Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
JEZS 2018; 6(4): 1679-1681

Received: 15-05-2018
Accepted: 16-06-2018

Gajendra Singh
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

AK Singh
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

SK Yadav
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

SK Giri
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Kuldeep Verma
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Correspondence
Gajendra Singh
Department of Entomology
N.D. University of Agricultural and Technology Kumarganj, Faizabad, Uttar Pradesh, India

Studies on correlation between populations of major insect-pests with abiotic factors

Gajendra Singh, AK Singh, SK Yadav, SK Giri and Kuldeep Verma

Abstract
The present investigation was conducted to study the occurrence of major insect-pests of Indian mustard (*Brassica juncea* L.) during Rabi, 2016-2017 at major insect-pests from germination to pre-harvest stage of the crop at three farmers 'fields. In the village Pithla, Shivnathpur and Jorium of Narendra University of Agriculture and Technology, Kumarganj Faizabad total of five insects namely mustard sawfly, mustard aphid, painted bug, cabbage butterfly and Coccinellids was found associated with mustard crop of these first were found as pests and the Coccinellids as the predator of aphids. The aphid population build up significant negative correlation with minimum temperature (-0.469*) and non-significant negative correlation with maximum temperature (-0.283) and sunshine hours (-0.098) while it showed significant positive correlation (0.079*) with RH.

Keywords: Indian mustard, correlation coefficient, insect-pests with weather parameters

Introduction
Oilseeds crop play an important role in agriculture economy of India. Constitutes the second largest agriculture product in the country next after food grains 47.80 lakh in country Area under mustard cultivation in India as 36.15million ha with production of 71.09 mt. Rapeseed-mustard oil production increased from1.94 million MT from 2014-15 to 2.11 million MT in 2015-16 European Union is expected to be top producer followed by China & Canada tonnes and the national productivity (Anonymous, 2016) [1].

Indian mustard is a major winter (*Rabi*) season oilseed crop grown mainly in Northern parts of India. Farmers generally start sowing during late October which continues till late November In Uttar Pradesh the crop was grown on 0.82 m ha with production of 0.90 MT and productivity of 1262 kg/ha (FAO, 2015) [5].

The crop starts flowering in the months of December to January and harvesting season start mainly from mid- February to April month. Mustard seed is the third biggest source of vegetable oil in the world after soybean oil and palm oil. It is the second largest source of protein meal in the world after soybean meal. Oil content in rapeseed & mustard varies from 33% to 46% and average oil recovery is around 32% to 38%. After oil extraction, the remaining part of the seed is used to produce rapeseed/mustard meal an important component of cattle and poultry feed. Being a winter crop, it requires a temperate climate to prosper.

A dozen of insect-pests have been found associated with the crop out of which mustard sawfly, mustard aphid are the important pests of rapeseed- mustard (Bakhetia and Sachan 1997, Bakhetia and Sekhon 1989) [2, 3]. The incidences of insect-pests cause lower production and productivity of mustard due to direct and indirect damage. The present study was under taken to the know association the different association of different insect population. To record the correlation between populations of major insect-pests with abiotic factors.

Materials and Methods
The mustard crop was regularly monitored for occurrence of major insect-pests from germination to pre-harvest stage of the crop at three farmers 'fields- In the village Pithla, Jorium and Shivnathpur. The occurrence of insect-pests was recorded on ten randomly selected from each field from weekly interval and are presented in (Table-1). The mode of observations for different insect-pests and natural enemies has been given below.

Table 1: Correlation coefficient between incidence of insect-pests and weather parameters during *Rabi*, 2016-17

S. No.	Insect- pests	Temperature(0C)		RH (%)	Rainfall(mm)	Sunshine (hrs)
		Min	Max			
1.	Mustard Sawfly	-0.259	-0.402	-0.116	0.499*	-0.427
2.	Mustard aphid	-0.469*	-0.285	0.285*	0.079	-0.098
3.	Painted bug	-0.358	-0.619*	-0.149	0.602*	-0.565*
4.	Cabbage butter fly	-0.058	0.131	-0.114	-0.254	0.281
5.	*Coccinella* spp.	-0.322	-0.062	0.098	-0.127	0.139

Results and Discussion

Studies on correlation coefficient between incidence of insect-pests and weather parameters (Temperature (0C), RH (%), Rainfall (mm), Sunshine (hrs during Rabi, 2016-17 The mustard sawfly populations build up showed non-significant negative correlation with minimum, maximum temperature, relative humidity and sunshine while positive correlation was found with rainfall. This is a partial agreement with findings of Gour and Pareek (2003a) [4] who found no significant positive correlation with any of the abiotic factors except relative humidity which showed positive correlation and negative with sawfly population build up. This is in contrary with findings of Singh *et al.,* (2015) [6] who found non-significant and positive correlation and negative correlation maximum temperature sunshine hours. The populations build up of mustard sawfly showed significant positive correlation with minimum relative humidity. The population build up of mustard sawfly showed significant negative correlation minimum temperature and non-significant negative correlation maximum temperature and sunshine hours. The population build showed significant with relative humidity and non-significant with positive correlation rainfall. The present findings are in partial agreement with the findings of Rana *et al.,* (1993) [7] who found significant negative correlation with temperature has findings of significant negative correlation with relative humidity and rainfall with present findings this is also in with the findings. Gour and Pareek (2003a) [4] reported a negative correlation the maximum and minimum temperature and relative humidity in case of aphid population build up is an accordance with the present findings is also supported by Singh *et al*., (2007) [9] who found that aphid population was significant negative correlation with minimum and maximum temperature. However this finding of negative correlation of RH and rainfall with aphid population is in contrary with the present findings. The present findings are also in accordance with findings who found a positive correlation with minimum and maximum temperature and significantly negative with relative humidity finding.

The present findings is also in accordance with Shukla *et al.,* (2014) [10] who found positive correlation with rainfall and relative humidity negative correlation with minimum and maximum temperature these findings are also in contrary with finding who found that the mustard aphid population build up in maximum temperature while the findings of non-significant negative correlation with minimum temperature and non-significant with positive correlation support this findings.

The population of painted bug (Table-1) showed significant negative correlation with maximum temperature and sunshine hours and non-significant negative correlation with minimum temperature and relative humidity. The rainfall hours should significant positive correlation with rainfall this is in partial agreement with finding who found the maximum showed the highly rainfall and negative correlation with population build up painted bug. This is also contrary with the findings of Gaur and Pareek (2003a) [4] who population with any of the abiotic factor this findings with findings. Singh *et al*., (2015) [6] who found non-significant and positive correlation with minimum and maximum temperature and relative humidity.

The population of cabbage butterfly showed a non-significant negative correlation with minimum temperature, relative humidity and rainfall while it was negative significantly positively correlation with maximum temperature and sunshine hours. The results could not be compared with work with other scientist due to non-availability of literature.

The populations buildup of *Coccinellids* showed non-significant negative correlation with minimum temperature, maximum temperature and rainfall while it had a non-significant positive correlation with sunshine hours. The present findings in contrary with findings Singh *et al*., (2015) [6] who found that the population build up of *Coccinella* at the highly significant positive correlation the temperature but negative with rainfall and relative humidity.

Conclusion

The recorded on studies on occurrence of major insect-pests of Indian mustard during Rabi,201617 have been present in table-1 it is evident from the data was started since the vegetative stage and continued up to maturity of the crop. The lowest temp min mustard sawfly -0.259. Mustard aphid -0.469*, mustard sawfly RH (%) -0.116 Rainfall, painted bug 0.602*, painted bug Sunshine (hrs).

Acknowledgement

The authors are thankful to Department of Agricultural Entomology, NDUA &T Kumarganj, Faizabad and entire faculty for providing necessary facilities for conducting the investigation and valuable suggestions during the course of investigation.

References

1. Anonymous. Directorate General of Foreign Trade (DGFT), Department of Revenue and World Trade Organization (WTO). Commodity Profile for- Edible oil. 2016, 1-18.
2. Bakhetia DRC, Sachan GC. Identification and management strategies for insect- ests of rapeseed and mustard. Directorate of Extension, Ministry of Agriculture, Krisahi Vistar Bhawan, Pusa, New Delhi, 1997, 10-15.
3. Bakhetia DRC, Sekhon BS. Insect-Pests and their management in rapeseed - mustard. J Oilseeds Res. 1989; 6:269-299.
4. Gour IS, Pareek BL. Seasonal incidence of major insect pests of mustard crop and their correlation with abiotic factors under semi-arid region of Rajasthan. Journal of Insect Science (Ludhiana). 2003; 16(1, 2):37-40.
5. FAO. Food and Agriculture Commodities Production. (in) http:/ www mfao.org/3/a 4691e. 2015.
6. Singh, Sundar Pal Kumar, Shekhawat DK, Sanjeev

Kumar, Dheeraj CS. seasonal abundance of insect-pests on mustard varieties (Brassica spp.) and relation to abiotic factors. Annals of Biology (Ludhiana). 2015; 31(1):109-112.
7. Rana JS, Khokhar KS, Singh H, Sucheta. Influence of abiotic environment on population dynamics of mustard aphid, *Lipaphis erysimi* (Kalt.). Crop Research. 1993; 6(1):116-119.
8. Rashid MH, Rahman MM, Rahman AKM, Matiar Mohiuddin M, Choudhary AR. Study on the population dynamics of mustard aphid, *Lipaphis erysimi* (Kalt.) in relation to weather parameter in Chittagong Journal of Soil Nature. 2007; 3(1):20-22.
9. Singh Raj Singh, Diwan, Rao VUM. Effect of abiotic factors on mustard aphid (*Lipaphis erysimi* Kalt.) on Indian Brassica Indian. Journal of Argil. Res. 2007; 41(1):67-70.
10. Shukla Nisha. Seasonal incidence and relation to weather parameters of aphid and their natural enemies on okra, International Journal of Scientific and Research Publications. 2014; 4(3):1-3.