SOUTH AFRICAN SUGAR INDUSTRY

AGRONOMISTS' ASSOCIATION

AGRONOMIC EXPERIMENTS D(iv) HERBICIDES AND WEEDS.

Code: H.W. 43. Fertilizer: Ρ. Ν. к. Catalogue No.: 45 75 lb/acre Furrow _ 800 supers This crop: Plant T/Dress 100 200 mur--Site: Chaka's Kraal. Field 3B iate. urea Altitude: 300' Soil Analysis: No samples taken. Soil Series: Dwyka (Williamson) Mater Regime: 1" irrigation applied when soil Design: Random Block. 4 reps. moisture deficit reached 1". Variety: N:Co.376. Irrigation: 10.00 inches. Age: 12 months. Rainfall: 43.25 inches.

Object: To screen new herbicides for pre- and post-emergent activity.

Treatments and Results:

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I. Broad-leaved weed ratings

0 = No Control 9 = Full control 7 = Acceptable control.

| Formulation Rate/sprayed acre 12 21 28 33 47 56 63 75 0-75 days 0-50 days Sindone 2 1bs. 2.5 2 2 1 0.5 0 1.5 1 1.3 1.6 " 4 " 0.5 0 1 0 2 0 1.5 2 0.9 0.7 Sindone "B" 2 " 4.5 5.5 4 2 3 0 1 0 2.5 3.8 " 4 " 6 6.5 7 5.5 6 2 3.5 1.5 4.8 6.2 C.P.50144 2 " 8.5 9 8.5 8 9 7 6 5.5 7.7 8.6 " 4 " 9 9 8.5 8 9 8 8.5 8.7 Ramcod 6 | Treatment | - Pre-Emergent | Sc | ore | – da | vs a | fter | tre | atme | nt | Mean | Mean |
|--|-------------|-----------------|-----------|------------|----------|---------------------------------------|------|-------|--------------|-----|------|-------------|
| Sindone 2 lbs. 2.5 2 2 1 0.5 0 1.5 1 1.3 1.6 " 4 " 0.5 0 1 0 2 0 1.5 1 1.3 1.6 " 4 " 0.5 0 1 0 2 0 1.5 2 0.9 0.7 Sindone "B" 2 " 4.5 5.5 4 2 3 0 1 0 2.5 3.8 " 4 " 6 6.5 7 5.5 6 2 3.5 1.5 4.8 6.2 " 4 " 9 9 8.5 9 7.6 5.5 7.7 8.6 " 8 " 3 3 1 1.5 0 0.5 1.0 0.6 0.6 " 8 " 3 3 1 1.5 1 0.7 5.6 6.8 7.7 <td></td> <td></td> <td><u>.</u></td> <td></td> <td></td> <td>· · · · · · · · · · · · · · · · · · ·</td> <td></td> <td>·····</td> <td>T</td> <td></td> <td></td> <td>0-50 days</td> | | | <u>.</u> | | | · · · · · · · · · · · · · · · · · · · | | ····· | T | | | 0-50 days |
| " 4 " 0.5 0 1 0 2 0 1.5 2 0.9 0.7 Sindone "B" 2 " 4.5 5.5 4 2 3 0 1 0 2.5 3.8 " 4 " 6 6.5 7 5.5 6 2 3.5 1.5 4.8 6.2 C.P.50144 2 " $\frac{8.5}{9}$ 9 $\frac{8.5}{8}$ 9 7 6 5.5 7.7 $\frac{8.6}{10}$ " 4 " 9 9 $\frac{8.5}{8}$ 9 7 6 5.5 7.7 $\frac{8.6}{10}$ " 4 " 9 9 $\frac{8}{10}$ 0 0.5 0 0.5 1.0 0.6 0.6 " 8 " 1 0.5 1 0 0 0.5 1.3 1.9 Cotoran 2 " 2 4 2 2 1 1.7 2.2 " 4 " 9 9< | | | { | | | ! | | | <u>.</u> | | | |
| Sindone "B" 2 0 1 0 2 0 1.3 2 0.3 0.7 Sindone "B" 2 " 4.5 5.5 4 2 3 0 1 0 2.5 3.8 " 4 " 6 6.5 7 5.5 6 2 3.5 1.5 4.8 6.2 C.P.50144 2 " 8.5 9 8.5 8 9 7 6 5.5 7.7 8.6 " 4 " 9 9 8.5 8 9 7 6 5.5 7.7 8.6 " 4 " 9 9 8.5 1 0 0.5 1.0 0.6 0.6 " 8 " 1 1.5 1 0 0.5 1.3 1.9 Cotoran 2 " 8 8 7 8.5 5 5 6.8 8.6 " 10 " 3 6 5 4 4 | Sindone | 2 lbs. | 2.5 | 2 | 2 | 1 | 0.5 | 0 | 1.5 | 1 | 1.3 | 1.6 |
| " 4 " 6 6.5 $\frac{7}{2}$ 5.5 6 2 3.5 1.5 4.8 6.2 C.P.50144 2 " 8.5 9 8.5 8 9 7 6 5.5 7.7 8.6 " 4 " 9 9 8.5 8 9 7 6 5.5 7.7 8.6 Ramrod 6 " 1 0.5 1 0 0.5 0 0.5 1.0 0.6 0.6 " 8 " 3 3 1 1.5 1 0 0 0.5 1.3 1.9 Cotoran 2 " 8 8 8 7 8 5 5 5 6.8 7.8 " 4 " 9 9 8 9 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 7 9 8.1 8.2 9 9 | ti | 4 " | 0.5 | 0 | 1 | 0 | 2 | 0 | 1.5 | 2 | 0.9 | 0.7 |
| C.P.50144 2 " 8.5 9 8.5 8 9 7 6 5.5 7.7 8.6 " 4 " 9 9 8.5 8 9 7 6 5.5 7.7 8.6 " 4 " 9 9 8.5 8 9 8 8 8.5 8.5 8.7 Ramrod 6 " 1 0.5 1 0 0.5 1.0 0.66 0.66 " 8 " 3 1 1.5 1 0 0.5 1.0 0.66 0.66 " 8 " 3 1 1.5 0 0.5 1.0 0.66 0.66 " 4 " 9 9 9 9 8 9 8 9 8 8.6 8.7 8.6 8.6 8.6 7.8 9 8.6 8.6 7.9 9.6 8.7 | Sindone "B" | 2 " | 4.5 | 5.5 | 4 | 2 | 3 | 0 | 1 | 0 | 2.5 | 3.8 |
| " 4 " 9 9 8.5 8 9 8 8 8.5 8.7 Ramrod 6 " 1 0.5 1 0 0.5 0 0.5 1.0 0.6 0.6 " 8 " 3 3 1 1.5 1 0 0.5 1.0 0.6 0.6 " 8 " 3 3 1 1.5 1 0 0 0.5 1.3 1.9 Cotoran 2 " 8 8 8 7 8 5 5 6.8 7.8 " 4 " 9 9 8 9 9 8 9 8 9 8 8 8 9 8 8 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9 9 9 9 9 9 9 9 9 9 9 9 <t< td=""><td><u>†1</u></td><td>4 "</td><td>6</td><td>6.5</td><td>7</td><td>5.5</td><td>6</td><td>2</td><td>3.5</td><td>1.5</td><td>4.8</td><td>6.2</td></t<> | <u>†1</u> | 4 " | 6 | 6.5 | 7 | 5.5 | 6 | 2 | 3.5 | 1.5 | 4.8 | 6.2 |
| "4"99889888589888587Ramrod6"10.5100.500.51.00.60.60.6"8"3311.51000.51.31.9Cotoran2"88785556.87.8"4"998998988.668.8Banvel "D"5"2422101.511.72.2"10"365442233.64.42,4-D Amine31bs. a.e.8.598798.18.2Fenac21bs. a.e.9999988798.18.2Fenac21bs. a.e.9999988798.59.0Post-Emergent182330420-50 daysCotoran41bs.2.555.544.32.92.92.92.92.92.92.92.92.9Karmex41bs.9898.5-56.58.6< | C.P.50144 | 2 " | 8.5 | 9 | 8.5 | 8 | 9 | 7 | 6 | 5.5 | 7.7 | 8.6 |
| Ramrod6"10.5100.500.51.00.60.6"8"3311.51000.51.31.9Cotoran2"88785556.87.8"4"998998988.68.8Banvel "D"5"2422101.511.72.2"10"365442233.64.42,4-D Amine3 lbs. a.e.8.59877.55.5546.88.0Atrazine41bs.88898798.18.2Fenac2 lbs. a.e.999998798.18.2Fenac2 lbs. a.e.99999878.59.0- Post-Emergent182330420-50 daysCotoran41bs.2.555.544.32.9Karmex41bs.8.576.567.08.6Hand Weeding Tvice099898.55.55.58.6 | 11 | 4 11 | 9 | | | l I | | | 8 | 8.5 | 8.5 | 8.7 |
| Cotoran 2 " 8 8 9 9 9 8 5 5 6 6 7.8 " 4 " 9 9 8 9 9 8 9 9 8 8 7.8 8 5 5 5 6.8 7.8 " 4 " 9 9 9 8 9 9 8 9 8 8.6 8.8 Banvel "D" 5 " 2 4 2 2 1 0 1.5 1 1.7 2.2 " 10 " 3 6 5 4 4 2 2 3 3.6 4.4 2,4-D Amine 3 1bs. a.e. 8.5 9 8 7 7.5 5.5 5 4 6.8 8.0 Atrazine 4 1bs. 8 8 8 9 8 7 9 8.1 8.2 Fenac 2 1bs. 2.5 5 5.5 4 <td>Ramrod</td> <td>6 ¹¹</td> <td></td> <td></td> <td>1</td> <td>1 1</td> <td></td> <td></td> <td>ł</td> <td>1.0</td> <td>0.6</td> <td>0.6</td> | Ramrod | 6 ¹¹ | | | 1 | 1 1 | | | ł | 1.0 | 0.6 | 0.6 |
| "4"998998989898868.6Banvel "D"5"2422101.511.72.2"10"365442233.64.42,4-D Amine3 lbs. a.e. 8.5 987 7.5 5.5 54 6.8 8.0 Atrazine41bs.8889879 8.1 8.2 Fenac2 lbs. a.e.99999887 8.5 9.0 -Post-Emergent18233042 4.3 2.9 4.3 2.9 Karmex41bs. 2.5 5 5.5 4 4.3 2.9 Karmex41bs. 8.5 7 6.5 6 7.0 Cocktail*989 8.5 7.0 8.6 Hand Weeding Twice0 9^* 9 8 8 6.5 | ! 1 | 8 " | 3 | з | 1 | 1.5 | 1 | 0 | 0 | 0.5 | 1.3 | 1.9 |
| "4"998998989898868.6Banvel "D"5"2422101.511.72.2"10"365442233.64.42,4-D Amine3 lbs. a.e. 8.5 987 7.5 5.5 54 6.8 8.0 Atrazine41bs.8889879 8.1 8.2 Fenac2 lbs. a.e.99999887 8.5 9.0 -Post-Emergent18233042 4.3 2.9 4.3 2.9 Karmex41bs. 2.5 5 5.5 4 4.3 2.9 Karmex41bs. 8.5 7 6.5 6 7.0 Cocktail*989 8.5 7.0 8.6 Hand Weeding Twice0 9^* 9 8 8 6.5 | 🗠 Cotoran | 2 " | 8 | 8 | 8 | 7 | 8 | 5 | 5 | 5 | 6.8 | 7.8 |
| Banvel "D"5"2422101.511.72.2"10"365442233.64.42,4-D Amine3 lbs. a.e. $\frac{8.5}{9}$ 9877.55.5546.88.0Atrazine4 lbs.888999998798.18.2Fenac2 lbs. a.e.99999998798.59.0-Post-Emergent18233042 2 2 3 3.5 9.0 -Post-Emergent18233042 2 3 3.5 9.0 Cotoran4lbs. 2.5 5 5.5 4 4.3 "6lbs. 4 2.5 3 2 2 7 0.5 Karmex4lbs. $\frac{8.5}{7}$ 7 6.5 6 7.0 8.6 Hand Weeding Twice 0 9^{1} 9 8 2 8 2 5 6.5 | 51 | 4 11 | | ſ | | | | 8 | 9 | 8 | 8.6 | 8.8 |
| 10 3 0 3 4 4 2 2 3 3.0 4.4 2,4-D Amine 3 lbs. a.e. $\underline{8.5}$ 9 $\underline{8}$ $\underline{7}$ $\underline{7.5}$ 5.5 5 4 6.8 $\underline{8.0}$ Atrazine 4 1bs. $\underline{8}$ $\underline{8}$ $\underline{8}$ $\underline{9}$ 9 $\underline{8}$ $\underline{7}$ $\underline{9}$ | Banvel "D" | 5 '' | | | | | | | 1 | | 1.7 | 2.2 |
| Atrazine 4 lbs. $\frac{1}{9}$ $\frac{1}{9}$ $\frac{1}{9}$ $\frac{1}{9}$ $\frac{1}{9}$ $\frac{1}{8.2}$ Fenac 2 lbs. a.e. $\frac{9}{9}$ $\frac{9}{9}$ $\frac{9}{9}$ $\frac{9}{9}$ $\frac{9}{9}$ $\frac{9}{9}$ $\frac{9}{9}$ $\frac{8}{8}$ $\frac{7}{7}$ $\frac{9}{8.1}$ $\frac{8.2}{9.0}$ - Post-Emergent 18 23 30 42 0-50 days Cotoran 4 lbs. 2.5 5 5.5 4 4.3 " 6 lbs. 4 2.5 3 2 2.9 Karmex 4 lbs. $\frac{8.5}{7}$ 6.5 6 $\frac{7.0}{7.0}$ Baddening Twice 0 $\frac{9}{7}$ $\frac{9}{9}$ $\frac{8}{9}$ $\frac{8}{7}$ $\frac{6.5}{7.5}$ | t† | 10 " | 3 | 6 | 5 | 4 | 4 | 2 | 2 | 3 | 3.6 | 4.4 |
| Atrazine 4 lbs. 8 8 8 9 8 7 9 8.1 8.2 Fenac 2 lbs. a.e. 9 9 9 9 9 9 8 7 9 8.1 8.2 Penac 2 lbs. a.e. 9 9 9 9 9 8 7 9 8.1 8.2 Penac Post-Emergent 18 23 30 42 9 9 8 7 9 8.5 9.0 Cotoran 4 lbs. 2.5 5 5.5 4 4.3 2.9 4.3 2.9 Karmex 4 lbs. 8.5 7 6.5 6 7.0 8.6 7.0 8.6 Hand Weeding Twice 0 9 8 9 8.5 9 8.5 6.5 6.5 | 2,4-D Amine | 3 lbs. a.e. | 8.5 | 9 | 8 | 7 | 7.5 | 5.5 | 5 | 4 | 6.8 | 8.0 |
| Fenac2 lbs. a.e.9999998878.59.0- Post-Emergent182330420-50 daysCotoran4 lbs.2.555.544.3"6 lbs.42.5322.9Karmex4 lbs. $\frac{8.5}{7}$ 6.56 $\frac{7.0}{8.6}$ Cocktail*9898.56.5Hand Weeding Twice099898 | Atrazine | 4 lbs. | 8 | | | 1 | 9 | 8 | 7 | 9 | 8.1 | 8.2 |
| - Post-Emergent 18 23 30 42 0-50 days Cotoran 4 lbs. 2.5 5 5.5 4 4.3 " 6 lbs. 4 2.5 3 2 2.9 Karmex 4 lbs. $\frac{8.5}{7}$ 6.5 6 $\frac{7.0}{8.6}$ Cocktail * 9 8 9 8.5 8.6 Hand Weeding Twice 0 9 9 8 6.5 6.5 | Fenac | 2 lbs. a.e. | 1 | | | | | | | | 8.5 | 9.0 |
| " 6 lbs. 4 2.5 3 2 2.9 Karmex 4 lbs. $\frac{8.5}{7}$ $\frac{6.5}{6}$ $\frac{7.0}{8.6}$ Cocktail * $\frac{9}{2}$ $\frac{8}{2}$ $\frac{8.5}{2}$ $\frac{8.5}{2}$ $\frac{8.5}{2}$ Hand Weeding Twice 0 $\frac{9}{2}$ $\frac{9}{2}$ $\frac{8}{2}$ $\frac{8}{2}$ $\frac{6.5}{2}$ | | - Post-Emergent | <u></u> | | | | | | 1 | | | 0-50 days |
| " 6 lbs. 4 2.5 3 2 2.9 Karmex 4 lbs. $\frac{8.5}{7}$ $\frac{6.5}{6}$ $\frac{7.0}{8.6}$ Cocktail * $\frac{9}{2}$ $\frac{8}{2}$ $\frac{8.5}{2}$ $\frac{8.5}{2}$ $\frac{8.5}{2}$ Hand Weeding Twice 0 $\frac{9}{2}$ $\frac{9}{2}$ $\frac{8}{2}$ $\frac{8}{2}$ $\frac{6.5}{2}$ | Cotonan | 4 lbc | 125 | 5 | 5 5 | ц | | | | | | <u></u> и З |
| Karmex 4 lbs. $\frac{8.5}{7}$ $\overline{7}$ 6.5 $\overline{7.0}$ Cocktail * $\underline{9}$ $\underline{8}$ $\underline{9}$ $\underline{8.5}$ $\overline{2.0}$ Hand Weeding Twice 0 $\underline{9}$ $\underline{9}$ $\underline{8}$ $\underline{9}$ $\underline{8.5}$ $\overline{6.5}$ | | | | | | | | | | | | |
| Cocktail * 9 8 9 8.5 8.6 Hand Weeding Twice 0 9 9 8 6.5 | Kammou | | | | | - | | | | | | |
| Hand Weeding Twice 0 9 8 6.5 | | | | | | | | | | | | |
| | | | <u> </u> | | 2 | | | | | | | <u>0.0</u> |
| Control 0 0 0.5 1 0.4 | - | | 0 | <u>9</u> ` | <u>9</u> | 8 | | | | | | 6.5 |
| | Control | | 0 | 0 | 0.5 | 1 | | | | | | 0.4 |

* Cocktail = 1.5 lb. Hyvar X + 3 lbs. Karmex + 3 lbs. a.e. 2,4-D amine / acre.

- 2 -

| Treatment - Pre-Emergent | | Stalk Counts | | | |
|--------------------------|-------------------|--------------------------|--------|-----------|--------|
| Formulation | Rate/sprayed acre | X 10 ⁻³ /acre | T.C.A. | % Sucrose | T.S.A. |
| Sindone | 2 lbs. | 38.1 | 15.4 | 13.0 | 1.83 |
| 11 | 4 lbs. | 25.6 | 12.8 | 13.2 | 1.68 |
| Sindone "B" | 2 " | 29.3 | 17.9 | 13.8 | 2.46 |
| 11 | 4 ¹¹ | 35.7 | 27.8 | 13.7 | 3.77 |
| C.P.50144 | 2 " | 48.1 | 42.4 | 14.1 | 5.93 |
| ** | 4 " | 42.6 | 33.8 | 14.5 | 4.85 |
| Ramrod | 6 ¹⁷ | 24.2 | 16.6 | 13.5 | 2.23 |
| 11 | 8 " | 32.4 | 21.9 | 13.5 | 2.87 |
| Cotoran | 2 " | 32.8 | 26.7 | 14.0 | 3.72 |
| 17 | 4 " | 45.1 | 35.6 | 14.0 | 4.95 |
| Banvel "D" | 5 " | 28.6 | 26.5 | 11.9 | 3.23 |
| PT | 10 " | 31.5 | 14.0 | 13.1 | 1.87 |
| 2,4-D Amine | 3 lbs. a.e. | 31.0 | 20.8 | 14.2 | 2.93 |
| Atrazine | 4 lbs. | 43.0 | 27.0 | 14.0 | 3.67 |
| Fenac | 2 lbs. a.e. | 46.1 | 41.2 | 13.8 | 5.61 |
| - Post-Emergent | | | | | |
| Cotoran | 4 lbs. | 21.9 | 12.5 | 13.4 | 1.68 |
| îf | 6 ^{it} | 26.3 | 23.6 | 13.3 | 3.22 |
| Karmex | 4 ¹¹ | 28.3 | 21.3 | 13.9 | 2.97 |
| Cocktail | * | 35.3 | 18.2 | 14.0 | 2.54 |
| Hand weeding twice | | 46.1 | 27.9 | 14.3 | 3.98 |
| Control | | 22.9 | 16.9 | 12.4 | 2.10 |

II Yield Results

*Cocktail = 1.5 lb. Hyvar X + 3 lbs. Karmex + 3 lbs. a.e. 2,4-D amine/acre

Comments:

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Due to the extreme variability of harvest data for plots of the same treatment, the yield results cannot be statistically analysed fully and must only be accepted with caution. However there is a very close relationship between the degree of successful weed control and the mean yields obtained per treatment.

Broad-leaved weeds were dominant during the early stages of the trial but were gradually replaced by grasses - mainly <u>Digitaria adscendens</u>. <u>Cyperus</u> species were present in various areas of the trial site but at no time reached serious proportions.

Pre-emergent applications of both rates of C.P.50144 and Cotoran gave excellent weed control under the irrigated conditions prevailing, and compared most favourably with the "established" herbicides 2,4-D, Atrazine and Fenac. Both chemicals gave a fair measure of control over annual and perennial grasses but had no effect on <u>Cyperus</u> spp. where these were present. Banvel "D" was extremely phytotoxic to cane. Post-emergent results were generally poor, mainly due to lack of grass control.