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Screening of Okra (*Abelmoschus esculentus* L.) Germplasm against Shoot and Fruit Borer, *Earias vitella* Fabricius

Key words : *Abelmoschus esculentus*, *Earias vitella*

Okra is one of the most important vegetable grown extensively all over the country. In Andhra Pradesh the area under cultivation of this crop is about 18614 ha with the production of 122982 tonnes and yield is 6607 kg ha^{-1} (Anonymous, 2004). The crop is cultivated throughout the year, but summer and *kharif* are the favourable seasons for its cultivation. Recently due to heavy demand of vegetables for export purposes the area under okra is increased, but the average production remains low. One of the major factors responsible for low productivity is the losses caused by insect pests.

Among the various insect pests infesting okra crop, shoot and fruit borer, *Earias vitella* Fabricius is quite serious (Uthamasamy and Balasubramanian, 1978). As the okra fruits are required to be harvested very frequently in order to obtain tender marketable fruits, the frequent use of insecticides cannot be recommended because of their hazardous residues.

Beside the limitations of chemical control, use of plant resistance varities to their pest attack is one of the solutions to overcome the pest problem. Keeping in view the present studies were under taken to screen out some of the new germplasm of okra against shoot and fruit borer.

A Field Experiment was conducted at Vegetable Section, Agricultural Research Institute, Rajendranagar, Hyderabad during *kharif*, 2005. The number of healthy and bored shoots from the five randomly selected tagged plants was recorded separately and cumulative mean per cent damaged shoots on number basis was calculated against shoot damage. The data was recorded separately for each germplasm line at every picking and the cumulative mean per cent damaged fruits based on number and weight basis was calculated against fruit damage.

The mean per cent damage of the shoot and fruit in different germplasm lines was calculated for shoot and fruit borer infestation according to Jalgaonkar *et al*. (2002). Based on the standard deviation values, the germplasm lines were categorized as resistant, tolerant, moderately tolerant, susceptible and highly susceptible (Ratnasudhakar, 1987)

Shoot damage by shoot and fruit borer:

Among the 95 genotypes, IC/61302, IC/218894, IC/218872, IC/169378, IC/43742, IC/69242 and IC/282266 were categorized as tolerant genotypes (Table 1), while, Abhishek *et al*. (1998) found that varieties *viz.,* AROH 2 and Komal Hybrid F_1 are highly resistant against shoot damage. The genotypes, IC/329359, IC/45815, IC/45800, IC/140872, IC/128883, EC/329402, EC/329357, IC/128889, EC/169384, IC/69290, IC/282241, IC/282232, IC/282244, IC/282231, IC/43735, IC/140934, IC/282282, EC/329407, IC/282292, IC/128894, IC/282278, IC/69304, EC/329360, IC/140880 and IC/282212 were categorized as moderately tolerant genotypes. Naresh *et al*. (2003) observed cultivar Vijaya was comparatively less susceptible on the basis of shoot damage. The 35 genotypes were categorized as susceptible genotypes which are ranged from 10.99 to 16.47 per cent shoot damage. The remaining 27 genotypes were categorized as highly susceptible genotypes.

Fruit damage by shoot and fruit borer (number basis):

Among the 95 tested genotypes, 92 were categorized as highly susceptible. Only few of the genotypes, IC/282278, IC/43742 and IC/282266 were found to be susceptible against fruit damage on number basis. The remaining 92 genotypes were categorized as highly susceptible genotypes 15.51 per cent damage.

Fruit damage by shoot and fruit borer (weight basis):

The mean per cent damage of shoot and fruit borer on weight basis during *kharif*, 2005 ranged between 13.07 to 35.56 per cent damage. Among the 95 genotypes, none of the genotypes were found resistant, tolerant, moderately tolerant against shoot and fruit borer on fruit on weight basis. The genotypes, IC/218872, IC/282278, IC/43742, IC/69242 and IC/282266 were categorized as susceptible genotypes.The remaining 90 genotypes were categorized as highly susceptible genotypes. However, Sharma *et al*. (2001) documented the avoidable fruit losses (weight basis) were highest in MR 8 (80.53%) and lowest in MR-21 (63.78%).

Table 1. Screening of Okra germplasm against shoot and fruit borer during *kharif*, 2005

S.No.	Genotype	Shoot and fruit borer to shoot		Shoot and fruit borer (Number basis)		Shoot and fruit borer (Weight basis)	
		Mean per cent damage	Level of resistance	Mean per cent damage	Level of resistance	Mean per cent damage	Level of resistance
1.	IC/169366	19.10	HS	31.45	HS	30.68	HS
2.	IC/45831	16.40	S	29.85	HS	28.91	HS
3.	IC/329359	10.60	MT	28.81	HS	28.00	HS
4.	IC/45815	8.03	MT	24.02	HS	23.20	HS
5.	IC/45800	10.20	MT	24.80	HS	24.85	HS
6.	IC/43743	15.00	S	31.25	HS	30.30	HS
7.	EC/13336	19.50	HS	32.06	HS	32.20	HS
8.	IC/140872	9.63	MT	23.43	HS	22.92	HS
9.	IC/128883	10.43	MT	27.45	HS	26.98	HS
10.	IC/128903	13.86	S	27.63	HS	27.87	HS
11.	IC/282296	16.43	S	31.52	HS	30.81	HS
12.	EC/329402	8.63	MT	25.50	HS	24.96	HS
13.	IC/140906	12.30	S	26.58	HS	26.98	HS
14.	EC/329406	14.66	S	24.46	HS	24.25	HS
15.	IC/282279	13.26	S	23.03	HS	22.61	HS
16.	IC/140915	17.30	HS	29.07	HS	29.28	HS
17.	IC/128885	12.23	S	21.83	HS	21.23	HS
18.	IC/282280	20.63	HS	29.93	HS	29.28	HS
19.	IC/282230	23.46	HS	33.16	HS	32.62	HS
20.	IC/33315	25.90	HS	35.25	HS	34.40	HS
21.	EC/329357	6.96	MT	21.46	HS	22.07	HS
22.	IC/61302	3.46	T	18.00	HS	17.68	HS
23.	IC/128889	5.66	MT	18.23	HS	18.57	HS
24.	IC/282272	12.10	S	26.82	HS	26.62	HS
25.	IC/43733	19.70	HS	30.55	HS	31.36	HS
26.	IC/128891	12.10	S	22.76	HS	22.72	HS
27.	IC/140877	15.10	S	26.95	HS	25.86	HS
28.	IC/282294	16.00	S	28.71	HS	28.17	HS
29.	EC/169384	7.53	MT	21.86	HS	21.23	HS
30.	IC/69290	8.53	MT	24.76	HS	24.08	HS
31.	IC/282241	9.63	MT	27.93	HS	28.15	HS
32.	IC/218894	3.73	T	15.70	HS	18.38	HS
33.	IC/218872	3.23	T	15.80	HS	15.18	S
34.	IC/282232	7.60	MT	23.56	HS	23.01	HS
35.	IC/282244	9.00	MT	24.82	HS	24.28	HS
36.	IC/282293	12.40	S	30.95	HS	30.33	HS
37.	IC/169378	4.50	T	19.52	HS	19.13	HS
38.	IC/282237	20.66	HS	34.26	HS	34.66	HS
39.	IC/282268	19.96	HS	30.28	HS	29.45	HS
40.	IC/282231	8.60	MT	20.65	HS	20.15	HS

41.	IC/43735	9.40	MT	27.06	HS	26.31	HS
42.	IC/140934	7.86	MT	23.92	HS	23.22	HS
43.	IC/282282	6.50	MT	19.52	HS	18.98	HS
44.	IC/28224	16.30	S	31.45	HS	32.07	HS
45.	IC/45792	18.83	HS	35.06	HS	35.56	HS
46.	IC/218877	12.76	S	27.56	HS	27.32	HS
47.	EC/329380	12.70	S	26.65	HS	26.42	HS
48.	IC/69237	11.70	S	20.63	HS	20.15	HS
49.	IC/43752	20.40	HS	33.60	HS	34.16	HS
50.	IC/45803	20.78	HS	34.97	HS	35.40	HS
51.	IC/282229	16.76	HS	26.62	HS	27.07	HS
52.	IC/282233	18.16	HS	27.92	HS	28.35	HS
53.	IC/43750	16.76	HS	28.32	HS	27.75	HS
54.	IC/45814	17.66	HS	26.73	HS	26.17	HS
55.	EC/329407	5.86	MT	17.42	HS	18.61	HS
56.	IC/282298	14.23	S	25.56	HS	24.98	HS
57.	IC/2822691	13.43	S	26.00	HS	26.83	HS
58.	IC/140902	15.10	S	28.52	HS	28.36	HS
59.	IC/282292	10.10	MT	21.02	HS	20.58	HS
60.	IC/282273	11.33	S	23.91	HS	22.83	HS
61.	IC/282289	11.73	S	26.41	HS	25.02	HS
62.	IC/128894	10.40	MT	24.15	HS	23.01	HS
63.	IC/282278	5.86	MT	13.72	S	13.07	S
64.	IC/4374 2	5.30	T	14.50	S	15.08	S
65.	IC/140912	11.40	S	25.37	HS	26.00	HS
66.	IC/128888	19.53	HS	30.75	HS	30.07	HS
67.	EC/329422	19.43	HS	30.13	HS	29.46	HS
68.	EC/169362	15.80	S	26.15	HS	25.01	HS
69.	IC/43748	12.53	S	22.57	HS	22.03	HS
70.	IC/140910	13.63	S	23.52	HS	22.83	HS
71.	IC/6924 2	3.53	T	16.55	HS	15.60	S
72.	IC/282277	18.76	HS	29.15	HS	28.83	HS
73.	IC/43720	20.46	HS	32.01	HS	31.01	HS
74.	IC/43746	24.73	HS	35.42	HS	35.50	HS
75.	IC/69257	27.56	HS	34.31	HS	32.41	HS
76.	IC/218873	15.96	S	25.70	HS	25.25	HS
77.	IC/43732	18.13	HS	27.75	HS	26.85	HS
78.	IC/140929	16.70	HS	25.15	HS	24.62	HS
79.	IC/69248/1	16.60	HS	25.30	HS	26.87	HS
80.	IC/69304	8.23	MT	19.02	HS	19.70	HS
81.	IC/282266	4.13	T	13.66	S	14.48	S
82.	IC/282284	14.90	S	25.20	HS	24.67	HS
83.	IC/45802	15.10	S	26.48	HS	25.31	HS
84.	IC/45805	23.63	HS	32.77	HS	31.78	HS
85.	IC/85595	12.36	S	26.66	HS	25.91	HS

86.	IC/69259	11.90	S	25.71	HS	26.58	HS
87.	EC/169359	15.23	S	28.68	HS	30335	HS
88.	EC/329360	8.40	MT	26.68	HS	25.03	HS
89.	EC/282287	12.43	S	31.27	HS	29.91	HS
90.	IC/128893	12.73	S	30.72	HS	29.51	HS
91.	IC/140880	9.73	MT	25.30	HS	25.71	HS
92.	IC/33344	15.66	S	31.22	HS	29.63	HS
93.	IC/140927	18.63	HS	32.51	HS	31.11	HS
94.	IC/282283	20.90	HS	35.11	HS	35.38	HS
95.	IC/282212	8.33	MT	19.35	HS	17.40	HS
	Mean	**13.48**		**26.27**		**25.54**	
	SD	5.49*		5.170*		5.55*	
	SEm±	0.56*		0.53*		0.57*	

NR = Not recorded (or) Nil

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