SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code HW 252
Cat. No.: 1424

Title: Phytotoxicity of cane killing chemicals

1. Particulars of the project

This crop : 6th ratoon/plant
Site : CFS
Region : N.Coast Coastal
Soil system : Berea
Soil form/series: Hutton/Clansthal
Design : Randomised blocks
Variety : NCo 376

Fertilizer :

	N	P	K
In furrow (kg/ha)	47	-	47
Top Dressing	47	-	147
Total	94	-	194

Temik : 20 kg/ha in furrow

Soil analysis: Date: 24.2.83

pH	O.M.%	Clay %	Silt %	Sand %
8,6	0.07	6	2	92

ppm

P	K	Ca	Mg	Na	A1
> 80	53	>1800	56	13	

Age: 16,4 mnths Dates: 1.2.83 - 12.6.84
Rainfall: 1646 mm L.T.M.: 1304 mm
Irrigation: Nil

2. Objectives

To assess the effects of chemicals used to eradicate an old crop on the growth of the new crop.

3. Treatments

1. Roundup 10ℓ/ha planting 2 weeks after spraying
2. Roundup 10ℓ/ha planting 5 weeks after spraying
3. Fusilade 5ℓ/ha planting 2 weeks after spraying
4. Fusilade 5ℓ/ha planting 5 weeks after spraying

4. Experimental

The experiment was superimposed on an old burning and trashing experiment which had been recently harvested and the cane allowed to regrow Roundup and Fusilade were applied directly over the cane rows using an APM Green floodjet at a water volume of 267 ℓ/ha. Spray swaths reached across the interrows which in some plots had a light to heavy coverage of burnt cane tops and *Cyperus rotundus*. The cane growth stage at the time of spraying was: ± 50 cm leaf height.

Two weeks after spraying the cane, Roundup was applied by means of a brush applicator to *C. rotundus* which was not controlled by Fusilade. Immediately afterwards furrows were drawn and cane was planted into those plots where the interval after planting was two weeks. Lasso and atrazine was applied to control all grasses and broadleaf weeds.

Three weeks later Roundup was again used in all Fusilade plots (those planted 2 weeks after spraying and those to be planted 5 weeks after spraying) to control *C rotundus*. Only three cane shoots had emerged in all the plots which were planted two weeks after treatment with Fusilade. One plot which was originally treated with Roundup and in which all *C. rotundus* had been well controlled, was also treated with Roundup for *C. rotundus* control as in the Fusilade plots, in case there was any adverse effect from this treatment on the newly planted cane. Where the predetermined planting interval was 5 weeks after spraying the plots were planted soon after the treating of *C rotundus*.

Crop measurements and ratings on *C rotundus* infestation and cane regrowth were taken at intervals after planting.

5. Results

1. *C rotundus* control and cane regrowth

Table 1. Mean *C rotundus* infestations and cane regrowth after treatments, expressed as a percent ground cover and kill* respectively

Treatments	*C. rotundus*				Cane regrowth	
	1.2.83*	21.4.83	23.5.83	30.6.83	23.5.83	30.6.83
Roundup planting interval 2 weeks	95	5,5	6,5	5,5	2,8	3
Roundup planting interval 5 weeks	84	1,8	3,5	3,9	3,5	4,5
Fusilade planting interval 2 weeks	5	11,3	4,5	4,5	8,3	24
Fusilade planting interval 5 weeks	9	3,3	2,3	3	10,3	24

5. **Comments**

- Very poor *C rotundus* control was provided by Fusilade thus necessitating Roundup treatment and repeated hand weeding to prevent any competition from *C rotundus*.

- The ultimate cane kill from Fusilade was also far worse than that from Roundup in this experiment as indicated by regrowth ratings on 30.6.83.

2 **Crop measurements**

Table 2. Mean crop measurements taken at 2,3,5,7,10 and 13 months of age

Treatments / Age (months)		Crop measurements											
		Stalk length (cm)						Stalk population (1000/ha)					
		2	3	5	7	10	13	2	3	5	7	10	13
Roundup	2 weeks	13	20	31	54	101	171	70	106	145	176	139	149
Roundup	5 weeks	12	17	26	51	99	166	47	66	144	176	146	156
Fusilade	2 weeks	9	15	24	46	88	150	54	77	!48	161	119	143
Fusilade	5 weeks	12	18	26	50	101	167	51	66	151	171	141	151

Comments

- In plots treated with Fusilade and planted 2 weeks after spraying, germination was retarded and stalk elongation was also reduced. Stalk length differences persisted as did the reduction in stalk populations.

- In plots planted 5 weeks after spraying no differences were apparent in either stalk length or populations at any stage of the crop growth period.

3 **Yield characteristics**

Table 3 Mean yields and crop characteristics at harvest.

Treatments	Yield			Crop measurements	
	Cane t/ha	Sucrose % cane	Sucrose t/ha	Stalk length (m)	Stalk poplu (1000/ha)
Roundup 2 week interval	134,8	14,49	19,5	2,56	144
Roundup 5 week interval	133,5	14,63	19,5	2,51	141
Fusilade 2 week interval	96,9	14,55	14,1	2,16	128
Fusilade 5 week interval	129,8	14,40	18,6	2,51	138
CV%	11,1	3,2	9,7	7,5	6,2
LSD (0,05)	23,67	0,8027	3,018	0,3148	14,89
LSD (0,01)	35,98	1,220	4,587	0,4784	22,63

Comments

- A statistically significant yield reduction (P 0,01) was caused by Fusilade in plots planted two weeks after spraying. This was associated with both lower stalk length and populations.
- No effect on yield or crop growth was apparent in plots planted five weeks after spray application.

6. Discussion

Since *C rotundus* was not well controlled by Fusilade and needed to be treated with Roundup after and just before planting cane in these plots, it was suspected that competitive effects of *C rotundus* or alternatively damage from Roundup applications could have been responsible for poor cane growth. A second factor which may also have tended to depress cane growth in Fusilade plots was the competitive effects of sugarcane regrowth where cane was not adequately killed.

These reasons for the yield reductions in two week planted plots are very unlikely since no differences occurred in plots planted five weeks after spraying, where:

- poor *C rotundus* control
- applications of Roundup to *C rotundus* and
- poor cane kill with consequent regrowth in Fusilade plots also occurred.

Also, no evidence of Roundup damage was observed and only three shoots in all Fusilade plots had emerged at the time of spraying.

7. Conclusions

- Fusilade applied using the standard commercial practice of a flood-jet nozzle held directly over the cane row but with coverage on the interrow can cause severe and important yield reductions to cane planted two weeks after application in a light sandy soil (clay content 6%)

- No damage was apparent on cane (variety NCo 376) planted five weeks after application of Fusilade and hence a minimum waiting period of five weeks is likely to be acceptable.

PETT/IS
14 August 1984