

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code HW 245

Cat. No.: 1406

TITLE: *C rotundus* competition and control in ratoon cane under irrigation

1. Particulars of the project

This crop : Ratoon cane
Site : Glen Park Estate
Region : Northern Area
Soil system : Alluvium
Soil form/series : Oakleaf
Design : Random blocks
Variety : N52/219
Fertilizer/Ameliorants : N P K
Standard farm practice

Soil analysis: Date: 26.11.82

<u>pH</u>	<u>O.M.%</u>	<u>Clay%</u>	<u>Silt%</u>	<u>Sand%</u>		
				<u>F</u>	<u>M</u>	<u>C</u>
6,65	0,29	20	12	67	1	0

ppm

<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>	<u>Zn</u>	<u>Al</u>
68	181	1511	> 220	4,0	

Age: 12.5 months Dates: 31.10.82-15.10.83

Rainfall : 492 L.T.M.: 734

Irrigation: ± 56 mm/ month

2. Objectives

- To attempt to measure the competitive effects of *C rotundus* on ratoon cane growth under irrigation.
- To measure the efficacy of various herbicide treatments on *C rotundus*.

3. Treatments

- Untreated to allow 100% *C rotundus* competition
- Hand hoe (repeated) to simulate interrow cultivation
- Ametryne (50*) + Actril DS (70) (3,5 *2 + 1,1 l/ha) repeated
- Lasso (384) + 2,4 -D (72) + paraquate (20) (5,2 + 1,7 + 1,3 l/ha) followed by ametryne + Actril DS (3,5 + 1,1 l/ha).

- Daconate 6 (72) (3,5 l/ha) repeated.
 - Roundup (10% solution) plus hand weeding on the row.
- * 1 Percent active ingredient of the formulations used are indicated in brackets.
- * 2 Product rates used are indicated.

4. Experimental

A ratoon cane field of variety N52/219 harvested at the end of October 1982 was used for the experiment. *C rotundus* germinated throughout the area but was denser initially in the cane rows rather than in the interrows where cane harvesting equipment had left the soil surface very uneven. *C rotundus* numbers were assessed by means of sample counts on every plot taken on the interrow where treatments were to be applied.

Plot size consisted of four rows x 6 m of which three interrows x 4 m formed the main assessment area for *C rotundus* populations and two lines x 4 m formed the net rows for crop measurements. These were taken at regular intervals using heights from twenty randomly selected stalks per plot and counts from one row per plot.

Spray treatments (3-5) were applied by means of a lever-operated knapsack sprayer fitted with an Albuz APM Green floodjet nozzle. This was directed across the interrows so as to penetrate the cane rows from either side. Treatment six (Roundup) was applied by means of a brush (Herbibros) through which Roundup solution (10%) was allowed to flow. This was wiped over the *C rotundus* foliage of plants in the interrow only. *C rotundus* plants were also removed from the cane rows by hand.

The hand hoeing treatment was conducted on interrow weeds only to simulate mechanical cultivation.

Dates of application and of follow-up treatments or repeated treatments are indicated in table 1.

Table 1.

Treatment number	Dates (R = repeat or F = follow up)			
	25.11.82	20.12.82	7.1.83	20.1.83
1	-	-	-	-
2	✓	R	R	R
3	✓	R	-	-
4	✓	F	-	-
5	✓	R	-	-
6	✓	R	R	-

Application details and weather conditions at spraying and subsequently are indicated below.

Applicator: CP₃ knapsack or Herbibros (T6 only)

Nozzle : APM Green floodjet

Pressure : 1,75 Bars

Output : 258 ℓ/ha

Dates of application	Temperature °C		Rel. Humidity %		Rainfall (mm)			
	8am	2pm	8am	2pm	Day of spray	Days to first rain	Amount 1st rain	In 2 Weeks
25.11.82	25,0	28,0	61	54	0	1	3,0	14,3
20.12.82	27,0	31,0	81	60	0	3	4,0	21,0
7. 1.83	24,5	25,5	79	69	0	5	2,0	48,0

- Assessments consisted of
1. *C. rotundus* population counts.
 2. Visual ratings of *C. rotundus* populations and control.
 3. Crop growth measurements (stalk heights and population counts)

The trial was harvested without weighing plots, but subsequently emergence of *C. rotundus* plants was monitored.

5. Results

Cyperus rotundus infestation at spraying (25.11.82) and one year later (2 months after harvest)

Treatments	(25.11.82) Plants ^{-m²}	Plants ^{-m²} (14.12.83)
1	700	1750
2	700	750
3	700	1200
4	575	1450
5	975	600
6	650	100

Ratings of percent *C rotundus* control at various dates.

Treatments	Ratings (% Control)					
	20.12.72	7.1.83	20.1.83	8.2.83	*2 18.3.83	*1 23.11.83
1. Unsprayed	4	5	0	0	91	0
2. Hand hoe	23	51	50	79	93	67
3. Am+Actril DS- repeated	27	67	12	25	87	32
4. Lasso+2,4-D+par/ Am+Actril DS	32	54	13	18	92	32
5. Daconate 6 - repeated	29	75	47	52	91	77
6. Roundup - repeated	53	78	93	95	97	84

* NB The trial was harvested on 15 October. Thus rating on 23.11.83 relates to germinated plants after harvesting.

* 2 Ratings relate to green plants although much dead plant material was present. This had been controlled by shading due to the crop canopy.

Crop growth measurements taken at spraying and 2,3,5 and 8 months after spray (3,4,6 and 9 months of age).

Treatments	Stalk length (m)					Stalk popu (1000/ha)				
	At spray	2	3	5	8	At spray	2	3	5	8
Unsprayed	0,18	0,93	1,32	1,91	2,13	253	149	122	105	111
Hand hoe	0,17	0,93	1,33	1,95	2,16	230	166	121	107	97
Am+Actr - repeated	0,18	0,91	1,27	1,86	2,10	227	155	117	98	93
Lasso+2,4-D+par/Am+Actr	0,17	0,88	1,25	1,94	2,14	224	162	119	104	96
Daconate 6 repeated	0,17	0,95	1,34	1,97	2,17	237	157	119	102	89
Roundup repeated	0,17	0,91	1,30	1,92	2,14	228	142	129	107	94

Estimated yield based on crop measurements at 6 and 9 months of age.

Treatment	Yield tc/ha		
	6 months	9 months	Mean
Unsprayed	44	78	61
Hand hoe	46	69	57
AM+Actr repeated	40	64	52
Lasso+2,4-D+par/ Am+Actr	44	68	56
Daconate 6 repeated	44	64	54
Roundup repeated	45	66	55

6. Comments.*C rotundus* control

- A high population of *C rotundus* plants was present at spraying (\pm 700 plants/m²)
 - Although the initial applications of Roundup were patchy in their contact with weeds, it eventually provided excellent longterm control of most interrow plants.
 - Only a short knockdown was provided by ametryne+Actril DS and Lasso +2,4-D+paraquat treatments, whereas Daconate 6 after the second application provided much better, longer lasting control.
 - The cane canopy shaded out all *C rotundus* growth so that in time all plants died back in all plots. This is the reason for ratings on 18 March showing good control even from the unsprayed treatment.
- New growth of *C rotundus* which occurred after Daconate 6 treatments took longer to die back under the influence of the cane canopy.
- The hand hoeing treatment maintained *C rotundus* populations at a low level and this was reflected in lower populations in the early assessment after harvesting.
 - Early ratings after harvest showed a marked reduction in populations from hand hoeing, Daconate 6 repeated and Roundup treatments although all treatments still had some reducing effect.
 - Population counts taken two months after harvest showed that there had been a net increase in plant population in unsprayed plots and some treated plots, whereas hand hoeing and Daconate 6 treatments had maintained similar levels. Only the Roundup treatment showed a marked decrease in plant populations, but this was on the inter-row only.

7. Crop measurements and estimated yields

Crop growth measurements show no marked differences between treatments (although cane growth was somewhat variable) and estimated yields are considered to show no real difference.

8. Conclusions.

- There was no obvious advantage to controlling *C rotundus* in this ratoon cane crop under irrigation by these means. However, no treatment was able to eliminate or even adequately control the *C rotundus* during the early ratoon cane growth period when its control could be expected to have the greatest benefit to the crop.

- Crop growth will be monitored in the present ratoon to gauge the benefits of the present lower *C rotundus* populations from the residual effects of some treatments

PETT/IS
29 March 1984