



Effect of Integrated Weed Management on Growth and Yield of Okra (*Abelmoschus esculentus* L.) cv. Arka Anamika in North Plain Zone

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present investigation entitled "Effect of Integrated Weed Management on Growth and Yield of Okra (*Abelmoschus esculentus* L.) cv. Arka Anamika in north plain zone." was conducted during Kharif season of 2022-23 at student instructional farm of the S.C. Bose P.G. College, Kahli, Terwa, Gaushganj, Hardoi (U.P.). The experiment was conducted in Randomized Block Design with 6 treatments combinations and 3 replications. Different treatments were applied at the different interval of time and effect were recorded. Gap identified over the topic is -Weed control in okra through conventional methods has become expensive, time consuming and difficult during heavy and continuous rains particularly during early stages of the crop. While continuous, use of herbicides might sooner or later lead to resurgence of secondary weeds besides causing pollution problems. So an experiment was conducted to study the effect of chemical & cultural means alone or in combination, on the weed control efficiency and yield of okra. The selection of specific season is associated that most of okra is sown in kharif season in north plain zone as less seed rate is required [1].

Keywords: *Treatments; parameters; pre-emergence; pendimethalin; attributes; replications; management; experiments.*

1. INTRODUCTION

Okra (*Abelmoschus esculentus* (L). Moench) belongs to family malvaceae, known as Bhendi or Lady's finger, is one of the most important traditional Vegetable grown in tropical and sub-tropical parts of the world. Okra is also one of the most nutritious vegetables which contains on an average 1.9g of protein, 0.2g fat, 6.4g carbohydrate, 0.7g minerals and 1.2g fibres per 100g of edible portion [2].

In the year 2022-23, in India the area of vegetable cultivation was 11.34(000'ha) and production 212.55 (000'MT). India is the largest producer of okra with an area of 513.6(000' ha) and production of 6170 (000'MT) with the productivity of 11.33 MT, respectively (NHB,2018-19). Percent share of vegetable production is 59.83% of total horticulture Production.

Its tender green fruits are used as a vegetable and are generally marketed as fresh state, but sometimes as canned or in dehydrated form. Mature fruits and stem containing crude fibre are used in the paper industry. In some places the plants are also soaked in water and the result and solution is used as a clarifier in the manufacture of jaggery.

The daily balance diet for adult human in our condition should constitute 125g leafy vegetables, 75g other vegetables and 100g of root and tuber vegetables along with 475g

cereals, 80g pulses, 92g fruits, 200ml milk, 40g sugar or jaggary [3].

Hence, the importance of vegetables in a daily diet increasing day by day in many developing countries. National Agricultural Development Programme is focused on the need to increase the production of vegetables in order to increase their proportion in the daily diet [3].

2. MATERIALS AND METHODS

The experiment was carried out at student instructional farm of the S.C. Bose P.G. College, Kahli, Terwa, Gaushganj, Hardoi (U.P.). Research is planned with the following objectives: To study the effect of different herbicides for weed control on growth, yield and it's attributes in okra.

The method of analysis is-Total Six treatments are taken and divided in three blocks. Effect of different treatments can be seen easily on various growth and yield parameters. Treatment T₁ has Weed check (Control), In treatment T₂, Weedfree check (3 hand weeding), In treatment T₃, (Pre emergence application of pendimethalin @ 6ml/l). are occur, In treatment T₄, (Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding are occur), In treatment T₅, pre emergence application of pendimethalin @ 6ml/l. + quazalofop ethyl 40-50 gm/h. at 20 DAS are occur and last one, Treatment T₆, post emergence application of metribuzin @ 525 g/h. at 20 DAS are occur [4].

3. RESULTS AND DISCUSSION

Effect of different treatments on different days on Growth parameters & Yield attributes parameters are as under following.

3.1 Plant Height (cm.)

The effect of weed control was found significant on plant. For the estimation purpose sample size of five plant is selected in each treatment and averaged to find best performed treatment. the highest plant height was recorded under T₄- Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding (87.88 cm) and the

lowest plant height were recorded in T₁- weed check (control) is (81.22) [5].

3.2 No. of Fruits Per Plant

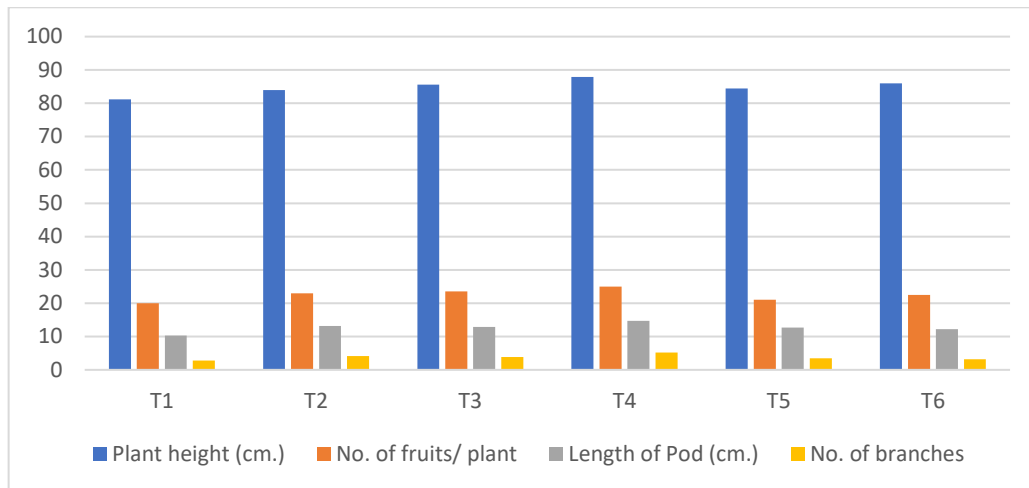
Weed management treatments registered significant effect on number of fruits per plant. For the estimation purpose sample size of five plant is selected in each treatment and averaged to find best performed treatment. T₄ Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding recorded highest number of fruit per plant (24.99) In weed (control) plot the number fruit /plant were found lowest T₁(19.99) [6].

Table1. Showing different yield attributing characters and growth parameters

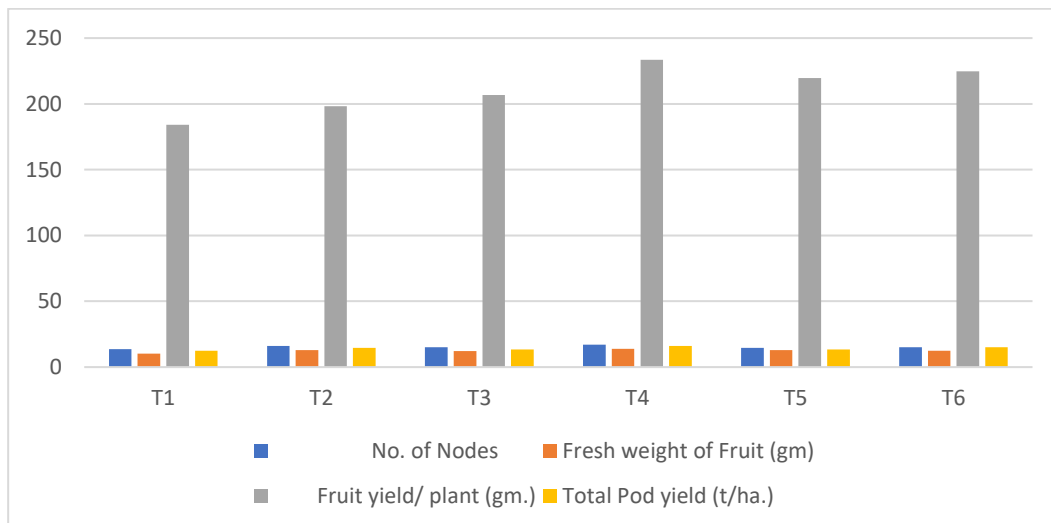
Treatments	Plant height (cm.)	No. of fruits/ plant	Length of Pod (cm.)	No. of branches
T1- Weed check (Control)	81.220	19.995	10.330	2.830
T2-Weed free check (3 hand weeding)	83.993	22.995	13.160	4.160
T3-Pre emergence application of pendimethalin @ 6ml/	85.553	23.495	12.830	3.830
T4-Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding	87.883	24.995	14.665	5.160
T5-Pre emergence application of pendimethalin @ 6ml/l. + quazalofop ethyl 40-50 gm./h. at 20 DAS	84.443	20.995	12.660	3.500
T6- Post emergence application of metribuzin @ 525 g/h. at 20 DAS.	85.997	22.495	12.165	3.160
C.D.(5%)	1.837	1.919	1.698	0.002
S.E.(m)	0.576	0.516	0.457	0.000
S.E.(d)	0.814	0.730	0.646	0.001

Table 2. Showing different yield attributing characters and growth parameters

Treatments	No. of Nodes	Fresh weight of Fruit (gm)	Fruit yield/ plant (gm.)	Total Pod yield (t/ha.)
T1- Weed check (Control)	13.665	10.330	184.165	12.495
T2-Weed free check (3 hand weeding)	16.165	12.995	198.160	14.495
T3-Pre emergence application of pendimethalin @ 6ml/	15.165	12.160	206.830	13.495
T4-Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding	17.160	13.995	233.495	15.995
T5-Pre emergence application of pendimethalin @ 6ml/l. + quazalofop ethyl 40-50 gm./h. at 20 DAS	14.660	12.995	219.665	13.330
T6- Post emergence application of metribuzin @ 525 g/h. at 20 DAS.	14.995	12.330	224.660	14.995
C.D.(5%)	1.157	1.745	6.146	1.197
S.E.(m)	0.311	0.470	1.654	0.322
S.E.(d)	0.440	0.664	2.339	0.456



Graph 1. Bar graph showing different growth parameters



Graph 2. Bar graph showing different yield attributing characters

3.3 Length of Pod

The lowest fruit length was observed under treatment T₁ (weed check) is (10.33 cm.), and highest fruit length was observed in T₄ (Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding) are (14.66 cm.). For the estimation purpose sample size of five plant is selected in each treatment and averaged to find best performed treatment.

3.4 No. of Branches

Number of branches per plant was significantly influenced by various treatments of weed management and Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding (T₄) recorded maximum number of branches (5.16).

and minimum no. of branches are in (T₁)- Weed Control (2.83). For the estimation purpose sample size of five plant is selected in each treatment and averaged to find best performed treatment

3.5 No. of Nodes

Number of nodes per main stem was significantly influenced by various treatments of weed management and Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding (T₄) recorded maximum nodes per main stem (17.16) and minimum no. of nodes are recorded in (T₁) Weed check (Control) are (13.66). For the estimation purpose sample size of five plant is selected in each treatment and averaged to find best performed treatment [7].

3.6 Fresh Weight of Fruit (gm.)

Treatment T₁ [Weed check (Control)] has lowest fresh weight of fruit is (10.33 gm.) and highest are recorded in T₄ (Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding) are (13.99). For the estimation purpose sample size of five fruits is selected in each treatment and averaged to find best performed treatment [8].

3.7 Fruit Yield/ Plant(gm.)

The fruit yield per plant ranged from 184.16 to 233.49. Among the treatments maximum fruit yield per plant was observed in T₄ (233.49) and Minimum fruit yield per plant are in T₁ (184.16). The yield is recorded over season from single plant, each time picking is done For the estimation purpose sample size of five plant is selected in each treatment and averaged to find best performed treatment [9].

3.8 Total Pod Yield (t/ha.)

(Among different weed control treatments T₄ (Pre emergence application of pendimethalin @ 6ml/l.+ one hand weeding) recorded maximum okra fruit yield (15.99 t/ha) and being at par with treatment T₃ and T₄. Significantly the lowest okra green fruit yield (12.49 t/ha) was recorded under treatment weedy check (T₁) [10].

4. CONCLUSION

Plant height affected by the treatments had manifested the maximum height of the plant(87.88cm) at all the stages of observation indicated that the height of plant mainly governed by weed free check followed by pre- emergence application of pendimethalin @ 6ml/l.+one hand weeding and lowest (81.22cm) in weedy check(control) [11].

Maximum number of fruits per plant clearly indicated that in (T₄) Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding (24.99) followed by Pre emergence application of pendimethalin @ 6ml/l. produced number of fruits (23.49) and lowest (19.99) in weed check in control.

Length of Pod clearly indicated that (T₄) Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding produced highest length of fruit (14.66 cm.) followed by (T₂) Weed free check (3 hand weeding). It was also clear that

the lowest in T₁ (10.33 cm.) fruit length per plant recorded in weedy check (control).

No. of Branches clearly indicated that (T₄) Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding produced highest no. of branches (5.16) followed by (T₂) Weed free check (3 hand weeding). It was also clear that the lowest in T₁ (2.83) no. of branches per plant recorded in weedy check (control).

No. of Nodes clearly indicated that (T₄) Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding produced highest no. of nodes (17.16) followed by (T₂) Weed free check (3 hand weeding). It was also clear that the lowest in T₁ (13.66) no. of nodes per plant recorded in weedy check (control).

Average fruit weight (g) of ten fruits showed highest in (T₄) Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding followed by (T₅) Pre emergence application of pendimethalin @ 6ml/l. + quazalofop ethyl 40-50 gm./h. at 20 DAS and lowest in (T₁) weedy check(control) [12].

Fruit yield per plant clearly indicated that (T₄) Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding produced heights fruits yield (233.49g) followed by (T₆) Post emergence application of metribuzin @ 525 g/h. at 20 DAS. It was also clear that the lowest in T₁ (184.16g) fruit yield per plant recorded in weedy check (control).

Total Pod yield/plant (t./ha.) clearly indicated that (T₄) Pre emergence application of pendimethalin @ 6ml/l. + one hand weeding produced highest pod yield/plant (15.99) followed by (T₆) Post emergence application of metribuzin @ 525 g/h. at 20 DAS. It was also clear that the lowest in T₁(12.49) pod yield/plant recorded in weedy check (control).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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