
OCCURRENCE OF ARMY WORM, *Mythimna separata* WALKER ON KHARIF SORGHUM

PATEL, D. R.,* PUROHIT, M. S. AND PATEL, R. K.

POLYTECHNIC IN AGRICULTURE
NAVSARI AGRICULTURAL UNIVERSITY,
BHARUCH, GUJARAT, INDIA

*Email: patel.devendra2829@yahoo.com

ABSTRACT

The present investigation was carried out at Agricultural Research Station, Navsari Agricultural University, Tanchha, Dist. Bharuch to study the population dynamics of *Mythimna separata* Walker on sorghum in relation to weather parameters during *kharif* 2007-08 and 2008-09. The incidence of army worm noticed that the population was initiated from 33rd standard week (second week of August). The average number of army worm ranged between 0.01 to 0.24 larvae per plant during the month of August to October. More or less two peaks of population level were observed, the first being in 36th standard week (first week of September, 0.24 larvae per plant) and second in 39th standard week (last week of September, 0.14 larvae per plant). Thereafter, the pest population declined gradually. The activity was low when crop was in early stage or at maturity stage. The correlation coefficient study revealed that the army worm population significantly and positively correlated with minimum temperature and morning relative humidity, indicating that when these climatic factors increased, the pest population increased significantly and vice versa. The other weather parameters had no or little impact on army worm population.

KEY WORDS: Army worm, correlation, *Mythimna separate*, sorghum, weather parameters

INTRODUCTION

Sorghum [*Sorghum bicolor* (L) Moench] is one of the most important drought tolerant crops, which allow farmers to use one third less water than similar crops such as corn. The area of sorghum cultivation is declined fast for the past 10 decades yet it will continue to be an important food grain in India, since its relative importance for alternate uses such as poultry and cattle feed, livestock forage, starch, sugar, alcohol and other uses will increase. It is, therefore, of paramount importance that technological developments are extended to increase the productivity and sustainability of sorghum production. In India, sorghum is cultivated in 7.53 mha, of which 2.89 mha is cultivated during rainy and *kharif* season with a production of 3.05 mt (Anonymous, 2010). The major sorghum growing states are Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu. In Gujarat the area under sorghum cultivation is 1.17 lakh ha with a production of 1.28 lakh tones and productivity being 1151 kg/ha (Anonymous, 2011).

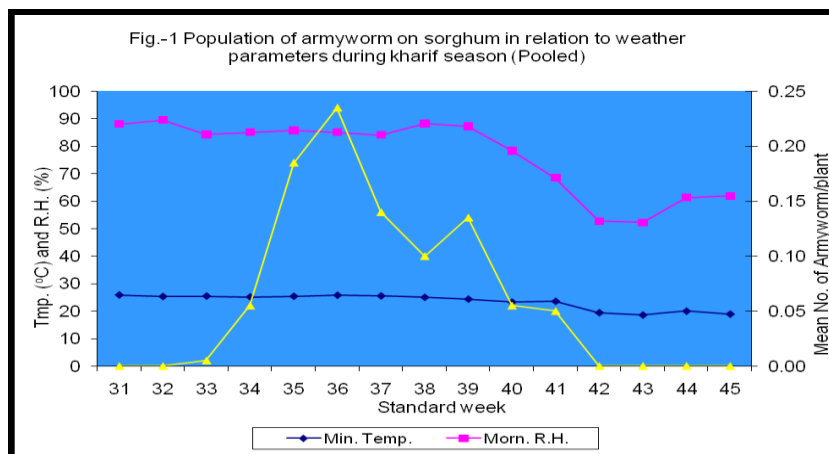
The army worm, *Mythimna separata* Walker has attained major pest status in recent years on several field crops including rice, wheat, maize, sorghum and sugarcane. The pest activity begins with the onset of monsoon rains; its population builds up gradually to reach a peak by the end of August, causing heavy losses to many crops (Giraddi and Kulkarni, 1985).

MATERIALS AND METHODS

The present investigation was carried out at Agricultural Research Station, Navsari Agricultural University, Tanchha, Dist. Bharuch to study the population dynamics of army worm and its relation to weather parameter during *Kharif* 2007-08 and 2008-09. The sorghum crop (variety GJ 38) was grown in an area of 400 m² during both the seasons and raised successfully by adopting recommended agronomical practices. For recording observations, whole plot was divided in to 20 sectors and 5 plants were randomly selected from each spot. Observations on population of army worm were recorded from the same selected five plants from the each sector at weekly interval throughout the growing season. The crop was kept free from any insecticidal application. In order to study the effect of weather parameters, viz., maximum temperature, minimum temperature, average temperature, morning relative humidity, evening relative humidity, average relative humidity, sunshine hours, rainy days and rainfall on population of army worm, correlation coefficient and multiple/simple regression were worked out.

RESULTS AND DISCUSSION

The data recorded for army worm population were presented in Table 1 showed that the larval population was observed in between 34th standard week (third week of August) to 41st standard week (second week of October) during *kharif* 2007-08, ranging from 0.01 to 0.16 larvae per plant with a maximum of 0.16 larvae per plant during 36th standard week (first week of September). During *kharif* 2008-09, it appeared in between 33rd standard week (second week of August) and 40th standard week (first week of October) and ranging from 0.01 to 0.31 larvae per plant with a maximum during first week of September (36th standard week, 0.31 larvae per plant). The pooled data of two years (Table 1 and Figure 1) revealed that the army worm population was initiated from 33rd standard week (second week of August). The average number of army worm ranged between 0.01 to 0.24 larvae per plant during the month of August to October, while the population was not recorded in early and later stage of crop.



More or less two peaks of population level were observed, the first being in 36th standard week (first week of September, 0.24 larvae per plant) and second in 39th standard week (last week of September, 0.14 larvae per plant). Thereafter, the pest population declined gradually. The activity was low when crop was in early stage or at maturity stage. Similar observation was made by Mote (1984), who noted higher army worm damage on sorghum during September.

The correlation coefficient study (Table 2) revealed that the army worm population significantly and positively correlated with minimum temperature and morning relative humidity, indicating that when these climatic factors increased, the pest population increased significantly and vice versa. The correlation with maximum temperature, average temperature, evening relative humidity, average relative humidity, rainfall, rainy days, sunshine hours and wind velocity were non-significant, indicating that no or little impact of these weather parameters on army worm population.

The multiple linear regression equation fitted for army worm was,

$$Y = -0.2254 + 0.0103 \text{ min temperature} + 0.0006 \text{ MRH} (R^2=0.1875)$$

Multiple regression coefficient (R^2) was 0.1875 which explaining that there was 18.75 per cent variation in population due to minimum temperature and morning relative humidity.

Kulkarni *et al.* (1974) reported that army worm appeared from July to November with peak incidence during August on sorghum in Karnataka, which is slightly differing from present investigation. The variation in present finding may be due to effect of ecological condition prevailing in the area and population density of army worm in the locality. Rajgopal and Channabasavanna (1975) reported that this pest was common on maize from July to October attacking the crop commencing from one month and lasting till harvest in Karnataka. The variation in population might be due to effect of weather parameters and other factors. In case of correlation, present finding is in close agreement with Mallapur (1997), who reported the meteorological factors like minimum temperature and average relative humidity positively correlated with army worm population.

CONCLUSION

The incidence of army worm noticed from second week of August and remained up to second week of October, ranged between 0.01 to 0.24 larvae per plant with a maximum (0.24 larvae per plant) during first week of September. Abiotic factors, minimum temperature and morning relative humidity had significant and positive correlation with army worm population on sorghum.

REFERENCES

- Anonymous (2010). Ministry of Agriculture, Department of Agriculture and Cooperation. Status Paper on Millets. Directorate of Millets Development.
- Anonymous (2011). Gujarat.gov.in. State based on Final Fore-cast reports for the year.

-
- Giraddi, R. S. and Kulkarni, K. A.(1985). Biology of army worm, *M. separata* under laboratory conditions. *J. Farm systems*. **1**: 29-37.
- Kulkarni, K. A., Naidu, B. N. B. and Thimmaicy, G. (1974). Seasonal incidence of sorghum armyworm, *Pseudaletia separata* (Walker). *Sorghum News letter*, **17**: 36.
- Mallapur, C. P. (1997). Key mortality factors of oriental armyworm on sorghum. *J. Maharashtra Agric. Univ.*, **22** (3): 347-349
- Mote, U. N. (1984). Occurrence of armyworm on *rabi* sorghum. *J. Maharashtra Agric. Univ.*, **9** (2): 230.
- Rajgopal, D. and Channabasavanna, G. P. (1975). Insect Pests of Maize in Karnataka. *Mysore J. Agric. Sci.*, **9**: 110-121.

Table 1: Population of army worm, *M. separata* on sorghum variety GJ 38

Sr. No.	MW	WAS	Mean Armyworm Population Per Plant		
			2007-08	2008-09	Pooled
1	31	2	0	0	0
2	32	3	0	0	0
3	33	4	0	0.01	0.01
4	34	5	0.01	0.1	0.06
5	35	6	0.09	0.28	0.19
6	36	7	0.16	0.31	0.24
7	37	8	0.11	0.17	0.14
8	38	9	0.07	0.13	0.10
9	39	10	0.14	0.13	0.14
10	40	11	0.06	0.05	0.06
11	41	12	0.10	0	0.05
12	42	13	0	0	0.00
13	43	14	0	0	0.00
14	44	15	0	0	0.00
15	45	16	0	0	0.00

Where, MW = Standard Meteorological Week

WAS = Week After Sowing

Table 2: Correlation coefficient between *M. separata* and weather parameter.

Year	weather parameter										
	Temperature ($^{\circ}\text{C}$)			Humidity (%)			Rainfall (mm)	Rainy Days	Sunshine Hours	Wind Velocity	Evaporation
	Max.	Min.	Mean	Morn.	Even.	Mean					
2007-08	-0.291	0.445	0.416	0.407	0.295	0.344	0.585*	0.275	-0.204	-0.250	-0.271
2008-09	-0.008	0.481	0.375	0.469	0.368	0.410	-0.023	0.149	-0.189	-0.109	-0.178
Pooled	-0.102	0.431*	0.339	0.415*	0.310	0.355	0.155	0.179	-0.198	-0.190	-0.207

* Significant at 5% levels of significance

[MS received: July 28, 2012]

[MS accepted: August 11, 2012]