

Original Research Article

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Varietal Preference of Okra Shoot and Fruit Borer, *Earias vittella* (Fab.) in Summer Season under Field Condition in Konkan Region of Maharashtra

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ABSTRACT

Keywords

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The field experiment was conducted to study the varietal preference of okra shoot and fruit borer, *Earias vittella* (Fab.) under field condition in Konkan region during *summer* 2016 and 2017 at RARS, Karjat. There were eight varieties *viz.*, ArkaAnamika, Akola 10, Akola Bahar, PhuleUtakarsh, GOA-5, ParbhaniKranti, Panjab, Padmini, and VarshaUpahar (as a check) were screened for their relative susceptibility to okra shoot and fruit borer under field conditions. Among the eight genotypes/varieties of okra, none of the cultivars was found to be free from pest infestation in the year 2016 and 2017. The minimum shoot damage was recorded on variety Akola bahar (12.98%), whereas the maximum damage was recorded on Punjab Padmini (26.81%). The per cent fruit damage revealed that the infestation fruit damage ranged from 21.29 to 36.38 per cent on different genotypes/varieties. The variety Akola 107 recorded less damage (21.29%) to fruits as compared to rest of the other varieties.

Introduction

Several insect pests have so far been recorded to attack okra like okra shoot and fruit borer (OSFB), jassid, aphid, whitefly, and cotton leaf roller. Among these pests OSFB (*Eariassp.*) is considered as the most important one (Aziz *et al.*, 2011) which causes both quantitative and qualitative losses of the okra crop (Butani and Jotwani, 1984). *Earias* sp. alone causes damage up to 71% (Pareek

and Bhargava, 2003) whereas in general the overall pod damage is about 49% and 42% according to Kanwar and Ameta (2007) and Fletcher and Mishra (1990) respectively. Moreover, Radake and Undirwade (1981) reported that 88-100% fruits can be damaged by the okra shoot and fruit borer. The adult female okra shoot and fruit borer lays eggs individually on leaves, floral buds and on tender fruits. After hatching, small brown caterpillars bore into the top shoot and feed

inside the shoot before fruit formation. The shoots wilt and dry results the development of side branches. When fruits become available, caterpillars bore into the fruits and feed inside as a result the infested plant bears smaller and deformed pods (Mohan *et al.*, 1983). Knowledge on varietal preference of okra shoot and fruit borer can play a significant role in the successful okra production and its management. Unfortunately, very limited efforts were given in this regards. Considering the above situation, the present research was conducted to screen out the resistant okra variety which might be an important tool for the management of this pest.

Materials and Methods

A statistically designed field experiment was laid out in uniform sized plots in Randomized Block Design at Regional Agriculture Research Station, Karjat (M.S). The row to row and plant to plant spacing for okra was maintained at 45 cm and 30 cm respectively. Sowing of okra was done in the 1st week of February in the year 2016 and 2017. The details of the experiment are given below.

Experimental details

Crop: Okra

Variety: Eight (8)

Design: RBD

Season: Summer season crop

Spacing: 45 cm X 30 cm

Plot size: 2.5 m X 3.00 m

Eight varieties *viz.*, ArkaAnamika, Akola 10, Akola Bahar, PhuleUtakarsh, GOA-5, ParbhaniKranti, Panjab, Padmini, and VarshaUpahar (as a check) were screened for their relative susceptibility to okra shoot and fruit borer under field conditions during summer season of year 2016 & 2017. Each variety was grown in a gross plot of 2.5 X 3.00 m with three replications and 45 X 30 cm

spacing at Regional Agriculture Research Station, Karjat (M.S). All the recommended agronomical practices were adopted for raising the crop. The plot of these varieties was kept unsprayed with any insecticide throughout the crop season.

Method of recording observations

Shoot and fruit borer, *Eariasvittella* (Fabricius)

The observations on shoot infestation and flower bud infestation were recorded from five randomly selected plants from each plot. There was no shoot infestation and flower bud infestation was minor. The observations on fruit infestation were recorded from five randomly selected plants from each plot. Total number of fruits, healthy fruits and infested fruits were recorded from five randomly selected plants from each treatment. The per cent infestation was worked out on the basis of healthy and infested fruits on number basis. The data was converted into per cent infested fruit and analysed statistically.

Results and Discussion

Screening of different okra germplasm against okra shoot and fruit borer

Results of the field experiment conducted during summer season of 2016 and 2017 at Regional Agricultural Research Station, Karjat (Maharashtra) to screen different okra germplasm reaction against major arthropod pests are mentioned below:

Summer season 2016

Shoot damage

The result was pertaining in Table 1. The data on mean shoot damage recorded from different genotypes/varieties of okra revealed

that, among nine genotypes/varieties of okra, none of the cultivars was found to be free from the infestation of shoot damage. The percent shoot damage by this pest varied from 12.98 to 26.81 percent. It indicates the varying response of all the varieties/genotypes to shoot damage.

The minimum shoot damage was recorded on variety Akola Bahar (12.98%), whereas the maximum damage was recorded on Punjab Padmini (26.81%). The Cultivars viz., PhuleUtkarsha, VarshaUpahar, GOA -5, ArkaAnamika, Akola 107, and ParbhaniKranti, recorded 15.89, 19.85, 22.00, 22.51, 22.95 and 24.37 percent damage respectively.

Fruit damage

A close perusal of the data on percent fruit damage was pertaining in Table 1 and revealed that the infestation of fruit damage ranged from 24.42 to 36.38 percent on different genotypes/varieties. The variety Akola Bahar recorded less damage (24.42%) to fruits as compared to rest of the other varieties. The maximum fruit damage was recorded in the variety ParbhaniKranti (36.38%). The Cultivars viz., PhuleUtkarsha, VarshaUpahar, Akola 107, Punjab Padmini, GOA -5 and ArkaAnamika recorded 27.64, 28.59, 31.86, 32.82 and 34.57 percent damage respectively. Among eight genotypes/varieties of okra none of the cultivars was found to be free from the infestation of fruit damage.

Summer season 2017

Shoot damage

The result was pertaining in Table 2. The data on mean shoot damage recorded from different genotypes/varieties of okra revealed that, among nine genotypes/varieties of okra, none of the cultivars was found to be free

from the infestation of shoot damage. The percent shoot damage varied from 16.75 to 24.54 percent. It indicates the varying response of all the varieties/genotypes to shoot damage.

The minimum shoot damage was recorded on variety Akola Bahar (16.75%), whereas the maximum damage was recorded on Punjab Padmini (26.81%). The Cultivars viz., PhuleUtkarsha, VarshaUpahar, GOA -5, ArkaAnamika, Akola 107, and ParbhaniKranti, recorded 17.31, 18.14, 19.96, 20.26, 20.90 and 21.05 percent damage respectively.

Fruit damage

A close perusal of the data on percent fruit damage was pertaining in Table 2 and revealed that the infestation of fruit damage ranged from 21.29 to 31.59 percent on different genotypes/varieties. The variety Akola 107 recorded less damage (21.29%) to fruits as compared to rest of the other varieties.

The maximum fruit damage was recorded in the variety GOA- 5 (31.59%). The Cultivars viz., ArkaAnamika, PhuleUtkarsha, ParbhaniKranti, Punjab Padmini, Akola bahar and VarshaUpahar recorded 31.01, 29.76, 29.43, 29.32, 27.81 and 26.20 percent damage respectively. Among eight genotypes/varieties of okra none of the cultivars was found to be free from the infestation of fruit damage.

These findings are in close conformity with the findings of Banger *et al.*, (2012), reported that, out of 10 varieties screened, the variety AOL 05-1, Gujarat Okra-2 AOL 08-2 were least susceptible for fruit borer. Gonde *et al.*, (2012) reported that the lowest infestation on number basis was recorded in EMS 8-1 followed by Punjab Padmini and VRO 3.

Table.1 Screening of different okra germplasm against Shoot and fruit borer, *Earias vittella* (Fab) during 2016

Sr. No.	Genotypes/varieties	Mean damage percentage	
		Shoot damage (%)	Fruit damage (%)
1	T ₁ = VarshaUpahar	19.85 (26.42)	28.59 (32.27)
2	T ₂ = Akola Bahar	12.98 (21.05)	24.42 (29.60)
3	T ₃ = PhuleUtakarsh	15.89 (23.42)	27.64 (31.69)
4	T ₄ = GOA-5	22.00 (27.97)	34.57 (35.97)
5	T ₅ = ArkaAnamika	22.51 (28.32)	33.02 (35.06)
6	T ₆ = Punjab Padmini	26.81 (31.18)	32.82 (34.94)
7	T ₇ = ParbhaniKarnti	24.37 (29.53)	36.38 (37.05)
8	T ₈ = Akola 107	22.95 (28.59)	31.86 (34.33)
	Mean	20.92 (27.06)	31.16 (33.86)
	SE	0.08	0.23
	CD	0.24	0.70

Table.2 Screening of different okra germplasm against Shoot and fruit borer, *Eariasvittella* (Fab) during 2017

Sr. No.	Genotypes/varieties	Mean damage percentage	
		Shoot damage (%)	Fruit damage (%)
1	T ₁ = VarshaUpahar	18.14 (25.18)	26.20 (30.79)
2	T ₂ = Akola Bahar	16.75 (24.12)	27.81 (31.82)
3	T ₃ = PhuleUtakarsh	17.31 (24.58)	29.76 (33.02)
4	T ₄ = GOA-5	21.05 (27.28)	31.59 (34.14)
5	T ₅ = ArkaAnamika	20.26 (26.71)	31.01 (33.83)
6	T ₆ = Punjab Padmini	24.54 (29.67)	29.32 (32.77)
7	T ₇ = ParbhaniKarnti	20.90 (27.20)	29.43 (32.83)
8	T ₈ = Akola 107	19.96 (26.78)	21.29 (27.48)
	Mean	19.86 (26.44)	28.30 (32.09)
	SE	0.36	0.11
	CD	1.12	0.33

Varietal details

T₁ = VarshaUpahar	T₂ = Akola Bahar
T₃ = PhuleUtakarsh	T ₄ = GOA-5
T₅ = ArkaAnamika	T ₆ = Panjab Padmini
T₇ = ParbhaniKarnti	T ₈ = Akola 107

Similar results found by Kaur *et al.*, (2013) recorded low mean fruit infestation (18.09-18.68% and 18.10-19.68 %, fruit in number and weight basis, respectively) was observed in Punjab- Padmini and Punjab-8 as against Punjab-7 (22.27 -23.29% fruit in number and weight basis). Rehman *et al.*, (2015) evaluated seven okra varieties *viz.*, Taj Vendhi, BARI Dharos- 1, ArkaAnamika, Green Finger, Green Soft, OK-285 and Nabik against okra shoot and fruit borer. Among the seven varieties, Taj Vendhi was the most preferable variety as the highest average shoot (26%) and fruit (24%) infestation were recorded. On the contrary, ArkaAnamika was found least preferable variety with lowest shoot (10%) and fruit (11%) infestations. Moderately preferred variety was OK-285, followed by Green Soft and Green Finger. Preference rank for okra shoot and fruit borer among seven okra varieties was Taj Vendhi, OK-285, Green Soft, Green Finger, BARI Dharos-1, Nabik and ArkaAnamika.

The varietal section is the best tactic of integrated pest management system for suppressing pest population below economic injury level. During this field study, among theeight genotypes/varieties of okra, none of the cultivars was found to be free from pest infestation in the year 2016 and 2017. The minimum shoot damage was recorded on variety Akola Bahar (14.87%), whereas the maximum damage was recorded on Punjab Padmini (25.68%). The per cent fruit damage revealed that the infestation fruit damage ranged from 26.12 to 33.08 per cent on different genotypes/varieties. The variety Akola Bahar recorded less damage (26.12%)

to fruits as compared to rest of the other varieties.

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