



SEASONAL INCIDENCE OF MUSTARD APHID, *LIPAPHIS ERYSIMI* IN JHANSI DURING *RABI* CROP SEASON

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Abstract

The population dynamics of mustard aphid, *Lipaphis erysimi* (Kalt.) on mustard in relation to weather parameters was studied at the Institute of Agricultural Sciences, Bundelkhand University, Jhansi during the *Rabi* crop season 2015-16. The natural appearance of mustard aphid population was started from 1st week of Dec 2016 upto 2nd week of March 2016 (8.0 to 51.15 Aphids/plant) in response to increase in temperature, as a result maximum infestation of aphids were encountered during the same period of time on mustard crop particularly on flower portion as depicted, after 3rd week of March 2016, the population of aphids drastically decreased (39.60 to 12.25 Aphids/plant) due to gradual increase in high temperature and flower become pods.

Key words : Mustard aphid, high temperature, seasonal incidence.

Introduction

In India, the oil seeds scenario has changed dramatically after the establishment of technology mission on oil seed in May 1986. Fivefold increase in oil seed production during the period of 1950-2004 was recorded and it was found to be higher than even the corresponding increase in total food grains production. Due to the improvement in living standards and increased purchasing power, the vegetable oil consumption in India is rising continuously and has reached roughly 12.4kg/head/year. However, this is still lower than the world average of 17.8kg, while in the developed countries of the western world the per capita consumption is 44-48 kg/year (Hegde, 2002).

Mustard aphid is one of the important oleiferous crops and constitute major source of edible oil for the human consumption and cake for animals. Every effort is being made to raise yield of this crop by adopting modern agriculture practices, such as the use high yielding varieties, heavy manuring and assured irrigation in order to meet the growing demands of oils. These composite efforts are, however, nullified if crop is not protected from the ravages of insect-pests. More than three dozen of

insect-pests are known to be associated with rapeseed mustard crop in India (Backhetia and Sekhon, 1989). Among these, mustard aphid, *Lipaphis erysimi* (Kalt) is the most serious pest of this crop and is considered to be the limiting factor in the successful cultivation of mustard causing 35 to 73 per cent reduction in yield (Rai, 1961; Rohilla *et al.*, 1987). It is therefore, essential to keep this pest under control so as to reap profitable harvest. The ecological approach to the pest management suggests to use pesticides only when and where necessary. Therefore, for ensuring an effective and economical management of this serious pest, the present studies were undertaken for studying its population fluctuations in relation to weather parameter. These studies will provide an opportunity to face the pest challenge by manipulating sowing time, varieties selection, correct timing of pesticidal application besides other management practices (Singh and Lal, 2012).

Materials and Methods

The present investigations were conducted at the Farm and lab of Institute of Agricultural Sciences, Bundelkhand University, Jhansi (U.P.), India. It is situated at 77.30° E Longitude and 27.15°N Latitude and is about 178.37 m

Table 1 : Seasonal Incidence of mustard aphid *Lipaphis erysimi* (Kalt.) and weather parameters during crop period 2015-2016.

S. no.	Standard week	Date	No. of aphids/plant	Temperature		Humidity %		Wind Velocity	Rainfall (mm)	Evaporation (mm)
				Max	Min	Morning	Evening			
1.	47	23-30 Nov.	0.00	28.0	13.8	84	54	1.3	4.4	3.6
2.	48	1-7 Dec.	8.00	27.1	10.2	88	42	2.0	0.0	3.1
3.	49	8-15 Dec.	10.00	25.1	09.2	88	42	2.7	0.0	2.6
4.	50	16-23 Dec.	13.00	21.4	5.2	89	49	2.1	0.0	2.9
5.	51	24-31 Dec.	15.00	23.4	6.7	87	43	2.1	0.0	3.1
6.	52	1-7 Jan.	19.00	25.5	8.2	86	46	1.8	0.0	3.5
7.	1	8-15 Jan.	22.00	26.1	8.8	82	48	2.4	0.0	3.9
8.	2	16-23 Jan.	23.00	15.0	6.8	92	81	3.2	8.0	2.7
9.	3	24-31 Jan.	25.00	22.5	5.5	91	56	1.8	0.4	2.9
10.	4	1-7 Feb.	29.00	25.4	9.2	83	48	2.5	0.0	3.7
11.	5	8-15 Feb.	33.00	24.3	8.0	83	44	2.4	0.0	3.7
12.	6	16-23 Feb.	37.00	25.6	10.6	83	49	3.0	0.0	3.8
13.	7	24-3 Feb.	46.00	29.5	12.0	79	39	3.0	0.0	4.1
14.	8	4-11 Mar.	51.15	30.1	12.6	84	42	2.5	0.0	4.9
15.	9	12-19 Mar.	39.60	31.3	15.6	82	46	3.6	0.4	5.3
16.	10	20-27 Mar.	12.25	31.0	15.2	85	42	4.7	7.4	5.5

above mean sea level. The climate is subtropical and semi-arid. The mean maximum daily temperature ranges from 35.0-47.0°C and the mean minimum temperature from 12.0-29.0°C during the hot weather. July to September is the rainy season and average rainfall is about 700 mm. The mean maximum and minimum temperature ranges from 18.0-24.0°C and 4.0-12.5°C during winter (November- March), respectively.

The experimental site fall under subtropical climatic zone of indo-gangetic plains and situated at 26.47° latitude and 82.12° E-longitude at an altitude of 113 meter from mean sea level. The region receives between June 2015 to April 2016 rainfall of about 581.7 mm, of which about 85-90 per cent is concentrated from first week of July to mid-August. The winter months are very cold and summer months are hot and dry. Westerly hot winds start blowing from the month of April and continue till the onset of monsoon.

Results and Discussion

The influence of various environmental factors on the population of aphids gradually increased from 1st week of Dec 2016 upto 2nd week of March 2016 (8.0 to 51.15 Aphids/plant) in response to increase in temperature, as a result maximum infestation of aphids were encountered during the same period of time on mustard crop particularly on flower portion as depicted in table 1. On the other hand, after 3rd week of March 2016, the

population of aphids drastically decreased (39.60 to 12.25 Aphids/plant) due to gradual increase in high temperature and flower become pods. Rate of mortality of eggs of aphids was increased due to high temperature because they could not have maintained moisture in side of the egg as result the embryo would have desiccated and shrink while mature aphid would not get sufficient amount of food in absence of flower and unable to sustain their life and proliferate. Moisture is also one the major influencing factor for proliferation of aphid population and its development as observed. Aphid population is greatly depending on Host resistance, Environmental factor, and management practices adopted by growers.

Thereafter, aphid population started declining with increase in temperature from 8th standard week till the harvest of crops in the study years. The present findings are in conformity with the observations of Uttam *et al.* (1993), who reported the mustard aphid population reached at peak in February. The present findings are agree with the observations of Ansari and Lal (2008), who reported the mustard aphid cause the varying levels of infestation on different Brassica species in different crop seasons.

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