



E-ISSN: 2320-7078

P-ISSN: 2349-6800

[www.entomoljournal.com](http://www.entomoljournal.com)

JEZS 2021; 9(1): 131-133

© 2021 JEZS

Received: 19-11-2020

Accepted: 21-12-2020

**Sharayu Patil**

Department of Agril.

Entomology, PGI, Mahatma

Phule Krishi Vidyapeeth,

Rahuri, Maharashtra, India

**Uttam Hole**

Department of Agril.

Entomology, PGI, Mahatma

Phule Krishi Vidyapeeth,

Rahuri, Maharashtra, India

## Seasonal incidence of brinjal shoot and fruit borer, *Leucinodes orbonalis* Guenee, during Kharif season

**Sharayu Patil and Uttam Hole**

### Abstract

The field experiment was carried out at Post Graduate Institute, Research Field of Department of Agricultural Entomology, MPKV, Rahuri during *Kharif* 2018 and *Kharif* 2019. The experiment was laid out in a Randomized Block Design. Brinjal seedlings were transplanted during 32<sup>nd</sup> standard metrological week (first week of August). The peak per cent shoot damage was noticed around 40<sup>th</sup> standard metrological week (first week of October) during *Kharif* season. Similarly per cent fruit damage was reached its maximum at 45<sup>th</sup> standard metrological week (first week of November). The correlation studies revealed that the damage by *Leucinodes orbonalis* on brinjal shoots showed significant positive correlation with maximum temperature and minimum temperature while, non-significant positive correlation with morning relative humidity, evening relative humidity and sunshine hrs. The per cent shoot damage showed negative correlation with rainfall. The correlation studies revealed that the damage by *Leucinodes orbonalis* on brinjal fruits showed significant negative correlation with minimum temperature, morning relative humidity and evening relative humidity whereas, non-significant negative correlation with rainfall. The per cent fruit damage showed significant positive correlation with sunshine hrs and non-significant positive correlation with maximum temperature.

**Keywords:** Brinjal, seasonal incidence, *Leucinodes orbonalis*, SMW (standard metrological week)

### 1. Introduction

Brinjal (*Solanum melogena* L.) is widely grown fruit vegetable of tropical and subtropical parts of the world. Maharashtra accounts thirty five thousand hectares area and produces about four hundred ninety thousand tonnes of fruits annually with productivity of 14.00 tonnes per hectare. (Anonymous, 2019) <sup>[1]</sup>.

Among the major constrains in brinjal cultivation, pest management. Among the major constraints in brinjal cultivation, pest damage is the most important one, causing heavy losses. The crop is attacked by about 140 species of insect and non-insect pests (Frepong, 1979) <sup>[2]</sup>. However, shoot and fruit borer is the most limiting factor distributed all over the India, causing heavy yield losses upto 70 per cent (Jat and Pareek, 2003) <sup>[4]</sup>.

The damage by this insect starts soon after transplanting of the seedlings and continues till harvest of fruits. Eggs are laid singly on ventral surface of leaves, shoots, and flower-buds and occasionally on fruits. In young plants, appearance of wilted drooping shoots is the typical symptom of damage by this pest; these affected shoots ultimately wither and die away. At later stage, the larvae bore into flower buds and fruits, entering from the base of calyx, they have no visible sign of infestation, but the larvae fed inside. The damaged flower buds shed without blossoming. Whereas, the fruits exhibit circular exit holes, such fruits, being partially unfit for human consumption, reduce their market value considerably. It is also reported that there was reduction in vitamin C content to an extent of 68 per cent in the infested fruits (Hami, 1955) <sup>[3]</sup>. The objective of present study was to study the seasonal incidence of brinjal shoot and fruit borer, *Leucinodes orbonalis* (Guenee) during *Kharif* season.

### 2. Materials and Methods

To study the seasonal incidences of brinjal shoot and fruit borer, *Leucinodes orbonalis* during *Kharif* 2018 and *Kharif* 2019. Field experiment was carried out at Post Graduate Institute Research Field of Department of Agricultural Entomology, MPKV, Rahuri. The experiment was laid out in a Randomized Block Design. The F1 hybrid Krishna was raised. The total area was divided and made into five equal sized blocks each measuring 25 m X 20 m.

**Corresponding Author:****Sharayu Patil**

Department of Agril.

Entomology, PGI, Mahatma

Phule Krishi Vidyapeeth,

Rahuri, Maharashtra, India

All the agronomic practices were followed to raise crop as per the recommended package of practices. Brinjal seedlings were transplanted during 32<sup>nd</sup> SMW. No plant protection measures were taken for brinjal shoot and fruit borer during the entire study period. After transplanting at vegetative growth phase, number of infested shoots from five randomly selected and tagged plants from each block were counted as against total number of healthy and infested shoots per plant and then per cent shoot damage was worked out.

At the time of harvesting, the fruits from each block were harvested separately and number of healthy and infested fruits per plot were counted to work out per cent fruit damage. The mean of per cent shoot and fruit damage due to *Leucinodes orbonalis* was correlated with meteorological parameters like temperature, relative humidity, rainfall and sunshine hrs during experimental period. The meteorological data was collected from the Department of Agronomy, Post Graduate Studies, MPKV, Rahuri

### 3. Results and Discussion

#### 3.1 Per cent shoot damage during Kharif 2018 and Kharif 2019

The data on per cent shoot damage by *L. orbonalis* in brinjal during Kharif 2018 is given in Table 1. It is evident from the data that there were periodical differences in the observations of shoot damage.

The shoot damage due to *Leucinodes orbonalis* was 1.48 per cent after 3<sup>rd</sup> week of transplanting. It was increased gradually and reached at its peak of 14.01 per cent in 40<sup>th</sup> SMW. Thereafter, the shoot damage started decline and recorded minimum of 2.11 per cent in 44<sup>th</sup> SMW. The data on per cent shoot damage by *Leucinodes orbonalis* in brinjal during Kharif 2019 is given in Table 2. The shoot damage due to *Leucinodes orbonalis* was 1.67 per cent after 3<sup>rd</sup> week of transplanting. It was increased gradually and reached at its peak of 13.91 per cent in 40<sup>th</sup> SMW. Thereafter, the shoot damage started decline and recorded minimum of 1.89 per cent in 44<sup>th</sup> SMW. The present findings are also in agreement with Nandi *et al.* (2017) [5] and Saran *et al.* (2018) [7].

#### 3.2 Per cent fruit damage during Kharif 2018 and Kharif 2019

The data regarding per cent damage of fruits on number basis during Kharif 2018 is presented in Table 1. The data clearly indicates that the fruit damage due to *Leucinodes orbonalis* during Kharif 2018 was noticed from 40<sup>th</sup> SMW *i.e.* in first week of October. The fruit damage ranged from 13.85 to 37.34 per cent. The per cent fruit damage recorded maximum of 37.34 in 45<sup>th</sup> SMW, during first week of November. However, the minimum fruit damage of 13.85 per cent registered in 40<sup>th</sup> SMW. The data regarding per cent damage of fruits on number basis during Kharif 2019 is presented in Table 2. The data clearly indicates that the fruit damage due to *Leucinodes orbonalis* during Kharif 2019 was noticed from 40<sup>th</sup> SMW *i.e.* in first week of October. The fruit damage ranged from 14.03 to 36.28 per cent. The per cent fruit damage recorded maximum of 36.28 in 45<sup>th</sup> SMW, during first week of November. However, the minimum fruit damage of 14.03 per cent registered in 40<sup>th</sup> SMW. The present findings are also in agreement with Nandi *et al.* (2017) [5] and Saran *et al.* (2018) [7].

**Table 1:** Seasonal incidence of *Leucinodes orbonalis* in Kharif 2018

Month	Standard Metrological Week	Shoot damage (%)	Fruit damage (%)
August	32	0	0
	33	0	0
	34	0	0
	35	1.48	0
September	36	5.18	0
	37	7.23	0
	38	11.43	0
	39	13.68	0
October	40	14.01	13.85
	41	10.56	15.26
	42	7.69	23.89
	43	5.21	29.07
November	44	2.11	33.19
	45	0	37.34
	46	0	35.42
	47	0	31.51
December	48	0	29.38
	49	0	28.14
	50	0	26.9
	51	0	21.11
	52	0	18.24

**Table 2:** Seasonal incidence of *Leucinodes orbonalis* in Kharif 2019

Month	Metrological Week	Shoot damage (%)	Fruit damage (%)
August	32	0	0
	33	0	0
	34	0	0
	35	1.67	0
September	36	3.44	0
	37	5.87	0
	38	9.14	0
	39	10.26	0
October	40	13.91	14.03
	41	12.08	17.57
	42	8.32	20.27
	43	4.57	28.12
November	44	1.89	32.67
	45	0	36.28
	46	0	34.12
	47	0	31.05
December	48	0	28.92
	49	0	26.24
	50	0	24.69
	51	0	21.68
	52	0	18.08

**Table 3:** Correlation relationship of weather parameters with per cent shoot damage and fruit damage by brinjal shoot and fruit borer, *Leucinodes orbonalis* during Kharif 2018 and Kharif 2019

Weather parameters	Correlation coefficient value			
	Kharif 2018		Kharif 2019	
	% Shoot damage	% Fruit damage	% Shoot damage	% Fruit damage
Max. temperature (°C)	0.670	0.204	0.195	0.144
Min. temperature (°C)	0.503	-0.713	0.417	-0.766
Morning RH (%)	0.079	-0.816	0.5371	-0.102
Evening RH (%)	0.021	-0.758	0.490	-0.497
Rainfall (mm)	-0.220	-0.383	-0.075	-0.044
Sunshine hrs	0.225	0.052	0.246	0.353

\*\*Significant at 1% level = 0.549 \*Significant at 5% level = 0.433

### 3.3 Correlation relationship of weather parameters with per cent shoot damage by brinjal shoot and fruit borer, *Leucinodes orbonalis* during Kharif 2018 and Kharif 2019

The data related to the correlation relationship of weather parameters with per cent shoot damage by brinjal shoot and fruit borer, *Leucinodes orbonalis* during Kharif 2018 and 2019 are presented in Table 3. The correlation studies during Kharif 2018 revealed that the damage by *L. orbonalis* of brinjal shoots showed significant positive correlation with maximum temperature (0.670) and minimum temperature (0.503). While, non-significant positive correlation with morning relative humidity (0.079), evening relative humidity (0.021) and sunshine hrs (0.225). The per cent shoot infestation showed negative correlation with rainfall (-0.220). The correlation studies during Kharif 2019 revealed that the damage by *Leucinodes orbonalis* on brinjal shoots showed significant positive correlation with morning relative humidity (0.537) and evening relative humidity (0.490), whereas non-significant correlation with maximum temperature (0.194), minimum temperature (0.417) and sunshine hrs (0.246). The per cent shoot infestation showed negative correlation with rainfall (-0.075). The present findings are also in agreement with Saran *et al.* (2018)<sup>[7]</sup> and Nitesh Kumar and Ashwini Kumar (2019)<sup>[6]</sup>.

### 3.4 Correlation relationship of weather parameters with per cent fruit damage by brinjal shoot and fruit borer, *Leucinodes orbonalis* during Kharif 2018 and Kharif 2019

The data related to the correlation relationship of weather parameters with per cent fruit damage by brinjal shoot and fruit borer, *Leucinodes orbonalis* during Kharif 2018 and 2019 are presented in Table 3.

The correlation studies during Kharif 2018 revealed that the damage by *L. orbonalis* of brinjal fruits showed significant negative correlation with minimum temperature (-0.713), morning relative humidity (-0.816) and evening relative humidity (-0.758) whereas, non-significant negative correlation with rainfall (-0.383). The per cent fruit infestation showed significant positive correlation with sunshine hrs (0.052) and non-significant positive correlation with maximum temperature (0.204).

The correlation studies during Kharif 2019 revealed that the damage by *Leucinodes orbonalis* of brinjal fruits showed significant negative correlation with minimum temperature (-0.766) and evening relative humidity (-0.497) whereas, non-significant negative correlation with morning relative humidity (-0.102) and rainfall (-0.044). The per cent fruit infestation showed significant positive correlation with sunshine hrs (0.353) and non-significant positive correlation with maximum temperature (0.144). The present findings are also in agreement with Saran *et al.* (2018)<sup>[7]</sup> and Nitesh Kumar and Ashwini Kumar (2019)<sup>[6]</sup>.

### 4. Conclusion

The correlation studies revealed that the damage by *Leucinodes orbonalis* on brinjal shoots showed significant positive correlation with maximum temperature and minimum temperature while, non-significant positive correlation with morning relative humidity, evening relative humidity and sunshine hrs. The per cent shoot damage showed negative correlation with rainfall. The correlation studies revealed that the damage by *Leucinodes orbonalis* on brinjal fruits showed significant negative correlation with minimum temperature,

morning relative humidity and evening relative humidity whereas, non-significant negative correlation with rainfall. The per cent fruit damage showed significant positive correlation with sunshine hrs and non-significant positive correlation with maximum temperature.

### 5. Acknowledgement

The authors are highly grateful to the Department of Agricultural Entomology, Mahatma Phule Krishi Vidyapeeth, Rahuri, India for providing technical assistance during Ph.D. programme.

### 6. References

1. Anonymous. Data published by Ministry of Agriculture, Govt. of India 2019. <http://www.indiastat.com>.
2. Frepong E. The nature of damage to egg plant in Ghana by two important pests, *Leucinodes orbonalis* and *Ezophora vilore* Bull. de Institute Fundamental d Afrique 1979;41:408-416.
3. Hami MA. Effect of borer attack on the vitamin 'C' content of brinjal. Pakistan Journal of Health 1955;4:223-224.
4. Jat KL, Pareek BL. Biophysical and biochemical factors of resistance in brinjal against *Leucinodes orbonalis*. Indian J. Ent 2003;65(2):252-258.
5. Nandi C, Narbenchi G, Jakatimath S, Prafulkumar MV. Seasonal Incidence of Brinjal shoot and fruit borer, *Leucinodes orbonalis* Guene, during kharif season. International Journal of current Microbiology and applied science : 2319-7706 2017;(6):1088-1093.
6. Nitesh Kumar, Ashwini Kumar. Comparison of bio-rational and bio-intensive IPM modules for safe pesticide residue and management of brinjal shoot and fruit borer *Leucinodes orbonalis* Guenee with economics. Journal of Entomology and zoology studies 2018;6(6):256-265.
7. Saran S, Singh DV, Singh A, Kumar U, Kumar S. Incidence of shoot and fruit borer, *Leucinodes orbonalis* (Guenee) on brinjal in relation to weather factors in Western U.P. Journal of Entomology and Zoology Studies 2018;6(5):2314-2316.