SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Cat No : 1708
Project No :
Code No : HW 387/89/R9

Title : Cane eradication methods

Objectives:
- To compare the efficiency of cane eradication between Roundup and rotavating.
- To establish whether the efficacy of Roundup can be improved by mechanical slashing compared to hand cutting.

1. Particulars of project

This crop : 9th ratoon

Site : Experiment Station Field 16

Region : North Coast Coastal

Soil system : Umzinto Coast Lowlands

Soil form/series: Arcadia/Mayo

Variety : NCo376

Dates : 24/7/89 - 19/3/90

Rainfall (mm) :

Total : 917,4 mm

Soil analysis

pH (water)	Clay (%)	OM (%)
5,35	18	2,10

ppm

P	K	Ca	Mg
29	73	467	126

Fertilizer

N	P	K
-	Nil	-

2. Design

Design : Randomised blocks
Replication : 5
Whole plot size : 4 rows x 11 m x 1,4 m = 61,6 m^2
Net plot size : 2 rows x 9 m x 11,4 m = 25,2 m^2
Row spacing : 1,4 m

3. Experimental :

The trial was harvested by hand. Rotavating was carried out at 17 weeks after harvesting and the mechanical and hand slashing operations were done in November 17,5 weeks after harvesting. A rotary mower was used in the mechanical slashed treatments.

Cane that was not slashed back or rotavated was sprayed with Roundup in early December, 19 weeks after harvesting (T2). The slashed back treatments (T3 and T4) were sprayed with Roundup in early January, 5,5 weeks after slashing and 23 weeks after harvesting.

4. Treatments

		Rate ℓ ha^{-1}	Weeks after harvest
T1	Control - (Rotavate only)		17 (Nov)
T2	Roundup	8	19 (Nov)
T3	Hand slash/Roundup	8	17,5/23 (Nov/Jan)
T4	Mechanical slash/Roundup	8	17,5/23 (Nov/Jan)

5. Chemical formulation used

Product	Formulation	Active ingredient
Roundup	359 gm/ℓ (sol)	Glyphosate

6. Application details

Treatment dates:
- Rotavate - 20/11/1989
- Roundup (T2) - 6/12/1989
- Roundup (T3 and T4) - 3/1/1990

Time (T2) : 7.40 am
Time (T3 and T4) : 7.55 am
Applicator : CP3
Nozzle : APM Green
Pressure : 150 kpa
Output (T2) : 36,9 mℓ/sec
(T3 and T4) : 39,5 mℓ/sec
Output (T2) : 26,4 mℓ/m^2
(T3 and T4) : 28,2 mℓ/m^2
Method : Over the row

7. Weather conditions at spraying

		T2	T3 and T4
Date		6/12/89	3/1/90
General		Cloudy	Clear - very hot
Dew		Nil	Nil
Soil surface		Damp	Dry
Wind		Slight (south)	Nil
Sunshine hours		1,2	11,3
Temperature (°C)	08h00	18,5	25,7
	14h00	22,2	27,4
Relative humidity (%)	08h00	76	73
	14h00	67	71
Rainfall (mm)			
On day of spray		Nil	Nil
Number days to first rain		1	3
Amount of first rain		7,0	9,5
Total in first 14 days		28,3	18,6
Total for duration of trial		917,4	917,4

8. Results:

Table I : Stalk populations (x 1000/ha) and complete stool (x 1000/ha) counts carried out approximately 8 months after harvest

Treatment	Stalk populations	Stool counts
T 1 Control	360,0	35,4
T 2 Roundup after harvesting	214,6	15,8
T 3 Hand slash/Roundup	23,2	2,6
T 4 Mechanical slash/Roundup	12,8	0,8
CV%	22,9	48,5
SE Treatment means	± 15,6	± 3,0
LSD (0,05)	48	9
(0,01)	68	13

9. **Comments**

The two methods of slashing back resulted in different growth habits in the following ratoon. Cane slashed mechanically was shattered but regrowth was still dominated by primary tillers. Tillers in the hand slashed cane grew evenly as apical dominance was suppressed.

Tiller population for the site at 4 months of age was approximately 240 000/ha. At 8 months after harvest, stalk populations had increased by 50% in the rotavated plots but had decreased by 11%, 90% and 95% for T2, T3 and T4 respectively. This represents a highly significant difference in regrowth between cane conventionally sprayed with Roundup after harvest and that which was slashed back prior to spraying (Table I).

Tiller mortality appeared to be greater where cane was mechanically slashed compared to hand slashing but differences were non-significant (Table 1).

Complete stool regrowth followed a similar trend to tiller counts (Table I).

10. **Conclusion**

Slashing back prior to Roundup application increased the efficacy of the chemical and only increased the harvest/spray delay by 4 weeks. However, climatical conditions were different on the days of spraying which may have influenced the efficacy of Roundup.

Mechanically slashed cane appears to be slightly more susceptible to Roundup compared to hand slashed cane. This may be attributed to the different regrowth pattern following the two operations.

This trial confirms that rotavating is an unsuitable cane eradication method on the heavier soils.

NBL/cvp - 28 May 1990