SHORT COMMUNICATION

Effect of Abiotic Factors on Seasonal Incidence of Shoot and Fruit Borer [*Eariasvittella* (Fabricius)] on Okra

Balwant S. Rathore[1*], Kanchan Baghla[2], Sasya Thakur[3]

DOI: 10.18811/ijpen.v7i03.10

Abstract

A study on the seasonal incidence of the shoot and fruit borer [*Eariasvittella*(Fabricius)] on okra in relation to abiotic factors was carried out at the Central field, SamHigginbottom University of Agriculture Technology and Sciences, Prayagraj, Uttar Pradesh, India, during Kharif season. Results revealed that the occurrence of shoot and fruit borer (*Eariasvitella*) commenced from the third week of September with an average infestation of 4.98%, and then the population gradually increased and reached to its peak level by the third week of October with an average population of 40.12%. After that a declining trend was observed as temperature decreased. It was found that the infestation of shoot and fruit borer (*Eariasvitella*) increased with increasing maximum temperature.

Keywords: Correlation Prayagraj, Okra, Seasonal incidence, Shoot and fruit borer (Eariasvitella).

International Journal of Plant and Environment (2021); **ISSN:** 2454-1117 (Print), 2455-202X (Online)

Introduction

Okra (*Abelmoschus esculentus* (L) Moench) is one of the most important vegetables belonging to the family Malvaceae. Though it is mainly used as a fresh vegetable, it is also consumed as canned, dehydrated, or frozen. Potential exports account for 60 percent of fresh vegetables (Sharman and Arora, 1993). One of the major constraints in okra production is insect pests. Several insect pests have attacked the crop from seedling to maturity. Out of 56 insect species attacking the crop, the shoot and fruit borer appeared to be the most serious, inflicting 45-57.1% damage to fruits (Srinivasan and Krishnakumar, 1983). It is reported that okra is infested severely by many pests during warm and rainy season such as leafhopper and shoot and fruit borer (Gandhale *et al.,* 1987; Clement and David 1989; Madan *et al.,* 1996). Indiscriminate and injudicious uses of conventional insecticides for the management of these insect pests have been causing different environmental hazards, including resurgence, resistance, and residue problems in foodstuff. For effective pest management, the study on the influence of the various factors responsible for population fluctuation on a particular crop might assist in the prediction of its occurrence in a given area(Subharani and Singh, 2007). Therefore, thepresent experiment was conducted to a brief study of the population dynamics of the shoot and fruit borer on okra.

Materials and Methods

The experiment was conducted during Kharif season at the Central Field of "Sam Higginbottom University of Agriculture, Technology and Sciences" Prayagraj, Uttar Pradesh, India, in a randomized block design with eight treatments, using variety AHB-118 in a plot size of (2 x 1 m) at a spacing of (45 x 30 cm) with a recommended package of practices excluding plant protection. For population dynamics of the shoot and fruit borer, the population was recorded in weekly intervals starting from the appearance of the pest. The observation of the pests was recorded from five randomly selected plants from every plot. The data was statistically analyzed by correlation analysis between weather parameters and shoot and fruit borer.

[1]Department of Entomology, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj-211 007, U.P., India.

[2]Department of Entomology, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior–474002, M.P., India.

[3]Department of Entomology, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj-211 007, U.P., India.

***Corresponding author:** Balwant Singh Rathore, Department of Entomology, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj-211 007, U.P., India., Email: balwantsinghrathore91@gmail.com

How to cite this article: Rathore, B.S., Baghla, K., & Thakur, S. (2021). Effect of Abiotic Factors on Seasonal Incidence of Shoot and Fruit Borer [*Eariasvittella* (Fabricius)] on Okra. International Journal of Plant and Environment. 7(3), 240-242.

Conflict of interest: None

Submitted: 22/08/2021 **Accepted:** 25/09/2021 **Published:** 25/11/2021

The percent fruit damage was the total number of affected fruits from each plot. The extent of the damage was computed by using the formulae;

Percent Shoot and Infestation

Number of damage shoot and fruit = Percent shoot and fruit damage / Total number of shootand fruit x100

Results and Discussion

The shoot and fruit borer incidence on Okra during *Kharif* season 2016 (Table 1) commenced from the 37th standard week with an average percent infestation of 4.98. The shoot and fruit borer population gradually increased and reached a peak level of 40.12% on 42nd standard week. Thereafter, declining trend was observed and population of shoot and fruit borer reached 8.57% during 46th standard week. Similar, Observations are reported by Meena *et al.* (2010). Vijayalakshmi *et al.,* (2014) Studied the results revealed that weather parameters highly influenced the infestation and severity of insect pests. The Thrips population peaked (1.80/leaf) in the 52nd Standard Meteorological Week (SMW). Sharma *et al.* (2010) studied that *Eariasvittela* (Fab) borer

Table 1: Population dynamics of shoot and fruit borer [*Eariasvittella* (Fabricus)] during *Kharif* season.

Standard week	Percentage infestation	Temperature		Humidity %		Rainfall (mm)	Wind velocity	Sunshine (hr/day)
		Max.	Min.	Morning	Evening			
31st	0	35.34	28.02	90.71	58.71	0.42	2.77	5.45
32nd	0	34.08	27.74	90.57	55.42	2.2	1.33	5.82
35th	0	35.82	27.28	90.57	53.42	6.94	0.25	5.07
36th	0	35.14	27.2	87.85	53.85	0.65	2.26	8.08
37th	4.98	35.25	27.28	89.42	54.28	4.91	1.26	8.34
38th	8.87	33.28	26.87	89.14	62.57	1.14	0.87	6.62
39th	14.99	30.25	26.22	89.42	66.28	8.08	0.66	5.28
40th	22.18	34.65	26.68	87.42	53.85	6.37	2.22	7.45
41st	26.22	34.48	26.34	89.85	52.28	1.42	1.01	8.52
42nd	40.12	35.05	25.77	89.71	51.71	0	0.81	8.77
43rd	36.09	34.37	24.8	90.28	53.71	0	1.01	8.75
44th	31.48	33.97	19.82	90.71	54.42	0	1.08	8.57
45th	23.18	33.14	18.2	91.85	55.71	0	1.02	6.91
46th	8.57	32.74	16.91	91.42	53.85	0	0.66	8.51
R		0.858	0.256	1.589	0.178	-0.467	0.800	2.720
t=		0.935	0.750	1.162	0.727	0.556	0.916	1.454
Results		NS	NS	NS	NS	NS	NS	NS

incidence commenced in the 29th standard week. The peak infestation of plants was observed in the 45th standard week. Pal *et al.* (2013) recorded that shoot and fruit borer incidence was not observed at early growth stages of the crop. However, the population was observed from the 14th standard week. This pest was initiated by the presence of wilted shoot and then shifted to green fruits and noticed to feed the internal content. Initially (14th standard week *i.e.*, peak vegetative period), the borer population increased slowly (4.99-8.66% shoot damage) but soon after the development of fruits, the population rapidly increased and attained a maximum level (43.42% fruit damage) just one week after fruiting initiation (16th standard week). Later, the population gradually decreased but caused considerable damage to the fruits till the maturity of the crop. This observation was also in accordance with the findings of Kumar *et al.* (2017) reported different abiotic factors on the temporal fluctuations of the shoot and fruit infestation by *the Eariasvittella*on okra crop. Shoot infestation was observed during 37th SW (one month after sowing), whereas fruit infestation was observed during 39th SW (6 weeks after sowing). Nalini and Kumar (2016) The occurrence of shoot and fruit borer (*Eariasvittella*), commenced from 36th standard week (August fourth week) with an average infestation of 2.50%. Then the population gradually increased and reached its peak level by 42" standard week (October third week) with an average population of 49.86%. Thereafter declined trend was observed as temperature decreased. It was found that the infestation of the shoot and fruit borer (*Eariasvittella*) increased with increasing maximum temperature. Singh *et al.* (2015) revealed that shoot and fruit borer incidence on fruits started from the fourth week of August on 5-week-old plants and continued until fourth week of October on 14-week-old plants. Badiyalaand Raj (2013) revealed that the okra shoot infestation varied between 1.78 to 2.24% during first year and 0.82 to 1.56% during the second year, while the fruit infestation varied between 1.83 to 35.85% and 1.23 to 29.64%. Peak fruit infestation (%) and peak larval population per fruit were observed in the third to fourth week of August during the two seasons.

Conclusion

The study revealed that the occurrence of shoot and fruit borer (*Eariasvitella*), commenced from 37th standard week (September third week) with an average infestation of 4.98%, and then the population gradually increased and reached its peak level by the October third week with an average population of 40.12%. Thereafter the declining trend paralleled with decreasing temperature. It was found that the infestation of the shoot and fruit borer (*Eariasvitella*) increased with increasing maximum temperature.

References

Sharman, B. R. and Arora, S. K. (1993) Advances in breeding of Okra Abelmoschus esculentus (L.) in India. *Proc. Sixth Int.Cong., SABRAO.* 285-288.

Srinivasan, K. and Krishnakumar, N. K. (1983) Studies on the extent of loss and economics of pest management in okra. *Trop. Pest Management,* 29(4): 363-370.

Glendale, D.N., Patil, A.S. and Naik, L., 1987. Effective control of *Earias* sp. on okra with synthetic pyrethroids. *Pesticides*, *21*(1): 44-45.

Clement, P. and David, B. V. (1989) Evaluation of certain insecticides for the control of brinjal and okra fruit borers. *Pestology,* 13: 29-31.

Meena, N. K., Meena, B. L. and Kanwat, P. M. 2010) (Seasonal occurrence of shoot and fruit borer on okra in semi-arid region of Rajasthan. *Annals of Plant Protection Sciences*. 18(2): 504-506.

Vijayalakshmi, T.; Pathipati, V.L.; and Naram, N. L. (2014) Seasonal incidence of major insect pests of Chilli in relation to weather parameters in Andhra Pradesh Pest Mangt. *In Horti. Ecosystems*, 20(1): 36-40.

Sharma, R. P., Swaminathan. R. and Bhati, K. K. (2010). Seasonal incidence of fruit and shoot borer of okra along with climate factors in Udaipur region of India. Asian J. of Agril.Res., 4 (4):232-236.

Singh, H.P., Bajad, V.V. and Chamroy, T. (2015) Seasonal incidence and field efficacy of insecticides against shoot and fruit borer, *Eariasvittella*(Fab) on Okra in Allahabad (UP). *Trends in Biosciences*, 5(3): 199-201.

Kumar, G.S., Raju, S.V.S. and Kattula, S.Y. (2017) Role of Different Abiotic Factors Influencing Fluctuations of Fruit and Shoot Infestation Caused by *Eariasvittella* on Okra (*Abelmoschus esculentus* L.). *International Journal of Current Microbiology and Applied Sciences*, *6*(6): 2514-2521.

Nalini, C. and Kumar, A. (2016) Population dynamics and comparative efficacy of certain chemicals and biopesticides against okra shoot and fruit borer (*Eariasvitella*). *The Bioscan*, 11(3):1589-1592.

Badiyala, A and Raj, D. (2013). Seasonal incidence, varietal screening, and management of shoot and fruit borer infesting Okra in Kangra valley of Himachal Pradesh. *Indian J. Hort.* 70(2): 304-30