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INCIDENCE OF SUCKING INSECT PESTS OF OKRA IN RELATION TO WEATHER PARAMETERS

A.S. CHUNDAWAT AND O.P. AMETA

Department of Entomology, Rajasthan College of Agriculture
Maharana Pratap University of Agriculture and Technology, Udaipur

ABSTRACT

A field experiment was conducted at Rajasthan College of Agriculture farm, Udaipur, during *kharif* 2010 to investigate the incidence of sucking insect pests of okra. The incidence of aphid, *Aphis gossypii* (Glover) was initiated in the second week of August, while, jassid, *Amrasca biguttula biguttula* (Ishida) and whitefly, *Bemisia tabaci* (Gennadius) commenced in fourth week of July. Aphid, jassid and whitefly touched the peak during fourth week of August (86.5 aphids/ten plants), first week of October (15.4 Jassids/ten plants) and first week of September (6.9 whiteflies/ten plants), respectively. The aphid and whitely exhibited a positive correlation with temperature, relative humidity and negative correlation with total rainfall; however, the correlation was non–significant. The correlation between jassid population and temperature, relative humidity and rainfall was significantly negative.

Key words: Incidence, Aphid, Jassid, Whitefly, Correlation

INTRODUCTION

Okra (Bhindi), *Abelmoschus esculentus* (L.) Moench is an important vegetable crop grown throughout the country during both summer and rainy seasons. Besides various reasons of low production, heavy damage inflicted by insect pests is a key limiting factor. Okra crop suffers heavy damage by a number of insect pests *viz.*, the jassid, *Amrasca bigutula Biguttula* Ishida; the aphid, *Aphis gossypii* Glover; whitefly, *Bemisia tabaci* Genn; The fruit borers, *Earias vitella* Fab; leaf roller, *Sylepta derogata* Fab. and the red cotton bug, *Dysdercus koenigii* Fab. (Dikshit *et al.*, 2001). Among these aphids, jassids and whitefly are considered as important sucking insect pests of okra.

Krishnaiah (1980) reported about 40–56 per cent losses in yield of okra due to leafhoppers. Aphids and leafhoppers are important pests in the early stage of the crop which desap the plants, make them weak and reduce the yield. Failure to control them in the initial stages was reported to cause yield loss to the tune of 54.04 per cent (Chaudhary and Dadeech, 1989). Due to the variation in agro climatic conditions of different regions, these insect pests show varying trends in their incidence and also in nature and extent of damage to the crop. Besides, some known and unknown factors also play a key role in determining the incidence and dominance of these insect pests. Hence, a region oriented study is necessary, as it would help in combating the problem and boosting up the production. Keeping this in view the present investigation was carried out during *kharif* 2010.

MATERIALS AND METHODS

The experiment was conducted during *kharif* 2010 at Rajasthan College of Agriculture, Udaipur to investigate the incidence of sucking insect pests of okra. Variety Arka Anamika was sown under natural conditions without spraying insecticides in plots of size 20.25 sq. m. (4.5m × 4.5m) replicated three times with 60 cm row to row and 45 cm plant to plant spacing. Ten plants were selected randomly from each replicated plot and tagged. Observations were recorded from these plants.

The population of sucking insect pests *viz.*, Aphid (*Aphis gossypii* Glover), jassid (*Amrasca bigutulla bigutulla* Ishida) and whitefly (*Bemisia tabaci* Gennadius) were recorded at weekly intervals during morning hours between 7.00 a.m. to 9.00 a.m. when most of the insect species remain less active by using the sampling technique given by Rawat and Sahu (1973) wherein, three leaves from each selected ten plants (one from top, middle and bottom were selected) for recording the observations. The data were subjected to statistical analysis and correlation coefficient was worked out. The mean population of *A. gossypii*, *A. bigutulla bigutulla* and *B. tabaci* has been presented in Table 1.

RESULTS AND DISCUSSION

Three sucking insect pests were recorded as major pests *viz.*, aphids (*Aphis gossypii* Glover), jassids (*Amrasca bigutulla bigutulla* Ishida) and whitefly (*Bemisia tabaci* Gennadius). All of them appeared on the crop right from

Table 1. Incidence of aphids, jassids and whiteflies on okra crop along with abiotic factors during *kharif*, 2010 at Udaipur

S.M.W.*	Date and month	Abiotic factors			Mean population per ten plants		
		Mean Temp. (°C)	Mean R.H.(%)	(Rainfall (mm)	Aphids	Jassids	Whiteflies
30	23–29 July	26.09	88.80	113.90	0	3.2	1.5
31	30–5 August	26.86	83.10	154.80	0	6.1	3.1
32	6–12 August	26.72	87.60	69.20	15.5	5.3	4.4
33	13–19 August	27.38	84.30	16.50	32.5	8.8	4.8
34	20–26 August	27.22	76.10	27.20	86.5	9.2	5.4
35	27–2 September	27.17	85.90	55.70	41.5	8.4	6.4
36	3–9 September	26.77	87.60	100.30	46.4	10.2	6.9
37	10–16 September	25.8	84.60	13.20	30.2	13.5	5.8
38	17–23 September	25.27	60.60	0.00	26.0	14.2	4.5
39	24–30 September	25.56	55.00	0.00	15.2	13.8	5.2
40	1–7 October	26.38	52.70	0.00	15.0	15.4	4.4
41	8–14 October	25.83	54.10	0.00	14.5	12.6	4.7
42	15–21 October	26.62	56.50	0.00	10.4	11.7	3.8

*Standard meterological week

initiation of crop growth and were observed throughout the experimental period. The investigation revealed that the incidence of aphid, *Aphis gossypii* (Glover) initiated in the second week of August, while, jassid, *Amrasca bigutulla bigutulla* (Ishida) and whitefly, *Bemisia tabaci* (Gennadius) infestation commenced in fourth week of July. Aphid, jassid and whitefly touched the peak during fourth week of August (86.5 aphids/ten plants), first week of October (15.4 Jassids/ten plants) and first week of September (6.9 whiteflies/ten plants), respectively (Table 1). The aphid exhibited a positive correlation with temperature, relative humidity and negative correlation with total rainfall. However, the correlation was non significant. While, the correlation between jassid population and temperature, relative humidity and rainfall was significantly negative. The whitefly exhibited a non significant positive correlation with temperature and relative humidity and negative correlation with rainfall (Table 2).

Table 2. Correlation coefficient between population of sucking insect pests and abiotic factors

Weather parameters	Aphids	Jassids	Whiteflies
Temperature (°C)	0.4175[a]	–0.5068[c]	0.1692[a]
Relative Humidity (%)	0.2084[a]	–0.7574[c]	0.0534[a]
Rainfall (mm)	–0.1936[b]	–0.7904[c]	–0.3121[b]

a. Positive and non significant; b. Negative and non significant; c. Negative and significant.

Aphis gossypii population occurred throughout the crop season and peaked during the fourth week of August (86.5 aphids/ten plants). The findings of present investigation are in close agreement with the findings of Anita and Nandihalli (2008) who observed that the incidence of jassids, aphids and whitely started in first week of April and touched its peak during last week of June, first week of July and last week of April, respectively.

A. bigutulla bigutulla population occurred throughout the crop season and attained a peak (15.40 jassids/ten plants) during the first week of October. The results obtained in the present investigation are in close agreement with the earlier reports of Pareek *et al.* (2001), who reported that jassid incidence commenced in Fourth week of September, thereafter it declined gradually. On the basis of data obtained in the present investigation, it can be concluded that temperature range of 18.3 to 34.5°C along with high relative humidity 52.71 per cent provided favourable conditions for the multiplication of jassids.

B. tabaci appeared from the fourth week of August and remained active up to December and peak population (6.9 whiteflies/ten plants) was observed during second week of September. On the basis of data obtained in the investigation, it could be concluded that temperature range of 23.2 to 34.4°C and relative humidity 87.57 per cent was favourable for the multiplication of whiteflies. The present findings conform the findings of Bored *et al.* (1993) who observed that the population of white fly was lowest in okra field during August and reached to its peak during

the first week of October. The present findings are also supported by Pareek *et al.* (2001) who reported that white fly incidence commenced in fourth week of September, thereafter it declined gradually.

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