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Screening of okra genotypes against shoot and fruit borer (*Earias vittella* Fab.) under field conditions in Allahabad

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Abstract

Were screened at the central research farm of Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad (SHUATS) during *Rabi* season 2017. The eight genotypes/cultivars of okra viz., IC117216, IC140934, VRO-5, Parbhani Kranti, IC433695, IC140906, VRO-4, IIVR-10. The lowest percent shoot damage was observed in IC117216 (6.81) where was significant to the fruit damage (no./wt.) bees. The lowest fruit damage IC117216 (6.40/8.07). The highest shoot damage percent IC140906 (32.40) where was highest fruit damage IC140906 (31.81/32.47).

Keywords: Okra, *Earias vittella* (Fab.), genotype, pest, severity

Introduction

Okra (*Abelmoschus esculentus* (L.) Moench), commonly called as bhendi is one of the largely cultivated vegetable crops in India due to its nutritional value. Shoot and fruit borer, *Earias vittella* (Fabricius) severely attacks the tender fruits causing nearly 52 to 71 per cent yield loss in the production of quality fruits (Pareek and Bhargava, 2003). Management of *E. vittella* through host-plant resistance has gained importance in recent past due to increased awareness among consumers regarding the adverse effects of pesticide residues. Several tolerant against shoot and fruit borer genotypes are available (Jalgaonkar *et al.*, 2002; Sharma *et al.*, 2007). However, there is a need for identifying the resistant germplasm for future progress in developing new promising varieties/ hybrids. Therefore, the present study was undertaken to screen certain okra genotypes/cultivars for its preference by shoot and fruit borer, *E. vittella*.

Materials and methods

The present investigation was carried out at Department of Entomology Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad during *Rabi* 2017. There were 8 varieties with diverse morphological characters collected from IIVR, Varanasi. The experiment consisted of 8 treatments and 3 replications in randomized block design.

As soon as the infestation of borer was noticed on the plants the first observations on shoot infestation was recorded and there after weekly observation was taken up to the starting of reproductive phase. Number of infested fruits and number of healthy fruits were counted from the five randomly selected and labelled plants to work out the per cent fruit infestation at each picking. The weight of healthy and infested fruits from the same five plants was also recorded. The damage percent of each varieties was calculated from the data obtained during the investigation with the help of below formula given by (Narayanan *et al.* 2016) [5], the varieties were categorized by adopting scale developed by Gupta and Yadav (1978) [3] where germplasm with no damage are grouped as immune (Table 2).

$$\text{Damage (\%)} = \frac{\text{Number of damaged plant parts}}{\text{Total number of plant parts}} \times 100.$$

Result and discussion

Mean per cent infestation of *E. vittella* on shoot

During the investigation, the shoot infestation ranged between 5 and 31.14% (Table 1). Out of 8 genotypes screened, minimum shoot infestation was registered by genotypes IIVR-10(9.47%) and IC117216 (6.81%). With ware, statistically *at par* with each other and graded as moderately resistant while, graded as moderately resistant, while the varieties IC117216 (9.475%), IIVR-10 (6.81%). The genotypes or IC 140934 (17.40%), IC 433695 (20.14%),

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VRO-4 (17.14%), were found moderately susceptible. Whereas, maximum infestation was registered by varieties VRO -5 (31.14%), Parbhani Kranti (check) with 31.55% of infestation and were graded as susceptible. The present study is conformity with those of (Gupta and Yadav, 1978, Singh, *et al.*, 2005) [3, 8] indicating that none of the lines/varieties were immune. This result are finding on Kashi Pragati okra Allahabad field condition Gonde *et al.*, (2013) [2].

Mean per cent infestation of *E.vittella* on fruit (number basis)

The data on per cent mean infestation of fruits by fruits borer (Table 1) revealed that the mean per cent infestation ranged between 6.40 and 31.81%.

Significantly least infestation was observed in IC117216 (6.40%), followed by IIVR-10 (8.03%), IC140934 (11.14%), IC433695 (15.96%), VRO-4 (16.95%). These varieties were statistically at par with each other and graded as moderately resistant. During screening, infestation of fruit borer was noticed and graded as moderately susceptible varieties in VRO-5 (19.69%) followed by Parbhani Kranti (check) (20.69%). Among the tested varieties on the had exhibited on the genotype was IC140906 (31.81%), susceptible reaction. This result is in conformation with the finding Gonde *et al.*, (2013) [2].

Mean per cent infestation of *E. vittella* on fruit (weight basis)

During investigation, fruit infestations were ranged between 8.07 and 32.47 % per cent on weight basis (Table 1).

Where, the least infestation was found in the variety IC117216 (8.07%) followed by the varieties IIVR-10 (9.47%), and IC433695 (14.99%), respectively, which was significantly lowest and graded as moderately resistant. During the screening, most of the varieties were graded as moderately susceptible. The maximum infestation was registered in IC140934 (17.73%) followed by the varieties VRO-4 (18.40%), and against fruit borer, Among the tested varieties on VRO-5(30.21%), Parbhani Kranti (check) (30.81%), and IC140906 (32.47%) on then had exhibited susceptible reaction. None of the 8 genotypes of okra were found free from the infestation of *E.vittella*. in the present study which is in conformity with those of (Gupta and Yadav, 1978, Bhala, *et al.*, 1989 and Singh, *et al.*, 2005) [3, 1, 8] who also food that the none of the lines/genotypes were immune. From the above results, it can be concluded that under Allahabad conditions, the varieties viz., VRO 3 and VRO 4 were highly promising as far as whitefly and jassid infestation is concerned. In case of shoot and fruit borer none of the variety was found resistant while IC117216, and IIVR-10 have performed better.

Table 1: Reaction of different genotypes against shoot and fruit borer damage Okra during under late Rabi in Allahabad 2017

Sr.no	Genotypes	Shoot damage (%) <i>E.vittella</i>		Fruit damage (%) <i>E.vittella</i> Number basis		Fruit damage (%) <i>E.vittella</i> weight basis	
		Mean (%)	Grade	Mean (%)	Grade	Mean (%)	Grade
1	IC117216	(6.81) ^e	MR	(6.40) ^f	MR	(8.07) ^f	MR
2	IC140934	(17.40) ^c	MS	(11.14) ^d	MR	(17.73) ^c	MS
3	VRO-5	(31.14) ^a	S	(19.69) ^b	MS	(31.21) ^{ab}	S
4	PK (check)	(31.55) ^a	S	(20.69) ^b	MS	(30.81) ^b	S
5	IC433695	(20.14) ^b	MS	(15.96) ^c	MR	(14.99) ^d	MR
6	IC140906	(32.40) ^a	S	(31.81) ^a	S	(32.47) ^a	S
7	VRO-4	(17.14) ^c	MS	(16.95) ^d	MR	(18.40) ^c	MS
8	IIVR-10	(9.47) ^d	MR	(8.03) ^e	MR	(9.47) ^e	MR
F-test		Sig		Sig		Sig	
SE±		18.06		5.08		7.6	
CD (0.05%)		1.983		1.053		1.297	

Table 2: Grading of different okra genotypes based on fruit infestation (Gupta and Yadav, 1978) [3].

Sr. No	Category	Grade	Level of fruit infestation	Okra genotypes (% fruit infestation)	
				Number basis	Weight basis
1	Resistant	R	1-5 percent	None	None
2	Moderately resist	MR	6-15 percent	IC117216(6.40), IC140935(11.14), IC433695(15.96), IIVR-10(8.03)	IC117216(8.07), IC1433695(14.99), IIVR-10(9.47).
3	Moderately susceptible	MS	16-30 percent	VRO-5(19.69), Parbhani Kranti (check) (20.69), VRO-4(16.95)	IC140934(17.73), VRO-4(18.40)
4	Susceptible	S	31-50 percent	IC140906(31.81),	VRO-5(31.21), PK(30.31), IC140906(32.47).

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