

**SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION**

Code: HW157/77/R4
Cat.No.: 1339

Title: VARIETY PHYTOTOXICITY TRIAL

1. Particulars of the project:

This crop	: 4th ratoon	Soil analysis:	Date: 17.11.81
Site	: Pongola Field Stn	pH	CLAY %
Region	: Northern area	6,7	> 30
Soil system	: Komatipoort	ppm	
Soil set/series	: Hutton/Shorrocks	P	K
Design	: Random block + split plots	9	134
Variety	: Six varieties	Ca	Mg
Fertilizer	: N P K	707	>220
Topdressing	137 26 125	Age	: 11,8 months
		Dates	: 4.11.81 - 27.10.81
		Rainfall	: 420 mm LTM: 625 mm
		Irrigation:	732 mm
		Total	1152 mm

2. Objectives:

To determine the sensitivity of six varieties to Velpar applied as a directed or over the cane treatment.

3. Treatments: See results

4. Experiment details:

Varieties : NCo 376, N55/805, NCo 293, N52/219, N8, N11

Plot size : 6 rows x 8 m x 1,4 m = 67,2 m² (gross)
4 rows x 6 m x 1,4 m = 33,6 m² (net)

Replications : 4

Date sprayed : 1 December 1981

Application : CP₃ knapsack + floodjet
Output 314 l/ha

Weather conditions: General : Overcast to clear and warm

Rainfall (mm) : On the day of spray = 0
 Days to first rain = 6
 Amount of first rain = 8,5

Sunshine hours : 3,7

Temperature °C : 8 am = 19,5
 : 2 pm = 23,5

Relative humidity % : 8 am = 73
 : 2 pm = 57

Stage of cane growth at spraying:

Variety	Stalk ht (cm)	Leaf ht (cm)	No. leaves per shoot
NCo 376	27	28	3-4
N55/805	33	32	3-4
NCo 293	27	26	3-4
N52/219	32	31	3-4
N8	22	21	3-4
N11	25	25	3

5. Results:

1. Vigour ratings (1-5 where 1 = very poor and 5 = fine) and ratings of leaf iron chlorosis on a 1-9 scale were taken prior to spraying and are presented in Table 1.

Ratings of leaf scorch stunting and iron chlorosis taken three weeks after spraying are also included in Table 1.

2. Leaf analyses taken at 3,3 months of age are presented in Table 2.
3. Crop growth measurements are presented in Table 3.
4. Yield data at harvest are presented in Table 4.

TABLE 1: Ratings of vigour and iron chlorosis at spraying and of stunting, leaf scorch and iron chlorosis 3 weeks after spraying (vigour and stunting 1-5 scale where 1 = very poor, 5 = fine; leaf scorch and iron chlorosis 1-9 where 1 = no effect and 9 = dead or 100% chlorotic)

Variety and treatment	Vigour at spray	Stunting at 3 weeks	Iron chlorosis		Leaf scorch at 3 weeks
			At spray	3 weeks	
NCo 376 - Control	3,8	4,9	2,6	1,3	1,3
Velpar x1 directed	3,8	4,3	2,6	1,8	1,6
Velpar x1 over cane	3,8	4,1	2,6	2,1	1,9
Velpar x2 over cane	3,8	3,9	2,6	2,4	2,4
N55/805 - Control	3,9	4,8	1,9	1,5	1,3
Velpar x1 directed	3,9	4,8	1,9	1,4	1,3
Velpar x1 over cane	3,9	4,4	1,9	1,8	1,6
Velpar x2 over cane	4	4	1,9	1,9	1,8
N52/219 - Control	3,8	5	5,5	1,9	1
Velpar x1 directed	3,8	4,1	5,5	4,1	2,6
Velpar x1 over cane	3,8	4,1	5,5	3,9	2,4
Velpar x2 over cane	3,8	4,4	5,5	4	2,9
NCo 293 - Control	3,8	4,8	3,6	1,8	1,3
Velpar x1 directed	3,6	4,1	3,8	2,6	2,6
Velpar x1 over cane	3,8	4,1	3,9	2,6	2,4
Velpar x2 over cane	3,6	4,1	3,5	3,3	3,3
N8 - Control	2,3	5	2,4	1,3	1
Velpar x1 directed	2,8	2,9	2,4	2,9	3,1
Velpar x1 over cane	2,5	3,3	2,4	2,9	2,1
Velpar x2 over cane	2,6	3,4	2,4	3,1	2,8
N11 - Control	3	4,9	3,9	1,6	1,1
Velpar x1 directed	3	3,9	3,8	2,5	1,8
Velpar x1 over cane	3	4	3,9	2,5	1,8
Velpar x2 over cane	3	4	3,9	2,9	2

TABLE 2: Leaf analyses taken at 3,3 months of age and 2,5 months after treatment

Varieties	Leaf analysis/treatment			
	N%		K%	
	Control	Mean Velpar	Control	Mean Velpar
NCo 376	1,65	1,62	1,60	1,56
N52/219	1,48	1,55	1,58	1,66
NCo 293	1,54	1,60	1,31	1,31
N55/805	1,60	1,55	1,46	1,65
N8	1,53	1,63	1,34	1,29
N11	1,39	1,53	1,40	1,63
Mean	1,53	1,58	1,45	1,52

TABLE 3: Mean crop measurements taken just prior to spraying and 2 and 4 months after spraying

Variety and treatment	Rate	Stalk length (m)			Stalk population (1000/ha)		
		0	2	4	0	2	4
NCo 376 - Control	-	0,22	0,80	1,47	430	645	352
Velpar directed	x1	0,22	0,72	1,40	429	592	354
Velpar over cane	x1	0,22	0,75	1,41	438	601	336
Velpar over cane	x2	0,22	0,69	1,36	360	627	331
N55/805 - Control	-	0,22	0,79	1,39	415	533	319
Velpar directed	x1	0,23	0,79	1,44	407	483	302
Velpar over cane	x1	0,22	0,73	1,44	420	525	314
Velpar over cane	x2	0,23	0,78	1,37	445	502	317
N52/219 - Control	-	0,22	0,88	1,46	352	355	258
Velpar directed	x1	0,23	0,82	1,45	300	383	265
Velpar over cane	x1	0,23	0,76	1,47	352	360	257
Velpar over cane	x2	0,21	0,78	1,41	398	362	267
NCo 293 - Control	-	0,21	0,82	1,44	412	415	283
Velpar directed	x1	0,21	0,76	1,36	389	420	295
Velpar over cane	x1	0,23	0,73	1,38	339	427	298
Velpar over cane	x2	0,22	0,76	1,36	393	462	305
N8 - Control	-	0,23	0,98	1,58	414	377	251
Velpar directed	x1	0,23	0,91	1,57	375	358	264
Velpar over cane	x1	0,23	0,88	1,54	369	374	267
Velpar over cane	x2	0,22	0,87	1,47	337	368	270
N11 - Control	-	0,21	0,73	1,43	317	535	314
Velpar directed	x1	0,23	0,70	1,41	329	480	314
Velpar over cane	x1	0,23	0,65	1,41	342	501	306
Velpar over cane	x2	0,22	0,66	1,37	361	494	313

TABLE 4: Yield data at harvest

Variety and treatment	Rate in kg prod/ha	Yield					Stalk length (m)
		% of control	Cane (t/ha)	Ers (t/ha)	Suc (t/ha)	Ers (% cane)	
NCo 376 - Control	-	100	144	17,4	19,9	12,1	2,27
Velpar directed	0,75	96	138	17,0	19,4	12,3	2,21
Velpar over cane	0,75	103	148	17,8	20,5	12,1	2,22
Velpar over cane	1,50	97	139	16,7	19,1	12,1	2,15
N55/805 - Control	-	100	113	15,2	17,0	13,5	2,18
Velpar directed	0,75	102	115	15,5	17,4	13,4	2,15
Velpar over cane	0,75	104	118	15,9	17,9	13,5	2,01
Velpar over cane	1,50	91	103*	13,6**	15,4**	13,2	2,08
N52/219 - Control	-	100	114	15,5	17,4	13,6	2,01
Velpar directed	0,75	103	117	15,6	17,5	13,3	2,01
Velpar over cane	0,75	98	112	14,7	16,6	13,1	2,00
Velpar over cane	1,50	99	113	15,1	16,9	13,3	1,89
NCo 293 - Control	-	100	116	14,0	16,0	12,1	2,04
Velpar directed	0,75	95	110	13,2	15,1	12,0	1,97
Velpar over cane	0,75	95	110	13,6	15,5	12,4	1,99
Velpar over cane	1,50	92	107*	12,7*	14,6*	11,8	1,95
N8 - Control	-	100	103	10,6	12,7	10,3	2,44
Velpar directed	0,75	95	98	10,2	12,2	10,4	2,18
Velpar over cane	0,75	101	104	10,9	13,1	10,5	2,32
Velpar over cane	1,50	91	94*	9,8	11,7	10,5	2,25
N11 - Control	-	100	112	13,8	15,7	12,3	1,89
Velpar directed	0,75	95	106	12,7*	14,4*	12,0	1,88
Velpar over cane	0,75	95	106	12,8*	14,5*	12,1	1,99
Velpar over cane	1,50	96	107	13,0	14,7	12,1	1,93
CV %			2,7	3,0	2,9	1,8	
LSD (0,05)*			8,853	1,092	1,175	0,482	
LSD (0,01)**			11,810	1,456	1,567	0,643	

Comments:• **Visual symptoms**

Stunting was apparent in all varieties at all rates of Velpar three weeks after application with the exception of variety N55/805 which had received a directed spray of Velpar at the recommended dose.

Iron chlorosis which was apparent before spraying was enhanced by herbicide applications particularly in varieties N52/219, NCo 293, N8 and N11, although this tendency also occurred in NCo 376 and N55/805. Generally the response to increased Velpar rates was linear.

Scorch from the chemical generally showed similar trends to the iron chlorosis but was not as severe.

• **Crop measurements**

Low stalk lengths were apparent from most treatments and in some varieties these persisted until the time of harvest. Generally over-the-cane sprays were more severe than directed interrow sprays and double rates were more severe than single rates.

• **Leaf analyses**

Leaf N and/or K contents were slightly higher in treated cane than in untreated cane of all varieties except NCo 376.

• **Yield data at harvest**

Although a general tendency was present towards lower yields from Velpar treated cane, statistically significant reductions were not always present.

N55/805 showed no effects from standard Velpar rates but was affected by double rates.

N52/219 was relatively unaffected by any treatment as was NCo 376 in spite of stalk length differences.

NCo 293, N11 and N8 all appeared to be affected to some extent by all treatments.

5. Conclusions:

Although varieties were affected to various extents by single and double rates of Velpar applied as a directed interrow or over the row treatment, the use of this product under these conditions would be acceptable.

PETT/HDN
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