

**SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION**

Code : HW214/80/R1  
Cat. No: 1347

**Title: VARIETY SENSITIVITY TO HERBICIDES**

**1. Particulars of the project:**

<p><b>This crop</b> : 1st ratoon</p> <p><b>Site</b> : Pongola Field Stn</p> <p><b>Region</b> : Northern area</p> <p><b>Soil system</b> : Komatipoort</p> <p><b>Soil set/series</b> : Hutton/Shorrocks</p> <p><b>Design</b> : Random blocks + split plots</p> <p><b>Variety</b> : NCo 376, N14, J59/3</p> <p><b>Fertilizer</b> :    N        P        K</p> <p style="padding-left: 20px;">Topdressing    161    -       -</p>	<p><b>Soil analysis:</b>        <b>Date:</b> 31.10.81</p> <p style="padding-left: 40px;">pH                    <b>CLAY%</b></p> <p style="padding-left: 60px;">6,65                   &gt; 30</p> <p style="text-align: center;">ppm</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">P</th> <th style="width: 10%;">K</th> <th style="width: 10%;">Ca</th> <th style="width: 10%;">Mg</th> <th style="width: 10%;">Zn</th> <th style="width: 10%;">Al</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">20</td> <td style="text-align: center;">147</td> <td style="text-align: center;">748</td> <td style="text-align: center;">&gt;220</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> </tr> </tbody> </table> <p><b>Age</b> : 11,7 months</p> <p><b>Dates</b> : 13.10.81-5.10.82</p> <p><b>Rainfall</b> : 397 mm        <b>LTM:</b> 628 mm</p> <p><b>Irrigation:</b> 793 mm</p> <p style="padding-left: 40px;"><b>Total:</b> 1 190 mm</p>	P	K	Ca	Mg	Zn	Al	20	147	748	>220	-	-
P	K	Ca	Mg	Zn	Al								
20	147	748	>220	-	-								

**2. Objectives:**

To assess the sensitivity of the varieties N14 and J59/3 to herbicide mixtures used in the northern areas.

**3. Treatments:**

Chemicals	Rate (prod/ha)	
1. Control	-	) NCo 376 )
2. Dual + atrazine	4 + 4	)            ) N14 and
3. Sencor	10	)            ) J59/3
4. Diuron + Actril DS	18	)            )

#### 4. Experimental:

Treatments were applied over cane foliage. Details of spraying are:

Applicator : CP<sub>3</sub> knapsack sprayer  
 Nozzle : Floodjet APM Green  
 Output : 319 ℓ/ha

#### Weather conditions on date of application - 20.11.81:

Soil moisture : very wet

Rainfall (mm) :

On the day of spray : 0  
 Within 2 weeks of spray : 19,8  
 Days to first rain : 4  
 Amount of first rain : 0,4

Temperature °C 8 am : 19,6  
 2 pm : 22,4

Relative humidity % 8 am: 78  
 2 pm: 66

Sunshine hours : 0,3

Plot size was: 6 rows x 8 m x 1,4 m = 67,2 m<sup>2</sup>  
 net: 4 rows x 6 m x 1,4 m = 33,6 m<sup>2</sup>

Cane growth stage at spraying was 35-40 cm leaf height.

#### 5. Results:

**Table 1: Ratings of leaf scorch and stunting taken 11 days after spraying. Leaf scorch: 1-9 scale where 1 = no effect and 9 = 100% kill. Stunting: 1-5 scale where 1 = very poor and 5 = very good growth**

Treatments	Leaf scorch			Stunting		
	NCo 376	N14	J59/3	NCo 376	N14	J59/3
Control (unsprayed)	1	1	1	5	5	5
Diuron + Sencor	2	4,1	4,2	4,2	3	3,3
Bimate + S	-	4,6	4,5	-	3	3,6
Bladex Plus + S	-	2,8	2,8	-	3,7	4

#### Comment:

- Diuron + Sencor caused slight symptoms of leaf scorch on NCo 376 but was far more severe on N14 and J59/3.
- Bimate + S and diuron + Sencor were similar in their effects on N14 and J59/3 and were worse than Bladex Plus + S.

**Table 2: Crop measurements taken at spraying and 1, 3 and 5 months after spraying**

Treatments	Stalk length (m)				Stalk popln (1000/ha)			
	0*	1	3	5	0	1	3	5
NCo 376 Control	0,26	0,66	1,37	2,26	294	358	382	254
Diuron + Sencor	0,26	0,59	1,34	2,17	238	310	361	230
N14 Control	0,28	0,68	1,46	2,35	224	277	318	204
Diuron + Sencor	0,30	0,56	1,26	2,13	234	271	305	207
Bimate + S	0,28	0,51	1,28	2,06	235	224	263	167
Bladex Plus + S	0,30	0,57	1,31	2,25	195	152	305	199
J59/3 Control	0,30	0,68	1,54	-	215	296	335	-
Diuron + Sencor	0,32	0,54	1,27	2,18	239	223	276	183
Bimate + S	0,29	0,48	1,26	1,98	213	277	308	196
Bladex Plus + S	0,30	0,55	1,39	2,20	234	243	279	152

\* leaf canopy height - not stalk length

**Comments:**

- Very slight differences in canopy height and stalk populations were evident at spraying. These differences did not persist with the exception of populations of NCo 376 treated with diuron + Sencor which remained inferior throughout the crop growth period.
- After spraying marked stalk height reductions were apparent from treatments on all varieties. Bimate + S was most severe on N14 and J59/3 and Bladex Plus was the safest.
- In most cases stalk populations were lower in treated plots than untreated. In particular Bimate + S appeared to reduce stalk numbers in N14 while in J59/3 diuron + Sencor and Bladex plus were worse.

**Table 3: Yield data at harvest**

Treatments	Rate in kg prod/ha	Yield				Crop measurements	
		Cane t/ha	Ers t/ha	Suc t/ha	Ers % cane	Stalk ht(m)	Stalk popln (1000/ha)
NCo 376 Control	-	149	16,6	19,6	11,2	2,88	182
Diuron + Sencor	4 + 4	145	16,1	19,0	11,0	2,85	187
N14 Control	-	159	19,4	22,2	12,2	3,04	136
Diuron + Sencor	4 + 4	150	17,8	20,5	11,8	2,93	145
Bimate + S	10	159	17,7	20,7	11,1	2,94	144
Bladex Plus + S	18	171	20,4	23,5	12,0	2,97	137
J59/3 Control	-	128	18,0	20,0	14,1	2,75	123
Diuron + Sencor	4 + 4	129	17,8	20,0	13,7	2,66	111
Bimate + S	10	121	17,1	19,1	14,2	2,60	113
Bladex Plus + S	18	129	18,2	20,3	14,0	2,68	111
CV %*		4,1	7,2	6,4	3,7	-	4,1
LSD (0,05)		NS	NS	NS	NS		NS

\* Statistical analysis relates to N14 and J59/3 only

**Comments:**

- In spite of marked early differences in growth relatively small differences were apparent in yield.
- Diuron + Sencor tended to reduce yields in NCo 376 and N14 while Bimate + S tended to reduce yields in J59/3. Bladex Plus + S in spite of producing shorter stalks was equal to or better than unsprayed control in terms of yield in both N14 and J59/3.

**6. Conclusion:**

1. The loss due to phytotoxic effects of herbicides is generally relatively small even at twice recommended rates applied over the cane at a sensitive growth stage.
2. Results show a greater sensitivity of N14 and J59/3 to herbicides compared with NCo 376. This is however manifested in early growth differences and not yield.

PETT/HDN  
1/7/83