SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Project No: 3537
Code No: HW330/87/R4
Cat. No: 1640

Title: Phytotoxicity of Garlon

Objectives:

To assess the phytotoxicity of Garlon on a heavy soil on ratoon cane of four varieties.

Particulars of project

This crop	: 4th Ratoon
Site	: Pongola Field Station
Region	: N. Irrigated
Soil system	: Komatipoort
Soil form/series	: Hutton/Shorrocks
Varieties	: J59/3, NCo376 N11, N14
Age	: 11,1 months
Dates	: 21/9/87-23/8/88
Rainfall	: 683 mm
Irrigation	549 mm
Total	: 1232 mm
LTM rainfall	: 646 mm

Soil analysis

pH (Water)	Clay%
6,15	> 30

ppm

P	K	Ca	Mg
27	209	768	305

Fertilizer kg/ha:	**N**	**P**	**K**
650 kg 5:1:5 (45) 9/10/87	133	27	133

Design

Design	:	Randomised block
Replications	:	4
Whole plot size	:	8 m x 6 rows x 1,4 m = 67,2 m^2
Net plot size	:	6 m x 4 rows x 1,4 m = 33,6 m^2

Treatments

Treatments	Rates ℓ or kg product/ha	Time of application	Method
Herbicides			
T^1 Garlon	3	Post em	Over the row
T^2 Garlon	1,5	Post em	Over the row
T^3 Control	Handweed	-	-
Varieties			
J59/3			
NCo376			
N11			
N14			

Chemcal Formulations Used

Product	Formulation	Active ingredients
Garlon 4	480 g/ℓ ec	triclopyr

Application Details:

Treatment dates : 19/11/87
Time of application : 05h15
Applicator : CP3
Nozzle : APM Green
Pressure : 130 kpa
Height of cane : 30 - 60 cm depending on variety
Method : Over row
Output (ml/s) : 32,7
Output (ml/m^2) : 23,3

Weather Conditions at Time of Spraying

Treatment dates : 19/11/87
General : Cloudy and cool
Dew : Slight
Soil surface : Moist
Wind : Nil
Sunshine hours : 2,4
Temperature (°C)
08h00 : 22,5
14h00 : 28,8
Relative humidity (%)
08h00 : 85
14h00 : 85
Rainfall
mm on day of spray : 0,6
No. days to 1st rain : 2
mm at 1 st rain : 4,5
mm in 1st 14 days : 34,2

Results

Scorch and stunting.

Table 1: Visual assessments of percent scorch and stunting from Garlon on 4 cane varieties at 25 days afer treatment

Treatment	Rate ℓ prod/ha	Leaf scorch %	Stunting *
Garlon - J59/3	1,5	5	4,1
Garlon - J59/3	3	5	4,2
Control - J59/3	Handweed	5	3,9
Garlon - NCo376	1,5	4	3,4
Garlon - NCo376	3	10	3,1
Control - NCo376	Handweed	1	4,3
Garlon - N11	1,5	4	3,9
Garlon - N11	3	7	3,9
Control - N11	Handweed	5,8	3,9
Garlon - N14	1,5	2	5
Garlon - N14	3	5,8	5
Control - N14	Handweed	0	5
Means			
J59/3		5	4,1
NCo376		4,9	3,6
N11		5,8	3,9
N14		2,6	5
Garlon	1,5	3,9	4,1
Garlon	3	6,9	4
Control	Handweed	2,9	4,3

* Stunting 1 - No stunting
5 - Severe stunting

There was considerable variation in growth after harvest so that at spraying plant height was not consistent (30-60 cm; 4-6 leaf/plant).

The degree of scorch even at 3 ℓ/ha only averaged 10% for NCo376 while it was lower for the other varieties. It would therefore appear that Garlon does not cause severe chlorosis to sugarcane.

The stunt ratings tended to agree with the physical plant height measurements recorded 8 days before spraying and 34 days after spraying except for the variety NCo376. It would appear that the application of Garlon did not stunt any particular variety although there were differences between varieties as regards growth.

Stalk height and plant populations count.

Table 2: Stalk height and plant population for different varieties treated with Garlon

Treatment	Rate ℓ prod/ha	Plant height (cm)				Counts (x 1000)			
		-8 DAT*	34 DAT	67 DAT	100 DAT	-8 DAT	34 DAT	67 DAT	100 DAT
Garlon J59/3	1,5	18	87	228	252	248	192	125	124
Garlon J59/3	3	18	89	218	256	246	205	129	121
Control J59/3	Handweed	16	86	222	257	240	233	113	110
Garlon NCo376	1,5	17	84	223	263	312	200	150	148
Garlon NCo376	3	17	82	209	280	331	226	170	162
Control NCo376	Handweed	15	93	231	282	317	211	140	131
Garlon N11	1,5	14	84	227	262	276	188	127	131
Garlon N11	3	15	81	225	274	283	202	148	143
Control N11	Handweed	15	83	234	265	263	220	129	129
Garlon N14	1,5	23	100	241	291	284	200	155	142
Garlon N14	3	22	101	233	282	276	205	145	137
Control N14	Handweed	22	101	246	287	270	188	119	114
Mean									
Garlon	1,5	18	89	230	267	280	195	139	136
Garlon	3	18	88	221	273	284	210	148	141
Control	Handweed	17	91	233	273	273	213	125	121
J59/3		17	87	223	255	245	210	122	118
NCo376		16	86	221	275	320	212	153	147
N11		15	83	229	267	274	203	135	134
N14		22	101	240	287	277	198	140	131

* Days after treatment

Harvest data.

Table 3: The effect of Garlon on various harvest variables

Treatment	Rate ℓ prod/ha	Cane t/ha	Sucrose t/ha	Pol % Cane
Garlon - J59/3	1,5	118	14,4	12,2
Garlon - J59/3	3	122	14,9	12,2
Control - J59/3	Handweed	119	15,5	13,1
Garlon - NCo376	1,5	119	13,5	11,3
Garlon - NCo376	3	125	14,3	11,4
Control - NCo376	Handweed	130	13,8	10,6
Garlon - N11	1,5	106	13.0	12,1
Garlon - N11	3	105	11,7	11,1
Control - N11	Handweed	98	10,8	11,0
Garlon - N14	1,5	135	16,9	12,5
Garlon - N14	3	139	17,0	12,2
Control - N14	Handweed	145	18,0	12,4
Mean				
Garlon	1,5	119	14,4	12,0
Garlon	3	123	14,4	11,7
Control	Handweed	123	14,5	11,8
J59/3		119	14.9	12,5
NCo376		125	13,8	11,1
N11		103	11,8	11,4
N14		140	17,3	12,6
CV whole plot %		4,6	10,9	6,5
CV sub plot %		5,3	12,6	11,6
SE within same whole plot		3,2	0,9	0,7
LSD (0,05)		9	3	2
LSD (0,01)		13	4	3

The variables measured did not seem to differ significantly within a variety although cane t/ha for N14 at 1,5 ℓ/ha Garlon was just significantly (0,05) lower than the untreated control. However the double rate of Garlon did not produce lower yields than the standard rates of Garlon for all the varieties.

Sucrose yield (t/ha) and Pol % cane did not show any treatment differences.

Discussion and Conclusion

The data would tend to substantiate the evidence from previous trials (HW309 Cat 1592, HW313 Cat 1604 and HW314 Cat 1619) that Garlon at rates upto 3 ℓ/ha did not cause any significant damage to sugarcane.

Heights at 64 days after treatment (and 54 days after treatment in HW314) did show a lower value than the control but by 100 days this effect was not evident in both trials.

It can be concluded therefore that Garlon would be safe for use on sugarcane.

The double rates (3 ℓ/ha) of Garlon suppressed plant heigh slightly more than the standard rate (1,5 ℓ/ha) relative to the unsprayed control for all varieties 67 days after treatment. This trend was not apparent at 34 days after spraying except for NCo376.

Stalk heights 100 days after treatment indicated that the double rate of Garlon had caught up in all varieties except N14.

However at no stage were there any significant differences in plant height within a variety.

Cane yield was not depressed by the application of Garlon at rates upto 3 ℓ/ha.

MWW/lb
20 October 1988