

EFFECT OF POST EMERGENCE WEEDICIDES ON THE YIELD AND YIELD COMPONENT OF COTTON *GOSSYPIMUM HIRSUTUM*. L.

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The study was done to see the effect of post emergence weedicides on the yield and yield components of cotton, variety TH-1100. Eight treatments vize, TOK-E-25, (1.5 gallon per acre), Karmex + MS M.A (2 lbs +5 pint per acre), Gasagard (2 lbs per acre), Gesgard (3 lbs per acre), Gramoxone (1 pint per acre), Gramoxone (2 pint per acre), Hand weeding and check, (Untreated) were tested.

Hand weeding produced maximum yield and yield components, followed by Gramoxone (2 pint/acre) recorded maximum mortality percent, seed cotton yield 2.607 M.t/ha, supported by maximum, plant height, number of branches/plant, number of open bolls/plant seed cotton yield/plant, respectively.

Key words: Cotton crop; Weed control; Herbicides; Yield; Pakistan.

INTRODUCTION

Cotton (*Gossypium* spp.) is an important cash crop of Pakistan, grown on area of more than 2.498 million hectares during 1986-87 [2]. The yield is still very low as compared to other cotton growing countries of the world. The causes of low yields are, improper agronomic practices, insects, pest and diseases attacks and weeds problem [1,3].

Cotton, a crop of irrigated areas is severely infested by almost all Kharif weeds. In the recent years, the problem has magnified particularly because of the high infestation of *Trianthema monogyna* (It. Sit) [7]. Literature indicate that chemical weed control method provides greater benefits in controlling the weeds in all growing crops. Saunders *et al* [4] reported that losses resulting from weeds equalled those caused by insects, pests and diseases: Skird [9] studied with thirteen grass weeds treated with Gramoxone 51 and Gramoxone 101 found that higher treatments of weedicides, however, checked emergence of weeds. Baloch [5] found a significant increase in the production of cotton crop about 70 to 90 percent by controlling the following weeds: Aderi, Bhurt, and Mundhari weeds, using gramoxone at a rate of three pint per acre. Makhdoom *et al*, [6] reported that Karmex at 1 to 2 lb per acre, Gramoxone at 1 to 2 pint per acre were the best pre-and post-emergence weedicides, respectively and increased the yield of cotton crop. Maximum seed cotton yield was obtained in hand weeded treatment. Yet its use for the control of weeds was uneconomical followed by gramoxone as post emergence and Karmex pre-emergence. The present study was carried out to see the effect of post emergence weedicides on the yield and yield of components of cotton. The major weeds observed are shown in (Table 1).

MATERIALS AND METHODS

An experiment was carried out to study the effect of post emergence weedicides on the yield and yield compo-

nents of cotton at students farm, Sind Agriculture University Tandojam during Kharif 1985-86 in Randomized Complete Block Design having four replications with a net plot size of 2.46 x 4.3 square metre. The seeds of cotton variety TH-1100 was drilled by single Coulter hand driven drill at a rate of 35 kg/ha, maintaining 75 cm row and 25 cm plant spacings. This variety has been evolved from the cross of *G. hirsutum* 21 x McNair TH-14920 at Cotton Section Agriculture Research Institute Tandojam. It possesses the outstanding characteristics like, boll weight, highest in yield steple length and other fibre technological characters in comparison to local varieties of this region. Eight treatments viz:

- T₁ = TOK-E-25, 1.5 gallon per acre
- T₂ = Karmex + MSMA 2 lb + 5 pint per acre
- T₃ = Gesagard 2 lbs per acre
- T₄ = Gesagard 3 lbs per acre
- T₅ = Gramoxone, 1 pint per acre
- T₆ = Gramoxone, 2 pint per acre
- T₇ = Hand weeding
- T₈ = Check (No weeding)

Table 1. Following weeds of cotton were studied.

| S. No. | Local name | Botanical name | Family |
|--------|------------|-------------------------------|----------------|
| 1. | It-sit | <i>Trianthema monogyna</i> | Aizoaceae |
| 2. | Kabah | <i>Cyperus rotundus</i> | Cyperalla |
| 3. | Mandhano | <i>Eleusine indica</i> | Poaceae |
| 4. | Naro | <i>Convolvulus arvensis</i> | Convolvulaceae |
| 5. | Lulur | <i>Digera arvensis</i> | Amaranthaceae |
| 6. | Hazardani | <i>Phyllanthus niruri</i> | Euphorbiaceae |
| 7. | Lunak | <i>Portulaca oleracea</i> | Aizoaceae |
| 8. | Chhabbar | <i>Cynodon dactylon</i> | Poaceae |
| 9. | Drubh | <i>Desmostachya bippinata</i> | Poaceae |

The weedicides were sprayed after 25 days of sowing. When the crop matured the seed cotton was picked by hand. The data collected after selecting normal looking 5 plants in each treatment and were analysed statistically using analysis of variance method. The treatment means were tested by L.S.D. (least significant difference) following Steel and Torrie [8].

RESULTS AND DISCUSSION

Mortality of weed. The analysis of variance mean reveals that the mortality of weeds had highly significant difference ($P < 0.01$) among each other. Hand weeding removed maximum 91.41 percent weeds per square metre followed by plots treated with Gramoxone (2 pint/acre) and Gramoxone (1 pint/acre) recorded 81.75 and 76.12 percent mortality per square metre. The minimum 15.92 percent mortality was recorded under plots treated with TOK-E-25 (1.5 gallon/acre) over check plots (untreated) (Table 2).

Plant height. It is evident from the data presented in (Table 2) that plant height had highly significant differences ($P < 0.01$) among each other. The maximum height 123.50 cm per plant was recorded under hand weeded plots, followed by Gramoxone (2 pint/acre) and Gramoxone (1 pint/acre) recorded 101.81 and 101.80 cm/plant respectively. Whereas the minimum plant height 48.40 cm was recorded under check plots (untreated).

Number of branches per plant. It is depicted from the analysis of variance means that weedicides had highly significant ($P < 0.01$) effect on number of branches/plant. Hand weeded plots recorded maximum 8.75 number of branches/plant, followed by plots treated with Gramoxone (2 pint/acre) and Gramoxone (1 pint/acre) recorded 7.50 and 7.25 respectively. The minimum number of branches 3.75/plant was recorded under check plots (untreated) (Table 2).

Number of open bolls per plant. It is explicit from the data given in (Table 2) that number of open bolls/plant were significantly affected ($P < 0.01$) by different weed

Table 2. Mean yield and yield component of cotton variety TH-1100 as affected by different weedicides.

| Treatments | Mortality percent of weeds % | Plant height cm. | Number of branches per plant % | Number of open bolls per plant | Seed cotton yield per plant | Seed cotton yield/ha.M.t | Percent increase over (check) % |
|-----------------------------------------------------------|------------------------------|------------------|--------------------------------|--------------------------------|-----------------------------|--------------------------|---------------------------------|
| T ₁ = TOK-E-25 (1.5 gallon per acre) | 15.92 | 57.90 | 5.75 | 7.75 | 31.80 | 1.540 | 30.78 |
| T ₂ - Karmex + MSMA. (2 lbs + 5 pint per acre) | 40.91 | 66.20 | 6.00 | 7.75 | 44.00 | 2.014 | 47.07 |
| T ₃ - Gesagard, (2 lbs per acre) | 66.95 | 81.50 | 6.25 | 9.25 | 50.20 | 2.370 | 55.02 |
| T ₄ - Gesagard. (3 lbs per acre). | 63.89 | 84.00 | 6.26 | 10.75 | 63.30 | 2.370 | 55.02 |
| T ₅ = Gramoxone (1 pint per acre). | 76.12 | 101.80 | 7.25 | 11.00 | 63.80 | 2.448 | 56.45 |
| T ₆ = Gramaxone (2 pint per acre). | 81.75 | 101.80 | 7.50 | 13.00 | 74.30 | 2.607 | 59.11 |
| T ₇ = Hand weeding. | 91.41 | 123.50 | 8.75 | 13.75 | 77.10 | 2.962 | 64.01 |
| T ₈ = Check (No weeding) | 0.00 | 48.40 | 3.75 | 6.00 | 99.30 | 1.066 | — |
| SEM _± | | | | | | | |
| SEM ⁺ — | 8.30 | 5.09 | 0.63 | 1.20 | 4.80 | 0.150 | — |
| L.S.D. at P < 0.05% | 17.26 | 10.59 | 1.31 | 2.49 | 9.98 | 0.31 | — |
| L.S.D. at P < 0.01% | 23.49 | 14.41 | 1.78 | 3.39 | 13.60 | 0.43 | — |

control treatments. The maximum number of bolls 13.75/plant was obtained under hand weeded plots followed by Gramoxone (2 pint/acre) and Gramoxone (1 pint/acre) obtained 13.00 and 11.75 respectively. The minimum number of open bolls 6.00/plant was obtained under check plots (untreated).

Seed cotton yield per plant. The treatments had highly significant differences ($P < 0.01$) among each other with regards to seed cotton yield/plant. Hand weeded plots produced maximum seed cotton 99.30 gm/plant, followed by Gramoxone (2 pint/acre) and Gramoxone (1 pint/acre) produced 77.10 and 74.30 over untreated (check) respectively Table 2).

Seed cotton yield per hectare. The analysis of variance means showed that treatments had highly significant differences ($P < 0.01$) with regards to seed cotton yield/ha. Hand weeded plots recorded maximum 2.962 M.t/ha. which shows that 64 percent increase in yield over untreated check followed by Gramoxone (2 pint/acre) and Gramoxone (1 pint/acre) recorded 2.607 and 2.448 M.t/ha. respectively. Which mean that 59 and 56 percent yield increases over untreated check. Similar results were obtained by Baloch [5], Makhdoom *et al.* [6] and Skird [9]. It is observed that hand weeded plots recorded maximum yield and yield components. This is the most effective practice providing complete control of weeds, particularly during the critical period of weed crop competition. Two dry hoeing before the first irrigation are recommended for satisfactory results. This practice, due to rainy season and not easily available labour encounters serious drawbacks, and becomes uneconomical. It is also susceptible to weather, leaving only the chemical control method as the economical and effective alternate. This conclusion is supported by Shad [7].

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