Original Research Article

Population Dynamics of Painted Bug (*Bagrada hilaris*), in Different Varieties of Brassica Oil Seed Crops

Shailendra Singh[1], Shilesh Kumar[2], Jitendra Singh[3], A. P. S. Dohare[1], Pradeep Kumar[4] and M. N. Lal[5]

[1]Krishi Vigyan Kendra Belipar Gorakhpur-273011, India
[2]BIOSTADT, India
[3]J.H.School Hardoi, U.P., India
[4]Ag. Department Faizabad, India
[5]NDUAT Faizabad, India
*Corresponding author

A B S T R A C T

Keywords	The study was carried out on the effect of various weather parameters like minimum and maximum temperature, minimum and maximum relative humidity, rainfall and sunshine on incidence of painted bug *Bagrada hilaris* in different *Brassica* spp. *Brassica juncea* (Narendra rai), *Brassica juncea* (Vardan), *Brassica campestris* (YST-151), *Brassica campestris* (BSH-1), *Eruca sativa* (T-27) are five varieties. Incidence of *Bagrada hilaris* in varieties Narendra rai, vardan, YST-151, BSH-1, and T-27 all are positively correlated with maximum temperature under unprotected treatments.
Population Dynamics of Painted Bug, (Bagrada hilaris), Brassica Oil Seed Crops	

Introduction

The oilseed crop especially *Brassica species* play vital role in agriculture of India. Among these, *Brassica species* is an important *Rabi* crop of eastern India. India ranks third position in rapeseed-mustard production in world after China and Canada. Mustard seeds are known by different names in different places.

Sarson, rai, toriaor lahi. The oilseeds obtained from different *Brassica species* show variations in the percentage of oil content and varies from 37-49 percent among these *Brassica species*.

The total area, production and productivity under rapeseed-mustard is 6.45 million hectares, 6.40 million tonnes and 990 kg/ha respectively. However in Uttar Pradesh the area under rapeseed mustard cultivation was about 0.82 million hectare and the production was about 0.90 million tonnes with average productivity of 1141 ka/ha which has more than national productivity (Anonymous 2010). Rapeseed-mustard is attacked by large number of insect-pests viz., *Athalia proxima, Bagrada hilaris, Lipaphis erysimi, Chromatomyia horticola, Spilarctica obliqua, Pieris brassicae.*

Among these insect-pests, Painted bug has become in important pest of *Brassica* crops as it attacks at seedling as well as maturity stage of crops (Atwal and Dhaliwal, 2005).

The incidence and peak activity of these pests are greatly affected by weather parameters. The weather parameter play an important role in application of management practices, hence the present study was carried out to see the effect of weather parameter on incidence of Painted bug *Bagrada hilaris*.

Materials and Methods

The studies were conducted at the Students Instructional Farm of N. D. University of agriculture and Technology, Kumarganj, Faizabad during Rabi 2011-2012. Mustard cultivar Narendra Rai, Vardan, YST-151, BSH-1, and *Eruca sativa* was sown 24th November, 2011 with four replication, 4.2×3 m^2 plot size and distance from row to row and plant to plant were maintained at 30cm×20cm, respectively.

The sowing was done on the second fortnight of November. In addition to this all normal recommended agronomical practices were followed.

The weather data was collected from the Dept. of Agro meteorology, N.D. University of agriculture and Technology, Kumarganj, Faizabad. The data were statistically analyzed as suggested by Panse and Sukhatme (1985) by calculating correlation between incidence of insects and weather parameters viz., minimum and maximum temperature, minimum and maximum relative humidity, rainfall and sunshine were worked out by following formula.

$$r = \frac{Cov.X.Y}{\sqrt{\sigma^2 X \times \sigma^2 Y}}$$

Where,

Y= Population; X= Weather parameter; σ = Summation.

Results and Discussion

The relationship between minimum and maximum temperature, minimum and maximum relative humidity, rainfall and sunshine with infestation of insects was established and correlation coefficient was worked out. The data presented in tabular form revealed that in cultivar *Brassica juncea* (Narendra rai) the incidence *Bagrada hilaris* was positively correlated with minimum temperature (0.0504), minimum and maximum R.H. (0.47649 and 0.19485) and negatively correlated with maximum temperature (-0.2146), rainfall (-0.1747) and sunshine (-0.507).
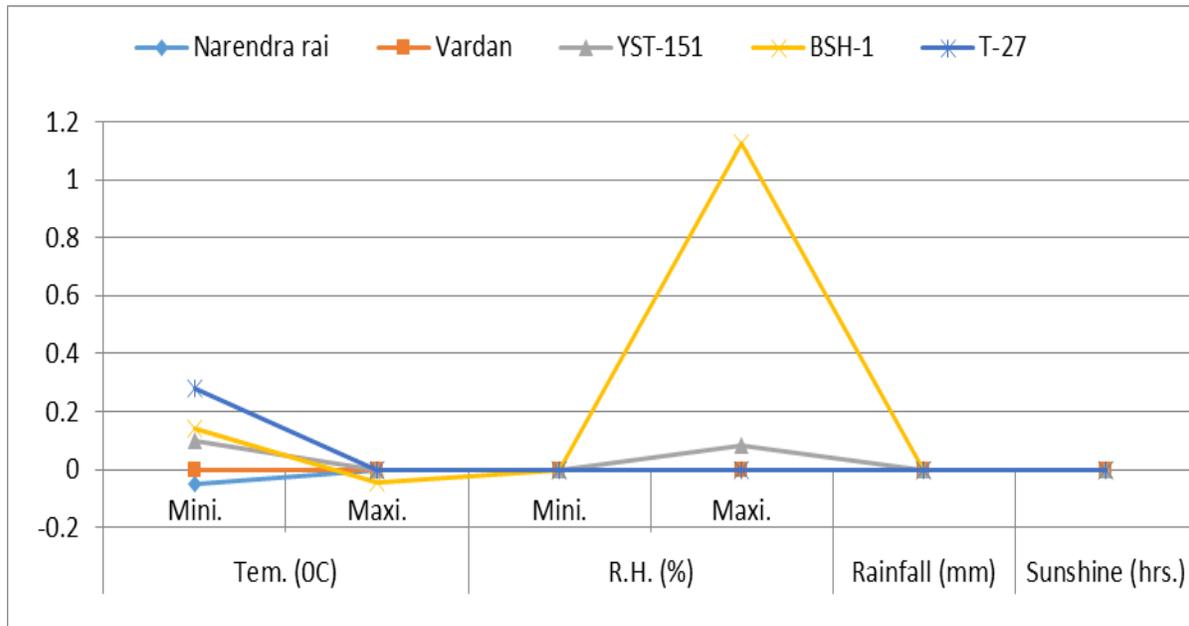
Cultivar *Brassica juncea* (Vardan) the incidence of *Bagrada hilaris*was positively correlated with minimum and maximum R.H. (0.51461 and 0.63067) and negatively correlated with minimum and maximum temperature (-0.2882 and -0.5764), rainfall (-0.1895) and sunshine (-0.5318). Cultivar *Brassica campestris* (YST- 151) the incidence of *Bagrada hilaris* was positively correlated with minimum temperature (0.0962), minimum and maximum R.H. (0.41274 and 0.08172) and negatively correlated with maximum temperature (-0.1267), rainfall (-0.1642) and sunshine (-0.4473).

Cultivar *Brassica campestris* (BSH-1) the incidence of *Bagrada hilaris* was positively correlated with minimum temperature (0.1398), minimum and maximum R.H. (0.36248 and 1.12727) and negatively correlated with maximum temperature (-0.0458), rainfall (-0.1874) and sunshine (-0.5047).

Table.1 Correlation coefficient between populations of painted bug on *Brassica* spp. and weather parameters during Rabi (2011-12)

Brassica species	Genotype	Weather parameter					
		Tem. (⁰C)		R.H. (%)		Rainfall (mm)	Sunshine (hrs.)
		Mini.	Maxi.	Mini.	Maxi.		
Brassica juncea	Narendra rai	0.0504	-0.2146*	0.47649**	0.19485*	-0.1747*	-0.5070**
Brassica juncea	Vardan	-0.2882*	-0.5764*	0.51461**	0.63067**	-0.1895*	-0.5318**
Brassica campestris	YST-151	0.0962	-0.1267*	0.41274**	0.08172	-0.1642*	-0.4473**
Brassica campestris	BSH-1	0.1398*	-0.0458	0.36248*	1.12727**	-0.1874*	-0.5047**
Eruca sativa	T-27	0.2785*	-0.5893*	0.54488**	0.60628**	-0.1572*	-0.5384**

Note: *Significant at 5% and ** highly significant at 1%.

Cultivar *Eruca sativa* (T-27) the incidence of *Bagrada hilaris* was positively correlated with minimum temperature (0.2785), minimum and maximum R.H. (0.54488 and 0.60628) and negatively correlated with maximum temperature (-0.5893), rainfall (-0.1572) and sunshine (-0.5384).

References

Anonymous, 2010. Annual Progress Report. All India Co-ordinated Research Project on rapeseed-mustard, National Research Centre on rapeseed-mustard. Bharatpur, Rajasthan, India.

Atwal, A.S. and Dhaliwal, G.S. 2005. Agriculture pests of South Asia and their management, Kalyani Publishers, New Delhi, 505 P. 231-237.

Bakhetia, D.R.C. and Sekhan, B.S. 1989. Insect-pests and their management in rapeseed-mustard. *J. Oilseeds Res.,* (6), 269-299.

Jat, D.S.; Jat, M.C. and Sharma, M.M. 2006.

Seasonal incidence of insect-pests of mustard in relation to abiotic factors. Annals of Plant Protec. Sci., 14(2): 475-476.

Manzar, A.; Lal, M.N. and Singh S.S. 2000. Effect of temperature on incidence of mustard saw fly, leaf miner and painted bug on rapeseed-mustard (*Brassica spp.*) Ann. Pl. Protc. Sci., 8(1): 84-191.

Panse, U.G. and Sukhatme, P.V. 1985. Statistical methods for agriculture workers. *Indian Council Agric. Res.,* New Delhi pp. 526.