Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(4): 2528-2530
Received: 04-05-2018
Accepted: 08-06-2018

Sudheer Bhumireddy
Naini Institute of Agriculture Science, SHUATS, Allahabad, Uttar Pradesh, India

S Simon
Naini Institute of Agriculture Science, SHUATS, Allahabad, Uttar Pradesh, India

S Nagar
Naini Institute of Agriculture Science, SHUATS, Allahabad, Uttar Pradesh, India

Correspondence
Sudheer Bhumireddy
Naini Institute of Agriculture Science, SHUATS, Allahabad, Uttar Pradesh, India

Seasonal incidence of rice leaf folder, *Cnaphalocrocis medinalis* (Guen) in Allahabad region

Sudheer Bhumireddy, S Simon and S Nagar

Abstract
A field experiment was conducted during *kharif* season of 2017-18 at Central Research Feild, Department of Entomology, SHUATS, Allahabad, (U.P) to study the "Seasonal Incidence of Rice leaf folder, *Cnaphalocrocis medinalis* (Guen) in Allahabad Region." A bulk plot of 180 m^2 was maintained to study the seasonal incidence of pests of paddy during *kharif*, 2017. The leaf folder, *Cnaphalocrocis medinalis* L. infestation started during 35th standard week (August 27th–September 2nd) with 12.95 per cent per 20 hills and reached a peak level at 44th standard week (29th October- 4thNovember) with 18.31% and declined gradually to 8.10% in 49th standard week.

Keywords: *Cnaphalocrosis medinalis*, seasonal incidence, correlation, weather parameter

Introduction
Rice (*Oryza sativa* L.) is life and princess of cereals, the staple food of 65% of the total population in India. It constitutes about 52% of the total food grain production and 55% of total cereal production. Rice is grown under diverse growing conditions such as irrigated, rainfed lowland, rainfed upland and flood prone ecosystems... Cultivation of rice is important for the food security of Asia. India has a long history of rice cultivation. India stands first in area (43.97 mha) and world's second largest producer (109.32mt) of rice after china with the productivity of 2.55 tons per hectare. Rice is the major crop in Uttar Pradesh and is grown in about 5.98 million hectares producing 14.63 million tons with the productivity of 2.44 tons per hectare. The state ranks 2nd in the country in production of rice. The hot and humid environment wherein rice is grown is highly conducive for proliferation of insect pests resulting in serious outbreak. Weather factors regulate insect pest populations under field circumstances (Hyslops, 1941) [3]. Under Indian conditions, though paddy is attracted by a wide range of insect pests as compared to any other crop scanty information is available on the incidence and population build-up of rice pests under varying agro-climatic conditions (Sharma *et al.*, 2004) [6].

Material and Methods
Seasonal incidence of leaf folder of paddy and impact of abiotic factors on their population during the kharif season of 2017-18, at Central Research Feild, Department of Entomology, SHUATS, Allahabad, (U.P). Paddy variety *Samba mashuri* (BPT-5204) was raised and maintained in a bulk plot of 180m^2 without any plant protection measures to study the occurrence of rice leaf folder in relation to weather parameters *viz.*, maximum temperature, minimum temperature, morning and evening relative humidity and rain fall. Observations was recorded on no. of larvae and no. of adults per 5 hills, per cent infested leaves at three days intervals. Data was recorded when the leaf folder activity was high (early hours at 6.00 AM).

Assessment of leaf folder infestation
The data so collected with reference to rice leaf folder damage was converted into per cent leaf damage by adopting the following formula

$$\text{Leaf folder per cent infestation} = \frac{\text{Number of damaged leaves per hill}}{\text{Total number of leaves per hill}} \times 100$$

Result& Discussion
The initial incidence of leaf folder (*Cnaphalocrosis medinalis*) was recorded in paddy variety *Samba mashuri* (BPT-5204) started during 35th standard week with 12.95 per cent leaf

folder infestation. Then the infestation decreased up to 38th standard week and then increased gradually up to 44th standard week with 18.31 per cent leaf folder infestation per 5 hills. Later, the infestation declined and reached to minimum during 45th standard week with 8.10 per cent infestation per 5 hills.

The correlation analysis between weather factors and leaf folder incidence revealed that, there was no significant correlation between leaf folder infestation and maximum temperature (r = -0.088), minimum temperature (r = -0.009), rainfall (r = 0.296), morning relative humidity (r = 0.232) and evening relative humidity (r = 0.400). The data on leaf folder infestation and weather factors were subjected to multiple linear regression analysis and the following equation was obtained.

$Y= -0.3295 + 0.1814\ X_1 -0.3609\ X_2 +0.0874\ X_3 + 0.7662\ X_4+0.3045\ X_5$

Thus, it was observed that the coefficient of determination (R^2) for leaf folder infestation was 0.2008 which indicated that the abiotic factors were able to cause the variation in leaf folder infestation to the extent of 20.08 per cent only. These observations are similar to the results of Ahmed *et al.* (2010) [1] who reported that mean maximum and minimum temperature had no impact on leaf infestation by leaf folder. However, the present results differed from the findings of Khan and Ramamurthy *et al.* (2004) [4] who reported that all weather factors *viz*., maximum and minimum temperature, rainfall and relative humidity showed a significant and negative relation with per cent leaf damage of leaf folder. These variations may be due to variation in weather parameters in different locations and their influence on activity of the pest. But, according to Kumar *et al.* (1996) [5], weather factors *viz*., maximum and minimum temperature, rainfall and relative humidity had no definite role on population dynamics of leaf folder infestation. Leaf folder infestation started at maximum tillering stage but there were no favourable weather factors for multiplication of the pest. Later, though favourable factors occurred, the crop has escaped the most susceptible stage. There was an irregular infestation level throughout the crop period and hence, it was difficult to estimate the correlation of leaf folder infestation with that of weather factors.

Table 1: Influence of abiotic factors on seasonal incidence of Rice leaf folder during (Kharif 2017)

S No.	Standard week	Leaf folder damage (%)	Temp. Max. (^{0}C)	Temp. Min. (^{0}C)	Rainfall (mm)	RH Mor. (%)	RH Eve. (%)
1	33(13 -19th Aug)	0.00	35.70	24.98	4.24	76.00	73.00
2	34(20-26th Aug)	0.00	32.05	24.02	12.08	84.57	78.28
3	35(27th Aug - 2nd Sep)	12.95	33.78	25.72	0.00	80.57	74.14
4	36(03-09th Sep)	10.89	33.27	24.76	3.00	82.42	73.00
5	37 (10-16th Sep)	5.89	34.18	25.70	1.40	82.57	73.43
6	38 (17-23rd Sep)	8.39	36.82	24.44	1.20	72.42	66.57
7	39 (24-30th Sep)	10.56	32.00	22.78	19.60	83.14	75.29
8	40 (01-07th Oct)	10.34	30.55	21.61	141.20	85.85	75.29
9	41 (08 -14th Oct)	14.74	30.28	20.81	0.00	83.85	68.57
10	42 (15-21st Oct)	15.47	30.51	22.01	34.50	84.71	73.57
11	43 (22-28th Oct)	17.34	30.74	20.30	76.00	91.14	80.29
12	44 (29 Oct -4th Nov)	18.31	30.41	17.65	0.00	88.57	75.57
13	45 (05-11th Nov)	8.10	30.27	17.91	0.00	87.14	64.86
14	46 (12-18th Nov)	0.00	30.58	18.20	0.00	87.05	67.40
15	47 (19-25th Nov)	0.00	29.34	20.97	0.00	85.28	68.59
16	48 (26 Nov- 2nd Dec)	0.00	29.31	16.3	0.20	86.12	65.37

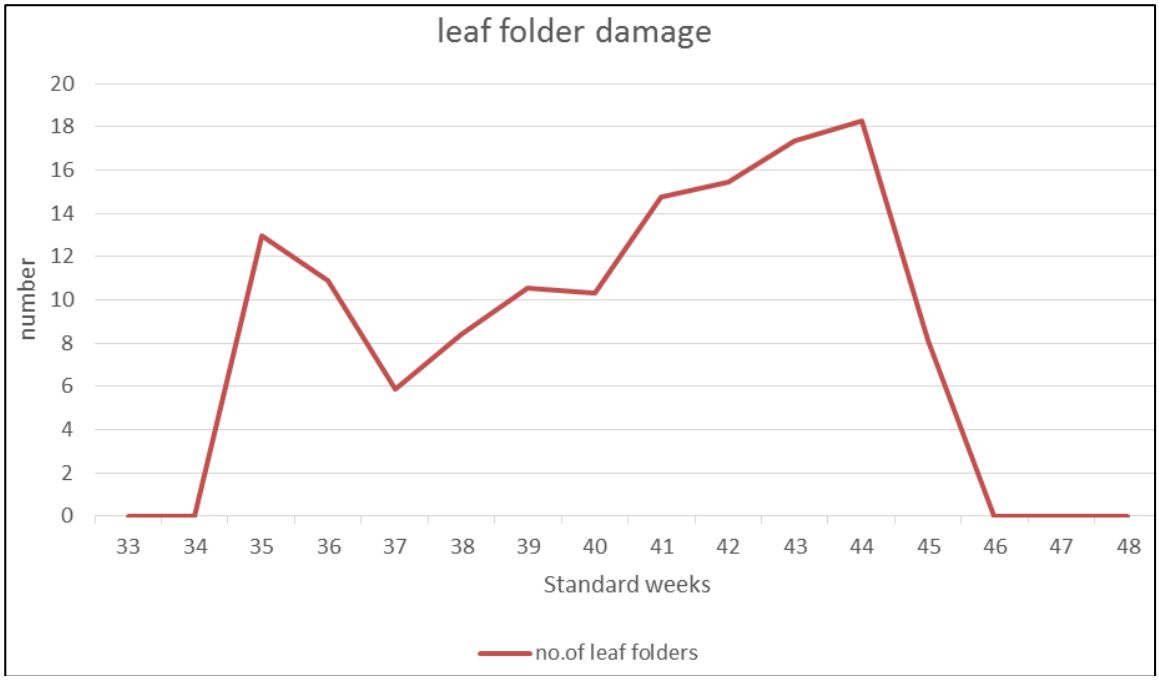

Fig 1: Incidence of Leaf Folder Infestation

Table 2: Correlation between rice leaf folder infestation with abiotic factors during *kharif*, 2017

Variable	Correlation Co-efficient (r)
X_1- Maximum temperature (^{0}C)	-0.088
X_2-Minimum temperature (^{0}C)	-0.009
X_3-Morning relative humidity (%)	0.232
X_4- Evening relative humidity (%)	0.400
X_5- Rain fall (mm)	0.296

r_{tab} (14,0.05)=0.497 r_{tab} (14,0.01)=0.62

Table 3: Multiple linear regressions – interaction of rice leaf folder infestation with abiotic factors during *kharif*, 2017

Variable	Regression Coefficient (r)	Standard error (B)	t-value
X_1- Maximum temperature (^{0}C)	0.398	2.196	0.1814
X_2-Minimum temperature (^{0}C)	-0.477	1.322	-0.3609
X_3-Morning relative humidity (%)	0.106	1.220	0.0874
X_4- Evening relative humidity (%)	0.583	0.761	0.7662
X_5- Rain fall (mm)	0.017	0.058	0.3045

Intercept (a) = -0.453 F (cal) = 5.025

Percentage of variation attribute to the regression (R^2) = 20.08 % * Significance at 5

Conclusion

The incidence of leaf folder infestation started initially during 35th standard week with 12.95 per cent leaf folder infestation and attained peak during 44th standard week with 18.31 per cent leaf folder infestation per 5 hills. Later, again infestation got declined and there was no infestation from 46th standard week till the end of crop season. There was no significant correlation was existed between leaf folder infestation and weather parameters tested.

The correlation between the leaf folder infestation and all the weather parameters tested was non- significant. But, a significant and negative correlation existed between blast severity and maximum temperature (r = -0.561), minimum temperature (r = -0.632) and a

Significant and positive correlation with mean relative humidity (r = 0.672) and blast incidence. However, the correlation with other parameters tested was non-significant.

References

1. Ahmed H, Khan RB, Sharma D, Singh JVV, Saurav G. Seasonal incidence, infestation and trap catch of *Cnaphalocrocis medinalis* (Guenee) in rice. Annals of Plant Protection Sciences. 2010; 18(2):380-383.
2. Directorate of Economics and Statistics (D&ES), 2016-17.
3. Hyslops JA. Insects and weather; climate and man. United States Department of Agriculture, Washington, D.C. 1941; 20:503-504.
4. Khan ZH, Ramamurthy VV. Influence of weather factors on the activity of rice leaf folder, *cnaphalocrocis medinalis* (Guenee), Annals of plant protection science: 2004; 12(2):263-266.
5. Kumar P, Singh R, Pandey SK. Population dynamics of rice leaf folder*Cnaphalocrocis medinali*s (Guenee) in relation to the stage of the crop, weather factors and predatory species. Journal of Entomology Research. 1996; 20(3):205-210.
6. Sharma Ak, barche s, mishra pk. Seasonal activity of *sogatella furcifera* H., *cnaphalocropcis medinals* G. and *mythmbaseparata* w. in relation to weather parameter in central India. A Journal of multidisciplinary advance research. 2004; 20(2):145-152.
7. Chakraborty K, Chandradeb D. Incidence of adult leaf folder, *Cnaphalocrocis medinalis* (Lepidoptera Pyra) on paddy crop in the Agro-Climatic conditions of the Northern parts of West Bengal, India. World Journal of Agricultural Sciences. 2011; 7(6):738-742.
8. Chattergee PB. Rice leaf folder infestation in west Bengal. International Rice Research Newsletter. 1987; 12 (4):444.
9. Dhaliwal GS, Malhi SSJS, Sukhuja HS. Effect of date of transplanting of rice on the incidence of leaf folder. Journal of Insect Science. 1988; 1(2):191-192.
10. Goyal A, Mahal MS. Threshold temperature and thermal constant for the development of rice leaf folder *Cnaphalocrocis Medinalis* (Guenee). Journal of Insect Science. 2009; 22(1):23-26.