SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Cat. No. : 1379

Title: Cane killing trial - Observation

1. Particulars of the project:

This crop	:	Ratoon cane
Site	:	C.F.S.
Region	:	N. Coast Coastal
Soil system	:	Berea
Soil form/series	:	Hutton/Clansthal
Design	:	Random blocks
Variety	:	NCo 376
Time of spraying	:	25.1.82

Soil analysis:

O.M.%	Clay %	Silt %	Sand % C	Sand % M	Sand % F
0,87	11	4	-	23	62

Dates 25.1.82 - 6.5.82

Rainfall: 8,4 mm on the day of spraying (3 pm)

Temperature °C: 8 am : 24,0
2 pm : 23,2

Rel. humidity % 8 am : 71
2 pm : 80

Sunshine hours: 0

General: Overcast, mild breeze

2. Objectives:

1. To test new methods of applying Roundup for killing sugarcane
2. To test additives to Roundup
3. To compare a new chemical with Roundup for killing cane

3. Treatments:

	Treatment	Rates	Application method
1.	Roundup	8 ℓ/ha	Conventional
2.	Roundup	6	Conventional
3.	Roundup + Frigate	4 + 1%	Conventional
4.	Roundup + Frigate	6 + 1%	Conventional
5.	Roundup + Frigate	6 + 0,5%	Conventional
6.	Roundup (Split)	3 + 3	Conventional
7.	Roundup + Rev 9/80	6 + 3	Conventional

	Treatment	Rates	Application method
8.	Roundup + Rev 9/80	6 + 3	Conventional
9.	Roundup	6	Conventional
10.	PP009	4	Conventional
11.	Roundup	50% soln.	Rope-wick applicator
12.	Roundup	10% soln.	Rope-wick applicator
13.	Roundup	4	'Wrickshaw' applicator
14.	Roundup	6	'Wrickshaw' applicator

Note on treatments

1. Conventional application involves the use of a lever-operated knapsack sprayer CP_3 fitted with a floodjet nozzle (TK5) held directly over the cane rows.

2. Rope-wick application is the use of a Hectaspan weed wiper mounted on a tractor. This consists of a series of three one metre tubes filled with Roundup solution and into which are inserted lengths of nylon rope which act as wicks.

3. 'Wrickshaw' applicator is a wheeled framework designed by the Wattle Research Institute which carries a mixture container and battery-operated spinning disc. The framework is surrounded by curtains which become wet from drifting chemical. These wipe over the cane as the machine moves forward.

4. Frigate is an additive produced by Diamond Shamrock which is claimed to improve the efficiency of Roundup.

5. Rev 9/80 is a product from Revertex SA which is claimed could reduce runoff caused by rainfall after application. For the purposes of testing this, cane in plots of treatments 8 and 9 were either sprayed with water using a knapsack sprayer and TK5 nozzle (at a rate of $\pm$ 0,25 ℓ/m^2) or had some cane in the plot doused with buckets of water.

Results

1. The rope-wick applicator showed immediate design faults. The ropes took a long time to become saturated with solution even with the grommets loosened to maximum. In practice application was affected by this as some caps came off and ropes came out allowing some spillage of solution.

2. Apart from this, the 4 m boom was very satisfactory for obtaining good coverage of three cane rows at a pass and could be set at a height of 15 cm above ground. Two passes (one in each direction) was made per treatment.

3. The 'Wrickshaw' sprayer was very suitable for coverage of one row at a time in terms of width but the cane was somewhat tall and interfered with the distribution from the disc.

Treatments	Rate	Ratings % kill		
		3	6	12
1. Roundup	8	30	60	75
2. Roundup	6	30	55	78
3. Roundup + Frigate	4 + 1%	18	33	33
4. Roundup + Frigate	6 + 1%	40	68	80
5. Roundup + Frigate	6 + 0,5%	25	50	65
6. Roundup - repeated	3 + 3	65	80	95
7. Roundup + Rev 9/80	6 + 3	25	38	45
8. Roundup + Rev 9/80	6 + 3	15	33	20
9. Roundup	6	20	38	35
10. PP009	4	68	93	65
11. Rope-wick + Roundup	50% soln*	53	-	80
12. Rope-wick + Roundup	10% soln	40	-	65
13. Wrickshaw + Roundup	5	15	-	13
14. Wrickshaw + Roundup	7	25	-	20

* NB. T11 at 50% with spillage used up 21 ℓ Roundup/ha
T12 at 10% with spillage used up 16 ℓ Roundup/ha
} ∴ Accurate assessment of rate applied to foliage is impossible

Comments:

1. 8,4 mm of rain fell after application was completed at + 1 o'clock. Treatment 1 was applied last and thus was probably affected by rain more than other treatments.

2. Frigate at 1% improved the visual kill by 6 ℓ/ha of Roundup initially but differences were very slight at the last assessment. At 0,5% the additive did not improve the cane kill and in fact may have decreased it.

3. The repeated application of Roundup was the most effective treatment. Weather conditions on the second application date were ideal with no rainfall.

4. Rev 9/80 decreased the effect of Roundup under the conditions of this experiment (8,4 mm of rainfall) although the time lag between application and rainfall was shorter for this treatment than for Roundup at 6 ℓ/ha without Rev 9/80 and this factor may be responsible for the difference.

Where plots were watered after application there was again a detrimental effect from adding Rev 9/80.

5. PP009 provided a good initial control but finally in terms of regrowth the kill was inferior to that from the repeated Roundup application. A notable feature of the PP009 treatment was that perennial Panicum maximum plants were not adequately controlled whereas Roundup did control them.

6. The rope-wick applicator was fairly effective in contacting cane but missed some smaller shoots. The very high rates used because of mechanical factors make it difficult to judge the relative efficacy of this method of application. There was, however, a marked difference in effect between high and low rates ie 50% and 10% solutions.

7. The 'Wrickshaw' was extremely unsatisfactory in terms of kill.

Conclusions:

1. The cane kill achieved after 8,4 mm of rain was still relatively good from treatments at high rates.

2. The repeated application of Roundup appears encouraging but possibly the advantages were related to better weather conditions during the second spraying. A comparison with a single 6 ℓ/ha application on the second spraying date would have been helpful.

3. The rope-wick applicator needs modification before further assessments can be made. New rope material with a quicker absorption is necessary and possibly the proportion of rope inside the tube to that outside the tube needs to be increased.

4. The 'wrickshaw' proved unsatisfactory in this experiment but does possibly warrant further investigation under more favourable conditions.

5. There appears to be no benefit to the addition of Rev 9/80 for improved rainfastness.

PETT/PMO
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