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EFFECT OF INTEGRATED WEED MANAGEMENT PRACTICES ON GROWTH, YIELD AND IT'S ATTRIBUTES IN OKRA (*Abelmoschus esculentus* (L.) Moench) cv. Arka Anamika

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ABSTRACT
A field experiment, **"**Effect of integrated weed management practices on growth, yield and it's attributes in okra (*Abelmoschus esculentus* (L.) Moench) cv. Arka Anamika**"** was conducted at Model Orchard, College of Horticulture, Dr. Y.S.R. Horticultural University, Rajendranagar, Hyderabad during *karif*, 2011-12. Among the different weed management practices, Oxyfluorfen as pre emergence @ 0.15 kg a.i ha^{-1}+ one hand weeding at 30 DAS produced significantly the tallest plants, high leaf area index, high pod yield per plant (127.16 g) and higher total pod yield (13279 kg ha^{-1}).

KEY WORDS: Okra, Integrated weed management and Oxyfluorfen.

INTRODUCTION

Okra (*Abelmoschus esculentus* L. Moench) belongs to family Malvaceae, known as Bhendi or Lady's finger is one of the most important vegetable grown in tropical and sub tropical parts of the world. India is the largest producer of Okra with an area of 452.5 (000' ha) and production of 4803.3 (000'MT) with the productivity of 10.6 MT (NHB, 2010). Among the problems encountered in cultivation of okra, control of weeds is of utmost importance. Weeds are the silent robbers of plant nutrients, moisture, sun light and also compete for space that would otherwise be available to the main crop. Weeds also harbour pests and disease causing organisms; cause adverse allelopathic effects on okra and reduce the yield and quality of the produce. Because of the slow growth rate of okra during the initial stages, weeds take advantage of moisture, soil fertility and environmental conditions to suppress the growth of the crop. Due to this weed competition, the crop remains weak and unhealthy; this results in the reduction of yield and quality of the crop (Singh et al., 1968). A yield loss of about 54.1 to 90.6 per cent was reported in okra due to weed competition (Sigh *et al.,* 1982). The most critical period of crop weed competition in okra is upto 2-6 weeks after sowing (Singh *et al.,* 1981). Use of herbicides for weed control is advocated for weed control due to their easy application and effectiveness in early control of weeds (Virender Sardana, 1997). But unfortunately no single herbicide alone provides the desired degree of weed control as degradation and loss in persistence of herbicides in soil results in re-emergence of weeds during the main part of growing season of the crop (Asok Mehta *et al.,* 1979). The present study was, therefore, designed to find out the Effect of Integrated Weed Management Practices on Growth, Yield and It's Attributes in Okra (*Abelmoschus Esculentus* (L.) Moench) Cv. Arka Anamika.

MATERIAL & METHODS

The preset investigation was conducted in the Model orchard, College of Horticulture, Dr. Y.S.R Horticultural University, Rajendranagar, Hyderabad, during *kharif*, 2011. The trial was laid out in Randomized Block Design replicated thrice. Twelve treatments consisting of Pendimethalin C.S as pre emergence @0.6 kg a.i ha^{-1}, Alachlor as pre emergence @1.0 kg a.i ha^{-1}, Oxyfluorfen as pre emergence @0.15 kg a.i ha^{-1}, Pendimethalin C.S as pre emergence @0.6 kg a.i ha^{-1}followed by Quizalofop ethyl @ 50 g a.i ha^{-1} as post emergence at 2-3 leaf stage of weed, Pendimethalin C.S as pre emergence @0.6 kg a.i ha^{-1}+ one hand weeding at 30 DAS, Alachlor as pre emergence @1.0 kg a.i ha^{-1} followed by Quizalofop ethyl @50 g a.i ha^{-1} as post emergence at 2-3 leaf stage of weed, Alachlor as pre emergence @1.0 kg a.i ha^{-1} + one hand weeding at 30 DAS, Oxyfluorfen as pre emergence @0.15 kg a.i ha^{-1} followed by Quizalofop ethyl @50 g a.i ha^{-1} as post emergence at 2-3 leaf stage of weed, Oxyfluorfen as pre emergence @0.15 kg a.i ha^{-1}+ one hand weeding at 30 DAS, Application of Quizalofop ethyl @50 g a.i ha^{-1} as post emergence at 2-3 leaf stage of weed, Farmers practice (2 HWs at 20 and 40 DAS) and Weedy check (Control). The field was fertilized with recommended doses of NPK at the rate of 100: 80:80 $kgha^{1}$, respectively. The seeds of Okra cv. Arka anamika

were sown on ridges at 50x25 cm spacing. The data was recorded on Plant height (cm) at final harvest stage, Initial plant population**(**lakh ha^{-1}), Final plant population(lakh ha^{-1}) , Days to 50 per cent flowering, Leaf area index (LAI) at final harvest stage, Number of pods per plant, Pod yield per plant (g/plant) and Total pod yield (q ha^{-1}).

RESULTS & DISCUSSION

The results of the investigation i.e., Effect of Integrated Weed Management Practices on Growth, Yield and It's Attributes in Okra (*Abelmoschus Esculentus* (L.) Moench) Cv. Arka Anamika were presented and discussed here under.

Growth characters

Weed management practices significantly influenced the crop growth characters like Plant height (cm), Initial plant population **(**lakh ha^{-1}), Final plant population (lakh ha^{-1}) and Leaf area index (LAI) and the data is presented in Table. The highest plant height was recorded in Oxyfluorfen@ 0.15 kg a.i ha^{-1} (PE) + one hand weeding at 30 DAS (T_9) (89.00) and it was followed by farmers practice (87.20). The lowest plant height was recorded in weedy check (58.53). There was no difference in the population of Okra seedlings as observed initially and the initial population was 0.8 lakh plants per ha in all the treatments. Final plant population ranged from 0.7 to 0.8 lakh plants per ha and it did not differ significantly in all the treatments. The maximum LAI was observed in Oxyfluorfen @ 0.15 kg a.i ha^{1} (PE) + Hand weeding at 30 DAS (T_9) (1.682). It was followed by farmer's practice (1.562). The minimum LAI was recorded in weedy check (0.554). This might be due to the reason that, the crop faced minimum crop weed competition because of herbicidal action and hand weeding practice and it resulted into maximum height of plant. Similar results were also recorded from the earlier findings of Jadho *et al*. (2001), Quasem (2007), Anisuzzaman *et al*. (2009) and Kolse *et al*. (2010).

TABLE 1: Effect of different weed control treatments on plant height (cm) at final harvest stage, Initial plant population, Final plant population, Days to 50 per cent flowering, Leaf area index (LAI) at final harvest stage, Number of pods per plant, Pod yield per plant (g/plant) and Total pod yield (kg ha^{-1}).

Treatment	Plant height (cm)	Initial plant population	Final plant population	leaf area index (LAI)	Days to 50 % flowering	Pods per plant	Pod yield per plant (g)	Total pod yield (kg ha^{-1}).
T_1	80.23	0.8	0.8	1.113	37.33	16.88	91.84	9023
T_2	78.27	0.8	0.77	1.057	37.33	15.66	82.26	8203
T_3	82.03	0.8	0.8	1.125	37.67	17.22	93.28	9156
T_4	84.63	0.8	0.8	1.189	38.00	17.99	103.47	10213
T_5	86.67	0.8	0.8	1.492	38.67	19.77	120.15	12523
T_6	82.33	0.8	0.77	1.171	37.67	17.77	102.69	9933
T_7	86.37	0.8	0.8	1.414	38.33	19.22	119.62	12127
T_8	84.87	0.8	0.8	1.237	38.00	18.66	109.63	10630
T_9	89.00	0.8	0.8	1.682	38.67	20.99	127.16	13279
T_{10}	76.73	0.8	0.73	1.045	37.33	14.94	80.66	7562
T_{11}	87.20	0.8	0.8	1.562	38.33	19.88	124.26	12762
T_{12}	58.53	0.8	0.7	0.554	35.33	11.99	41.06	4066
SE (m)±	0.58	--	0.026	0.0190	0.31	0.35	0.86	99
CD at 5%	1.72	NS	NS	0.0557	0.90	1.03	2.53	290

T1:Pendimethalin C.S as pre emergence @0.6 kg a.i ha^{-1}
T2: Alachlor as pre emergence @1.0 kg a.i ha^{-1}
T3:Oxyfluorfen as pre emergence @0.15 kg a.i ha^{-1}.
T4: Pendimethalin C.S as pre emergence @0.6 kg a.i ha^{-1}followed by Quizalofop ethyl @ 50 g a.i ha^{-1} as post emergence at 2-3 leaf stage of weed.
T5: Pendimethalin C.S as pre emergence @0.6 kg a.i ha^{-1}+ one hand weeding at 30 DAS.
T6:Alachlor as pre emergence @1.0 kg a.i ha^{-1} followed by Quizalofop ethyl @50 g a.i ha^{-1} as post emergence at 2-3 leaf stage of weed.
T7:Alachlor as pre emergence @1.0 kg a.i ha^{-1} + one hand weeding at 30 DAS.
T8:Oxyfluorfen as pre emergence @0.15 kg a.i ha^{-1} followed by Quizalofop ethyl @50 g a.i ha^{-1} as post emergence at 2-3 leaf stage of weed.
T9:Oxyfluorfen as pre emergence @0.15 kg a.i ha^{-1}+ one hand weeding at 30 DAS.
T10: Application of Quizalofop ethyl @50 g a.i ha^{-1} as post emergence at 2-3 leaf stage of weed.
T11: Farmers practice (2 Hand weedings at 20 and 40 DAS).
T12: Weedy check (Control).

Yield and yield attributes

The data pertaining to the yield and yield attributes like , Days to 50 per cent flowering, Number of pods per plant, Pod yield per plant (g/plant) and Total pod yield (q ha^{-1}) is presented in table. The data indicated that in general the crop had taken about 37 to 39 days for 50 per cent flowering in all treatments except to weedy check (T_{12}) where in 50 per cent flowering was earlier by 2-4 days than other treatments (35 days). In treatments where better weed control was achieved, the duration of the crop was normal while in weedy check (control) where weed infestation was heavy resulted in reduction in crop duration to a significant extent and there by 50 per cent flowering was achieved 2-4 days in advance than the other treatments. This might be due to stress experienced by the plants in weedy check(control) for various factors like nutrients, moisture, light and space as a result of heavy weed infestation.

Significantly the highest number of pods per plant recorded with Oxyfluorfen @ 0.15 kg a.i ha^1 (PE) +one hand weeding at 30 DAS (T_9) (20.99) followed by farmers practice (19.88) and it was on par with Pendimethalin C.S @ 0.6kg a.i ha^{-1} (PE) +one hand weeding at 30 DAS (19.77) and Alachlor @1.0 kg a.i ha^{-1} (PE) + one hand weeding at 30 DAS (19.22). The least number of pods per plant recorded in weedy check (11.99). Application of Oxyfluorfen @0.15 kg a.i ha^1 (PE) + one hand weeding at 30 DAS (T_9) (127.16) resulted in significantly higher pod yield per plant and it was followed by farmers practice (124.26) where two hand weedings were done at 20 and 40 DAS. The least pod yield per plant was recorded in weedy check (41.06). Application of Oxyfluorfen @ 0.15 kg a.i ha^1 (PE) + one hand weeding at 30 DAS (T_9) (13279) resulted in significantly highest total pod yield per hectare and it was followed by farmers practice (12762). The lowest pod yield per hectare was recorded in weedy check (4066).

The highest yield of 13279 kg ha^{-1} recorded with pre-emergence application of Oxyfluorfen and followed by hand weeding at 30 DAS over rest of the treatments, this might be due to more number of fruits per plant (20.99) and maximum fruit yield per plant (127.16 g $plant^{-1}$). Throughout the crop growth period this treatment exhibited better growth and development due to excellent control of weed infestation, less crop weed competition during the critical growth stage of crop and ultimately resulted in higher yields compared to all other treatments.

Reduced fruit yield in case of unweeded control may be due to reduced plant growth, reduced fruit size and number and due to severe crop weed competition for nutrients, moisture, light and space during the crop growth period. Similar results were reported by Bhowmik and Mcglew (1986), Ravinder *et al*. (2001), Anuradha *et al*. (2006), Quasem (2007) and Basavaraj *et al*. (2009). Based on the results obtained, the most effective measure of weed control in okra is the integrated weed management involved Oxyfluorfen as pre emergence @0.15 kg a.i ha^{-1}+ one hand weeding at 30 DAS.

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