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RESEARCH ARTICLE

Study on population build up of rice leaf folder, *Cnaphalocrocis medinalis* (Guenee) in relation to weather factors

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Mange Ram**Abstract**

Populations of rice leaf folder, *Cnaphalocrocis medinalis* (Guenee) were studied in basmati rice. The observations recorded from second fortnight of July (29th standard week) to harvest of the crop. The pest population recorded as number of larvae per hill ranged from 0.50 to 5.10 larvae. The larval population was low during July to fourth week of August and varied between 0 to 1.90 larvae per hill. The pest population increased from end of August to start of September and reached its peak (5.10 larvae/hill) during 38th standard week i.e. second fortnight of September. All the weather parameters showed negative correlation with larval population such as maximum ($r=-0.0909$) and minimum ($r=-0.3796$) temperature. Negative correlation was also found with relative humidity ($r=-0.1146$) and rainfall ($r=-0.5108$) during crop season i.e. *Kharif* 2011.

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Introduction

In India, basmati rice is grown mostly in northern India and in part of Pakistan touching India. India's Basmati rice production has been sizzling from around 3 million tonne in 2008-09 to 4.5 million tonne in 2009-10 season and is estimated to have zoomed further to 7.2 million tonnes (including both traditional & evolved varieties) in marketing year 2010-11. After record surge for the past couple of years, the basmati rice production for 2011-12 is likely to increase by 10-12 per cent to reach around 7.90-8 million tonnes (APEDA, 2011). Rice leaf folder, *Cnaphalocrocis medinalis* larvae feed on open leaves but later feed inside the rolled leaf formed by folding the leaf longitudinally with a sticky substance. The larvae chew inside the fold by scraping the green matter. The scraped leaves become membranous, turn whitish and finally wither. Weather factors are the major regulating causes for the insect pest populations under field circumstances. Certain factor support and other disfavor their multiplication and movement; therefore, it results in serious outbreaks of different insect pests (Hyslops, 1941).

Material and Methods

The experiment was carried out during *Kharif* 2011, at crop research centre of Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, in a randomized block design with three replications. Twenty five days old seedlings of basmati rice Pusa basmati-1 were transplanted at 5x4 m² plot size. Observation on population buildup of rice leaf folder was recorded on ten randomly selected hills from each untreated plot. These plants observed regularly at weekly interval. Larval populations in leaves were counted per hill starting from the transplanting till the harvesting of crop.

Result and Discussion

Populations of rice leaf folder, *C. medinalis* (Guenee) were studied in basmati rice. The observations recorded from second fortnight of July (29th standard week) to harvest of the crop (Table 1). The pest population recorded as number of larvae per hill ranged from 0.50 to 5.10 larvae during the crop season *Kharif* 2011. The larval population

Table1. Population build up of *Cnaphalocrocis medinalis* (Guenee) in relation to weather factors

S.W.	Date	Mean larval population/hill	Weather parameters						
			Temperature °C			Relative Humidity (%)			Rainfall (mm)
			Max.	Min.	Mean	Mor.	Even.	Mean	
29	July,19-25	0.00	33.70	26.00	29.85	89.71	79.57	84.64	0.70
30	July,26- Aug,01	0.00	34.00	25.50	29.75	87.71	76.14	81.93	7.20
31	Aug, 02-08	0.00	36.00	26.30	31.15	87.00	77.14	82.07	1.00
32	Aug, 09-15	0.50	33.10	25.30	29.20	90.00	85.14	87.57	7.85
33	Aug,16-22	1.20	32.30	24.60	28.45	91.85	81.42	86.63	12.34
34	Aug,23-29	1.90	34.40	25.40	29.90	63.98	66.00	65.03	7.20
35	Aug,30-Sep,05	2.30	35.00	26.30	30.65	55.54	57.10	56.32	0.00
36	Sep,06-12	2.60	33.50	25.10	29.30	91.00	87.78	89.35	4.21
37	Sep,13-19	3.40	33.70	24.90	29.30	92.00	82.28	87.14	1.20
38	Sep,20-26	5.10	33.50	21.10	27.30	91.42	73.00	82.21	0.00
39	Sep,27-Oct,03	4.60	32.80	21.60	27.20	91.14	76.57	83.85	0.00
40	Oct,04-10	4.20	33.30	20.20	26.75	91.00	71.28	81.14	0.00
41	Oct,11-17	4.00	33.30	17.30	25.30	90.42	58.28	74.35	0.00
42	Oct,18-24	3.80	32.30	15.50	23.90	89.85	58.42	74.13	0.00
43	Oct,25-31	3.60	32.90	13.00	21.95	89.00	59.71	74.35	0.00
44	Nov,01-07	3.00	29.42	13.61	21.51	89.00	56.85	72.92	0.00
45	Nov,08-14	2.60	29.42	12.54	20.98	88.85	51.28	70.06	0.00
46	Nov,15-21	2.30	27.14	12.32	19.73	88.57	63.00	75.78	0.00
47	Nov,22-28	1.40	27.57	10.44	19.00	88.14	57.00	72.57	0.00

was low during July to fourth week of August and varied between 0 to 1.90 larvae per hill. The pest population increased from end of August to start of September and reached its peak (5.10 larvae / hill) during 38th standard week. i.e. second fortnight of September. During this period mean temperature, relative humidity and rainfall ranged from 27.30 to 30.65°C, 56.32 to 82.21 per cent and 0 to 4.21 mm, respectively. The pest population declined thereafter and varied from 1.40 to 4.60 larvae/ hills when mean temperature and relative humidity varied from 19.00 to 27.20°C and 72.57 to 83.85 per cent, respectively. The activity of pest suddenly decreased in November i.e. 46th and 47th standard week, perhaps due to the reason that no more new leaves were produced. These observations are in agreement with the earlier finding of Kumar *et al.* (1966), Kaul *et al.* (1999) and Alvi *et al.* (2003) who reported the peak activity of *C. medinalis* from mid of August to the September end. However, Khan and Ramamurthy (2004) and Khan *et al.* (2004) reported its peak activity in the month of October.

The correlation studies between larval population and weather parameters showed negative correlation with maximum ($r=-0.0909$) and minimum ($r=-0.3796$) temperature. Negative correlation was also found with relative humidity ($r=-0.1146$) and rainfall ($r=-0.5108$) during crop season i.e. *Kharif* 2011. All the Weather parameters showed negative correlation with larval population indicating that they have no definite role in population dynamic of *C. medinalis*. Bhatnagar *et al.* (1999), Khan and Ramamurthy (2004), Khan *et al.* (2004) have also reported the negative correlation with temperature, relative humidity and rainfall. However, Patel *et al.* (2011) reported that the maximum temperature had positive correlation with the larval population of rice leaf folder.

References

- Alvi, S. M., Ali, M. A.; Chaudhary, S. and Iqbal S.(2003).** Population trends and chemical control of rice leaf folder, *Cnaphalocrocis medinalis* on rice crop. *International Journal of Agriculture and Biology*, 5 (4): 615-617.
- APEDA, (2011).** Agricultural and Processed Food Products Export Development Authority, Ministry of Commerce & Industry, Govt of India, New Delhi.
- Bhatnagar, A., Saxena, R.R. and Bhatnagar, A. (1999).** Environmental correlates of population build up of rice insect pest through light trap catches. *Oryza*, 36 (3):241-245.
- Hyslops, J. A. (1941).** Insects and weather; climate and man. United States Department of Agriculture, Washington, D. C.: 503.
- Kaul, B.K., Singh, R. and Singh, R. (1999).** Seasonal abundance of rice leaf folder in Kangravally of Himachal Pradesh, India. *Oryza*, 36 (1): 96-97.
- Khan, Z. H. and Ramamurthy, V. V. (2004).** Influence of weather factors on the activity of rice leaf folder, *Cnaphalocrocis medinalis* (Guenee). *Ann. Pl. Protec. Sci.*, 12 (2): 267-270.
- Khan, Z. H., Gupta, S. L. and Ramamurthy, V. V. (2004).** Population dynamics of rice leaf folder (*Cnaphalocrocis medinalis*) on Pusa Basmati-1 cultivar in relation to weather factors in Delhi. *Indian J. Ent.*, 66 (4): 361-363.
- Kumar, P., Singh R. and Pandey S.K. (1996).** Population dynamics of rice leaf folder, *Cnaphalocrocis medinalis* (Guenee), in relation to stage of the crop, weather factors and predatory spiders. *J. Ent. Res.*, 20 (3):205-210.
- Patel, H. N., Kadu, R. V. and Landge, S. A. (2011).** Study on seasonal incidence of rice leaf folders (*Cnaphalocrocis medinalis* Guen. and *Pelopidas mathias* Fb.) of paddy and its correlation with weather parameters. *Int. J. Pl. Protec.*, 4 (1): 175-180.