Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2019; 7(5): 350-352

Received: 19-07-2019
Accepted: 21-08-2019

SS Ajabe
Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

NE Jayewar
Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

AD Gaikwad
Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

RB Ambad
Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Correspondence
SS Ajabe
Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Monitoring of brinjal shoot and fruit borer *Leucinodes orbonalis* by using sex pheromone and the impact of abiotic factors on trap catches

SS Ajabe, NE Jayewar, AD Gaikwad and RB Ambad

Abstract
The field experiment was conducted during *Kharif* 2018-19 at Experimental field of Department of Agricultural Entomology, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani (Maharashtra). Mass trapping of shoot and fruit borer was maximum moth catch was recorded at 51th SMW with mean number 15 moths per traps followed by at 46th SMW with 12.71 moths per trap. The brinjal shoot and fruit borer moths population where shows positive non-significant correlation with rainfall, maximum temperature and morning relative humidity and negative significant correlation with minimum temperature, evening relative humidity and wind velocity. Bright sunshine where negative non-significant correlation with moths' population. Whereas correlation with field population shoot damage shows negative non-significant and positive significant correlation with fruit infestation.

Keywords: Mass trapping, brinjal shoot and fruit borer, abiotic factor

Introduction
Brinjal (*Solanum melongena* L.) is the native of India and it is cultivated throughout the year all over the country (Choudhary, 1970) [1]. It is the third most important vegetable crop grown throughout the year in all parts of India and it's contributes 17.8 per cent to the total production of vegetables in the country. It is prone to attack by a number of insect pests from nursery till harvest (Regupathy *et al*., 1997) [8]. Among these, the most important and destructive is the brinjal shoot and fruit borer (BSFB), *Leucinodes orbonalis* Guenee. The yield loss could be as high as 70-92% (Mall *et al*., 1992; Dhandapani *et al*., 2003) [3, 2]. Much of the work on BSFB in India and Bangladesh is about using chemical insecticides and these leave undesirable toxic residues, besides increasing cost of production. Also, insecticides do not provide satisfactory control due to development of insecticide resistance. To offset these, certain behavioral chemicals could be harnessed, and such an endeavour is the use of sex pheromones. Pheromone traps offer one of the best sampling tools for flying adult insects. The use of sex pheromones for monitoring insect pests is of recent origin. It has been reported to be very useful for determining seasonal activity of pests species by several workers (Tamhankar *et al*., 1989 [9]. Information obtained from pheromone trap collections in any area for a fairly long period of time can be used for development of models to predict the seasonal pests incidence. Pheromone traps are now effectively used for the early detection of the BSFB and to monitor its seasonal activity in order to schedule the appropriate time of plant protection measures (Tiwari *et al*., 2009) [10]. This management strategy satisfies all the biosafety and environmental concerns (Mazumder and Khalequzzaman, 2010) [4]. Pheromone traps also help in monitoring and mass trapping, and also useful for determining seasonal activity. It is important to conduct studies confirming the effectiveness of pheromone as a control technique. The present study was undertaken to know the seasonal variation in the population buildup of brinjal shoot and fruit borer and the influence of weather parameters on the trap catch.

Materials and Methods
The field experiment was carried out at in Department of Agricultural Entomology, V.N.M.K.V. Parbhani from *Kharif* 2018 with brinjal variety, (Ajay Ankur seeds Ltd,) were grown and pheromone traps were installed at 25 days after transplanting. Observations on number of entrapped moths were recorded at weekly intervals throughout the cropping season. Similarly, per cent shoot and fruit infestation where recorded at weekly. Further, the data on

weather parameters. Correlation were made between weekly trap catches of shoot and fruit borer and mean weather parameters like maximum temperature, minimum temperature, relative humidity and rainfall for every standard week and the influence of weather factors on trap catches was studied. The correlation was worked out using WASP 2.0 software.

Installation of pheromone traps

Brinjal shoot and fruit borer infestation was initiated after one months old crop. The traps were installed at 10 m distance at each traps. Then use a wire or thread to tie the trap. The lure set inside the trap and trap was placed 15 cm above the crop canopy. Such lures usually remain effective for one month but lures were replaced after 15 days to have effective catches.

Results and Discussion

The trapped moth population ranged from 0.99 to 15 moths/water trap. The maximum moth catch was recorded at 51th SMW with mean number 15 moths per traps followed by 12.71 moths per trap in 46th SMW while lowest in 33rd SMW 0.99 moths per trap. Whereas shoot infestation first appears in 31st SMW and maximum number of shoot infestation was recorded in 41st SMW after this week shoot infestation gradually decrease and infestation starts on fruits and highest number of fruit infestation was recorded in 47th SMW (Table 1). The results are in accordance with those of concluded Rani *et al*. (2017) [7] highest moth catches were in the 5th week of November (19.13 moths/trap 48th SMW) with peak in infestation being in November 2nd week (30.67% 45th SMW)

The data presented (Table 2) on the brinjal shoot and fruit borer moths population showed positive non-significant correlation with rainfall, maximum temperature and morning relative humidity and negative significant correlation with minimum temperature, evening relative humidity and wind velocity. Bright sunshine where negative non-significant correlation with moths' population. Whereas field population and shoot damage showed negative non-significant correlation and positive significant correlation was observed with fruit damage. The present findings are conformity with the findings with Prasannakumar *et al* (2011) [6] Brinjal shoot and fruit borer (44.13moths/trap) in 48th standard week and 41st standard week, respectively. These moth catches had a positive non significant relation with morning (r= 0.18 and 0.44) and afternoon relative humidity (r= 0.45 and 0.45) and wind speed (r= 0.50, and 0.05), respectively. Nayak *et al*. (2014) [5] revealed a significant positive correlation with temperature (maximum, minimum and average) and negative correlation with relative humidity (both morning and afternoon). Rainfall did not influence the trap catch significantly.

Table 1: Trap catches of shoot and fruit borer moths

SMW	Duration	Number of moth trapped in trap	Percent Infestation	
			On Shoot	On Fruit
31	30-5 Aug.	1.25	2.5	0.0
32	6-12 Aug.	1.41	3.6	0.0
33	13-19 Aug.	0.99	6.4	0.0
34	20-26 Aug.	1.91	8.2	0.0
35	27-2 Sep.	2.00	7.9	0.0
36	3-9 Sep.	2.14	7.6	0.0
37	10-16 Sep.	2.29	9.7	0.0
38	17-23 Sep.	1.71	10.9	0.0
39	24-30 Sep.	1.57	12.8	0.6
40	1-7 Oct.	3.29	11.9	0.9
41	8-14 Oct.	4.86	14.5	1.2
42	15-21 Oct.	6.57	9.1	2.7
43	22-28 Oct.	5.86	8.3	4.4
44	29-4 Nov.	8.43	7.6	9.6
45	5-11 Nov.	11.29	4.3	22.4
46	12-18 Nov.	12.71	0.0	29.3
47	19-25 Nov.	12.14	0.0	35.1
48	26-02 Dec.	8.29	0.0	23.1
49	3-9 Dec.	10.57	0.0	19.8
50	10-16 Dec.	11.57	0.0	15.9
51	17-23 Dec.	15.00	0.0	9.0
52	24-31 Dec.	9.43	0.0	6.0

Table 2: Trap catches of shoot and fruit borer and its correlation with weather parameters and field population

Weather parameters	RF (mm)	Temperature (C^{o})		Humidity (%)		BSS (hrs)	WV (km/hr)	Field Infestation on	
		Maxi	Mini	AM	PM			shoot	Fruit
('r, value)	0.292	0.177	-0.504*	0.359	-0.712*	-0.336	-0.601*	-0.141	0.737*
r = 0.423 (at 5%)									

Conclusion

Pheromones undoubtedly have an important role to play in insect pests management programmes. Monitoring of brinjal shoot and fruit borer maximum and minimum moth catches fluctuation observed in meteorological weeks, correlation studies revealed that there was significant and non-significant effect of different weather parameters and field insfestation.

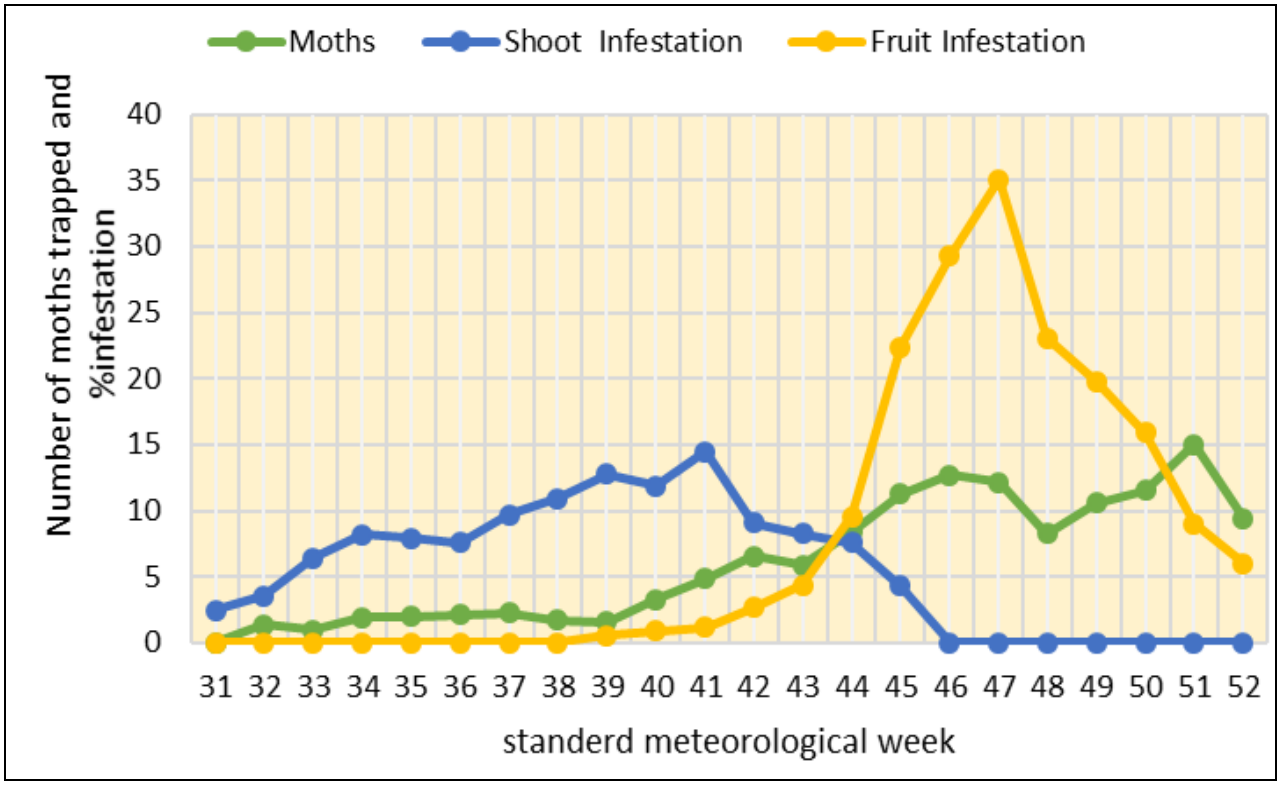

Fig 1: Monitoring of brinjal shoot and fruit borer mot

References

1. Choudhary B. Vegetables. National book trust, New Delhi. 1970, 25-50.
2. Dhandapani N, Shelkar UR, Murugan M. Biointensive pest management in major vegetable crops: An Indian perspective. Journal of Food Agriculture and Environment. 2003; 1(2): 330-339.
3. Mall NP, Pandey RS, Singh SV, Singh SK. Seasonal incidence of insect pests and estimation of the losses caused by shoot-and-fruit borer on brinjal. Indian Journal of Entomology. 1992; 54(3):241-247.
4. Mazumder F, Khalequzzaman M. Eggplant shoot and fruit borer *Leucinodes orbonalis* Guenéemale moth catch in sex pheromone trap with special reference of lure elevation and IPM. Journal of Bioscience. 2010; 18: 9-15.
5. Nayak US, Baral K, Khuntia A, Rath LK. Monitoring of brinjal shoot and fruit borer (*Leucinodes orbonalis* Guenee) through pheromone traps and the impact of abiotic factors on trap catch Journal of Crop and Weed. 2014; 10(1):143-146.
6. Prasannakumar NR, Chakravarthy AK, Naveen AH, Narasimhamurthy TN. Influence of weather parameters on pheromone trap catches of selected lepidopterous insect's pests on vegetable crops. Current Biotica. 2011; 4(4):442-452.
7. Rani AT, Chakravarthy AK, Kammar V, Prabhakara MS. Sex pheromone trapping plan for the management of brinjal shoot and fruit borer Leucinodes orbonalis Guenee Indian Journal of Entomology. 2017; 79(4):440-448.
8. Regupathy A, Palanisamy S, Chandramohan N, Gunathilagaraj K. A guide on crop pests. Sooriya desk Top Publishers, Coimbatore, 1997.
9. Tamhankar AJ, Guthi KK, Rahalkar GW. Responsiveness of *Earaias vitella* and *Earias insulana* males to their female sex pheromone. Insect Scie. Appli., 1989; 10(5):625-630.
10. Tiwari G, Prasad CS, Lok Nath. Moths trapping of brinjal shoot and fruit borer, *Leucinodes orbonalis* Guénee. Ann. Pl. Protec. Sci. 2009; 17:319-21.