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SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code : HW270/83/P
Cat. No.: 1489

Title: Cane Killing - Fusilade Phytotoxicity in Heavy Soils

1. Particulars of the project

This crop : Plant
Site : Experiment Station
: Mount Edgecombe
Region : North Coast
: Coastal
Soil system : Umzinto
: C. Lowlands
Soil form/series: Arcadia/Rydalvale
Design : Randomised blocks x
: 3 Replications
Variety : NCo376
Fertilizer/ : N P K
Ameliorants :
Kg ha⁻¹ i.f. - 42 -
Kg ha⁻¹ t/d 94 - 94

Soil analysis: Date 4.10.83

pH	O.M.%	Clay%	P.D.I.
5,20	-	< 29	-
ppm			

P	K	Ca	Mg	Zn	Al
24	138	1375	>220	-	-

Age 17,0 months Dates: 1st plant -(27.12.83)
16,4 months 2nd plant -(17.1.84)
* 28.5.85 Completed

Rainfall: 1820 or 1483 mm L.T.M.:1508 or 1300

Irrigation: Dryland

Application Details

Date sprayed: 7.12.83 Age at 2 mnths
Cane Height : ± 0,8 m Well tillered
Leaves : ± 9 leaves shoot⁻¹
Applicator : CP3 Lever-operated
knapsack
Nozzle : APM Green floodjet
Output : 319 l

Weather conditions at spray

Temperature °C : 8am : 25,5
: 2pm : 24,0
Rel. humidity% : 8am : 78
: 2pm : 91
Rainfall (mm) December
after spraying : Date 7 8 9 10 11 12
3 2,2 1,1 5,5 0,5 0,5

2. Objectives

To test the phytotoxicity of Fusilade to plant cane when used to kill the previous crop.

3. Treatments

- | | | |
|-------------|-----------------------|---|
| 1. Roundup | 10 l ha ⁻¹ | } Planted three weeks after application |
| 2. Fusilade | 6 l ha ⁻¹ | |
| 3. Fusilade | 12 l ha ⁻¹ | |
| 4. Roundup | 10 l ha ⁻¹ | } Planted six weeks after application |
| 5. Fusilade | 6 l ha ⁻¹ | |
| 6. Fusilade | 12 l ha ⁻¹ | |

4. Results

Table 1. Germination % and vigour assessment at 21 and 66 days after planting and growth measurements at 3,1 4,5 and 9 months of age

Treatment	Plant Weeks after spray	21 days		66 days		Heights (cm)			Counts x 10 ⁻³ ha ⁻¹		
		Germ %	Vig *	Germ %	Vig *	3,1 m	4,5 m	9 m	3,1 m	4,5 m	9 m
T1 Roundup 10 l ha ⁻¹	3	70	3,3	95	4,7	35	66	117	190	181	148
T2 Fusilade 6 l ha ⁻¹	3	63	3,3	95	5,0	33	62	110	204	189	149
T3 Fusilade 12 l ha ⁻¹	3	60	2,7	93	4,5	33	65	112	179	185	149
T4 Roundup 10 l ha ⁻¹	6	-	-	82	4,3	22	42	81	146	190	168
T5 Fusilade 6 l ha ⁻¹	6	-	-	60	4,2	18	34	73	124	163	154
Fusilade 12 l ha ⁻¹	6	-	-	62	3,5	18	34	68	149	187	170

* Vigour Ratings 1-5, where 1= very poor 5= very good growth

Table 2. Yield and Crop characteristics at harvest

Treatments	Planted weeks after spray	t ha ⁻¹ cane	Sucrose % cane	t ha ⁻¹ Sucrose	Stalk counts x10 ⁻³ ha ⁻¹	Stalk length (cm)	Mass stalk ⁻¹
T1 Roundup 10 l ha ⁻¹	3	111	12,1	13,4	124	220	0,90
T2 Fusilade 6 l ha ⁻¹	3	104	12,2	12,7	123	211	0,85
T3 Fusilade 12 l ha ⁻¹	3	112	12,8	14,3	121	217	0,92
T4 Roundup 10 l ha ⁻¹	6	92	12,7	11,7	117	199	0,78
T5 Fusilade 6 l ha ⁻¹	6	89	12,2	10,8	117	188	0,76
T6 Fusilade 12 l ha ⁻¹	6	91	12,3	11,2	114	194	0,79
Mean		100	12,4	12,4	119	205	0,83
C.V.%		11,1	6,3	13,6	4,8	5,6	
S.E. of treatment Mean ±		6,36	0,45	0,97	3,29	6,60	
S.E. Diff of treatment mean ±		8,99	0,63	1,38	4,66	9,34	
L.S.D. (0,05)		28,52	2,01	4,36	14,76	29,60	

Table 3. Third leaf % dm analysis @ 12,4 months sampled 30.1.85

Treatments	Plant weeks after spraying	% dm						N/S
		N	P	K	S	Ca	Mg	Ratio
T1 Roundup 10 l ha ⁻¹	3	1,44	0,18	1,13	0,15	0,18	0,20	9,5
T2 Fusilade 6 l ha ⁻¹	3	1,46	0,20	1,19	0,15	0,20	0,28	9,5
T3 Fusilade 12 l ha ⁻¹	3	1,62	0,20	1,24	0,16	0,18	0,20	10,3
T4 Roundup 10 l ha ⁻¹	6	1,65	0,20	1,23	0,16	0,20	0,21	10,6
T5 Fusilade 6 l ha ⁻¹	6	1,57	0,20	1,20	0,16	0,21	0,21	9,6
T6 Fusilade 12 l ha ⁻¹	6	1,52	0,20	1,13	0,16	0,19	0,22	9,5

5. CommentsCane kill

The previous crop was killed more effectively by Fusilade treatment than by Roundup and regrowth measurements showed 38% hoe units regrowth from Roundup treated plots as opposed to 7,5 and 2,9% from plots treated with 6 and 12 l/ha of Fusilade respectively. Assessment was made 4 months after spraying.

NB 1 hoe unit is taken as any live cane growth within a 250 mm section of cane row, ie 2 positive hoe units/metre = 50% hoe units regrowth.

Crop measurements

Early crop measurements show shorter stalks in plots treated with both Fusilade rates and at both planting dates. The trend was however, far more marked in cane planted on the second date.

These differences were still apparent at harvest but much less marked.

Yield

No differences in yield between Fusilade and Roundup treatments were apparent at harvest in terms of cane or sucrose in spite of trends in stalk measurements.

A difference was however, apparent between planting dates and the 3 week delay in planting resulted in a yield reduction of 18 tons of cane/ha on average. 337 mm of rainfall occurred between these planting dates and results in terms of cane t/ha/100 mm were:-

early planting 5,99 tc/ha/100 mm 6,41 tc/ha/month

later planting 6,14 tc/ha/100 mm 5,5 tc/ha/month

General comments

Although difficult to explain the trend towards poorer growth from Fusilade treated plots planted at the second date (6 weeks after spraying) is cause for concern. Similar treatments applied to cane in light soils showed yield reductions in earlier planted plots from Fusilade treatments. A possible explanation could be the greater rainfall required in heavy soils to take Fusilade down to the cane setts.

The lack of differences in yield at harvest could have been masked to some extent by competition from the regrowth of the previous crop in Roundup treated plots (although crop measurements do not suggest this) and due to some damage caused to one replication by Fusilade drift from adjacent fields.

6. Conclusions

A careful examination of all Fusilade cane killing trial results and possibly more trials on other soil types would be needed before registration for this use would be acceptable.

Since there appears to be no intention by the company concerned to develop the product further for this use no further trial work is envisaged at present.

PETT/IS
3 July 1986

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: HW270/84/R1

Cat.No: 1489

Title: Fusilade phytotoxicity in heavy soils

1. Particulars of the project

This crop: 1st ratoon

Site: Mt. Edgecombe

Region: N. Coast Coastal

Soil system: Umzinto/C.lowlands

Soil form/series: Arcadia/Rydalvale

Design: Random blocks

Variety: NCo376

Fertilizer: N P K

Top dressed 115 - 115

Soil analysis: Date: 28/5/85

pH Clay%

5,2 <29

ppm

P	K	Ca	Mg	Zn	Al
24	124	1222	>220	2,0	2

Age: 12,2 mths Dates: 28.5.85-4.6.86

Rainfall: 990mm L.T.M.: 938 mm

Irrigation: Nil

2. Objectives

To investigate any residual effects in the first ratoon crop after re-establishing sugarcane using Roundup and Fusilade as cane killing chemicals in the minimum tillage system.

3. Experimental

See plant crop report.

This ratoon was top dressed and weeds controlled by hoeing. No further treatments were applied.

4. Results

Table 1. Crop growth measurement taken 4 and 9 months after harvesting the previous crop.

Treatments	Stalk length(cm)		Stalk popln(x1000 ha ⁻¹)	
	4	9	4	9
Roundup 10ℓ 3 weeks	20	135	131	127
Fusilade 6ℓ 3 weeks	19	140	137	129
Fusilade 12ℓ 3 weeks	19	135	129	131
Roundup 10ℓ 6 weeks	19	137	137	118
Fusilade 6ℓ 6 weeks	19	132	119	123
Fusilade 12ℓ 6 weeks	19	133	136	124

Table 2. Yield and crop characteristics at harvest.

Treatments	Yield			Stalk length (cm)	Stalk popln (x1000 ha ⁻¹)
	Cane t ha ⁻¹	Sucrose % cane	Sucrose t ha ⁻¹		
Roundup 10ℓ 3 weeks	94	12,95	12,2	192	132
Fusilade 6ℓ 3 weeks	95	12,45	11,8	200	128
Fusilade 12ℓ 3 weeks	93	13,40	12,4	193	126
Roundup 10ℓ 6 weeks	93	12,62	11,7	194	123
Fusilade 6ℓ 6 weeks	86	13,22	11,3	186	123
Fusilade 12ℓ 6 weeks	88	12,88	11,3	188	126
C.V.%	9,3	5,2	8,2		5,7
L.S.D. (0,05)	15,6	1,2	1,76		13,1

Table 3. Planting time residual effect (3 weeks vs 6 weeks)

Average effect = -5,3 + 4,0 t cane ha⁻¹
 Roundup effect = -1,1)
 Fusilade 6ℓ effect = -9,3) + 9,6 t cane ha⁻¹
 Fusilade 12ℓ effect = -5,4)

5. Comments

Stalk measurements

A trend similar to that of the plant crop was evident at 9 months where all treatments were similar in the three week planting while Fusilade plots had shorter stalks in the six week planting. All plots had lower populations in the six week planting.

Yield

Similar trends were evident at harvest with a benefit (NS) being seen to the early planting. In the later planting Roundup plots were superior to Fusilade treated plots (NS) persistence of this effect is somewhat surprising and not easily explained.

6. Conclusions

These results confirm the need for careful consideration of all results and possibly more critical work before any registration could be supported. However, it is unlikely that this product will be developed further for this purpose at present.

PETT/SN
14 May 1987