SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: HW 196/80
Cat. No.: 1292

TITLE: Weed control programmes in the Midlands

1. Particulars of the project

This crop	:	2nd ratoon
Site	:	Little Harmony, Richmond
Region	:	Mistbelt
Soil system	:	Nottingham
Soil form/series	:	Clovelly/Balgowan
Design	:	Randomised blocks
Variety	:	NCo 293

Fertilizer (kg/ha):	N	P	K
+ top-dressing	96	64	96

Dates sprayed : 1. 28.08.80
2. 16.10.80
3. 5.11.80

Soil analysis: Date 16 October 1980

pH	O.M.%	Sand	Clay %	Silt %	P.D.I.
5,18	6,92	26	57	17	0,13

ppm

P	K	Ca	Mg	Zn	Al
29	148	643	220		11

Dates: August 1980 - November 1980

Rainfall: Below

Irrigation: Nil

August	14 mm
September	181 mm
October	38 mm
November	111 mm
December	61 mm

2. Objectives

To evaluate various weed control programmes for ratoon cane in the Midlands.

3. Treatments

See results

4. Experimental

Plot size consisted of 5 interrows x 6 m x 1,4 m.

The trial area was burnt and harvested in July 1980 ($\pm$ 10th July). Old perennial grass stools were removed by hand hoe and the field was top-dressed.

Herbicide treatments were applied on three dates as indicated in the results. Application was made on each occasion by means of a lever-operated knapsack

sprayer fitted with a Spraying System TK5 floodjet. The nozzle was held ± 45 cm above the ground and was held directly over the interrow. Pressure was two bars and the output varied between 244 and 288 ℓ/ha on different spray dates.

Unsprayed strips were left at the ends of each plot for weed control comparison purposes. Ratings were made on the basis of percent ground cover and using a 1-9 scale where 1 = complete control, 4 = just acceptable and 9 = no effect.

The whole trial area was mistakenly hand weeded six days after the last treatment. Subsequent ratings were taken to assess the effects of such an operation on existing treatments.

After weed assessments were completed the trial was hand weeded twice to remove subsequent weed growth.

Conditions and cane and weed growth stages at the times of spraying are indicated in Table 1.

Table 1 Climatic conditions, cane and weed growth stages at spraying

Conditions		Spraying dates		
		28 August	16 October	5 November
General		Cool, overcast drizzling	Cool, drizzling to warm & clear	Cool, overcast to misty
*1 Air temperature °C at	8 pm	10,6	15,4	16,2
	2 pm	13,0	20,4	17,4
*1 Soil temperature °C at 8 am (5 cm depth)		14,0	17,0	18,5
Rainfall (mm)	2 wks before spray	4,5	1,3	26
	Day of spray	1,5	0	0
	Days to 1st rain	0	1	2
	Amt of 1st rain	1,5	10,5	6,5
	2 wks after spray	124	37	34,5
*1 Sunshine hours		1,3	2,6	2
Cane growth stages		Few shoots ± 4/10 m	30-35 cm leaf ht. 3-4 leaves unfurled/shoot	± 13 cm Stalk heights
Weed growth stage		No grasses	D. sanguinalis 3-4 leaf stage pre-tillering to tillering	D. sanguinalis ± 3-4 leaf stage

*1 Data taken from Powerscourt meteorological station

5. Results

Weed control ratings taken before the trial was hand weeded are presented in Table 2.

Ratings taken after the whole trial was hand weeded are presented in Table 3.

Table 2

	Treatments/date of application/ rate in kg or ℓ prod/ha		Ratings/assessment dates		
			October *1 *D. sanguinalis* % ground cover	November 5 *D. sanguinalis* EWRS 1-9 *3	Days after spray
	28 AUGUST				
1	Diuron+Sencor	2+2	0	3,3	69
2	Diuron+Velpar	1+0,75	0,5	3,3	69
3	Ametryne+MCPA+S (repeated on 5 November)	5+4	1,5	7,8	69
4	Dual+ametryne+S	2,75+6	2	6,8	69
	16 OCTOBER				
5	Diuron+Sencor	2+2	5,3 *2	2,3	50
6	Diuron+Sencor+Actril DS	2+2+1	5,8	1,3	50
7	Diuron+Velpar	1+0,75	6	4	50
8	Diuron+Velpar	2,5+0,5	5,5	3,8	50
9	Bimate+S	5	7,5	2,5	50
10	Dual+ametryne+paraquat	2,75+3+1,5	3,8	1,5	50
11	Dual+ametryne+S	2,75+6	4,3	2,8	50

*1 Estimate of percent ground cover

*2 Assessment of ground cover prior to spraying treatments 5 to 11

*3 1-9 scale where 1 = complete control, 4 = just acceptable and 9 = no control

Table 3

	Treatments	Rate in kg or ℓ prod/ha	Ratings on 17 December: Grasses *1 1-9	Grasses *1 % ground cover	Broadleaf 1-9	Broadleaf % ground cover	P. laevifolium No. of plants/plot: Burnt tops	P. laevifolium No. of plants/plot: No burnt tops
	28 AUGUST							
1	Diuron+Sencor	2+2	3,8	7	2	2	4,8	1,5
2	Diuron+Velpar	1+0,75	3,8	7,8	1,8	1,5	4,5	0,3
3	Ametryne+MCPA+S (repeated on 5 November)	5+4	2,8	4,5	1,5	1,5	3,8	2
4	Dual+ametryne+S	2,75+6	5	20,3	3	4,5	13,8	10,3
	16 OCTOBER							
5	Diuron+Sencor	2+2	2,3	2,8	1	0,3	2	0,5
6	Diuron+Sencor+Actril DS	2+2+1	2,5	3,8	1,3	0,5	8,3	0,3
7	Diuron+Velpar	1+0,75	3,8	7,3	1	0,3	5,3	3,8
8	Diuron+Velpar	2,5+0,5	4,3	8,8	1,5	0,8	6,3	1,3
9	Bimate+S	5	3,8	4,3	1,3	0,3	4	0,8
10	Dual+ametryne+paraquat	2,75+3+1,5	1,8	2	2,3	2,8	0,3	0,3
11	Dual+ametryne+S	2,75+6	4,3	12	1,8	1,8	9,5	1,8
					Mean		5,7	2,1

*1 Grasses consisted of P. laevifolium, D. sanguinalis, E. indica and P. maximum, P. laevifolium was dominant

6. Comments on Table 2

1. Ratings on October 16 show that treatments applied on 28 August did provide control of grasses and that Diuron+Sencor and diuron+Velpar were superior to the other two treatments.

2. Ratings on November 5 show that in the case of Dual+ametryne+S particularly and diuron+Sencor, better weed control was obtained with October treatment. Diuron+Velpar showed a slight opposite trend.

3. Comparison of treatments applied on October 16 shows a definite advantage to the addition of Actril DS or paraquat to diuron+Sencor and Dual+ ametryne respectively.

7. Comments on Table 3

1. All herbicide treatments continued to have an effect on weeds after the trial was hand weeded.

2. It was again apparent that Dual+ametryne+S and diuron+Sencor performed better when sprayed in October but that diuron+Velpar showed a slight change for the worse in October treatment.

3. Repeated application of ametryne+MCPA+S was slightly better than diuron+Sencor sprayed in August but not as effective as diuron+Sencor sprayed in October. It was however better than diuron+Velpar sprayed in October or August.

4. The best treatment was Dual+ametryne+paraquat and this effect appears to be due to the addition of paraquat.

5. Herbicides were less effective on areas with burnt cane tops than bare soil, but germination of weeds also appeared to be greater in areas with burnt cane tops.

6. Although treatment differences were generally small and most treatments gave acceptable control for a considerable length of time (up to 112 days at least) at least one hand hoeing/weeding operation would be required with every treatment.

7. Broadleaf weeds were well controlled by all treatments although where ametryne was used at 3 ℓ/ha or in August the control was less effective than other treatments.

8. Conclusions

1. There appears to be a slight advantage to delaying herbicide treatment until conditions are more favourable particularly with medium term residual treatments such as Dual+ametryne+S.

2. The addition of paraquat and to a lesser extent Actril DS to herbicide combinations can considerably improve weed control.

3. As weed infestations were generally fairly low, $\pm$ 10% ground cover, further results would be required to confirm these trends.

PETT/VJ
5 July 1982