

## Chemical Weed Control in Cotton

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The exact loss in Cotton yield due to weed competition is not precisely estimated (Verma and Bhardwaj 1963) but the loss is considerable since cotton is widely spaced. The common weeds infesting cotton in transition belt of Dharwar are *Cynodon dactylon*, *Portulaca oleracea*, *Cyperus rotundus*, *Digitaria* sp, and *Panicum* sp Cotton is highly sensitive to phenoxy type of herbicides even at low concentrations, hence its use as a weed killer is out of question. Triazine compounds have shown some promise but the stand is affected adversely (Christidis and Harrison 1955, Verma and Bhardwaj 1963, and Horowitz and Klefeld 1968).

Cotton in Dharwar and Gadag areas is sown at the receding monsoon during August-September and is raised from the stored soil moisture. To conserve it, intercultivation becomes an indispensable operation which incidently removes the weeds from the crop rows. The weed competition is mostly by the weeds growing in the crop row. Hence several herbicides are tried as pre-emergence spray both in the crop row and on the entire plot. The quantity of herbicides required in the crop row will be considerably less than that required by the entire plot.

The objective of the present investigation was to study the effect of herbicides as pre-emergence spray both in the entire plot and in the crop row on seed cotton yield (*Kapas*)

### EXPERIMENTAL PROCEDURE

The experiment was conducted at Cadag (Scantly rainfall area) with Laxmi (*G. hirsutum*) and at Dharwar (Assured rain fall area) with Jayadhar (*G. herbaceum*) during 1968-69. The crop was sown in first week of August at Dharwar and first week of September at Gadag. The plots uniformly received a basal dressing of 40-20-20 kg. NPK per hectare at both the locations. Herbicides were applied as pre-emergence one day after sowing either in the entire plot or in the crop row. Two intercultivations were given to all treatments if the herbi-

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cides were applied on the crop row. No intercultivations were, however, received by treatments where herbicides were applied in the entire plot.

The weed count is from one m<sup>2</sup> area. The experiment with ten treatments was laid out in Randomised Block Design with three replications at Dharwar and four replications at Gadag. The plot size was 3.96x4.88m and 3.70x4.50m respectively at Dharwar and Gadag. The weed index (W. I.) for each treatment is calculated by the procedure given by Gill and Kumar (1969) which is defined by them as the "Reduction in yield due to the presence of weeds in comparison with no weed plot". Mathematically weed Index, W. I. is expressed as :

$$W. I. = \frac{X-Y}{X} \times 100$$

Where X is the yield from no-weed plot and Y is the yield from the treatment for which W. I. is to be obtained.

Table I

Seed Cotton Yield (*Kapas*) kg/ha and weed count as affected by herbicides at Dharwar during 1968-69.

Treatments	Yield kg/ha.	Weed Count $\sqrt{x+1}$	Actual Weed Count	Weed Index (W. I.)
Tafazine 3.75 kg/ha entire plot.	586.2	2.88	7.3	19.0
Tafazine 0.625 kg/ha in crop row+2 intercultivations	658.7	4.63	21.0	9.0
Cotoron 3.75 kg/ha entire plot	670.6	3.20	9.3	7.4
Cotoron 0.625 kg/ha in crop row+2 intercultivations	803.6	4.64	21.3	—
Diuron 3.75 kg/ha entire plot	635.9	2.72	12.3	12.8
Diuron 0.625 kg/ha in crop row+2 intercultivations	810.3	5.05	25.7	—
Taffapon 3.75 kg/ha entire plot	565.5	5.35	28.3	21.9
Taffapon 0.625 kg/ha in crop row+2 intercultivations	527.8	5.42	29.0	27.1
Weeded check—3 intercultivation+2 hand weedings	724.4	1.00	—	—
Un-weed control	669.0	4.21	17.0	7.6
'F' test	N.S.	Sig	—	—
LSD at 5%	—	0.03	—	—
C. V. %	17.89	8.05	—	—

Table 2  
Seed Cotton Yield (*Kapas*) kg/ha and plant stand as affected by herbicides at Gadag during 1968-69

Treatment	Yield kg/ha	Weed Index (W.I.)	Plant stand per plot (3.70×4.50 m)
Tafazine 2.5 kg/ha entire plot	12.0	98.6	3.5
Tafazine 0.625 kg/ha entire plot	419.9	53.6	48.2
Tafazine 2.5 kg/ha on crop row+2 interculturations	4.8	99.4	5.2
Tafazine 0.625 kg/ha on crop row+2 interculturations	97.2	89.2	8.5
Cotoron 2.5 kg/ha entire plot	512.3	43.3	49.0
Cotoron 0.625 kg/ha entire plot	863.0	4.6	76.0
Cotoron 2.5 kg/ha on crop row+2 interculturations	219.8	75.5	14.2
Cotoron 0.625 kg/ha on crop row+2 interculturations	811.4	10.3	99.7
Weeded check—4 intercultural- tion+2 hand weedings	905.1	—	97.7
Un-weeded control	430.0	52.4	96.0
'F' Test	Sig	—	—
LSD at 5%	228.2	—	—
C. V. %	39.97	—	—

## RESULTS AND DISCUSSION

Seed cotton yield and other ancillary data are given for both centres in tables 1 and 2. Different herbicides did not affect the seed cotton yield significantly at Dharwar (Table 1) while weed count was significantly affected. Lowest weed count was obtained in Taffapon treatment applied either in the crop row or in the entire plot. Taffapon did not seem to control the weed flora. Yield reduction was relatively less due to weed competition (low W. I. values) in the crop row application of Diuren, Cotoron and Taffazine than the application of these herbicides in the entire plot. This possibly indicates that the control of weeds in the crop row is more important than between the rows which are mostly taken care off by the inter cultivation.

Significant treatment effect with respect to seed cotton yield was noted for Gadag centre (Table 2). Application of herbicides 2.5 Kg/ha in the group row was highly toxic which reflected adversely on the plant stand. Among the herbi-

cides substituted-urea compound like Cotoron applied at 0.625 Kg/ha either in the crop row or in the entire plot gave the higher seed cotton yield and lower weed index than any of the treatments. The beneficial effect of two inter cultivations in combination with the crop row application of herbicides was, however, not noticed at this location.

The plausible conjectures seems that substituted-urea compounds like Cotoron and Diuron can safely be used as pre-emergence spray in a low dose of 0.625 Kg./ha in the crop row without adversely affecting the stand and more economical yields can be obtained by applying in the crop row than in the entire plot. Experiments are further continued to study the efficacy of these herbicides both as pre- and post emergence spray. Horowitz and Kiefield (1968) opine that a combination of prometryne and diuron can be used as pre and post emergence spray respectively to control the wider spectrum of weed flora.

#### SUMMARY

The investigations were carried out at Dharwar and Gadag during 1968-69 to study the efficacy of herbicides applied either in the crop row or in the entire plot on seed cotton yield. Substituted-urea compounds like Diuron and Cotoron applied in the crop row at 0.625 Kg./ha controlled weeds effectively and produced more seed cotton yield. Weed index (W. I.) values were low in plot where diuron and cotoron were applied in the crop rows, suggesting that reduction in seed cotton yield due to weed competition is considerably less. The application of herbicides for cotton in the crop row seems to be better than in the entire plot.

#### REFERENCES

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