

A14

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: HW 303/86

Cat. No.: 1519

Title: Cyperus rotundus control in trays

1. Particulars of the project:

<p>This crop : <u>Cyperus rotundus</u> <u>Site</u> : Mount Edgecombe <u>Region</u> : North Coast Coastal <u>Soil system</u>: Umzinto coast lowlands <u>Soil form/series</u>: Hutton/Shorrocks <u>Design</u>: Randomised blocks <u>Variety</u>: -</p>	<p><u>Soil analysis</u>: Date: 29.1.86</p> <table border="1"> <thead> <tr> <th><u>O.M.%</u></th> <th><u>Clay%</u></th> <th><u>Silt%</u></th> <th><u>Sand%</u></th> </tr> </thead> <tbody> <tr> <td>0,50</td> <td>35</td> <td>13</td> <td>52</td> </tr> </tbody> </table> <p style="text-align: center;">ppm</p> <table border="1"> <thead> <tr> <th><u>P</u></th> <th><u>K</u></th> <th><u>Ca</u></th> <th><u>Mg</u></th> <th><u>Zn</u></th> </tr> </thead> <tbody> <tr> <td>51</td> <td>80</td> <td>>1800</td> <td>>220</td> <td>0,8</td> </tr> </tbody> </table> <p><u>Irrigation</u>: Drip irrigation</p>	<u>O.M.%</u>	<u>Clay%</u>	<u>Silt%</u>	<u>Sand%</u>	0,50	35	13	52	<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>	<u>Zn</u>	51	80	>1800	>220	0,8
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51	80	>1800	>220	0,8															
<p><u>Application details</u>:-</p> <p><u>Applicator</u>: Gas operated Knapsack sprayer</p> <p><u>Nozzle</u>: 8004-E fanjet</p> <p><u>Pressure</u>: + 2 Bars</p>																			

Weather condition at spraying:

Date sprayed	10.3.86	13.3.86	20.3.86	27.3.86	3.4.86	17.4.86
General	Hot & clear	Warm	Warm	Cool	Warm	Warm
infall: On day of spray	0,7	0	0	0	0	0
No. days to 1st rain	1	1	3	10	3	2
No.m.m. at 1st rain	107,1	1,1	3,0	0,5	0,5	1,1
Sunshine hrs	9,2	9,1	7,3	10,2	10,4	9,0
Dew	Nil	Nil	Nil	Nil	Nil	Nil
Wind	Nil	Light	Nil	Nil	Nil	Nil
Temperature (°C) 8 am	24,5	22,2	22,4	19,8	21,2	21,0
2 pm	27,8	28,1	25,4	24,2	24,8	26,8
Relative humidity(%) 8 am	87	82	89	80	80	84
2 pm	68	73	71	60	60	68
Time of spraying	10:00	08:45	09:25	10:00	09:00	08:45

2. Objectives

To screen a number of treatments for the control of C. rotundus, at different stages of growth, in trays.

3. Treatments

<u>Treatment No.</u>	<u>Chemicals</u>	<u>Rate(Kg or ℓ prod.ha⁻¹)</u>
1*	Control	-
2	Dopax + Gramoxone/Diuron + Actril (pre-flowering)	7 + 1,5/2,5 + 1,25
3	Dopax + Gramoxone (pre-flowering)	7 + 1,5
4	Gramoxone (pre-flowering)	2,0
5	Actril DS (")	1,5
6	Actril DS (")	2,0
7	MSMA (")	3,0
8A	MSMA/MSMA (1st appln:pre-flowering)	2/2 (1 week interval)
8B	MSMA/MSMA (" ")	2/2 (2 weeks)
8C	MSMA/MSMA (" ")	2/2 (3 weeks)
8D	MSMA/MSMA (" ")	2/2 (5 weeks)
9A	MSMA/MSMA (" ")	3/2 (1 week)
9B	MSMA/MSMA (" ")	3/2 (2 weeks)
9C	MSMA/MSMA (" ")	3/2 (3 weeks)
9D	MSMA/MSMA (" ")	3/2 (5 weeks)
10A	MSMA/MSMA (" ")	4/4 (1 week)
10B	MSMA/MSMA (" ")	4/4 (2 weeks)
10C	MSMA/MSMA (" ")	4/4 (3 weeks)
10D	MSMA/MSMA (" ")	4/4 (5 weeks)
11	Velpar (" ")	1,8
12	Velpar (" ")	2,8
13	Dual (incorporated at planting)	2,5
14	Eptam Super (incorporated at planting)	7,0

- * T1 = 8 replications
- T2 -T12 = 2 replications each
- T13-T14 = 3 replications each

3.1 Chemical formulation

<u>Product</u>	<u>Chemical name</u>	<u>Formulation</u>
Dopax	ametryne/metolachlor	250/250 g/ℓ ec
Gramoxone	paraquat	200 g/ℓ soln
Actril DS	2,4-D/ioxynil	600/100 g/ℓ ec
MSMA	MSMA	720 g/ℓ soln
Velpar	hexazinone	240 g/ℓ ec
Dual	metolachlor	960 g/ℓ ec
Eptam Super	EPTC	720 g/ℓ ec

4. Experimental

On 21 February, C. rotundus tubers were planted into 54 trays. 3 rows of 5 tubers were placed in each tray at a depth of 25 mm.

The dates of spraying of each treatment are indicated in Table 1.

Treatments 13 and 14 were sprayed on 22 February. The products used, Dual and Eptam Super, were incorporated immediately, by hand. C. rotundus tubers were planted soon afterwards.

With the exception of Treatments 13 and 14, the 1st treatments were applied as C. rotundus plants started flowering and were at the 8-10 leaf stage.

All trays were top-dressed with 5:1:5(45) : 6 g/tray on 20 March.

Control trays were emptied at different intervals and counts of old and new tubers per tray were taken.

5. Results

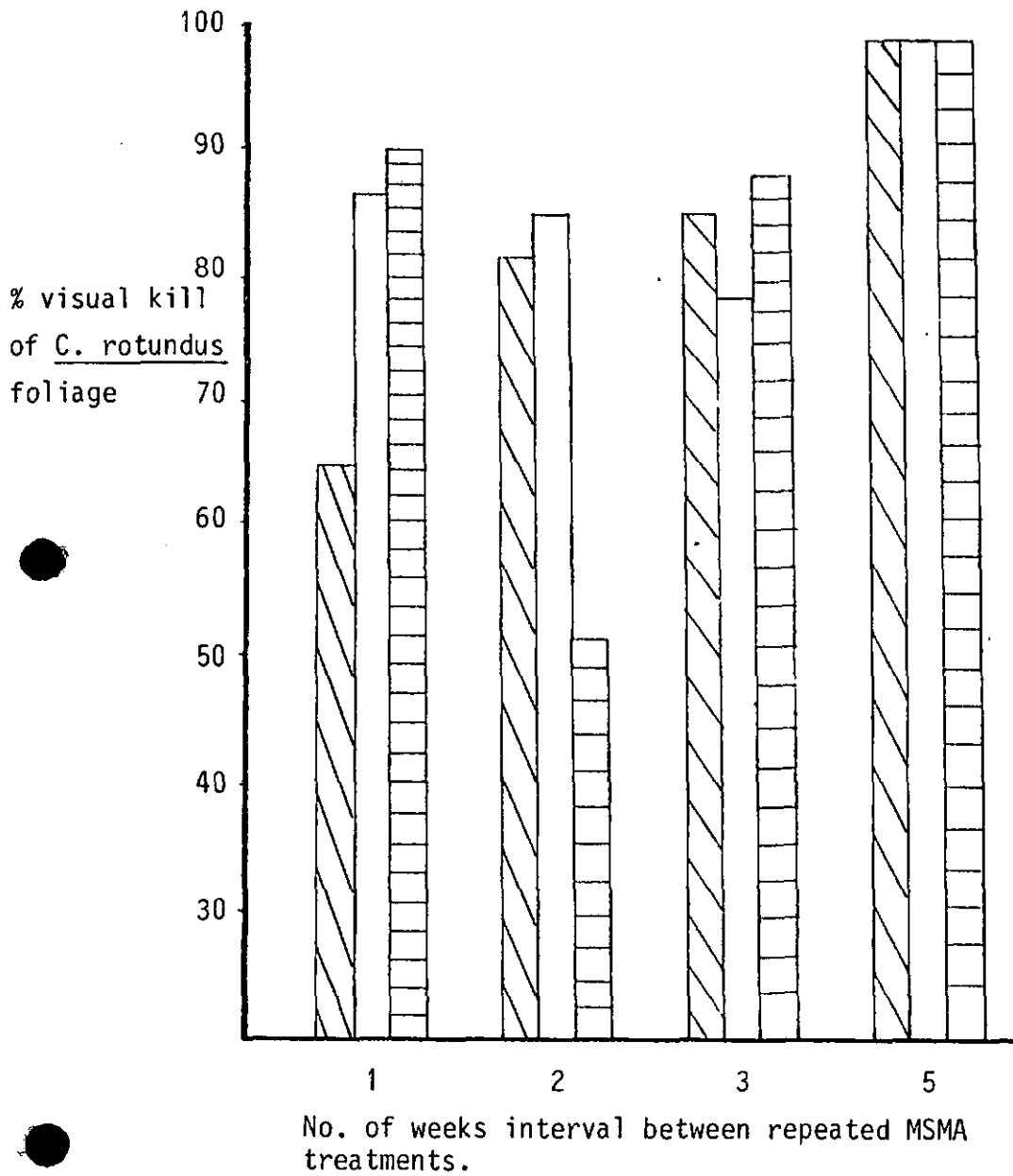
Table 1. Effect of treatments on C. rotundus foliage




TREATMENT & (SPRAYING DATES)	% scorch of <u>C. rotundus</u> (No. days after last treatment)				
	Assessment dates				
	21.3.86	2.4.86	16.4.86	1.5.86	28.5.86
1 Control	7	10	13	20	40
2 Dop + Gram/Diur + Actril(10.3.86/17.4.86)	82(11)	50(23)	50(37)	92(14)	91(41)
3 Dopax + Gramoxone (10.3.86)	80(11)	45(23)	62(37)	60(52)	67(79)
4 Gramoxone (13.3.86)	32(8)	12(20)	22(34)	30(49)	79(76)
5 Actril DS (13.3.86)	25(8)	62(20)	55(34)	57(49)	72(76)
6 Actril DS (13.3.86)	35(8)	62(20)	50(34)	55(49)	80(76)
7 MSMA (13.3.86)	22(8)	40(20)	32(34)	40(49)	83(76)
8A MSMA/MSMA (13.3.86/20.3.86)	32(1)	75(13)	45(27)	65(42)	90(69)
8B MSMA/MSMA (13.3.86/27.3.86)	22(8)	75(6)	67(20)	82(35)	92(62)
8C MSMA/MSMA (13.3.86/3.4.86)	42(8)	62(20)	82(13)	85(28)	92(55)
8D MSMA/MSMA (13.3.86/17.4.86)	30(8)	67(20)	75(34)	99(14)	100(41)
9A MSMA/MSMA (13.3.86/20.3.86)	35(1)	94(13)	90(27)	87(42)	92(69)
9B MSMA/MSMA (13.3.86/27.3.86)	40(8)	80(6)	85(20)	85(35)	97(62)
9C MSMA/MSMA (13.3.86/3.4.86)	45(8)	68(20)	80(13)	78(28)	90(55)
9D MSMA/MSMA (13.3.86/17.4.86)	30(8)	52(20)	85(34)	99(14)	100(41)
10A MSMA/MSMA (13.3.86/20.3.86)	47(1)	72(13)	82(27)	90(42)	96(69)
10B MSMA/MSMA (13.3.86/27.3.86)	55(8)	62(6)	55(20)	52(35)	80(62)
10C MSMA/MSMA (13.3.86/3.4.86)	47(8)	45(20)	82(13)	88(28)	96(55)
10D MSMA/MSMA (13.3.86/17.4.86)	52(8)	50(20)	50(34)	99(14)	100(41)
11 Velpar (13.3.86)	12(8)	58(20)	90(34)	87(49)	89(76)
12 Velpar (13.3.86)	15(8)	65(20)	89(34)	85(49)	90(76)
13 Dual (10.3.86)	100(11)	80(23)	50(37)	23(52)	55(79)
14 Eptam Super (10.3.86)	100(11)	70(23)	50(37)	20(52)	63(79)

Comments on Table 1

1. All treatments were sprayed relatively late in the season and this should be borne in mind when analysing the data. For example, on 28 May (the last assessment date) the control plots were rated 40% scorched. It may be more realistic to analyse results on assessment date 1 May 1986.
2. The follow-up of Diuron + Actril DS to Dopax + Gramoxone (treatment 2) vastly improved the control of C. rotundus compared to Dopax + Gramoxone only (treatment 3).
3. Single sprays of Gramoxone at 2,0 l/ha; Actril DS at 1,5 and 2,0 l/ha and MSMA at 3,0 l/ha were inadequate in controlling C. rotundus.
4. Velpar at 1,8 and 2,8 l/ha provided an acceptable control of C. rotundus.
5. Both incorporated treatments, namely Dual and Eptam Super provided good temporary control for 30 days, after which C. rotundus germinated extensively.
6. Repeated MSMA treatments provided the best control of C. rotundus, as shown in Figure 1.

FIGURE 1 : % VISUAL KILL OF *C. ROTUNDUS* 49 DAYS AFTER 1st SPRAY OF MSMA



	Treatment	Rate (l prod.ha ⁻¹)
	MSMA + MSMA =	2 + 2
	MSMA + MSMA =	3 + 2
	MSMA + MSMA =	4 + 4

Comments on Figure 1

1. All 3 treatments sprayed at a 5 week interval provided 99% control of C. rotundus.
2. There are no marked differences in the control of C. rotundus from using the above 3 repeated treatments, of MSMA.
3. C. rotundus control appears to be more sensitive to the time interval between MSMA sprays than to the actual rates of MSMA applied.

Table 2: C. rotundus population counts and tuber development in control trays

Date planted	Date count	No. plants per tray	No. flowers per tray	No. old tubers	No. new tubers
21.2.86	13.3.86	28	14	15	12
21.2.86	20.3.86	42	7	15	10
21.2.86	17.4.86	58	16	15	72
21.2.86	2.6.86	68	22	15	90

Comments on Table 2

1. Extensive tuber formation took place in a time period of between 5 and 9 weeks after planting, during which time the 3 and 5 week interval treatments were applied.

Comments on results

General

1. Repeated MSMA treatments have provided the best control of C. rotundus in this trial. In addition, these treatments are currently the cheapest.
2. Both Velpar treatments as well as the Dopax + Gramoxone followed by Diuron + Actril DS are the only other treatments to have provided an acceptable control of C. rotundus.

Future

1. Further trials, in the field, with a range of repeated MSMA treatments compared to single MSMA treatments on an equal l/ha basis may help confirm the superiority of repeated treatments in controlling C. rotundus. They would also help to confirm optimum time interval between repeated MSMA sprays.
2. Such trials should include regular counts of C. rotundus tubers in order to establish whether there is a relationship between tuber formation and translocation of herbicide, and also to determine the long term effect of these treatments on tuber numbers and viability.

GW/SN
22 August 1986