



## IMPACT OF SOWING DATES ON THE INCIDENCE OF *EARIAS* SPP. ON OKRA

R. SHARMA, B.L. JAT AND N. RAM

Department of Agricultural Entomology and Zoology  
S.K.N. College of agriculture, Jobner, Rajasthan, 303329

### ABSTRACT

A study was conducted to find out the impact of sowing dates on the incidence of *Earias* spp. on okra during kharif 2006. The minimum infestation of *Earias* spp. was observed on early sown okra crop (3<sup>rd</sup> July), with highest fruit yield while, maximum was on late sown crop (24<sup>th</sup> July) with minimum fruit yield. Infestation of *Earias* spp. on okra shoots and fruits, both number and weight basis had significant positive correlation with sowing dates whereas, significant negative correlation with fruit yield. The correlation study indicated that with the advancement of sowing dates, the infestation in okra shoots as well as fruits increased and fruit yield decreased.

**Keywords :** *Earias* spp, resistance, varieties.

### INTRODUCTION

Okra [*Abelmoschus esculentus* (L.) Moench] commonly known as *Bhindi* or lady's finger, is a popular fruit vegetable crop due to its high nutritional and medicinal values. The okra crop is attacked by a number of insect pests right from germination to harvesting of the crop of which, shoot and fruit borer, *Earias* spp. is one of the major constraints in achieving potential yield. The pest is active throughout the year and prefers high humidity and temperature (Choudhary and Dadheech, 1989).

Manipulation of sowing dates is an important cultural practice to escape the most vulnerable stage of the crop with the peak population buildup of pest without any addition of cost. The impact of sowing dates on the population dynamics of *Earias* spp. on okra was thoroughly studied by Brar *et al.* (1994), Hafeez and Rizvi (1994), Bairwa (2001) and Singh (2004) in different parts of India. Therefore, the present study was aimed to find out the influence of sowing dates on the incidence of *Earias* spp. and fruit yield in rainy season okra in semi-arid region of Rajasthan.

### MATERIALS AND METHODS

The experiment was laid out in a randomized block design (RBD) to evaluate the impact of sowing dates (3<sup>rd</sup>, 10<sup>th</sup>, 17<sup>th</sup> and 24<sup>th</sup> July, 2006), each sowing date was replicated five times during rainy season, 2006 at Horticulture Farm, SKN College of Agriculture, Jobner (Jaipur) Rajasthan. The plot size was 1.8 x 1.8 m<sup>2</sup> with row to row and plant to plant spacings of 45 and 30 cm,

respectively. The okra varieties, Parbhani and Kranti was used for experiment. The crop was exposed to natural infestation. The observations on shoot damage were recorded at weekly intervals on ten randomly selected and tagged plants after appearance of damage till harvesting or last picking of the crop by visual counting. Fruit damage was recorded on number and weight basis by counting and weighing infested and healthy fruits at each picking on tagged plants. The data were statistically analysed after angular transformation.

### RESULTS AND DISCUSSION

The data on impact of sowing dates on the incidence of shoot and fruit borer, *Earias* spp. on okra (Table 1) revealed that the infestation of pests on shoots as started in the 2<sup>nd</sup> week of August on 3<sup>rd</sup> and 10<sup>th</sup> July sown crop (3.61 and 3.14%) whereas, in the 3<sup>rd</sup> week of August, on 17<sup>th</sup> and 24<sup>th</sup> July sown crop (5.81 and 6.51%). The infestation increased gradually and reached to its peak in the last week of September, thereafter started declining. During peak, the minimum infestation (23.70%) was observed on early sown crop *i.e.* 3<sup>rd</sup> July which was closely followed by 10<sup>th</sup> July sown crop (27.47%) while, maximum was on late sown crop *i.e.* 24<sup>th</sup> July (32.52%), however, it was at par with 17<sup>th</sup> July sown crop (29.17%). The present results were partially supported by Hafeez and Rizvi (1994) who reported that infestation on shoots of okra was lowest on 10<sup>th</sup> July sown crop *i.e.* early sown.

The data (Table 2 and 3) revealed that the infestation of pest on fruits of okra started in the 2<sup>nd</sup> week of September

**Table 1. Impact of sowing dates on the incidence of shoot and fruit borer, *Earias* spp. on shoots of okra during, 2006**

S. No.	Date of sowing	Mean per cent shoot infestation* (weekly interval)												Mean
		9/8	15/8	22/8	29/8	5/9	12/9	19/9	26/9	3/10	10/10	17/10	24/10	
1.	3 <sup>rd</sup> July	3.61 (9.73)	8.84 (17.26)	12.61 (20.79)	17.00 (24.33)	20.55 (26.95)	21.74 (27.79)	23.05 (28.26)	23.70 (29.11)	21.85 (27.86)	21.00 (27.26)	19.81 (26.41)	17.61	
2.	10 <sup>th</sup> July	3.14 (9.14)	8.43 (16.84)	13.70 (21.71)	19.23 (25.99)	23.44 (28.95)	22.69 (28.42)	26.00 (30.64)	27.47 (31.60)	25.77 (30.63)	23.46 (28.97)	21.95 (27.93)	19.57	
3.	17 <sup>th</sup> July	0.00 (0.00)	5.81 (13.84)	13.63 (21.63)	21.06 (27.31)	25.04 (30.00)	24.78 (29.85)	27.07 (31.34)	29.17 (32.68)	27.20 (31.42)	24.84 (29.88)	23.31 (28.85)	20.17	
4.	24 <sup>th</sup> July	0.00 (0.00)	6.57 (14.86)	14.13 (22.01)	23.09 (28.71)	27.65 (31.72)	28.11 (32.01)	30.07 (33.25)	32.52 (34.76)	29.11 (32.64)	25.78 (30.50)	26.15 (30.75)	22.10	
SEm ±		0.19	0.49	0.68	0.86	0.95	0.96	0.99	1.02	0.98	0.93	0.91		
CD (P=0.05)		0.59	1.51	2.10	2.63	2.90	2.95	3.04	3.13	3.01	2.86	2.78		

\* Mean of five replications

Figures in parentheses are angular transformed values

**Table 2. Impact of sowing dates on the incidence of shoot and fruit borer, *Earias* spp. on fruits of okra during, 2006 (number basis)**

S. No.	Date of sowing	Mean per cent fruit infestation* (at each picking)												Mean			
		12/9	15/9	18/9	21/9	24/9	27/9	30/9	3/10	6/10	9/10	12/10	15/10		18/10	21/10	24/10
1.	3 <sup>rd</sup> July	3.18 (9.19)	5.93 (13.90)	8.55 (17.49)	11.04 (19.34)	14.95 (22.69)	18.35 (25.33)	20.47 (26.88)	23.28 (28.84)	27.47 (31.58)	30.68 (39.46)	32.19 (34.56)	34.38 (35.89)	37.08 (37.50)	40.40 (39.45)	0.00 (0.00)	20.59
2.	10 <sup>th</sup> July	4.51 (12.08)	5.77 (13.74)	9.64 (18.57)	13.41 (21.46)	17.94 (25.05)	20.57 (26.96)	22.69 (28.28)	25.36 (29.57)	28.04 (31.97)	31.37 (34.06)	33.59 (35.41)	36.78 (37.32)	39.35 (38.83)	42.54 (40.70)	0.00 (0.00)	22.10
3.	17 <sup>th</sup> July	0.00 (0.00)	5.35 (13.20)	9.88 (18.87)	14.28 (22.20)	20.17 (26.17)	22.50 (28.31)	23.52 (29.00)	26.66 (31.08)	30.90 (33.77)	32.65 (34.80)	34.92 (36.21)	38.24 (38.18)	41.61 (40.16)	44.98 (42.11)	50.28 (46.99)	26.39
4.	24 <sup>th</sup> July	0.00 (0.00)	5.10 (13.01)	6.06 (14.09)	9.88 (18.87)	14.95 (22.69)	18.54 (25.49)	23.15 (28.75)	27.77 (31.80)	31.62 (34.21)	34.29 (35.84)	35.92 (36.81)	39.64 (39.01)	42.23 (40.12)	47.42 (43.51)	53.62 (47.05)	26.00
SEm ±		0.20	0.42	0.53	0.64	0.76	0.84	0.90	0.97	1.05	1.16	1.18	1.20	1.25	1.33	1.23	
CD (P=0.05)		0.62	1.31	1.64	1.97	2.33	2.57	2.76	2.99	3.24	3.56	3.61	3.69	3.84	4.08	3.78	

\* Mean of five replications

Figures in parentheses are angular transformed values

**Table 3. Impact of sowing dates on the incidence of shoot and fruit borer, *Earias* spp. on fruits of okra during, 2006 (weight basis)**

S. No.	Date of sowing	Mean per cent fruit infestation* (at each picking)																Mean
		12/9	15/9	18/9	21/9	24/9	27/9	30/9	3/10	6/10	9/10	12/10	15/10	18/10	21/10	24/10		
1.	3 <sup>rd</sup> July	3.11 (9.09)	5.29 (13.16)	8.39 (16.77)	11.04 (19.33)	14.18 (22.22)	18.09 (25.15)	20.20 (26.45)	23.24 (28.80)	26.36 (30.86)	30.34 (42.17)	32.07 (34.48)	34.03 (35.47)	37.05 (37.47)	40.38 (39.41)	0.00 (0.00)	20.25	
2.	10 <sup>th</sup> July	4.18 (11.68)	5.77 (13.74)	9.60 (17.98)	12.92 (21.10)	17.94 (25.05)	20.17 (26.64)	22.47 (28.12)	25.26 (30.16)	28.04 (31.97)	31.37 (34.06)	33.35 (35.27)	36.00 (36.86)	39.35 (38.82)	42.34 (40.68)	0.00 (0.00)	21.93	
3.	17 <sup>th</sup> July	0.00 (0.00)	5.17 (13.00)	9.83 (18.78)	14.28 (22.16)	19.23 (26.00)	22.50 (28.31)	23.19 (28.77)	26.66 (31.08)	30.54 (33.54)	32.46 (34.70)	34.68 (36.07)	38.08 (38.65)	41.60 (40.14)	44.96 (42.09)	50.00 (45.00)	26.27	
4.	24 <sup>th</sup> July	0.00 (0.00)	5.08 (13.02)	6.00 (14.09)	9.69 (18.65)	14.95 (22.95)	18.45 (25.43)	23.04 (28.59)	27.40 (31.56)	31.08 (33.88)	34.05 (35.69)	35.79 (36.73)	39.64 (39.02)	42.23 (40.13)	47.40 (43.48)	53.52 (47.01)	25.86	
SEm+		0.20	0.41	0.53	0.64	0.76	0.83	0.89	0.97	1.04	1.09	1.18	1.20	1.25	1.33	1.25		
CD (P=0.05)		0.61	1.26	1.61	1.95	2.34	2.56	2.73	2.98	3.20	3.36	3.63	3.69	3.84	4.08	3.78		

\* Mean of five replications  
 Figures in parentheses are angular transformed values

on 3<sup>rd</sup> and 10<sup>th</sup> July sown crop and in the 3<sup>rd</sup> week of September on 17<sup>th</sup> and 24<sup>th</sup> July sown crop. During peak period the minimum infestation was observed on 3<sup>rd</sup> July sown crop (40.40% on number and 40.38% on weight basis) which was at par with 10<sup>th</sup> July sown crop (42.54 and 42.52%) while, the maximum infestation was recorded on 24<sup>th</sup> July sown crop (53.62 and 53.52%) followed by 17<sup>th</sup> July sown crop (50.28 and 50.00%) and both were at par. The present results corroborate with the findings of Hafeez and Rizvi (1994), Singh and Brar (1994), Satpathy and Rai (1998) and Singh (2004) who reported that minimum fruit damage was found in okra crop sown in the first fortnight of July. They also reported that in extra early sown crop *i.e.* in the month of May-June as well as in late sown crop the damage was highest.

The data also revealed that the maximum fruit yield of 43.56 q ha<sup>-1</sup> was obtained from the crop on 3<sup>rd</sup> July (early sown) followed by 10<sup>th</sup> July sown crop (41.08 q ha<sup>-1</sup>) and minimum (31.90 q ha<sup>-1</sup>) was from 24 July sown crop (late sown). The present results conform with the findings of Bairwa (2001).

#### REFERENCES

- Bairwa, D.K. (2001). Management of insect pests of okra [*Abelmoschus esculentus* (L.) Moench] with special emphasis on cultural practices. M.Sc. Thesis, submitted to Rajasthan Agricultural University, Bikaner.
- Brar, K.S.; Arora, S.K. and Ghai, T.R. (1994). Losses in fruit yield of okra due to *Earias* spp. influenced by dates of sowing and varieties. *Journal of Insect Science*, **7**:133-135.
- Choudhary, H.R. and Dadheech, L.N. (1989). Incidence of insects attacking okra and avoidable losses caused by them. *Annals of Arid Zone*, **28**:305.
- Hafeez, A. and Rizvi, S.M.A. (1994). Incidence of okra shoot and fruit borer, *Earias vittella* Fab. *Indian Journal of Plant Protection*, **22**:222-223.
- Satpathy, S. and Rai, S. (1998). Influencing of sowing dates and crop phenology on pest infestation in okra. *Vegetable Science*, **25**:178-180.
- Singh, D. (2004). Effect of different sowing dates and plant density on seed production of okra variety Parbhani Kranti. *Udyanika*, **10**:42-46.
- Singh, G. and Brar, K.S. (1994). The effect of dates of sowing on the incidence of *Amrasca biguttula biguttula* (Ishida) and *Earias* spp. on okra. *Indian Journal of Ecology*, **21**:140-144.