



## INCIDENCE STUDY OF MAJOR PESTS AND PREDATORS ON MUSTARD (*BRASSICA JUNCEA L*)

Yogesh D. Charjan\*, Sonali R. Wankhade\*\* & Shrikant P. Chikate\*\*\*

Associate Professor (Agronomy), Agricultural Research Sub-Centre, Achalpur,  
Amravati, Maharashtra

**Cite This Article:** Yogesh D. Charjan, Sonali R. Wankhade & Shrikant P. Chikate,

“Incidence Study of Major Pests and Predators on Mustard (*Brassica Juncea L*)”, International Journal of Scientific Research and Modern Education, Volume 2, Issue 1, Page Number 204-206, 2017.

**Copy Right:** © IJSRME, 2017 (All Rights Reserved). This is an Open Access Article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

### Abstract:

The present investigation was carried out during *Rabi*, 2016 at Agricultural Research Sub-Centre, Achalpur, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola (MH), India to study the seasonal incidence of major pests and predators on mustard crop. Results of the present investigation showed that, population of aphids attained its peak in 6<sup>th</sup> MW (7.4/ 5 cm twig) which was favoured by min. temp. of 28.43 °C and max. temp. of 33.71 °C with morning 74.86 % and evening 35.86 % humidity along with no rainfall. However, Peak incidence of leaf hopper was recorded in 1<sup>st</sup> MW (0.2 Larvae/plant) which was favoured by min. temp. of 27.51 °C and max. temp. of 33.00 °C with morning 78.50 % and evening 31.57 % humidity along with no rainfall. Predator, spider population was recorded in 6<sup>th</sup> MW (0.1) which was favoured by min. temp. of 28.43 °C and max. temp. of 33.71 °C with morning 74.86 % and evening 35.86 % humidity along with no rainfall.

**Key Words:** Seasonal Incidence, Major Pests. Predators & Mustard

### Introduction:

Mustard (*Brassica juncea L.*), the major edible oilseed brassica crop in India, is extensively grown traditionally as a pure crop as well as intercrop (or mixed crop) in marginal and sub-marginal soils in the eastern, northern and north western states of India. In India, it had the area of 6.3 m ha with production of 7.6 m tonnes and productivity of 11.90 q / ha. India contributes 28.3 and 19.8 per cent in world acreage and production, respectively (Anonymous, 2013). According to Bakhetia and Sekhon (1992), 38 insect pests are known to be associated with different stages of mustard growth in India. Among these, the leaf webber, *C. binotalis* is a serious pest causing yield loss of 13.2 to 81.8 per cent. Mustard aphid, *L. erysimi* is also one of the most destructive insect which is responsible for causing severe reduction in seed yield varying from 15.0 to 73.3% (Bakhetia and Sekhon 1989). According to Rao et al. (2013) Aphid appearance and population build up is found to be regulated by temperature and time to attain peak population was relatively short in warm humid climates than in cool climates. Excessive use of the chemicals to control this pest not only causes the economical restrain on farmers but also produces the harmful side effects on the environment as well as human being. The best way to overcome this situation is to destroy the pest at its initial stage of the life-cycle. This is possible if timely prediction of the occurrence of the pest can be made.

### Material and Methods:

In order to study the seasonal incidence of major pests on mustard, the crop was sown at Agricultural Research Sub-Centre, Achalpur, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during *rabi* 2016. The crop was grown in plot size of 10 m x 10 m keeping 45 cm x 20 cm spacing. The mustard variety ACN-9 was sown in the last week of November, 2016. All recommended management practices were followed for raising the crop. Weekly observations were recorded on randomly selected 10 plants. Aphid population count was recorded on 5cm central apical shoot while population leaf webber was recorded on whole plant. In order to study the effect of weather parameters, the simple correlation coefficients were worked out.

### Results and Discussion:

Based on regular monitoring during *Rabi*, 2016, mustard aphid and leaf webber were found attacking *Brassica* crops at different growth stages. Aphids were observed from 3<sup>rd</sup> MW (0.7 /5 cm twig) to 7<sup>th</sup> MW (4.9 /5 cm twig). It attained its peak in 6<sup>th</sup> MW (7.4/ 5 cm twig) which was favoured by min. temp. of 28.43 °C and max. temp. of 33.71 °C with morning 74.86 % and evening 35.86 % humidity along with no rainfall. Significantly negative correlation was recorded with morning humidity with aphid population. Arshad Ali and Rizvi (2012) reported that, on late (November 10 and 25) seeded cultivars, the maximum temperature, maximum relative humidity and evaporation are the key factors responsible in reducing the population of 3.06, 5.00 and 1.74 %, respectively. Sahoo (2012) observed that, natural appearances of the aphid on the yellow sarson variety, Binoy (B-9) was observed from 52<sup>nd</sup> standard week, with the peak population on 6<sup>th</sup> standard week and the aphid disappeared after 10<sup>th</sup> standard week. Bhati et al. (2015) found that, incidence of mustard aphid on BSH-1 was recorded from the 52<sup>nd</sup> to 10<sup>th</sup> SW with peak population of this insect 197.18 aphids /plant on 6<sup>th</sup> SW.

Leaf webber incidence was noticed in 1<sup>st</sup> MW (0.2 Larvae/plant) and continued up to 3<sup>rd</sup> MW. Peak incidence was recorded in 1<sup>st</sup> MW (0.2 Larvae/plant) which was favoured by min. temp. of 27.51 °C and max.

temp. of 33.00 °C with morning 78.50 % and evening 31.57 % humidity along with no rainfall. Significantly negative correlation was recorded with minimum and maximum temperature with leaf webber population. Pawar et al. (2010) revealed that the pest was active from 3<sup>rd</sup> week of November to 4<sup>th</sup> week of December. The pest population ranged between 1.10 to 9.20 larvae per plant throughout the season.

Table 1: Incidence of aphids on mustard crop as influenced by different weather parameters

S.No	MW	Date of Observation	Average No of Aphid	Weather Parameters				
				Temp Min.	Temp Max	R.H. (M)	R.H. (E)	RF (mm)
1	45	-	0.0	29.83	33.89	82.14	40.71	0.00
2	46	-	0.0	29.14	33.96	74.14	28.43	0.00
3	47	-	0.0	28.86	33.37	83.14	39.86	0.00
4	48	-	0.0	28.59	33.76	78.00	33.43	0.00
5	49	-	0.0	28.61	34.16	82.00	36.00	0.00
6	50	-	0.0	28.06	33.40	84.86	39.00	0.00
7	51	18.12.16	0.0	28.03	33.44	81.71	35.71	0.00
8	52	24.12.16	0.0	27.51	32.99	84.14	37.29	0.00
9	1	02.01.17	0.0	27.51	33.00	78.50	31.57	0.00
10	2	09.01.17	0.0	27.69	32.70	83.31	35.29	0.00
11	3	16.01.17	0.7	27.53	31.79	80.57	38.57	0.00
12	4	22.01.17	3.2	28.39	32.93	82.00	41.43	0.00
13	5	29.01.17	4.1	28.39	33.19	82.00	41.57	0.10
14	6	06.02.17	7.4	28.43	33.71	74.86	35.86	0.00
15	7	13.02.17	4.9	29.07	33.73	72.00	37.71	0.00
16	8	20.02.17	0.0	29.13	34.09	81.00	37.86	2.00
<b>R values</b>				<b>0.0994</b>	<b>0.037</b>	<b>-0.518*</b>	<b>0.2507</b>	<b>-0.13</b>

\*Significant at 0.05% level (Table value-0.482)

\*\* Highly significant at 0.01% level (Table value-0.606)

Predator, spider population was recorded in 6<sup>th</sup> MW (0.1) which was favoured by min. temp. of 28.43 °C and max. temp. of 33.71 °C with morning 74.86 % and evening 35.86 % humidity along with no rainfall. Sambhrant et al. (2017) reported that, the occurrence of bioagent population was observed during third week of January when the mean aphid population was varying between 10.07 to 21.67 aphid/10 cm terminal shoot. During 3<sup>rd</sup> week of January the mean of bioagent population was observed to be 0.04 per plant on 20.01.2016.

Table 2: Incidence of leaf webber on mustard crop as influenced by different weather parameters

S.No	MW	Date of Observation	Average No of Leaf Webber	Weather Parameters				
				Temp Min.	Temp Max	R.H. (M)	R.H. (E)	RF (mm)
1	45	-	0.0	29.83	33.89	82.14	40.71	0.00
2	46	-	0.0	29.14	33.96	74.14	28.43	0.00
3	47	-	0.0	28.86	33.37	83.14	39.86	0.00
4	48	-	0.0	28.59	33.76	78.00	33.43	0.00
5	49	-	0.0	28.61	34.16	82.00	36.00	0.00
6	50	-	0.0	28.06	33.40	84.86	39.00	0.00
7	51	18.12.16	0.0	28.03	33.44	81.71	35.71	0.00
8	52	24.12.16	0.0	27.51	32.99	84.14	37.29	0.00
9	1	02.01.17	0.2	27.51	33.00	78.50	31.57	0.00
10	2	09.01.17	0.1	27.69	32.70	83.31	35.29	0.00
11	3	16.01.17	0.2	27.53	31.79	80.57	38.57	0.00
12	4	22.01.17	0.0	28.39	32.93	82.00	41.43	0.00
13	5	29.01.17	0.0	28.39	33.19	82.00	41.57	0.10
14	6	06.02.17	0.0	28.43	33.71	74.86	35.86	0.00
15	7	13.02.17	0.0	29.07	33.73	72.00	37.71	0.00
16	8	20.02.17	0.0	29.13	34.09	81.00	37.86	2.00
<b>R values</b>				<b>-0.604*</b>	<b>-0.716**</b>	<b>0.0021</b>	<b>-0.235</b>	<b>-0.125</b>

\*Significant at 0.05% level (Table value-0.482)

\*\* Highly significant at 0.01% level (Table value-0.606)

Table 3: Incidence of spider on mustard crop as influenced by different weather parameters

S.No	MW	Date of Observation	Average No of Spider	Weather Parameters				
				Temp Min.	Temp Max	R.H. (M)	R.H. (E)	RF (mm)
1	45	-	0.0	29.83	33.89	82.14	40.71	0.00
2	46	-	0.0	29.14	33.96	74.14	28.43	0.00
3	47	-	0.0	28.86	33.37	83.14	39.86	0.00
4	48	-	0.0	28.59	33.76	78.00	33.43	0.00
5	49	-	0.0	28.61	34.16	82.00	36.00	0.00
6	50	-	0.0	28.06	33.40	84.86	39.00	0.00
7	51	18.12.16	0.0	28.03	33.44	81.71	35.71	0.00
8	52	24.12.16	0.0	27.51	32.99	84.14	37.29	0.00
9	1	02.01.17	0.0	27.51	33.00	78.50	31.57	0.00
10	2	09.01.17	0.0	27.69	32.70	83.31	35.29	0.00
11	3	16.01.17	0.0	27.53	31.79	80.57	38.57	0.00
12	4	22.01.17	0.0	28.39	32.93	82.00	41.43	0.00
13	5	29.01.17	0.0	28.39	33.19	82.00	41.57	0.10
14	6	06.02.17	0.1	28.43	33.71	74.86	35.86	0.00
15	7	13.02.17	0.0	29.07	33.73	72.00	37.71	0.00
16	8	20.02.17	0.0	29.13	34.09	81.00	37.86	2.00
<b>R values</b>				<b>0.0027</b>	<b>0.143</b>	<b>-0.384</b>	<b>-0.077</b>	<b>-0.07</b>

\*Significant at 0.05% level (Table value-0.482)

\*\* Highly significant at 0.01% level (Table value-0.606)

**References:**

1. Anonymous (2013). Annual Progress Report. All India Co-ordinated Research Project on Rapeseed-Mustard, National Research Centre on Rapeseed-Mustard, Bharatpur, Rajasthan, India.
2. Arshad Ali and Parvez Qamar Rizvi (2012) Influence of Abiotic and Biotic Factors on the Population Dynamics of Mustard Aphid, *Lipaphis erysimi* (Kalt.) On Indian Mustard, *Brassica juncea* with Respect to Sowing Dates. *Academic Journal of Plant Sciences* 5 (4): 123-127.
3. Bakhetia, D.R. and Sekhon, K.S. (1992). Insect pests and their management in rapeseed-mustard. *J. Oilseeds Res.*, 6(2): 269-299.
4. Bakhetia, D.R.C. and B.S. Sekhon, (1989). Insect-pests and their management in rapeseed-mustard. *J. Oilseed. Res.*, 6: 269-299.
5. Bhati R., R. C. Sharma and R. Singh (2015) Studies on occurrence of insect-pests of different Brassica species. *Int J Curr. Sci.* 14 (E): 125-132.
6. Pawar V.R., J.G. Bapodra, M.D. Joshi, S.M. Ghadge and S.K. Dalve (2010) Incidence of leaf webber, *Crociodomia binotalis* (zeller) on mustard. *Int J Plant Prot.* 3 (1): 130-131.
7. Rao B.B., V. U. M. Rao, Linitha Nair, Y. G. Prasad A. P. Ramraj and C. Chattopadhyay (2013) Assessing aphid infestation in indian mustard (*Brassica juncea* L.) under present and future climate scenarios. *Bangladesh J. Agril. Res.* 38(3): 373-387.
8. S.K. Sahoo (2012) Incidence and management of mustard aphid (*Lipaphis ery-simi* Kaltenbach) in West Bengal. *The Journal of Plant Protection Sciences*, 4(1) : 20-26
9. Sambhrant K., N.N., Singh and V. K. Mishra (2017) Studies on the influence of biotic and abiotic factors on aphid, *Lipaphis erysimi* Kalt. Population under mustard ecosystem. *J. Ent. Res.* Volume: 41(1): 69-75.