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SOUTH AFRICAN SUGAR INDUSTRY
AGRONOMISTS' ASSOCIATION

Code: HW166/78

Cat.No.: 1245

Title: ROUNDUP EFFICACY FOR KILLING SUGARCANE IN POTS

1. Particulars of the project:

This crop	:	Ratoon cane in pots
Site	:	Mount Edgecombe
Region	:	North Coast Coastal
Soil form/series	:	Hutton/Shorrocks
Variety	:	NCo 376
Fertilizer/ Ameliorants	:	N P K No fertilizer applied
Dates	:	22.5.79 - 10.7.79
Moisture	:	Hand watered

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2. Objectives:

To determine the effects of coverage, crop growth stage, rates, additives and time of application on Roundup's efficacy in killing cane.

3. Treatments:

Treatments are listed in Table I.

3. Treatments

Treatment number	Bin No.	Chemicals	Rate of solution	Volume of spray per bin	Leaf ht. (mm)
1	13	Roundup	3% solution	40 ml	450
"	3	"	"	16 ml	500
"	10	"	"	40	700
"	8	"	"	40	750
"	9	"	"	53	900
"	22	"	"	40	1100
"	6	"	"	40	1100
2	11	Roundup	0,5% solution	40	400
"	12	"	"	40	350
"	14	"	"	40	700
"	7	"	"	40	750
"	5	"	"	40	1050
"	15	"	"	40	1100
"	2	"	"	53	1100
"	20	"	"	40	1150
3	1	Roundup + $(NH_4)2$ SO4	1% + 3%	16	450
4	21	Roundup	1%	16	350
5	4	Roundup + $(NH_4)2$ SO4	1% + 1,5%	16	500
6	17	Roundup + Urea	1% + 3%	16	450-500
7	23	Roundup + Urea	1% + 1,5%	16	350
8	18	Roundup + Zn Cl2	1% + 1,5%	16	450
9	16	Roundup + Zn Cl2	1% + 3%	16	500
10	19	Zn Cl2	3%	16	800

4. Experimental

The cane of variety NCo 376 growing in 23 bins (200 ℓ capacity) after the completion of the first trial HW166/79, was cut back, on various dates commencing in February 1980 so that cane at different stages of growth was ready for spraying on 25th April 1980.

Treatments were applied on that date by means of a hand held garden sprayer which produced a fine mist spray. Adequate coverage of all foliage was achieved. The applicator applied approximately 40 ml per bin for treatments 1 and 2 (except bins 2, 9 and 3 where the volumes were 53 ml, + 50 ml and 16 ml respectively) and 16 ml per bin for treatments 3 to 10.

No fertilizer or supplementary water was applied to the cane.

Visual ratings of cane kill were taken at intervals after treatment. These were based on the EWRC 1-9 scale where 1 = no effect and 9 = dead.

66 days after spray application the remaining green shoots and all dead material were cut back in each pot. Watering commenced and counts of new shoots were taken regularly thereafter.

Weather conditions on the day of spraying were:-

On the day of spray:

Temperature 8 a.m. : 19,2° C

Relative humidity 8 a.m.: 81%

Sunshine hours : 7,3

Rainfall : 25 mm

5. Results

1. Visual ratings of cane kill taken 2, 3 and 5 weeks after spraying, and shoot counts taken prior to cutting back and 2, 4 and 9 weeks after cutting back are presented in Table I.

6. Comments

A. Roundup rate

1. The 0,5% solution did not provide an acceptable kill at any growth stage while the 3% solution was adequate at all growth stages. The 1% solution was unacceptable.

2. Subsequent regrowth in all cane stages was unacceptable from the 0,5% solution and the 1% solution but acceptable from the 3% solution.

B. Growth stages

1. Where low rates of Roundup were used (ie. 0,5% solution) there was an indication that the later the stage of cane growth the better the kill.

2. Since no water was applied to these pots, stress may have been more pronounced in cane at a later growth stage and so contributed to the greater kill.

3. Subsequent regrowth in the pots did not follow this pattern.

C. Additives

1. Ammonium sulphate at 1,5 and 3%, Zn Cl2 at 1,5 and 3% and Urea at 3% caused a slightly greater effect on cane when used in combination with Roundup at 1%. However, no treatment produced an acceptable kill.

2. Regrowth was unacceptable from all treatments with additives to Roundup although that from urea treatments was less than other combinations.

D. Zn Cl2

1. Zn Cl2 as an alternative to Roundup, caused a higher degree of visual leaf scorch and in fact had less regrowth than Roundup at 1% solution.

2. The kill achieved was however unacceptable.

3. Zn Cl2 was more effective alone than in combination with Roundup.

General comments

1. Visual effects on cane foliage may have been exaggerated by moisture stress.

2. Only one bin was used per treatment where additives to Roundup were compared.

Conclusions

1. A certain minimum dose of Roundup is required for an acceptable kill.

2. At an acceptable rate of Roundup, the cane growth stage at spraying within the range tested is unimportant.

3. No major improvement can be expected to Roundup efficacy from the addition of ammonium sulphate, urea or zinc chloride.

4. Zn Cl2 was unacceptable as an alternative to Roundup at the rates tested, but did have some effect.

PETT/SN
16 September, 1981

Table 1

Treatment	Bin No.	Cane growth stage at spraying (average)		Age (days)	Visual rating			Live shoot counts on 30 June 80	Regrowth (shoot counts)		
		Leaf canopy ht. (mm)	No. leaves unforled/shoot		Weeks after spraying				Weeks after cutting back (cut back on 1 July 80)		
					2	3	5		2	4	9
Roundup 3% solution	13	450	4-5	31	5	6	8	1	0	0	0
"	3	500	6	38	4	5,5	8,5	3	5	1	0
"	10	700	6-7	45	5	7	8,5	0	0	0	0
"	8	750	6	52	4	5,5	8	0	0	0	0
"	9	900	7	58	8	8,5	9	0	0	0	0
"	22	1100	8	65	4	6,5	7,5	2	0	1	5
"	6	1100	6	72	7	8	8,5	0	0	0	0
Roundup 0,5% solution	11	400	5	31	2	3,5	5,5	9	26	47	71
"	12	350	5	38	2	3	4,5	9	12	31	44
"	14	700	7-8	45	2	4	6,5	8	24	58	87
"	7	750	6	52	2	3,5	6	8	10	33	62
"	5	1050	6	65	2	3,5	7	4	41	114	165
"	15	1100	8	72	3	4,5	6	1	19	54	62
"	2	1100	7	79	7	5,5	7,5	4	3	16	55
"	20	1150	7-8	79	2	3,5	7,0	6	32	90	125
R/up (1%) + $(NH_4)_2$ SO4 (3%)	1	450	5	31	2	3	4	10	19	66	84
R/up (1%)	21	350	5	31	1	3	3,5	10	13	29	48
R/up (1%) + $(NH_4)_2$ SO4 (1,5%)	4	500	5-6	31	2	3	5,5	6	16	34	29
R/up (1%) + Urea (3%)	17	475	5	31	2	5	5,5	2	4	8	16
R/up (1%) + urea (1,5%)	23	350	4-5	31	1	2,5	4,5	3	3	4	5
R/up (1%) + Zn Cl_2 (1,5%)	18	450	5	31	2	4	3	6	25	63	85
R/up (1%) + Zn Cl_2 (3%)	16	500	5	31	2	4	4,5	6	15	41	58
Zn Cl_2 (3%)	19	800	8-9	31	3	5	6,5	5	7	13	17