

## Comparative Efficiency of Aflon, Tafazine 50-W and 2, 4-D in Controlling Weeds in Jowar (*Andropogon sorghum Brot*)\*

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With the need for changing food habits from rice to other cereals, there is wide scope for growing jowar in majority of the up-lands of Orissa. Jowar can be most profitably taken up in Orissa if the problem of control of weeds is tackled efficiently in the up-lands. Hence, it was thought very necessary to undertake studies for control of weeds in jowar by chemical, cultural and chemical-cum-cultural methods.

Krishna Rao *et al.* (1951) recorded 83% increased yield of jowar by controlling *Cyperus rotundus* with a post-emergence application of Fernoxone (2, 4-D), one month after sowing. Rahudkar (1959) could completely control annual grasses and broad leaved weeds by pre-emergence application of 0.2% aqueous solution of 80 per cent Na salt of 2, 4-D. A series of studies undertaken at Nagpur from 1955-60 indicated that a cultural-cum-herbicidal approach was the best for controlling weeds in jowar. But reports from Gwalior (1959) showed that a cultural method of weeding, once with implements and once with hand gave the highest grain yield/ha.

Basing on the above information and with the introduction of new herbicides, the triazines and the urea derivatives, to the Indian market the treatments of the experiments were finalised.

### MATERIALS AND METHODS

The experiment was carried out during the winter season of the year 1968-69 in the 'A' block of the Agronomy Research Farm, Bhubaneswar. The soil of the experimental site was sandy loam with average fertility status. The variety chosen was C S H-1 and was sown on 20th December, 1968 maintaining a spa-

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ing of 45 cm from line to line and 15 cm from plant to plant. The experimental lay-out was in a simple randomised block design consisting of eight treatments with three replications. Afalon [N-(3,4-dichlorophenyl)-N<sup>1</sup>-methoxy-N<sup>1</sup>-methyl urea] @ 1.0 Kg. a.e./ha, Tafazine 50 W [Simazine i. e. 2-chlore 4, 6 bis (ethyl amino)-s-triazine] @ 1.0 Kg. a e/ha and Na salt of 2, 4-D @ 1.68 Kg. a.e./ha were chosen for experimentation and were tried as pre-emergence sprays immediately on the next day of sowing of the crop. The gallonage of water used for the spray was equal in all the treatments and was @ 1124 litres of water/ha. The first hoeing, weeding and earthing operations were done 20 days after sowing while the second hoeing, weeding and earthing operations were done 40 days after sowing in the cultural treatment of 2 hoeings, 2 weedings, 2 earthings. But for herbicidal cum cultural treatments, the hoeing and earthing operations were done 40 days after sowing. Germination counts were recorded plot wise on 5-1-69 and weed counts were taken throwing quadrants of 30 cm x 30 cm at three places at random in each plot on 15-2-69. Two picking of ear heads were done on 27-3-69 and 4-4-69 respectively. The grain yields were recorded after complete drying and till a constant weight was maintained. The details of all the eight treatments alongwith their germination counts, weed counts and final grain yield are presented in Table 1

## RESULTS AND DISCUSSION

The results of the experiment presented in Table 1 and are discussed below :

### Effect of Germination :

Among the three herbicides tried, both Afalon [N-(3, 4-dichlorophenyl) N<sup>1</sup>-methoxy-N<sup>1</sup>-methyl urea] and Tafazine 50 W (Simazine) with a dosage of 1.0 Kg a e./ha appeared to have exercised no adverse effect on germination of jowar seeds.

But application of 2, 4-D @ 1.68 Kg. a.e./ha in treatments No. 5 and No. 8 reduced the germination significantly over the rest of the treatments. The reduced germination count can apparently be attributed to the toxic effect of the herbicide,

### Weed flora :

The weed flora in the experimental field mainly consisted of the following groups of weeds.

**Monocots :** Sedges : *Cyperus rotundus*, *Cyperus articulatus*, *Elcocharis parvula*, *Fimbristylis miliaceae*.

**Grasses :** *Echinochloa colonum*, *Digitaria sanguinalis*, *Panicum taxanum*, *Eleusine indica*, *Dactyloctenium aegypticum*.

*Amaranthus retroflexus*, *Croton capitatus*, *Celosia argentea*, *Commelina benghalensis*, *Euphorbia hirta*, *Sida cordifolia*.

The monocot group of weeds were the most dominant and consisted of the major bulk of weed population. The dicot group of weeds being very limited were not a serious problem in the experimental plots.

#### Effect on weed population :

The unweeded control treatments recorded the maximum weed population and significantly increased the weed population over the rest of the treatments tried. This was possibly due to free allowance of all the weeds to sprout and grow unchecked.

It was further observed that application of herbicides alone in treatments Ne. 3, 4 and 5 showed a general increase in the weed population over the herbicidal cum cultural treatments in treatments nos. 6, 7 and 8 although the variations were found to be not significant. This increase was probably due to the reduction in toxicity of the herbicides at the later stages of crop growth and there by giving chance for certain weed seeds to sprout. But in the cultural cum herbicidal treatments and in the conventional method of 2 hoeing, 2 weeding, 2 earthing, weeds that came up at the later stages of crop growth were also eliminated by giving the cultural treatment.

#### Effect on Grain Yield :

The mean grain yield presented in Table 1 shows that the maximum grain yield of 45.14 q/ha was obtained with a pre-emergence application of Afalon 1.0 kg a.e./ha supplemented with one hoeing and earthing operation. This was further followed by 40.13 q/ha and 38.93 q/ha in the treatments 'Tafazine 50 W @ 1.0 kg a.e./ha + one hoeing and earthing' and the cultivators' practice of '2 hoeings, 2 weedings and 2 earthings' respectively. The high yields were possible obviously due to very effective control of weed population from the time of sowing till the maturity of the crop. But such high yields were not possible to the single application of Afalon and Tafazine 50W treatments, as the weeds appeared after about one and half months after sowing and interfered in crop growth partially. The treatments that received interculture at a fairly later stage from the date of sowing i. e. Afalon + one hoeing and earthing, Tafazine 50 W + one hoeing and earthing, 2 hoeings, 2 weedings and 2 earthings were found to

Table 1  
Showing the Germination count, weed count and yield of grain of Jowar.

Sl. No.	Treatments	Germination count/ plot	Mean weed population count of 30 cm × 30 cm area recorded after 55 days of sowing on 15-2-69	Mean yield of grain in Q/ha
1.	Un-weeded control	225.0	56.6	21.27
2.	Cultivators' practice (2 hoeings, 2 weeding and 2 earthings)	224.0	13.4	38.93
3.	Afalon @ 1.0 kg a. e./ha	219.0	25.6	33.01
4.	Tafazine 50W @ 1.0 kg a.e./ha	182.0	23.3	31.37
5.	Na salt of 2,4-D@1.68 kg a.e./ha	107.3	22.9	21.77
6.	Treatment No. 3+One hoeing and earthing	213.0	12.6	45.14
7.	Treatment No. 4+one hoeing and earthing.	194.0	12.6	40.13
8.	Treatment No. 5+one hoeing and earthing.	106.0	13.5	22.97
	'F' Test	Sig.	Sig.	Sig.
	C. D.	62.40	16.01	10.24

WEED CONTROL IN JOWAR

N. B. All the herbicides were used pre-emergence sprays, immediately on the next day of sowing the seeds. The gallonage of water used was @ 1124 litres/ha for all herbicides.

be the best treatments with respect to grain yield and were at par. Afalon and one hoeing and earthing was found to be significantly superior to all the rest of the five treatments i. e. Treatment No 1, 3, 4, 5, 8. Afalon alone was found to be significantly superior to control and 2, 4-D alone. The lowest yield in control treatment was obviously due to heavy weed infestation resulting in non-availability of plant nutrients to the main crop taken. The low yield in 2, 4-D treated plots can be attributed for the deleterious effect of 2, 4-D in reducing the plant population by over 50% from the normal

#### SUMMARY

The investigation was carried out on jowar crop with the variety CSH-1 in the 'A' block of the Agronomy Research Farm, Bhubaneswar during the winter season of the year 1968-69 in a sandy loam soil of average fertility status with eight treatments and three replications in a randomised block design. Afalon [N-(3, 4-dichlorophenyl)-N<sup>1</sup>-methoxy-N<sup>1</sup>-methyl urea] @ 1.0 kg a.e./ha, Tafazine 50 W [Simazine i.e. 2-chloro 4, 6-bis-(ethyl amino)-s-triazine] @ 1.0 kg a.e./ha and Na salt of 2, 4-D @ 1.68 kg a.e./ha were tried alone and in combination with one hoeing and earthing comprising of six herbicidal treatments. The other two treatments 'Cultivators' practice' (Two hoeings, two weeding and two earthings) and un-weeded control. All the herbicides were tried as pre-emergence sprays, immediately on the next day of sowing mixing in water @ 1124 litres/ha.

The salient results obtained are given below :

1. Afalon and Tafazine 50W appeared to have no adverse effect on germination. Na salt of 2, 4-D significantly reduced germination over all the rest of the treatments.
2. All the treatments significantly reduced the weed population over un-weeded control. Afalon and Tafazine 50 W when supplemented with one hoeing and earthing recorded the minimum weed population count.
3. Maximum grain yield/ha was recorded with Afalon, when supplemented with one hoeing and earthing.

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