

A14

SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION

Code: HW251/83/R2  
Cat No: 1453

Title: Phytotoxicity of herbicides on N8 growing on weak sands

1. Particulars of the project

This crop : 2nd ratoon  
Site : Felixton  
Region : Zululand  
Soil system : Berea Recent Sands  
Soil form/series : Fernwood/Fernwood  
Design : Random blocks  
Variety : N8  
Fertilizer : N P K  
Top dressing 129 - 129  
Temik applied at 20 kg/ha

Soil analysis: Date 28.9.83  
pH Clay% Silt% Sand%  
5,79 2 5 93

ppm

P	K	Ca	Mg	Zn
>80	99	725	73	>4,0

Age: 11,9 months Dates: 28.9.83 - 25.9.84  
L.T.M. 1 356

Rainfall (mm)

83				84		
Sept	Oct	Nov	Dec	Jan	Feb	Mar
55	96	196	83	203	333	119
Apr	May	June	July	Aug	Sept	Total
98	33	54	193	71	23	1 557

2. Objectives

To test the sensitivity of N8 growing on a weak sandy soil to a range of herbicide treatments.

3. Treatments

	<u>Chemicals (% ai)</u>	<u>Rate kg or l/ha (prod)</u>
1.	Control (unsprayed)	-
2.	Lasso (38) + diuron (80) + Actril DS (70)	6 + 2,5 + 1,25
3.	Lasso + ametryn (80)	6 + 6
4.	Dual (72) + ametryn	2,75 + 6
5.	Diuron + Sencor (70)	2 + 2
6.	Bimate (75) + S	4
7.	Diuron + Velpar (90)	2 + 0,5
8.	Bladex Plus (50) + S	6

### Note on treatments

Application details: Date 24.10.83

Method : Directly over cane foliage  
 Applicator : Lever operated knapsack sprayer  
 Nozzle : APM Green floodjet  
 Pressure : 1,5 bars

### Weather conditions

Temperature °C 8 am : 20,2 (Mtunzini met station)  
 2 pm : 24,0

Rel. humidity % 8 am : 64  
 2 pm : 46

Sunshine hours : 4,0

Rainfall (mm) on day of spray: 7 mm (at site)  
 days to first rain: 0  
 amount of first rain: 7 mm

Dew : Nil

Wind : Strong

General : Windy overcast with drizzle and rain during  
 last 3 treatments

Cane growth at spray : 25 cm leaf height

Weeds : some tillered Panicum maximum

### Experimental

Plot size was 5 rows x 8 cm x 1,3 m row spacing with 5 replications. The trial was burnt at harvest and the cane was lodged to some extent.

Weed growth was prolific at this site and was removed from all plots on 3 occasions. In spite of this some competition is expected to have occurred in unsprayed plots.

## Results

Table 1

Visual ratings of leaf scorch taken 30 days after spraying and crop measurements taken 2,5, 3,5 and 6,5 months after spraying

Treatments	Leaf scorch %	Stunting 1-5	Stalk length (m)			Stalk popln. (1000/ha)		
	30 days		2,5	3,5	6,5	2,5	3,5	6,5
Control (unsprayed)	1,2	4,8	,70	1,05	2,19	188	151	136
Lasso + diuron + Actril DS	15	2	,58	,93	2,02	214	165	146
Lasso + ametryn + S	14,6	1,8	,54	,93	2,06	227	162	142
Dual + ametryn + S	11,4	2,8	,60	,98	2,07	200	172	155
Diuron + Sencor	11,6	2,6	,60	1,00	2,13	218	165	142
Bimate + S	12,8	2	,59	,93	2,14	212	172	155
Diuron + Velpar	11,2	3	,61	1,01	2,12	213	174	159
Bladex Plus + S	3,4	3,8	,65	1,07	2,16	196	171	136

## Comments

Visual ratings : Severe visual effects in the form of leaf scorch and stunting were apparent from most treatments. Bladex Plus showed least effect, but this was nevertheless present.

Stalk length : All treatments stunted sugarcane during early growth, plots treated with Bladex Plus being least affected.

Stalk population : Generally treatments causing shorter stalks had higher populations.

Table 2

Yield data at harvest

Treatments	Rate in kg or l. prod/ha	Yield			Stalk length (m)	Stalk popln (1000/ha)
		Cane t/ha	Sucrose % cane	Sucrose t/ha		
Control (unsprayed)	-	67,3	11,77	7,9	2,24	177
Lasso + diuron + Actril DS	6+2,5+1,25	67,7	11,70	7,9	2,16	187
Lasso + ametryne + S	6+6	67,0	11,48	7,7	2,16	188
Dual + ametryne + S	2,75+6	67,9	11,88	8,1	2,13	189
Diuron + Sencor	2+2	70,6	12,35	8,7	2,25	179
Bimate + S	4	72,5	11,76	8,5	2,21	194
Diuron + Velpar	2,0+0,5	69,0	11,95	8,2	2,15	193
Bladex Plus + S	6	69,7	11,75	8,2	2,23	187
CV%		8	4,3	8,3	4,0	6,0
LSD (0,05)		7,15	0,66	0,88	0,11	14,4
LSD (0,01)		9,63	0,89	1,19	0,15	19,5

## Comments

Crop measurements: Crop measurements at harvest showed a similar pattern to earlier measurements. Stalk lengths were lower and

populations higher in most treated plots than in unsprayed plots.

**Yield** : No differences in yield reached a level of statistical significance.

### Discussion

Weed competition in unsprayed control plots may have exaggerated the differences in stalk length and populations between treated and untreated plots ie stalk lengths could be increased by weed competition while populations could tend to be reduced. Thus weed competition could have masked the effect of herbicides on the cane growth. However, differences in yield between plots treated with severely damaging and not so severe chemicals (based on initial stunting effects on cane stalks ie Lasso + ametryne vs Bladex Plus) are small and therefore the masking effect of weed competition is likely to have been small.

### Conclusions

Under the conditions of this experiment (adequate rainfall) herbicide treatments applied directly over the cane foliage do not appear to have damaged the sugarcane crop in yield terms.

All treatments, however, scorched cane foliage and caused some initial stunting with Bladex Plus being the least damaging and Lasso + diuron + Actril DS and the ametryn treatments being most severe.

APPENDIX I : Chemicals used in this experiment were:

Chemical name	Trade name
alachlor	Lasso
diuron	
ioxynil + 2,4-D	Actril DS
ametryn	
metolachlor	Dual
metribuzin	Sencor
tebuthiuron + diuron	Bimate
hexazinone	Velpar
cyanazine + atrazine	Bladex Plus

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