

**SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION**

Cat No : 1620
Project No: 3248
Cat. No : HW 300/85/R2

Title: Herbicide phytotoxicity to N14.

Objectives: To confirm phytotoxic responses of N14 to high rates of Diuron + Actril DS.

1. Particulars of the project:

		<u>Soil analysis</u>			
This crop	: 2nd ratoon	pH (water)	Clay %	OM %	
Site	: Central Field Station	8,65	11	0,7	
Region	: N. Coast Coastal	=====			
Soil System	: Berea	P ppm	K ppm	Ca ppm	Mg ppm
Soil form/series:	Hutton/Clansthal	79	69	>1800	55
Variety	: N14				
Age	: 10,8 months *	=====			
Dates	: 13/11/86 -7/10/87	Fertiliser: (kg/ha) N P K			
Rainfall	: 1401 mm	304 kg/ha Urea		137	- -
Irrigation	: Nil	350 kg/ha KCI		-	- 175
Total	: 1401 mm				
LTM	: 851,6 mm				

2. Design

Design : Randomised Blocks
Replication : 4
Whole plot size : 6 m x 6 rows x 1,4 m
Net plot size : 4 m x 4 rows x 1,4 m

* The trial was harvested early because of the high incidence of flowering and side shooting.

3. Treatments

Treatments	Rates & or kg product /ha	Time of application	Method
Control	-	-	-
Diuron + Sencor	2 + 2	Post em	Over Row
Diuron + Actril DS	2,5 + 1,25	Post em	Over Row
Diuron + Actril	5,0 + 2,5*	Post em	Over Row

* This treatment was a repeated application of diuron + Actril, each application being sprayed at the rate of 2,5 + 1,25 l/ha.

4. Chemical Formulations Used

Product	Formulation	Active ingredient
Diuron	800 g/l sc	diuron
Sencor	700 g/kg wp	metribuzin
Actril DS	600/100 g/l ec	2,4-D/ioxynil

5. Application detail

Treatment dates	18/12/86
Age of cane at spray	35 days after harvest of ratoon 1
Time of application	11h00
Applicator	CP3
Nozzle	APM Green
Pressure	120 kpa
Method	Over the row
Output	219 l/ha

6. Weather Conditions at time of spraying

Treatment dates	18/12/86
General	Cool
Dew	Nil
Soil surface	Moist
Wind	Slight
Sunshine hours	3,8
Temperature (°C)	
08h00	22,6
14h00	23,8
Relative humidity (%)	
08h00	78
14h00	72
Rainfall	
mm On day of spray	0
No of days to 1st rain	1
mm At 1st rain	1,7
mm In 1st 14 days	31,7

7. Results

No visual phytotoxicity ratings were carried out.

Table 1: Stalk length and population counts at 25, 62 and 100 days after spraying and at harvest

Treatment	Rate l or kg product ha ⁻¹	Stalk length (cm)				Counts (x 100 ha ⁻¹)			
		Days after treatment							
		25	62	100	Harvest	25	62	100	Harvest
Control	unsprayed	38	96	155	193	166	186	130	101
Diuron + Sencor	2 + 2	24	75	130	180	159	196	136	106
Diuron + Actril	2,5 + 1,25	25	71	125	181	162	205	125	99
Diuron + Actril (split)	5,0 + 2,5	27	72	132	182	174	175	129	99
CV %		15,1	8,9	5,0	4,2	12,5	12,1	5,7	5,7
SE mean		2,2	3,5	3,4	3,9	10,3	11,7	3,7	2,9
LSD (0,05)		7	11	11	12	33	37	12	9
(0,01)		10	16	16	18	48	53	17	13

Comment

Stalk length was reduced significantly (10%) upto 100 days after spraying for all three herbicide treatments but no significant differences were observed in plant population. The repeat application of diuron + Actril did not affect N14 any more than the single application of diuron + Actril.

At harvest the differences in plant population were still non-significant but the stalk length measurement bordered on significance at the 5% level, relative to the unsprayed control.

The sprayed treatments did not differ from each other to any great degree with regard to stalk length.

Table 2: Yield data and eldana damage at harvest of N14 sprayed with 4 herbicide treatments

Treatment	Rate l or kg product ha ⁻¹	Cane t ha ⁻¹	Sucrose t ha ⁻¹	Pol % cane	% Bored	
					Internode	Stalk
Control	unsprayed	98	12,2	12,65	7	58
Diuron + Sencor	2 + 2	85	10,1	11,86	4	28
Diuron + Actril	2,5 + 1,25	82	10,2	12,44	4	20
Diuron + Actril	5,0 + 2,5	86	9,8	11,47	5	40
CV %		8,0	9,9	4,3	69	36
SE mean		3,5	0,5	0,3	1,7	6,5
LSD (0,05)		11	1,7	0,8	5	21
(0,01)		16	2,4	1,2	6	30

Comment

Sucrose yield was significantly lower (5%) and cane yields bordering on significance (5%) for the treated plots compared to the untreated plots. This cane yield difference can be attributed to the difference in height at harvest.

Eldana damage was highest in the untreated plots but the coefficient of variation was very high and therefore the eldana damage data should be treated with circumspection, especially considering that the unsprayed controls had the highest sucrose ratings as well as the highest eldana damage.

Discussion and Conclusion

The stalk length data which indicates that the diuron + Actril treated plots were significantly shorter than the untreated plots ratifies the stalk length data from the first ratoon data HW300/85/R1, Cat No. 1547. However in this trial diuron + Sencor also severely affected stalk length unlike the first ratoon.

The double application of diuron + Actril did not appear to have any different effect on the cane growth compared with only a single application.

The level of eldana was highest in the unsprayed controls for both the first and second ratoon crops.

The yield data showed that cane yield and sucrose yield per hectare was reduced to a significant degree (5%) by the application of herbicides but that there were no real differences between the different sprayed treatments.

This differs with the first ratoon yields which found that only the repeat application of diuron + Actril at a later date reduced yields significantly.

Stalk length was also reduced in both the diuron + Actril treatments in the first ratoon while there were no real differences between diuron + Sencor and the untreated control.

This trial confirms that diuron + Actril should be directed away from N14 cane foliage.

While this trial showed a significant yield reduction (5%) from diuron + Sencor, HW214/82, Cat No. 1408 and HW214/83, Cat No. 1408 both showed a slight but non-significant yield reduction with N14.

It would, therefore, appear that while diuron + Sencor was slightly less phytotoxic than diuron + Actril on N14 it could nevertheless cause significant yield reductions.

MWW/dlz
4 May 1988