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# EXTENT OF INFESTATION BY BRINJAL FRUIT BORER *LEUCINODES ORBONALIS GUEN*

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## ABSTRACT

*The study on extent of infestation by Brinjal fruit borer, Leucinodes orbonalis Guen. was carried out from September 2004 to February 2005. Each week, 3 kg brinjal fruits were observed randomly from local market of Tandojam. The results revealed that brinjal was attacked by borer, Leucinodes arbonalis from September to February. The infestation of borer to brinjal fruit in the market remained fluctuating during the period under study. Maximum infestation (46.6%) was recorded in the first week of February, 2005, however, minimum infestation (6.60%), was recorded in the 4th week of October and second week of November. Mean temperature raged between 17.25-31.75$^0$C with 62-76 R.H%.*

***Key Words:*** **Egg plant, local market, fruit borer, correlation, abiotic factors.**

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## INTRODUCTION

Brinjal, *Solanum melongena* L., also called egg plant or aubergine (French name), belongs to Solanaceae family, of uncertain origin, but it is extensively grown in almost all parts of the world and is a normally self fertilized annual. A wild form with many small fruits, some times called insanum is found in the Bengal plains of India (Shanmugavelu, 1989). The mass trapping against brinjal borer has been incorporated into an integrated crop management strategy for brinjal that includes grafting for control of soil pathogens and crop hygiene practices to remove pest and disease inoculum. This provided a strategy that has reduced damage to less than 15% without the use of insecticides, and the technology has now reached a point where it can be released to farmers (Ahmed, 2004).

Keeping in view the importance of brinjal and significance of its protection from fruit borer a field study was carried out to anticipate the infestation of brinjal fruit borer under agro-ecological conditions of Tandojam, Sindh Pakistan.

## MATERIALS AND METHODS

The study was carried out to examine the extent of infestation of fruit borer, *Leucinodes orbonalis* to brinjal fruits at Sindh Agricultural University, Tandojam during 2004-2005. The study was started in the first week of September, 2004 and remained continued up to the second week of February, 2005. The process of recording observations on brinjal fruit borer was continued up to 23 weeks. For this purpose, 3kg Brinjal fruits mixed varieties (oval and long) were purchased from local market and were put under observation as such. The Brinjal fruits were picked randomly from six lots and were brought to laboratory for recording the borer infestation.

Environmental conditions were also recorded during each observation date to see any association with pest population. The characters recorded were maximum and minimum air temperature and relative humidity. Furthermore, the correlations were determined between fruit borer infestation percentage and maximum/mean temperatures and between borer infestation percentage and relative humidity %.

The data thus collected were subjected to statistical analysis using mean and standard error to assess the variance using Mstat-C Computer Statistical Software, following Gomez and Gomez (1984).

## RESULTS AND DISCUSSION

The data in (Table I) depict that infestation of brinjal fruits infestation remained fluctuating throughout the period under study. However, percent infestation increased from December 30, 2004 to February 10, 2005 (with a range of (26.6 to 46.4%) except 20% on January 13, 2005 with 20%. This means lower temperature range of 13 to 18 ºC and 64-85 RH%. The maximum 46.6% was recorded in 1st week of February with 17 ºC

temperature with R.H% 74%. Similarly, minimum infestation (6.60%) was recorded in 4th week of October and (6.60%) was recorded in 2nd week of November.

**Table I** *Mean percent infestation of brinjal fruit borer, Leucinodes orbonalis from September 2004 to February 2005*

| Observation | Fruits | | | | Temperature °C | |
|---|---|---|---|---|---|---|
| Date | Total Fruits | Healthy Fruits | Attacked fruits | % Infestation | Mean | R.H.% |
| Sep. 04.04 | 30 | 22 | 08 | 26.60 | 29.25 | 74 |
| Sept. 11.04 | 30 | 26 | 04 | 13.30 | 29.75 | 72 |
| Sept. 18.04 | 30 | 20 | 10 | 33.30 | 30.25 | 74 |
| Sept. 25.04 | 30 | 25 | 05 | 16.60 | 31.75 | 69 |
| Oct. 01.04 | 30 | 19 | 11 | 36.60 | 29.25 | 70 |
| Oct. 08.04 | 30 | 25 | 05 | 16.60 | 26.50 | 82 |
| Oct.15.04 | 30 | 24 | 06 | 20.00 | 25.25 | 64 |
| Oct.22.04 | 30 | 28 | 02 | 06.60 | 17.25 | 67 |
| Oct.29.04 | 30 | 23 | 07 | 23.30 | 22.75 | 70 |
| Nov.05.04 | 30 | 24 | 06 | 20.00 | 23.00 | 64 |
| Nov.12.04 | 30 | 28 | 02 | 06.60 | 23.75 | 69 |
| Nov.19.04 | 30 | 25 | 05 | 16.60 | 24.25 | 62 |
| Nov.26.04 | 30 | 24 | 06 | 20.00 | 22.50 | 76 |
| Dec.02.04 | 30 | 23 | 07 | 23.30 | 17.75 | 63 |
| Dec.09.04 | 30 | 24 | 06 | 20.00 | 19.50 | 64 |
| Dec.16.04 | 30 | 27 | 03 | 10.00 | 21.00 | 74 |
| Dec.23.04 | 30 | 26 | 04 | 13.00 | 16.25 | 68 |
| Dec.30.04 | 30 | 22 | 08 | 26.60 | 17.25 | 76 |
| Jan.06.05 | 30 | 19 | 11 | 36.60 | 16.25 | 73 |
| Jan.13.05 | 30 | 24 | 06 | 20.00 | 13.25 | 64 |
| Jan.20.05 | 30 | 20 | 10 | 33.30 | 15.50 | 64 |
| Jan.27.05 | 30 | 17 | 13 | 43.30 | 15.50 | 69 |
| Feb.03.05 | 30 | 16 | 14 | 46.60 | 17.75 | 74 |
| Feb.10.05 | 30 | 19 | 11 | 36.60 | 18.00 | 85 |
| Mean±Std. | - | 22.92±0.675 | 7.08±0.678 | 23.57±2.259 | 21.851±1.126 | 70.259±1.222 |

The data in (Table II) further shows that during lower temperature range and higher humidity conditions favoured the fruit borer infestation. The correlation between mean temperature and infestation percent was negative (r 2=-0.448). Whereas, there was slightly positive correlation (r 2=0.247) between borer infestation and R.H%.

**Table II** *Correlation between percentage infestation of brinjal fruit borer and various environmental factors from September 2004 to February 2005*

| Variables | Correlation (r) |
|---|---|
| Infestation percentage vs Mean temperature | -0.200 |
| Infestation percentage vs Maximum temperature | -0.448 |
| Infestation percentage vs Relative humidity | 0.247 |

It is evident from present study that the brinjal fruit borer, is a serious pest on marketable brinjal fruits in this area. The infestation percent varied from 6.60-46.6% throughout the period under study; this variation in infestation could be due to arrival of brinjal fruit of different varieties in the local market of Tandojam. The other reason could be the sowing dates of brinjal in the field with variable infestation of the pest. Other reasons could be due to variation in number of folliar applications against pest in the field condition. The reason could be the varietal differences in fruit infestations. The results of present study are in agreement with these of Kabir *et al*. (1994) who mentioned that brinjal shoot and fruit borer, damaged 10-20% brinjal fruits and sometimes the infestation reached upto 40%. Mukhopadhyay and Mandal (1994) mentioned that infestation to fruit borer in brinjal varied variety to variety. Kumar and Sadashiva (1996) stated that brinjal shoot and fruit borer is a serious pest of egg plants, and even a ready brinjal crop could collapse (10-50% infestation), if strict monitoring of the pests is not managed while, Mall *et al*. (1996) considered fruit borer disastrous for the brinjal. Choudhary and Saraf (1998) found brinjal fruit damage ranged between 20-25% as compared to 10-23% in control. Furthermore, Misra (1999) experienced 7-11 % infestation and in some cases infestation was over 25 percent. Whereas, Srinivas and Peter (2000) stated that none of the varieties were found completely immune to borer infestation. Bothara and Dethe (2003) also observed higher infestation if brinjal left untreated. Surprisingly, Cork (2004) mentioned that fruit damage due to the borer is often more than 80% in northern India and Bangladesh. The results of the above researchers are well comparable with the results of the present study.

## CONCLUSION AND RECOMMENDATIONS

The study showed that the brinjal fruits available in the market were of different varieties and percentage infestation varied during the study period. However, it was noted that the percentage infestation increased in the winter months and relatively reduced in the warm season.

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