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RESEARCH ARTICLE

Monitoring of alate mustard aphid, *Lipaphis erysimi* through yellow sticky trap in relation to ecological parameters

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SUMMARY : Field experiment was conducted at the Student's Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during *Rabi* 2009-10 and 2010-11 to monitor, *Lipaphis erysimi* through yellow sticky trap installed all around mustard growing field. The catches of alate aphid was maximum (186.00 /trap) and (280.00/trap) during the 8th standard week in both the years. The catches of alate, *Lipaphis erysimi* showed non-significant positive correlation with temperature (%), rainfall and sunshine (hrs). However, humidity showed non-significant negative correlation with alate catches.

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Lipaphis erysimi is one of the most destructive insects, which alone is responsible for causing severe reduction in seed yield of *Brassica* crop varying from 15.0 to 73.31% losses (Gupta *et al.*, 2003). This pest survives on wild host during off season and colonizes mustard crop at reproductive stage and fly away when crop attain maturity. The alates are attracted towards yellow colour of the mustard flower (Dilwari and Atwal, 1989). The initiation and cessation of infestation takes place through winged from the aphid. Thus, alate form determines the initiation of infestation and intensity of aphid attack on the crop. In spite of the facts, the very little works has been done pertaining to the use of sticky trap for monitoring alate population of mustard aphid (Roy, 1976).

The efforts were made to monitor alate population by installing yellow sticky traps around mustard crop in relation to weather parameters prevailing at the same time.

EXPERIMENTAL METHODOLOGY

The experiment was conducted at the Students Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during *Rabi* 2009-10 and 2010-11. The mustard cv. VARUNA, BSH-1, YST-151, T-27, HYOLA-401 and KIRAN were sown on November, 20 during 2009 and 2010. All the recommended agronomic practices were followed for raising the crop of good stand. Yellow sticky traps were made by using empty cylindrical tin of 1 kg capacity. These were installed on a 1.5 meter long bamboo pole after removing the top of the tin. Then coating of petroleum grease was applied on the outer surface of empty box. The petroleum grease were changed daily after recording observation. Grease were applied with a brush on the cleaned outer surface of the traps.

Five such traps were installed at uniform distance around mustard crop. Observations were recorded daily during morning hours. The number of alate trapped in each trap was counted on whole surface of the box. The meteorological parameters, *viz.*, temperature (^{0}C) (maximum, minimum), relative humidity (%), rainfall (mm) and sunshine (hrs) were recorded daily. The mean values of previous seven days data of the above parameters were computed for seven days, the day of observation, correlation co-efficients were determined to find

out the relationship of catches of alate aphid with temperature (^{0}C) (maximum, minimum), relative humidity (%), rainfall (mm) and sunshine hrs).

EXPERIMENTAL FINDINGS AND DISCUSSION

The results revealed that the first alate aphid was noticed on the trap of last week of December and first week of January, during 2009-10 and 2010-11, respectively (Tables 1 and 2). The number of alate aphids caught on the trap increased slowly till 5th and 4th standard week during corresponding year. The alate population accelerated afterwards and reached the highest density of 186.00 and 280.40 alates per trap on 8th standard week during the both years, respectively. Thereafter, the alate catches showed declining trend. The present findings are in conformity with the observations of Vekaria and Patel (2005) who reported the maximum population of alate mustard aphid during third week of February.

The correlation between alate aphid population and temperature (maximum, minimum), rainfall, sunshine (hrs) showed significant positive correlation however, humidity showed non-significant negative correlation with alate trapped (Table 3). The present findings confirm the results of Roy (1976) that the variation in trap catches of the alate aphid was mainly due to the change in the alate population as the variation in the catch could not be explained on the bases of changes in

Table 1: Population of alate mustard aphid on yellow sticky traps during *Rabi* 2009-10

Standard weeks	Temperature (^{0}C)		R.H. (%)	Rainfall (mm)	Sunshine (hrs)	No. of alate aphids/trap
	Max.	Min.				
52	26.80	4.80	71.10	6.60	7.60	0.40 (0.73)
1.	15.90	7.80	82.30	0.00	2.70	3.80 (2.00)
2.	15.60	7.60	82.30	5.40	3.50	7.20 (3.00)
3.	15.30	7.70	86.65	0.00	0.90	18.00 (4.29)
4.	17.30	5.40	78.50	0.00	3.20	21.80 (4.70)
5.	25.00	7.10	65.55	0.00	6.70	42.50 (5.86)
6.	25.00	9.50	70.90	9.70	4.70	80.00 (8.96)
7.	23.80	11.80	69.05	15.40	5.50	153.80 (12.39)
8.	25.90	9.30	64.75	0.40	7.50	186.00 (13.65)
9.	29.20	12.50	56.50	0.00	7.40	89.80 (9.48)
10.	30.30	13.10	54.25	0.00	7.10	51.60 (7.18)
11.	32.10	13.40	55.60	0.00	7.90	8.00 (2.90)
12.	34.40	16.50	46.45	0.00	7.10	3.00 (1.85)

Figures given in parentheses are square root transformed values

Table 2: Population of alate mustard aphid on yellow sticky traps during *Rabi* 2010-11

Standard weeks	Temperature (^{0}C)		R.H. (%)	Rainfall (mm)	Sunshine (hrs)	No. of alate aphids/trap
	Max.	Min.				
52	25.57	5.64	81.60	0.00	5.50	0.00 (0.70)
1.	15.30	3.50	84.95	1.30	1.20	2.20 (1.60)
2.	14.30	2.50	85.70	0.00	1.40	7.80 (2.86)
3.	22.10	5.20	57.40	0.00	6.14	15.20 (3.95)
4.	19.50	4.60	77.80	1.30	3.80	35.50 (5.98)
5.	23.50	6.00	70.55	0.00	4.30	66.20 (8.15)
6.	26.20	7.40	70.40	0.00	7.80	126.60 (11.25)
7.	25.20	11.40	74.40	7.50	5.00	205.20 (14.33)
8.	25.20	8.20	67.60	1.40	7.20	280.40 (16.75)
9.	27.00	10.50	61.80	5.00	8.00	94.00 (9.71)
10.	25.30	8.60	68.50	8.90	6.60	37.80 (6.18)
11.	31.40	12.10	53.40	0.00	8.20	10.00 (3.21)
12.	35.10	14.00	42.60	0.00	7.70	5.80 (2.48)

Figures given in parentheses are square root transformed values

Table 3: Correlation between population of alate mustard aphid, *L. erysimi* and weather factors during 2009-10 and 2010-11

Years	Temperature (^{0}C)		R.H. (%)	Rainfall (mm)	Sunshine (hrs)
	Max.	Min.			
2009-10	0.156	0.190	-0.161	0.332	2009-10
2010-11	0.099	0.272	-0.048	0.392	2010-11

Figures given in parentheses are square root transformed values

the temperature and relative humidity. Bright sunshine hours also exhibited positive correlation on alate aphid population. Further, rainfall also exhibited positive influence on alate aphid population. The present findings are in close agreement with the work of Karim and Bashir (1965).

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