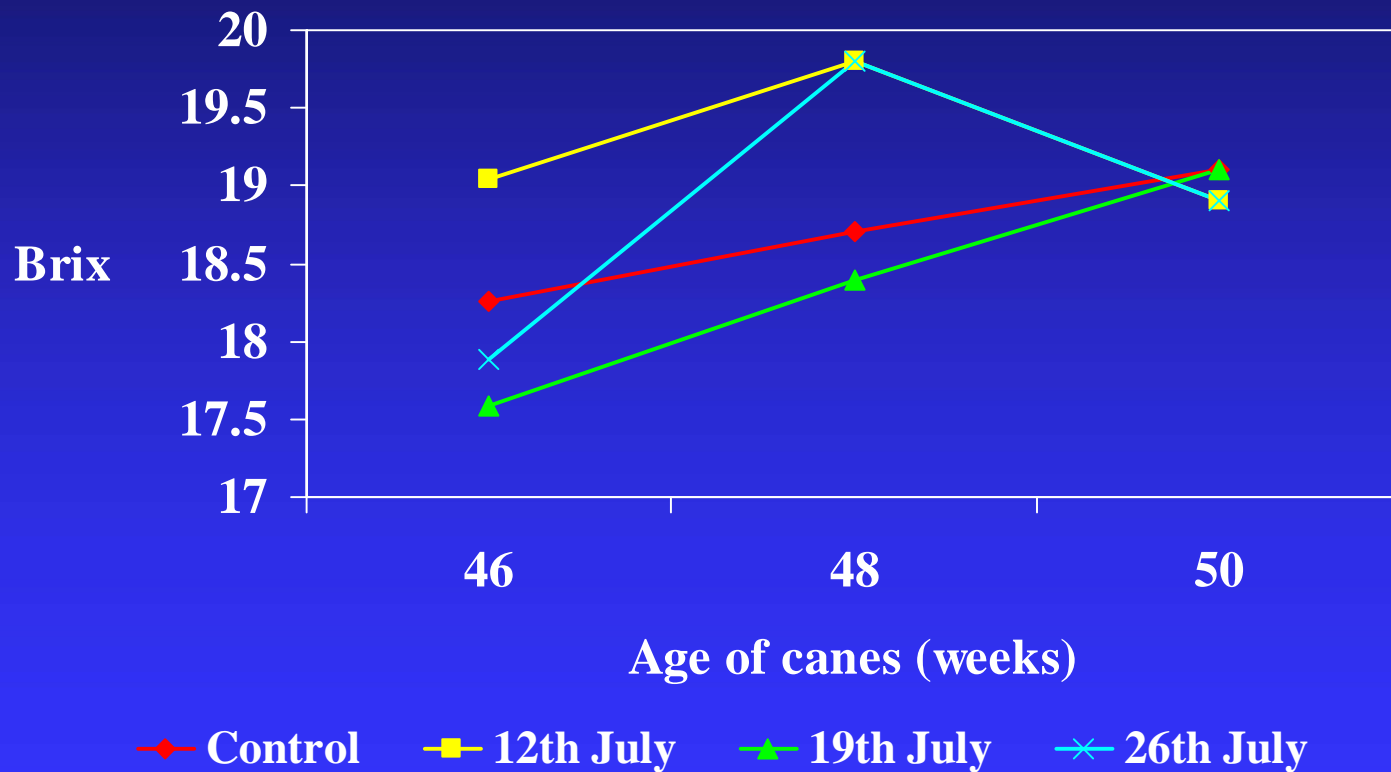


D15841

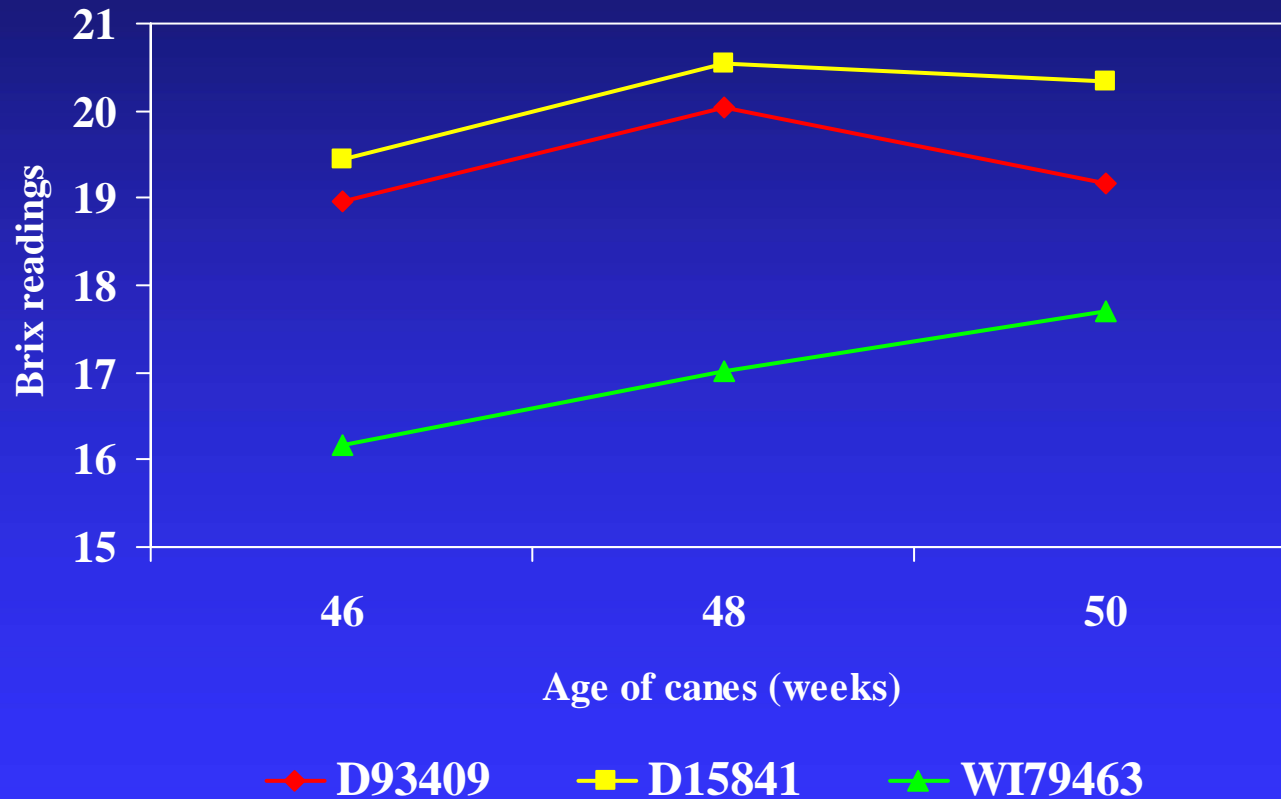


D93409

Mean brix readings prior to harvest (46-50 wks) for the different application times



Mean brix readings prior to harvest (46-50 wks) for the different varieties



Results – 2nd Study

- Maximum flowering intensity varied for the different trial locations.
- The mean maximum value for the control plots (averaged across the locations) was 59.6% and ranged from 97.6% at Albion (AN) to 19.8% at LBI.
- The mean maximum value (averaged across the locations) for the combined treatments of Ethrel-treated canes was 46.6% and ranged from 93.4% at AN to 8.2% at Wales (GV).

Maximum flowering intensity at the various locations

TRT	SWR	AN	RH	BCF	EHP	LBI	GV	Mean
Control	72.1	97.6	94.5	56.9	35.0	19.8	41.3	59.6
Ethrel	47.6	93.4	77.8	59.3	23.1	16.8	8.2	46.6

Flower inhibition (%) at the different locations

Estate location	Flower inhibition (%)
SWR	34.0
AN	4.3
RH	17.7
BCF	0.0
EHP	34.0
LBI	15.2
GV	80.1
ICBU	ND
Mean	26.5

Brix readings prior to harvest (44-50 wks) for the various treatments at the different locations

Trt	SWR	AN	RH	BCF	EHP	LBI	GV	ICBU	Mean
Control	18.7	17.0	19.3	22.2	20.0	21.7	19.1	20.0	19.8
Ethrel	19.1	19.1	20.0	20.2	19.5	22.3	17.9	19.5	19.7
Ethrel+ Ev'grn	18.9	18.1	18.1	19.0	21.5	21.7	17.4	21.5	19.6

Plant height (cm) for the various treatments at the different locations

Trt	SWR	AN	RH	BCF	EHP	LBI	GV	ICBU	Mean
Control	287	307	265	337	419	167	299	233	289
Ethrel	287	328	281	305	259	183	286	221	269
Ethrel+ Ev'grn	283	307	277	319	264	188	287	254	272
Sig (P<0.05)	ns	ns	ns	S	S	ns	ns	ns	

Plant girth (cm) for the various treatments at the different locations

Trt	SWR	AN	RH	BCF	EHP	LBI	GV	ICBU	Mean
Control	9.7	7.8	10.2	10.6	nd	nd	9.5	nd	9.6
Ethrel	9.4	8.0	10.6	10.9	nd	nd	9.1	nd	9.6
Ethrel+ Ev'grn	9.9	8.3	10.2	11.5	nd	nd	9.1	nd	9.8
Sig (P<0.05)	ns	ns	ns	ns			ns		

nd=not determined

Conclusion

- Great variation in flowering intensities was obtained from the two different studies conducted
- Generally, Ethrel application resulted in flower inhibition compared with untreated canes, while the amount of reduction varied from 0.0% to as much as 80%
- Flower inhibition for the two studies were 15 to 32% and 22 to 27% respectively

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- Plant growth parameters, juice quality and plant cane yields were not greatly affected by the application of Ethrel

Thank You