

SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

Code: HW190/78
Cat. No.: 1293

Title: Programmed Weed Control

Soil analysis: Date 9.19.79

1. Particulars of the project:

This crop : 3rd Ratoon
Site : La Mercy
Region : N. Coast Coastal
Soil system : Umzinto Coast Lowlands
Soil form/series : Longlands/Waldene
Design : Random blocks
Variety : NCo376
Fertilizer/ : N P K
kg/ha 125 25 125
Rainfall: (mm) L.T.M.

Aug	55	53
Sept	104	97
Oct	162	97
Nov	44	116
Dec	127	104

<u>pH</u>	<u>O.M.%</u>	<u>CEC</u>	<u>Clay%</u>	<u>Silt%</u>	<u>Sand%</u>
5,2	0,87	3,10	7	7	87

ppm

<u>P</u>	<u>K</u>	<u>Ca</u>	<u>Mg</u>	<u>Zn</u>	<u>Al</u>
76	184	190	51		

Dominant weeds in control plots:

C. esculentus
Eleusine indica
Ageratum conyzoides

2. Objectives: To evaluate weed control programmes for burnt ratoons on a light soil in spring
3. Treatments - rates in kg or ℓ prod/ha in brackets

1. Hand weeding/hoeing only
2. Pre-emerge (Lasso + atrazine (5 + 2)
3. Pre-emerge (Dual + atrazine) (0,75 + 2)
4. Pre-emerge band spray (Dual + atrazine) (2,75 + 2) + post emerge (diuron + MCPA + S) (2,5 + 4)
5. Pre-emerge - (diuron + Sencor) (2 + 2)
6. Pre-emerge - (Dual + atrazine + paraquat) (2,75 + 2 + 1,5)
7. Post-emerge- (diuron + Sencor) (2 + 2)
8. Post-emerge- (diuron + Velpar) (1,25 + 0,75)
9. Post-emerge- (Bladex Plus + S) (9)
10. Post-emerge- (Bimate + S) (5)
11. Post-emerge- (Ametryne + MCPA + S) - repeated (2,5 + 4)
12. Post-emerge. (Ametryne + MCPA + S) - repeated (2 kg + 4)
13. Late post-emerge (diuron + paraquat) (5 ℓ Gramuron/ha)

Experimental

Plots consisted of 4 interrows x 10 m x 1,5 m each and there were 4 replications. Treatments were applied by means of a lever-operated knapsack sprayer fitted with a spraying systems TK5 floodjet or 8004-E fanjet (for band spraying). Output ranged from 260 to 300 ℓ/ha on various application dates.

Growth stages of cane and weeds at spraying and dates of application are indicated below.

Date	Cane growth	Weed growth
24 Sept 79	10 cm leaf ht 20% ground cover from scattered tops	Slight broadleaf and <u>C. esculentus</u> Germination. B/leaf 1-2 mm ht.
9 Oct 79	30 cm leaf ht 3-4 leaves unfurled Application contacted 60% of cane foliage (30% from each side)	Grasses 2 leaf to tillering <u>C. esculentus</u> 5-6 leaves 7-10 mm ht Broadleaf 2-4 leaves 3-4 mm ht
13 Nov 79	50-60 cm ht Stalk ht 16-22 cm	T11 and T12 very young T11 and T13 mature weeds <u>C. esculentus</u> , broadleaf and grasses. <u>E. indica</u> and <u>P. laevifolium</u> .

Weather and soil conditions at each spraying date are indicated in Table 1.

Table 1: Weather conditions at, before and after each spraying date

Conditions	Application dates		
	24 Sept 79	9 Oct 79	13 Nov 79
General conditions	Overcast and cool	Clear and warm	Clear and warm
Wind	Very slight	Nil	Nil
Sunshine hours	0	8,7	8,9
Temperature Air %			
8 am	15,6	20,4	22,2
2 pm	18,8	25,6	26,4
Relative humidity %			
8 am	83	89	86
2 pm	66	55	72
Soil temperature %			
8 am at 5 cm depth	16,5	20,5	25,5
Soil moisture %			
surface	-	4,02	-
	damp	dry	dry
Rainfall 2 weeks before spray	9	32,4	5,8
On day of spray	2,8	0,3	0
Days to first rain	0	0	1
Amount of first rain	2,8	0,3	13,8
2 weeks after spray	32,6	130,8	36,6
Time of application	7-9 am		
Dew	-	Heavy dew	Nil

Other weeds which germinated in the trial were:

Digitaria sanguinalis, Panicum laevifolium, Fimbristylis hispidula
Commelina benghalensis, Portulaca oleracea.

Results

Ratings of visual weed infestation based on a logarithmic 1-9 scale where 1 = no weeds, 4 = 10% weed infestation and 9 = > 67,5% infestation taken 15, 31, 45 and 67 days after application of pre-emergence treatment are presented in Table 2 (see Table 2 attached).

Comments

1. The weed infestation was generally low particularly at the early assessment dates, although this did increase later to give about 40 percent ground cover at the time of hoeing unsprayed plots.
2. Hand hoeing was conducted at a rate of 10 man days per hectare. The whole trial was subsequently hand weeded twice at low labour rates to remove escaped weeds, particularly in unsprayed plots.
3. No damage or stunting of cane was noticeable from treatments 2-12. Competitive effects of weeds in hand-hoed control plots were also not apparent. However, diuron + paraquat (T13) caused severe scorching where contact was made with cane foliage and the canopy was consequently re-opened. This only occurred where cane was poorly grown and thus smaller than average.
4. All programmes provided adequate weed control. Two plots each of treatments 11 and 12 did not have a second treatment. Weed control ratings of these plots 67 days after pre-emergence treatment, were worse than where treatment had been repeated but were still acceptable.
5. Herbicides having both soil and foliar action - Sencor, Velpar, Bimate and Bladex Plus were superior to Dual or Lasso combinations for control of Cyperus esculentus and broadleaf weeds (post-emergence treatments only). Grass control was the same for all these treatments.
6. Dual + atrazine applied as a band spray followed by diuron + MCPA + S was superior to Dual + atrazine applied overall in terms of C. esculentus and broadleaf control 67 days after pre-emergence treatment. Grass control was however, inferior. Grasses are considered the most serious weed group and hence overall sprays would be preferred.

Conclusion

1. Adequate weed control was provided by all programmes but weed infestations were not severe. Choice of a programme for such a situation could be based on labour availability, logistics of two applications as opposed to one, and cost of herbicide treatments.

Table 2: Mean visual ratings of weed control taken 15, 31, 45 and 67 days after spraying of pre-emergence treatment

Treatments (application dates)	Ratings/weeds/days after pre-emergence													
	<u>C. esculentus</u>				<u>C. rot-</u>		Grasses				Broadleaf			
	15*	31	45	67	15	31	15	31	45	67	15	31	45	67
1 Hand hoeing - 11 Nov	5,3	4,8		2,8*	6	3,5	1,8	2,7		1,5	2	3,3		2,8
2 Lasso + atrazine (pre) - 24 Sept	2,5	3,3	6,3	4,8	4	4	1	-	1	1,3	1	1,5	2,5	2
3 Dual + atrazine (pre) - 24 Sept	2	2,3	4	2,5	2	2	1	1	1,3	1,3	1	1,5	2	2,3
4 Dual + atrazine (band) - 24 Sept + diuron + MCPA + S (post) - 13 Nov	3,8	4		1,8	3	4	1,3	2,5	-	2,3	2,3	3,7		1
5 Diuron + Sencor (pre) - 24 Sept	2	1,3	2,5	2	-	2	1	1	1	1,3	1	1,5	2	2
6 Dual + atrazine + par (post) - 9 Oct	4,3	3,4	3	3	-	-	1,3	-	1	2	2,3	2	2,5	2
7 Diuron + Sencor (post) - 9 Oct	4	1,3	1,8	1,8	5	4	2,8	1	1,7	1,3	2,8	1	1	1
8 Diuron + Velpar (post) - 9 Oct	4,5	1,3	2	1,5	-	1	2,3	1	1,3	1,5	3	1	1	1
9 Bladex Plus + S (post) - 9 Oct	3,3	1,5	2,7	2	-	2	2	1	1,5	1,3	1,5	1	1,5	1,3
10 Bimate + S (post) - 9 Oct	4	1,3	3	1	3	9	2,5	1	1	1,3	1,3	2	1	1
11 Diuron + MCPA + S (post) - 9 Oct + repeated - 13 Nov	3,3	1	6	1	3	3	1	-	1	1	2	2	-	1
12 Ametryne + MCPA + S (post) - 9 Oct + repeated - 13 Nov	4,3	1,3	2,3	1	3,5	3	2	1	2,5	1	2,8	1	3,5	1
13 Diuron + paraquat - 13 Nov	4,3	4		2	-	2	1,5	3	-	2,3	1,5	3	-	1,3

*' Lines indicate treatment application times.

2. Soil and foliar acting long term herbicides applied early post-emergence showed the lowest labour demand and the most efficient control of the range of weed species.
3. Diuron + MCPA + S would probably be the cheapest treatment if this were applied once only. The programme allows the flexibility of applying a second treatment if necessary but this increases the demand on equipment and management time.

PETT/PMO
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