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Population dynamics of spotted pod borer (*Maruca vitrata* Fabricius) of black gram (*Vigna mungo* L. Hepper*)* ecosystem in mid hills of Meghalaya

P. Ganesh Kumar . N.S. Azad Thakur

College of Post Graduate studies in Agricultural Science, Central Agricultural University, Umiam (Barapani), Ri-Bhoi District, Meghalaya

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ABSTRACT

Experiment was conducted at College of agriculture, Kyrdemkulai and School of Crop Protection, College of Post Graduate Studies in Agricultural Sciences, Umiam (Barapani), Meghalaya during pre-kharif season, 2018. Spotted pod borer was first observed during 20th SMW (16th May, 2018) and its highest pest infestation was noticed during 23rd SMW (6th June, 2018) with a mean population of 2.85 larvae per plant. Correlation studies showed that spotted pod borer had significant and negative correlation with minimum temperature.

1. Introduction

Pulses are a significant group of crops that deliver high quality protein supplementing cereal proteins for mainly substantial vegetarian population of the country. They are usually grown on marginal soils both as sole and intercrop during kharif, rabi and summer seasons. They are recognized as a rich source of proteins constituting an important human diet after cereals and act as smart food as these are critical for food basket (dal-roti, dal-chawal). Among the different pulses, blackgram is one of the significant pulse crops grown all-over India. It is scientifically known as *Vigna mungo (L.)* Hepper and commonly called as Urd, Mash and Biri in India. Similar to the other pulses, black gram being a legume crop, enriches soil nitrogen content especially for the succeeding crop and thereby plays a key role in the cropping system with cereal grain crops and vegetable crops. In India, the per capita per day and annual availability of pulses is 52.9 g and 19.3 kg respectively (GoI, 2017). But in North Eastern Hill Region, the per capita per day availability of pulses is 20 gas against a requirement of 34 g. This shows that the rate of pulse production is increased at much slower pace. One of the main reasons for this low production is that pulse crops did not receive due attention as was given to major cereal crops like rice and some commercial crops like turmeric and ginger. This low productivity may be due to several abiotic and biotic factors and it is well established fact that damage by insect pests which attack the plant from seedling to maturity is one of the foremost constraints in the realization of optimum yield of the black gram (Gupta *et al.,* 1998). Meteorological parameters like temperature, relative humidity, rainfall which vary greatly from place to place and season to season, play a key role in the development and build-up of insect species, which in turn determines the size of population and severity of damage in a region. They can be governed by the environmental factors as well as by the number of natural enemies (Becker, 1974).

*Corresponding author: ganeshchinnu33@gmail.com

2. Materials and Methods

The experiment was conducted at the experimental farm at College of agriculture, Kyrdemkulai and School of Crop Protection, College of Post Graduate Studies in Agricultural Sciences, Umiam (Barapani), Meghalaya. The black gram crop of variety "Uttara" was raised by following standard agronomic practices related in an area of 400 m^2 having 10 plots each measuring 40 m^2 on 4th April 2018 for one season. Population of different major insect pests on 50 randomly selected and tagged plants in 10 different plots @ 5 plants per plot were recorded at weekly intervals from germination to harvesting stage. These plants were examined weekly to check for the presence or absence of pests associated with black gram. Observations were taken throughout the cropping season from first appearance of the pest until the harvest of the crop and these observations were taken during early hours of morning from 6 to 9 am and late hours of evening, when most of the insects are less active. Pod borer infestation was recorded by counting the number of infested pods per plant taken from 5 randomly selected plants from each plot and then pooled for analysis. The weekly meteorological data [maximum and minimum temperature (°C), relative humidity (RH per cent), rainfall (mm)] during the crop growing period in pre-*kharif* 2018 was collected from the Division of Agricultural Engineering, ICAR Research Complex for NEH region, Umiam, Meghalaya and the correlation analysis was done by finding out the correlation coefficient, which was calculated by using method given by Pearson (1973).

3. Results and Discussion

The incidence of *Maruca vitrata* was found during 20th SMW with an average population of 0.78 larvae per plant. Afterwards, its population increased slowly and attained its highest population of 2.65 larvae per plant during 23rd SMW and then declined to its lowest level (0.61 larvae per plant) on 26th SMW. Correlation studies of weather parameters with the pest population indicated that *M. vitrata* had shown significant and negative correlation (r = -.757*) with minimum temperature. However, all the remaining weather parameters showed non-significant correlation with pest population. Similar results are also reported by Shivaraju, 2009 who stated that pest population was more active during maximum flowering time and later declined slowly with age of the crop as observed in present findings and also reported that the spotted pod borer incidence in black gram is significant and negatively correlated with minimum temperature similar to present study.

Table 1. Seasonal abundance of spotted pod borer or bean pod moth (*Maruca vitrata* Fabricius) in black gram ecosystem during pre-*kharif* season, 2018

SMW (Date of observation)	Mean no. of larvae per plant	Temperature (^{0}C)		Relative humidity (RH %)		Rainfall (mm)
		Maximum	Minimum	Morning	Evening	
20 (16th May' 18)	0.78	25.81	16.42	87.57	76.71	10.76
21 (23rd May' 18)	1.20	27.32	18.54	83.42	76.42	07.30
22 (30th May' 18)	1.68	28.54	18.81	89.00	68.14	12.05
23 (6th June' 18)	2.65	28.70	18.92	85.14	74.71	17.45
24 (13th June' 18)	1.51	26.85	20.34	90.71	80.71	22.43
25 (20th June' 18)	0.94	28.07	20.21	85.71	79.71	13.60
26 (27th June' 18)	0.61	27.95	20.71	91.71	84.14	17.25

(Total number of plants taken for observation (n) = 50 plants)

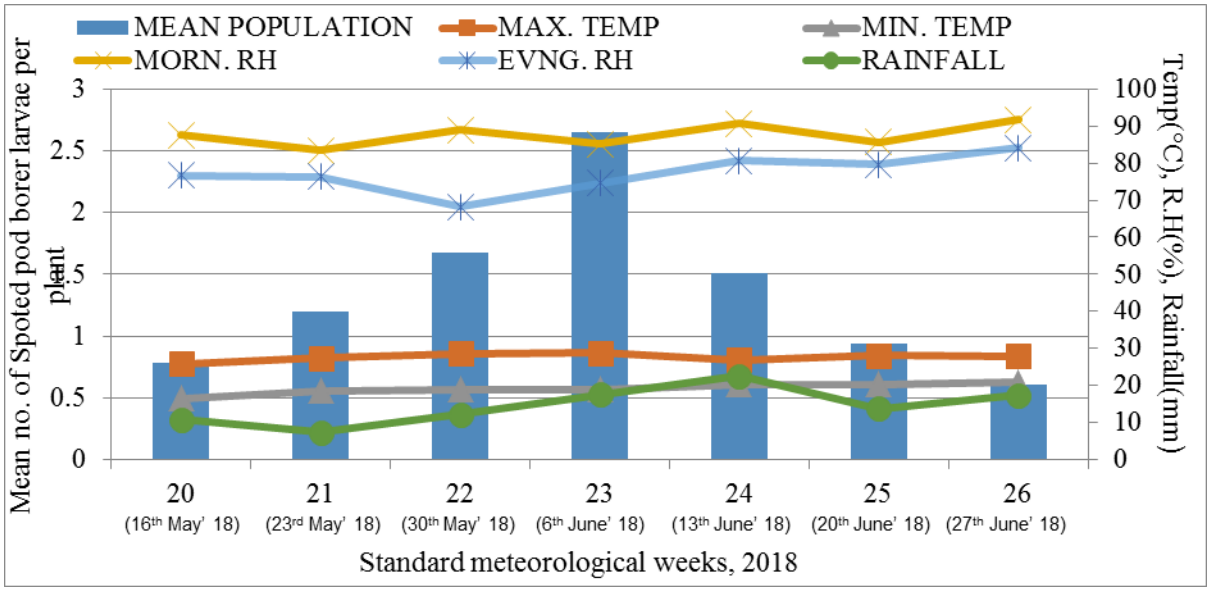

Figure 1. Seasonal abundance of spotted pod borer (*Maruca vitrata* Fabricius) in black gram ecosystem during pre-*kharif* season, 2018

4. Conclusion

Spotted pod borer infestation was more active during flowering stage and showed significant and negative correlation (r = -.757*) with minimum temperature.

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6. References

Becker PC (1974). Pest of ornamental plants. Ministry of Agriculture, Fisheries and Food, London.

GoI. (2017). Pulses in India: Retrospect & Prospects, Government of India, Ministry of Agriculture & Farmers Welfare. https://farmer.gov.in/ image default/ prospects_2017.pdf. Accessed 16 July 2018.

Gupta HS, Sarna BK, and Sahay G (1998). Present status and prospects of pulse production in north eastern hill region. *Indian Journal of Hill Farming* 11(1& 2): 77-87.

Pearson, K. (1973). Method of studying correlation. In: Gupta, C.B. (ed) An introduction to statistical methods. Vikash Publishing House Pvt. Ltd., New Delhi-2, pp. 371-378.

Shivaraju C. (2009). Pest complex of black gram, Vigna mungo (L.) with special reference to pod borers and their management. M. Sc. Thesis, Submitted to University of Agricultural Sciences, GKVK, (Bengaluru) India.