RESEARCH PAPER | Zoology | Volume : 3 | Issue : 9 | Sept 2013 | ISSN - 2249-555X

Army Work – a Serious Sporadic Insect Pest of Rice in Rewa Region of Madhya Pradesh

KEYWORDS

Neeta Mishra	Geeta Choubey
Deptt. Of Zoology,Govt. Science College, Rewa (M.P.)	Govt M.H. College Home Science and Science For Women(Auto.), Jabalpur (M.P.)

Dinesh Prasad Patel	Amitabh Mishra
Deptt. Of Zoology,Govt. Science College, Rewa (M.P.)	Deptt. Of Zoology,Govt. Science College, Rewa (M.P.)

ABSTRACT *Results from a surveillance of occurrence and population buildup of army worm in rice crop during rainy season for 2 consecutive years (1999 and 2000) in Rewa district reveal that the infestation this pest was sporadic. Out of two dominating species of this pest, swarming caterpillars of army worm (Mythemna seperata Walker syn. Pseudatia seperata Walker) had severely damaged the well fertilized high yielding crop varieties viz., Kranti, IR-36 and IR-64 at boot stage in only one year (1999). The infestation was above to economic threshold level (ETL) in 4 blocks only out 8 blocks of the district. The infestation was controlled by repeated spraying of insecticides at fortnightly intervals. Mean relative humidity of evening hours and sunshine/day had strong correlations for the spread of this pest, while number of rainy days had its strong inverse relationships.*

Introduction

Rice is a major food-grain crop of the country and it is widely grown in north-eastern parts of Madhya Pradesh comprising Rewa district. In modern agriculture, high yielding rice varieties are extensively grown with the use of fertilizers and manures. Such cultivation pattern of rice accidentally or inadvertently offers infestation of a large number of insect-pests, which results in to severe loss in crop yields. Among these pests, two species of army worm i.e. swarming type caterpillar (Spodoptera marutia Bosid) and climbing type caterpillar (Mythimna seperata Walker Syn. Pseudatia seperata Walker) many times cause serious damage to rice crop. Cloudy weather conditions followed by rains during crop season are most favorable for the prevalence of this pest. The caterpillar of both species of the pest is damaging stage. The caterpillars hide themselves in lower sides of leaves or clumps of plants or grasses of bunds or cracks of soil during days hours and damage the crop during night. This pest starts cutting of tender leaves and stems at vegetative phase of crop and becomes too destructive at maturity stage by cutting the ear heads. In epidemic infestation, this pest cut the matured earhead into pieces and removes, all ear heads from the plants within 1 or 2 days. They feed only rachis of ear heads by distributed all grains in the field. Thus, this pest damages the crop more rather than feeding it. Many times, there is no need to harvest the crop due to the severe infestation of this pest. Swarming type caterpillars also defoliate the plants of entire field within 1 or 2 days during few hours. Climbing type of caterpillars has ability to move on the plants particularly in water submerged fields. This pest completes the life cycle of 5-6 generations within a crop-cycle. Since this pest damages the crop during night hours in swarms within a very short time without showing its appearance, hence it is named as "army worm." Though the infestation of this pest is sporadic depending on the prevailing weather conditions and cultural practices (varieties, time and method of sowing and fertilizer application etc.) of rice cultivation, it cause severe losses (40 to 100%) in crop yields (Dhamdhere, 1990 and Dale, 1994). The information on site specific pest incidence in relation to weather conditions and cultural practices of crop are meager for Rewa region. Hence, a study on survey of the spread of armyworm on rice has been undertaken to take timely and efficient pest management measures.

Methodology

A survey for occurrence and spread of army worm in rice crop was made on farmer's fields and Government Farms in Rewa District of Madhya Pradesh, during wet (rainy) season for 2 consecutive years. Five villages were selected in each of the 8 blocks of the district for the regular surveillance programme. Five fields were marked in each selected village to record the data pertaining to out beak and population build-up of the pest during the entire growing season (July and October) of rice crop. Mean while, the information pertaining to crop parameters in the fields and prevailing weather conditions in the concerning blocks were also recorded. The correlations between the population of the pest and weather parameters were determined to predict the forecasting of pest-spread for its efficient control measures as per suggestions of Chatterjee (1997).

Results and Discussion

Though the presence of both swarming and climbing caterpillars was scatterly seen in surveyed area in rice crop from vegetative phase to maturity phase in both years, the epidemic of swarming army worm was recorded only at boot stage of crop during the year 1999 only. The population of pest was quite lesser than 2 pests/hill at other growth stages, which is economic threshold level (ETL) as per suggestions of Dhamdhere (1990). It is obvious from the data pertaining to mean population of caterpillars/hill at boot and earhead formation stages in various varieties of crop in different blocks of the district that its infestation was most severe at boot stage than ear head stage of the crop (Table 1). Farmers had used insecticides (monocrotophos + Nuvan) at boot stage of the crop, which attributed to reduced infestation of pest at ear head stage. Among the different rice varieties grown under varying systems, transplanted cv Kranti with the use of fertilizers had significantly maximum intensity (6.86 caterpillars/hills) of this pest, which was at par to direct seeded rice cv. IR-36 (5.25 larvae/hill). Lehi IR-36 (4.50 larvae/hill) with fertilizers was next to them being comparable to the IR-64 with fertilizers and direct seeded IR-36 without fertilizers. Infestation of this pest was significantly lesser in local and Kalinga-3 varieties.

Though the population of this pest was reduced at ear head stage, it was quite above than ETL in direct seeded IR-36 with fertilizers among all rice cultures and in Hanumana block

Volume : 3 | Issue : 9 | Sept 2013 | ISSN - 2249-555X

among all blocks. At ear head stage direct seeded IR-36 and significantly maximum infestation (2.82 larvae/hill) of this pest among all varieties. Several workers have been also reported similar infestation of this pest due to the effect of crop varieties, fertilizer application and pest management (Tiwari, 2000 & Singh et al., 2003).

Among different blocks, the infestation of this pest was maximum (7.80 larvae/hill) in Rewa, closely followed by in Hanumana (6.91 larvae/hill) block at boot stage. The position of next block was Teonthar (5.86 larvae/hill) and Mauganj (5.11 larvae/hill) in descending order. Other blocks had lesser infestation than ETL. At earhead stage of crop, Hanumana block had significantly maximum intensity (4.56 larvae/hill) of this pest among all mainly due to without repeated spraying of insecticides. But other blocks had population of this pest quite lesser than ETL at this stage.

Both maximum and temperature had positive relationships with the intensity of this pest, while rainfall had shown its negative relationships. But these relationships did not reach to the level of significance (Table 2). Relative humidity of evening hours and sunshine hours/day had very strong positive associations with the intensity of this pest, while number of rainy days had shown its strong inverse relationships. These results are in close conformity with the findings of Gupta et al. (1998) and Singh et al. (2003) also. Thus, it could be said that bright sunlight, high relative humidity and less rainy days enhanced the infestation of sworming army worm.

Table 1- Mean number of larvae of swarming armyworm/ hill on different rice cultures at reproductive growth phases in different blocks of Rewa District.

Treatment	Reproductive growth phases	
	Boot stage	Earhead state
Rice cultures		
DS IR-36 (F)	5.25	2.82
DS IR-36 (UF)	3.45	1.23
Lehi IR-36 (F)	4.50	1.60
DS IR-64 (F)	4.28	1.30
DS Local (UF)	2.50	1.65
DS Kalinga-3 (F)	2.17	0.70
TR Kranti (F)	6.86	1.54
SEm±	0.71	0.32
CD (P=0.05)	2.07	0.94
Blocks	5.11	1.13
Mauganj	6.91	4.56
Hanumana	0.80	0.09
Naigarhi	1.70	1.52
Raipur Karchuliyan	7.80	1.65
Rewa	0.60	0.89
Sirmour	0.90	1.20
Jawa	5.86	1.85
Teonthar	0.43	0.16
SEm±	1.19	0.44
CD (P=0.05)		

DS – Direct seeded, TR – Transplanted, F – Fertilized, UF – Unfertilized

Table 2- Correlation coefficient (r) between weather parameters and population of swarming armyworm/hill at reproductive phases of rice in Rewa District.

Mean monthly weather parameters	Reproductive phases	
	Boot stage	Ear head stage
Rainfall (mm)	-0.01104	-0.02508
Rainy days (number)	-0.16708**	-0.20350**
Maximum temperature (^{0}C)	0.01648	0.04471
Minimum temperature (^{0}C)	0.07577	0.10903
Morning RH (%)	0.05317	0.03684
Evening RH (%)	0.21957**	0.23154**
Sunshine hours/day	0.21683**	0.29023**

* and ** significant at 5 and 1% level of probability, respectively, RH – relative humidity

REFERENCE Chatterjee, P.B. 1997. Plant protection techniques. Bharti Bhawan, Patna, pp. 146-158. | Dale, D. 1994. Insect-pest of rice plant-their biology and ecology (in) Biology and Management of Rice Insect, IRRI, pp. 363485. | Dhamdhere, S.V. 1990. Phansalon Ke Pramukh Hanikark Keet, Haryana Sahitya Academy, Chandigarh, pp. 374. | Gupta, V.K., Agrawal, K.K, Upadhyaya, A.P. and Upendra Shankar 1998. Effect of rainfall, number of rainy days and length of rainy season on productivity of paddy crop at Jabalpur. Abstr. National Seminar on Technological Advances in Agriculture and Livestock Production, JNKVV, Jabalpur, April, 2022, pp. 24. | Singh, S.S., Singh, J.P. and Deshraj Subramanian 2003. Dakshin Bihar Ke Danhar Kshetron men Khet Ki Prabandh Parisbhit Ka Dhan Par Keet Vyadhiyon Ke Prakop Se Sambandh. Bharitya Krishi Anusandhan Simit, pp. 125. | Tiwari, V.K. 2000. Succession of insect pests of paddy at Jabalpur district Thesis of M.Sc.(Ag.) Entomology, JNKVV, Jabalpur (M.P.). |