

**SOUTH AFRICAN SUGAR INDUSTRY  
AGRONOMISTS' ASSOCIATION**

Cat.No. : 1853  
Project No. : 4040  
Code No. : HW 413/91/R

**Title : Cane eradication using different techniques with Roundup and Fusilade Super**

**1. Particulars of project :**

<p><b>This crop</b> : Ratoon <b>Site</b> : Mt. Edgecombe Field 31 <b>Region</b> : North Coast Coastal <b>Soil System</b> : Umzinto coast lowlands <b>Soil form / series</b>: Rensburg <b>Design</b> : Randomised block <b>Variety</b> : NCo376 <b>Fertilizer (kg/ha)</b>: Nil</p>	<p style="text-align: right;"><b>Soil analysis Date : 26/11/1991</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;"><b>pH</b></td> <td style="width: 25%;"><b>OM%</b></td> <td style="width: 25%;"><b>Clay%</b></td> <td style="width: 25%;"><b>PDI</b></td> </tr> <tr> <td>6.4</td> <td>1.96</td> <td>30</td> <td>-</td> </tr> </table> <p style="text-align: center;">ppm</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 16.6%;"><b>P</b></td> <td style="width: 16.6%;"><b>K</b></td> <td style="width: 16.6%;"><b>Ca</b></td> <td style="width: 16.6%;"><b>Mg</b></td> <td style="width: 16.6%;"><b>Zn</b></td> <td style="width: 16.6%;"><b>Al</b></td> </tr> <tr> <td>55</td> <td>155</td> <td>1412</td> <td>710</td> <td>0.8</td> <td>-</td> </tr> </table> <p><b>Dates</b> : August 1991 - March 1992</p> <p><b>Rainfall</b> : 582 - 672mm</p> <p><b>Irrigation</b> : Nil</p> <p><b>Total</b> : 582 - 682mm (see 7. weather conditions)</p>	<b>pH</b>	<b>OM%</b>	<b>Clay%</b>	<b>PDI</b>	6.4	1.96	30	-	<b>P</b>	<b>K</b>	<b>Ca</b>	<b>Mg</b>	<b>Zn</b>	<b>Al</b>	55	155	1412	710	0.8	-
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**2. Objectives**

- \* To determine whether there is any advantage in using a shear type implement to sever cane roots at the spray stage.
- \* If pre-shearing does improve stool mortality, herbicide rates may be reduced.
- \* To establish whether herbicide efficacy is increased with the use of an enclosed shield (due to increased coverage).
- \* To determine whether slashing back the young ratoon and spraying the second stage regrowth increases the efficacy of the herbicides.
- \* Partial and complete combinations of these techniques require testing.
- \* To establish the differences in cane eradication potential for the treatments from early spring to summer.

### 3. Treatments

Rates (l product/ha)

T1	Control	-
T2	Cutback	-
T3	Roundup	4
T4	Roundup	8
T5	Cutback + Roundup	4
T6	Cutback + Roundup	8
T7	Fusilade Super	3
T8	Fusilade Super	6
T9	Cutback + Fusilade Super	3
T10	Cutback + Fusilade Super	6
T11	Roundup (Shield)	4
T12	Roundup (Shield)	8
T13	Cutback + Roundup (Shield)	4
T14	Cutback + Roundup (Shield)	8
T15	Fusilade Super (Shield)	3
T16	Fusilade Super (Shield)	6
T17	Cutback + Fusilade Super (Shield)	3
T18	Cutback + Fusilade Super (Shield)	6

NOTE: Each of the above treatments were both sheared and left undisturbed after spraying.

Cane was slashed back by hand in the cutback treatments.

Treatments 3 to 10 (inc) were sprayed with a battery operated knapsack fitted with a hand held lance and APM (green) nozzle.

Treatments 11 to 18 (inc) were sprayed with a dragged shield with two angled APM nozzles (green) mounted under a spray cover.

Root shearing was carried out with a Howard single shank shear.

#### 4. Design

Design : Randomised block  
No replications : 2  
Whole plot size : 2 rows \* 7.5m = 15m<sup>2</sup>  
Net plot size : 2 rows \* 7.5m = 15m<sup>2</sup>  
Row spacing : 1 m  
Breaks : Nil  
Guard rows : One common row between each plot  
End effects : Nil

#### 5. Chemical formulations used

<u>Product</u>	<u>Formulation</u>	<u>Active ingredient</u>
Roundup	359 g/l (SOL)	glyphosate
Fusilade Super	125 g/l (EC)	fluazifop butyl

#### 6. Application details

	August cut	October cut	December cut
Harvested	: 17/8/91	7/10/91	14/12/91
Cutback	: 4/10/91	25/11/91	7/1/92
Spray dates	: 18/11/91	17/12/91	30/1/92
Pressure	: 150 kPa	150 kPa	150 kPa
Shear dates	: 25/11/91	19/12/91	5/2/92

#### 7. Weather conditions

	August cut	October cut	December cut
Spray dates	: 18/11/91	17/12/91	30/1/92
General	: Overcast	Sunny	Overcast
Dew	: Nil	Nil	Nil
Soil surface	: Dry	Dry	Dry
Sunshine hours	: 3.6	9.8	0.1
Temperature ( C)			
08h00	: 25	25	24
14h00	: 25	27	23
Relative humidity (%)			
08h00	: 73	74	75
14h00	: 78	74	84
Rainfall (mm)			
On day of spray	: Nil	Nil	Nil
No. days to first rain	: 1	3	1
At first rain	: 7.5	0.1	7.5
In first 14 days	: 30	3	12
Total for duration of trial	: 601	672	582

## 8. Results

Table 1 : Overall effect of cutting back on tiller regrowth and number of hoe units (both \* 1000/ha) for Roundup and Fusilade Super treatments. Counts were done at 114 days, 85 days and 41 days after spraying the August, October and December cut cane respectively.

Treatment	Shoot counts	Hoe units
Roundup		
Non-cutback	25,66	7,19
Cutback	26,43	6,35 (12)
-----		
Fusilade Super		
Non-cutback	20,30	7,05
Cutback	7,54 (63)	2,94 (59)

Note: Figures in brackets indicate percentage improvement.

Table 2 : Overall effect of the shield on tiller regrowth and number of hoe units (both \* 1000/ha) for Roundup and Fusilade Super treatments. Counts were done at 114 days, 85 days and 41 days after spraying the August, October and December cut cane respectively.

Treatment	Shoot counts	Hoe units
Roundup		
No shield	31,98	8,20
Shield	20,11 (37)	5,35 (35)
-----		
Fusilade Super		
No shield	12,22	4,94
Shield	15,62	5,05

Note: Figures in brackets indicate percentage improvement.

Table 3: Overall effect of shearing on hoe units (\*1000/ha) for cane cut in August, October and December.

Treatment	August	October	December
Non-sheared	8,41	8,00	14,15
Sheared	1,64 (80)	1,51 (81)	1,60 (89)
CV %	43	58	26
LSD (0,05)	1,4	1,9	2,3
LSD (0,01)	1,9	2,5	3,1

Note: Figures in brackets indicate percentage improvement.

## 9. Comments

Shearing resulted in by far the most dramatic improvements in cane mortality in this trial.

Improvements from the cutback and shield treatments were inferior and variable, and will be reported on in a more generalised form. Table 4 is a record of the hoe unit counts for each treatment for the three stages.

Note: - The standard treatment referred to in the results is the non-sheared 8 l/ha Roundup rate applied to normally ratooning cane without the use of the shield.

- A hoe unit is a 250mm section of cane row that would require one strike of the hoe to remove the cane regrowth in that section.

### Cutting back

The practice of cutting back prior to spraying resulted in only a marginal reduction in hoe units for the Roundup treatments, but was far more effective when used in conjunction with Fusilade Super [Table 1]. This trend remained unchanged for all three seasons. It is important to note that 3 l/ha of Fusilade Super was found to be more effective than the standard when applied to cut-back cane in spring.

### Shield

The effect on chemical efficacy from the shield was positive in the Roundup treatments while an unexplained decrease in efficacy was recorded for Fusilade Super [Table 2]. However, at no stage was the efficacy of 4 l/ha Roundup applied with the shield greater than that of the standard treatment. Increases in efficacy from Roundup with this implement were very much greater in the cooler period when Roundup efficacy is generally low.

### Cutting back + Shield

Increased cane mortality levels from the cutting back/shield combination were variable but did appear to be cumulative in some cases.

### Shearing

Benefits from this operation were dramatic throughout the duration of the trial with indications of greater improvements going into summer [Table 3]. The shearing operation on its own accounted for an average 84% reduction in hoe units compared to non-sheared treatments. Fig 1 displays the increases in mortality from shearing for each chemical.

#### Roundup/Shearing

Cane mortality from 4 l/ha of Roundup increased significantly with shearing for all three stages to equal or better that achieved by the standard. Eradication from 8 l/ha Roundup applied in combination with shearing was very much higher than that of the non-sheared standard.

#### Fusilade Super/Shearing

The non-sheared Fusilade Super treatments were very effective for the August cut cane where both rates compared favorably with the standard [Fig 1]. Thereafter the non-sheared Fusilade Super treatments were inferior to the standard. Shearing significantly

improved the performance of both rates of this product at all three stages, and it is important to note that 3 l/ha of Fusilade Super was far more effective than the standard when used in combination with shearing.

## 10. Conclusions

- Efficacy from Fusilade Super is greatly enhanced by cutting back and results do not appear to be significantly influenced by season. Low Fusilade Super rates sprayed onto previously cutback cane could therefore replace Roundup during the early season.
- Improvements in cane mortality from the shield were greater for Roundup especially during the cooler months, but effects diminished as growing conditions improved.
- Shearing after spraying for cane eradication is undoubtedly extremely effective.

It appears that "combination tillage" could enable Roundup or Fusilade Super rates to be reduced to  $\pm 4$  and  $\pm 3$  l/ha respectively without loss in cane killing ability.

Shearing in combination with standard rates of chemical could be regarded as insurance for adequate cane killing during times of the year when eradication is normally difficult.

21/10/1992

Fig 1. Comparisons in hoe units (\*1000/ha) between non-cutback, normally applied treatments (without shield) where the standard is plotted at zero.

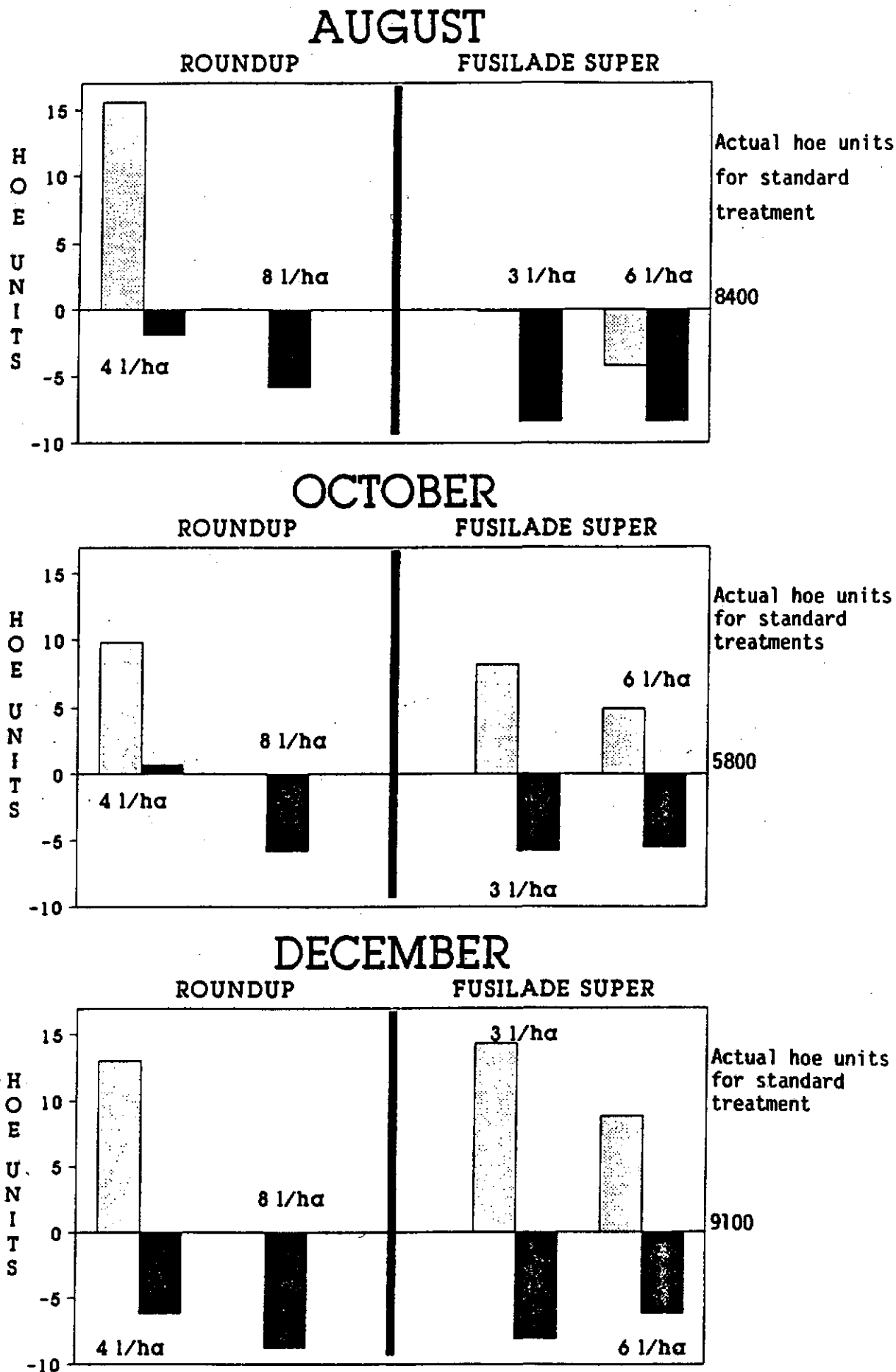


Table 4 : Hoe units (actual counts) for each treatment taken at 114 days, 85 days and 41 days after spraying the August, October and December cut cane respectively.

Treatment		Rate (l/ha)	August	October	December
Control		-	27900	26900	157800
Control	SHEAR	-	16600	12300	16600
Cutback		-	26000	25300	208800
Cutback	SHEAR	-	21100	22700	22100
Roundup		4	24000	15600	22100
Roundup	SHEAR	4	6500	6500	2900
Roundup		8	8400	5800	9100
Roundup	SHEAR	8	2600	0	300
Roundup + Cutback		4	24400	10100	22400
Roundup + Cutback	SHEAR	4	4200	3900	1600
Roundup + Cutback		8	10700	6200	6500
Roundup + Cutback	SHEAR	8	1900	1000	300
Fusilade Super		3	8400	14000	23400
Fusilade Super	SHEAR	3	0	0	1000
Fusilade Super		6	4200	10700	17900
Fusilade Super	SHEAR	6	0	300	2900
Fusilade Super + Cutback		3	3900	7500	10700
Fusilade Super + Cutback	SHEAR	3	1300	0	300
Fusilade Super + Cutback		6	1900	1900	8100
Fusilade Super + Cutback	SHEAR	6	0	0	300
Roundup + Shield		4	13600	8400	17900
Roundup + Shield	SHEAR	4	2600	5800	3900
Roundup + Shield		8	2300	3600	8800
Roundup + Shield	SHEAR	8	1300	300	600
Roundup + Cutback + Shield		4	11400	9100	16900
Roundup + Cutback + Shield	SHEAR	4	1900	300	3200
Roundup + Cutback + Shield		8	3200	1300	10400
Roundup + Cutback + Shield	SHEAR	8	600	300	1000
Fusilade Super + Shield		3	8400	16600	24000
Fusilade Super + Shield	SHEAR	3	0	3600	2900
Fusilade Super + Shield		6	8800	9700	9700
Fusilade Super + Shield	SHEAR	6	600	1600	600
Fusilade Super + Cutback + Shield		3	1000	4500	12300
Fusilade Super + Cutback + Shield	SHEAR	3	1900	0	2900
Fusilade Super + Cutback + Shield		6	0	3200	6500
Fusilade Super + Cutback + Shield	SHEAR	6	600	600	1000