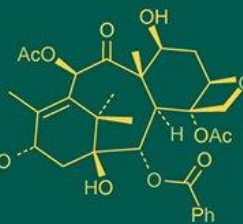
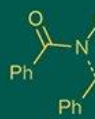


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Seasonal incidence of major sucking pest of okra in relation to weather parameters in Konkan condition

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Abstract

A field experiment was conducted during Summer 2023-24 and 2024-25 at the Central Experiment Station, Wakawali, to study the seasonal incidence of major sucking pests and their relationship with meteorological parameters. The crop was grown under unsprayed conditions and observations on aphids (*Aphis gossypii*), jassids (*Amrasca biguttula biguttula*) and whiteflies (*Bemisia tabaci*) were recorded weekly. The results revealed that aphid and whitefly populations initiated during the 5th-7th Standard Meteorological Week (SMW) and reached peak levels during the 10th-12th SMW (March), whereas jassid population peaked during the 15th SMW (April). The pooled maximum populations recorded were 12.33 aphids, 17.08 jassids, and 4.70 whiteflies per three leaves per plant. Correlation analysis indicated that maximum temperature had a significant positive influence on all three pests, while evening relative humidity showed a significant negative correlation with aphid population. Wind speed and evaporation also exhibited positive associations with pest buildup. Multiple linear regression analysis revealed that weather parameters accounted for 77-94% variation in aphid population, 87-88% in jassids and 82-93% in whiteflies. Understanding seasonal incidence patterns can aid in timely and effective pest management strategies for improving okra productivity.

Keywords: Seasonal incidence, sucking pests, okra, weather parameters, correlation

Introduction

Okra (*Abelmoschus esculentus* (L.) Moench) is one of the most important vegetable crops grown in India and commonly known as lady's finger or Bhindi belongs to family Malvaceae. India is the largest producer of okra in the world followed by Nigeria. In India, the okra crop is mainly cultivated in states of Maharashtra, West Bengal, Gujarat, Karnataka, Madhya Pradesh, Uttar Pradesh and Rajasthan (Shinde *et al.*, 2007) ^[10]. India ranks first in Okra production with estimated area of 531 thousand ha. with a production of 6466 thousand metric ton. Maharashtra rank 13th in production of okra with estimated area 13.06 thousand ha with a production of 140.88 thousand metric ton. (Source-<http://agricoop.nic.in> 2024). As high as, 72 species of insects have been recorded on Okra (Srinivas Rao and Rajendran, 2003) ^[11], of which, the sucking pests comprising of leafhopper, *Amrasca biguttula biguttula* (Ishida), whitefly, *Bemisia tabaci* (Gennadius) and mite, *Tetranychus urticae* (Boisduval) causes significant damage to the crop. Incidence of insect pests is one of the limiting factors in production of okra. According to (Rawat and Sahu 1973) ^[8] the aphid, *A. gossypii* (Glover) is a polyphagous sucking pest and also acts as a vector of virus and transmits mosaic and leaf curl diseases in okra. (Butani and Verma, 1976) ^[1]. The sucking pest complex consisting of aphids, leaf hoppers, whiteflies, thrips and mites are major pests and cause 17.46 percent yield loss in Okra (Sarkar *et al.*, 1996) ^[9]. Aphids, jassid, whiteflies and shoot and fruits borer are the major pests among the different pests infesting Okra (Das *et al.*, 2021) ^[4]. All efforts are needed to tackle these major sucking pests by knowing their peak period of infestation through studies on seasonal abundance it provides not only the information of initiation of the pest but also provides the peak activity of the pest. Biotic and abiotic parameters play a vital role in population build-up of insect pest. Correlation study helps in to provide either positive or negative association of pest population with biotic or abiotic factors.

Materials and Methods

A field experiment was conducted at Vegetable Improvement Scheme, Central Experiment Station, Wakawali running under Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth Dapoli in Summer 2023-24 and 2024-25 to study the seasonal incidence of different sucking pests infesting Okra. The experiment plot was kept unsprayed till final harvesting of crop. The Okra Konkan Bhendi genotype was sown in the spacing of 45x30 cm. All the recommended agronomic practices viz. weeding, harrowing, application of fertilizer dose and irrigation were carried out timely and properly to raise good crop.

Method of recording observations

The observations were recorded for different pests starting from one week after germination till the final harvesting of the crop. The number of nymph and adults of major sucking pest were recorded at weekly interval from three leaves (from top, middle and bottom) of selected plant for taking observations. Twenty plants were selected randomly and marked permanently for recording the observations.

Statistical analysis

The average of pest population/three leaves/plant recorded on Okra were correlated with meteorological weather parameters in each standard meteorological week (SMW).

Results and Discussion

The data on seasonal incidence of major sucking pests of okra during Summer 2023-24, Summer 2024-2025 and pooled are presented in Table 1 and graphically depicted in Figures 1, 2 and 3.

Aphid, (*A. gossypii* Glover)

Summer 2023-24

In summer 2023-24 aphid's population ranging from 0.20 to 12.20 aphids/three leaves/plant. The pest incidence was first noticed in the 5th SMW (29th January to 04th February) i.e. (0.20 aphid/three leaves/plant), then incidence increased continuously up to the 12th SMW (19th March to 25th March) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (12.20 aphids/three leaves/plant) was recorded in 12th SMW (19th March to 25th March) and minimum pest incidence (0.20 aphids/three leaves/plant) was recorded in 5th SMW (29th January to 04th February) and 18th SMW (30th April to 06th May). The seasonal incidence of the aphid's population during Summer 2023-24 exhibited a distinct trend correlated with the crop growth stages.

Summer 2024-25

In Summer 2024-25 the incidence of aphid's population ranging from 0.15 to 13.50 aphids/three leaves/plant. The pest incidence was first noticed in the 5th SMW (29th January to 04th February) i.e. (0.15 aphids/three leaves/plant) then incidence increased continuously up to the 10th SMW (05th March to 11th March) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (13.50 aphids/three leaves/plant) was recorded in 10th SMW (05th March to 11th March) and minimum pest incidence (0.15 aphids/three leaves/plant) was recorded in 5th SMW (29th January to 04th February).

Pooled data

The pooled data of both the years recorded that, the incidence of aphid's population was in the ranging from 0.10 to 12.33 per three leaves. The pest incidence started from 05th SMW (29th January to 04th February) i.e. (0.18 aphids/three leaves/plant), then incidence increased continuously up to the 12th SMW (19th March to 25th March) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (12.33 aphids/three leaves/plant) was recorded in 12th SMW (19th March to 25th March) and minimum pest incidence (0.10 aphids/three leaves/plant) was recorded in 18th SMW (30th April to 06th May). The results of above findings are discussed here with earlier research worker Chouhan *et al.* (2016) [2] revealed that the peak population of aphids observed on third week (11th SMW) of March with mean population of 22.07 aphid/plant.

Jassid (*Amrasca biguttula biguttula* Ishida)

Summer 2023-24

During Summer 2023-24 jassid population ranging from 0.80 to 15.95 jassids/three leaves/plant. The pest incidence was initiated from 06th SMW (05th February to 11th February) i.e. (0.80 jassids/three leaves/plant), then incidence increased continuously up to the 15th SMW (09th April to 15th April) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (15.95 jassids/three leaves/plant) was recorded in 15th SMW (09th April to 15th April) and minimum pest incidence (0.80 jassids/three leaves/plant) was recorded in 06th SMW (05th February to 11th February).

Summer 2024-25

In Summer 2024-25 the incidence of jassid ranging between 0.30 to 18.20 jassids/three leaves/plant. The pest incidence initiated from the 7th SMW (12th February to 18th February) with (0.30 jassids/three leaves/plant). Then incidence increased continuously up to the 15th SMW (09th April to 15th April) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (18.20 jassids/three leaves/plant) was recorded in 15th SMW (09th April to 15th April) and minimum pest incidence (0.30 jassids/three leaves/plant) was recorded in 7th SMW (12th February to 18th February).

Pooled

The pooled mean incidence of jassid population ranging from 0.40 to 17.08 jassids per three leaves/plant. The pest incidence was initiated from 06th SMW (05th February to 11th February) i.e. (0.40 jassids/three leaves/plant), then incidence increased continuously up to the 15th SMW (09th April to 15th April) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (17.08 jassids/three leaves/plant) was recorded in 15th SMW (09th April to 15th April) and minimum pest incidence (0.40 jassids/three leaves/plant) was recorded in 06th SMW (05th February to 11th February). Present findings are in close agreement with Dhandge *et al.* (2018) [6] revealed that the peak population of aphids was observed at 17th SMW (14.1 aphids/3 leaves) and 16th SMW (17.3 aphids/3 leaves).

Table 1: Seasonal incidence of aphid infesting Okra during (Summer 2023-24, Summer 2024-25 and pooled)

SMW	Period	Mean no. of aphids/3 leaves/plant			Mean no. of jassid/3 leaves/plant			Mean no. of whiteflies/3 leaves/plant		
		Summer 2023-24	Summer 2024-25	Pooled	Summer 2023-24	Summer 2024-25	Pooled	Summer 2023-24	Summer 2024-25	Pooled
5	29 Jan-04 Feb	0.20	0.15	0.18	0.00	0.00	0.00	0.00	0.00	0.00
6	05 Feb-11 Feb	3.00	2.35	2.68	0.80	0.00	0.40	0.00	0.25	0.13
7	12 Feb-18 Feb	3.60	3.95	3.78	1.65	0.30	0.98	0.45	0.55	0.50
8	19 Feb-25 Feb	2.00	6.35	4.18	2.20	1.70	1.95	1.80	1.30	1.55
9	26 Feb-04 Mar	4.80	9.50	7.15	4.55	3.50	4.03	3.15	2.10	2.63
10	05 Mar-11 Mar	7.15	13.50	10.33	6.20	5.75	5.98	3.60	3.25	3.43
11	12 Mar-18 Mar	9.30	12.50	10.90	9.15	7.00	8.08	4.25	3.25	3.75
12	19 Mar-25 Mar	12.20	12.45	12.33	11.75	9.90	10.83	5.15	4.25	4.70
13	26 Mar-01 Apr	11.35	10.35	10.85	12.00	14.00	13.00	4.35	3.30	3.83
14	02 Apr-08 Apr	10.00	9.25	9.63	12.55	16.25	14.40	3.90	2.65	3.28
15	09 Apr-15 Apr	9.00	8.35	8.68	15.95	18.20	17.08	3.25	4.00	3.63
16	16 Apr-22 Apr	6.55	2.00	4.28	9.40	14.45	11.93	2.25	3.45	2.85
17	23 Apr-29 Apr	3.45	1.10	2.28	4.35	5.00	4.68	3.15	2.40	2.78
18	30 Apr-06 May	0.20	0.00	0.10	1.45	3.00	2.23	1.00	1.20	1.10

Whitefly (*Bemisia tabaci* Gennadius)**Summer 2023-24**

During Summer 2023-24, whitefly incidence ranging from 0.45 to 5.15 whiteflies/three leaves/plant. The pest incidence was initiated from 07th SMW (12th February to 18th February) i.e. (0.45 whiteflies/three leaves/plant), then incidence increased continuously up to the 12th SMW (19th March to 25th March) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (5.15 whiteflies/three leaves/plant) was recorded in 12th SMW (19th March to 25th March) and minimum pest incidence (0.45 whiteflies/three leaves/plant) was recorded in 07th SMW (12th February to 18th February).

Summer 2024-25

During Summer 2024-25, whitefly incidence ranging from 0.25 to 4.25 whiteflies/three leaves/plant the pest incidence was initiated from 06th SMW (05th February to 11th February) i.e. (0.25 whiteflies/three leaves/plant), then incidence increased continuously up to the 12th SMW (19th March to 25th March) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (4.25 whiteflies/three leaves/plant) was recorded in 12th SMW (19th March to 25th March) and minimum pest incidence (0.25 whiteflies/three leaves/plant) was recorded in 06th SMW (05th February to 11th February).

Pooled

Pooled data ranging from 0.13 to 4.70 whiteflies/three leaves/plant. The pest incidence was initiated from 06th SMW (05th February to 11th February) i.e. (0.13 whiteflies/three leaves/plant), then incidence increased continuously up to the 12th SMW (19th March to 25th March) and then it showed declined trend but remained till maturity of the crop. The maximum pest incidence (4.70 whiteflies/three leaves/plant) was recorded in 12th SMW (19th March to 25th March) and minimum pest incidence (0.13 whiteflies/three leaves/plant) was recorded in 06th SMW (05th February to 11th February).

Correlation Studies**Correlation Studies between aphid incidence and weather parameters**

The correlation analysis was performed to ascertain the relationship between the aphid population and various

meteorological parameters presented in (Table 2).

During Summer 2023-24, the aphid population exhibited a significant positive correlation with maximum temperature ($r = 0.534^*$). Minimum temperature ($r = 0.327$), morning relative humidity ($r = 0.295$), evening relative humidity ($r = 0.202$), wind speed ($r = 0.427$), bright sunshine hours ($r = 0.328$), evaporation ($r = 0.344$) and rainfall ($r = 0.045$) showed positive but non-significant correlations and during Summer 2024-25, the population dynamics showed a stronger relationship with weather parameters. The aphid population showed a significant positive correlation with maximum temperature ($r = 0.585^*$). Conversely, a significant negative correlation was observed with evening relative humidity ($r = -0.642^*$) while, minimum temperature ($r = -0.067$), morning relative humidity ($r = -0.516$), wind Speed ($r = -0.237$) and bright sunshine hours ($r = -0.433$) showed negative non-significant correlations while, evaporation ($r = 0.324$) showed a positive non-significant correlation. Pandey and Kosta (2017) [7] reported that aphid population had significant positive correlation with maximum temperature.

Correlation Studies between jassid incidence and weather parameters

The correlation analysis indicated specific abiotic influences on the jassid population in Summer 2023-24, jassid population showed a significant positive correlation with maximum temperature ($r = 0.594^*$) and wind speed ($r = 0.601^*$). The jassid population had a positively non-significant correlation with minimum temperature ($r = 0.518$), evening relative humidity ($r = 0.361$), rainfall ($r = 0.157$) and evaporation ($r = 0.489$). The negatively non-significant correlation was recorded between the jassid population and morning relative humidity ($r = -0.224$) and bright sunshine ($r = -0.277$) and during Summer 2024-25, the jassid population exhibited a significant positive correlation with minimum temperature ($r = 0.565^*$). The jassid population had a positively non-significant correlation with maximum temperature ($r = 0.146$), evening relative humidity ($r = 0.156$), wind speed ($r = 0.222$) and evaporation ($r = 0.387$). The jassid population had a negatively non-significant correlation with morning relative humidity ($r = -0.193$) and bright sunshine ($r = -0.508$). Dhaka and Pareek (2021) [5] reported the population of jassids varied from 5.20 to 24.50 nymphs per plant during the peak

activity period, necessitating chemical intervention & highly significant positive correlation between the jassid population and maximum temperature. Results found in present study are in conformity with several earlier workers.

Correlation Studies between whitefly incidence and weather parameters

During Summer 2023-24 the whitefly population exhibited significant positive correlations with maximum temperature ($r = 0.570^*$), wind speed ($r = 0.645^*$) and evaporation ($r = 0.585^*$). The whitefly population had a positively non-significant correlation with minimum temperature ($r = 0.356$) and evening relative humidity ($r = 0.195$). The whitefly population had a negatively non-significant

correlation with morning relative humidity ($r = -0.509$), bright sunshine hours ($r = -0.382$) and rainfall ($r = -0.058$) and in Summer 2024-25, the population showed a significant positive correlation with evaporation ($r = 0.647^*$). The whitefly population had a positively non-significant correlation with maximum temperature ($r = 0.341$), minimum temperature ($r = 0.513$) and wind speed ($r = 0.350$). The whitefly population had a negatively non-significant correlation with morning relative humidity ($r = -0.337$), evening relative humidity ($r = -0.026$) and bright sunshine hour ($r = -0.317$). Das *et al.* (2023) [3] observed that the whitefly population exhibited a significant positive correlation with wind speed and evaporation.

Table 2: Correlation coefficient (r) of major sucking pests infesting Okra with weather parameters during Summer 2023-24 and Summer 2024-25

Weather Parameters	Correlation coefficient (r) Aphid		Correlation coefficient (r) Jassid		Correlation coefficient (r) whitefly	
	Summer 2023-24	Summer 2024-25	Summer 2023-24	Summer 2024-25	Summer 2023-24	Summer 2024-25
T _{max}	0.534*	0.585*	0.594*	0.146	0.570*	0.341
T _{min}	0.327	-0.067	0.518	0.565*	0.356	0.513
RH-I	0.295	-0.516	-0.224	-0.193	-0.509	-0.337
RH-II	0.202	-0.642*	0.361	0.156	0.195	-0.026
Wind speed (Kmph)	0.427	-0.237	0.601*	0.222	0.645*	0.350
BSS. (hrs)	0.328	-0.433	-0.277	-0.508	-0.382	-0.317
E _{pan} (mm)	0.344	0.324	0.489	0.387	0.585*	0.647*
Rainfall (mm)	0.045	-	0.157	-	-0.058	-

N = 14

* Correlation is significant at 0.05 level r value = 0.532;

** Correlation is significant at 0.01 level r value = 0.661

Multiple linear regression

Aphid, (*A. gossypii* Glover)

To determine the combined effect of various meteorological parameters on the aphid population, a multiple linear regression analysis was carried out. The multiple linear regression analysis for the both the season is presented in (Table 3). The regression equation for summer 2023-24 obtained was $Y = -137.110 + 3.851X_1 - 0.361X_2 + 0.333X_3 + 0.062X_4 + 15.803X_5 - 1.889X_6 - 7.847X_7 - 0.434X_8$ and the regression equation for summer 2024-25 worked out was Y

$$= 35.071 - 0.750X_1 + 1.336X_2 + 0.062X_3 - 0.569X_4 - 7.451X_5 - 1.177X_6 + 4.423X_7 + 0.000X_8$$

The coefficient of determination (R^2) for the season 2023-24 was found to be 0.77. This signifies that the recorded weather parameters collectively contributed to 77.00% of the total variation in the aphid population during this season and the coefficient of determination (R^2) for this season 2024-25 was 0.94, indicating a very high dependency 94.00% of the aphid population on the recorded meteorological factors.

Table 3: Multiple linear regression between aphid and weather parameters during Summer 2023-24 and Summer 2024-25.

Sr. No	Weather Parameters	Regression coefficient (b)		S.E. (b)		't' values	
		2023	2024	2023	2024	2023	2024
(X1)	T _{max}	3.851	-0.750	67.173	0.965	-2.041	-0.777
(X2)	T _{min}	-0.361	1.336	1.499	1.000	2.569	1.335
(X3)	RH-I	0.333	0.062	0.654	0.402	-0.553	0.154
(X4)	RH-II	0.062	-0.569	0.347	0.227	0.959	-2.504
(X5)	Wind speed	15.803	-7.451	0.202	3.988	0.307	-1.868
(X6)	BSS. (hrs)	-1.889	-1.177	9.360	1.037	1.688	-1.135
(X7)	E _{pan} (mm)	-7.847	4.423	0.766	2.189	-2.466	2.021
(X8)	Rainfall	-0.434	0.000	3.780	0.000	-2.076	65535.000
Intercept (a) (2023) = -137.110, N = 14, F value = 2.055, $R^2 = 0.77$							
Intercept (a) (2024) = 35.071, N = 14, F value = 10.197, $R^2 = 0.94$							

Jassid (*Amrasca biguttula biguttula* Ishida)

Multiple regression analysis was conducted to quantify the impact of weather factors during Summer 2023-24 and Summer 2024-25 presented in (Table 04) and the regression equation derived for summer 2023-24 is $Y = -190.062 + 4.275X_1 - 0.094X_2 + 0.693X_3 + 0.042X_4 + 19.584X_5 - 2.529X_6 - 7.765X_7 - 0.553X_8$. The coefficient of determination (R^2) was 0.88, suggesting that 88.00% of the variation in the

jassid population was collectively contributed by the weather parameters.

The regression equation worked out for summer 2024-25 $Y = 19.739 - 1.869X_1 + 2.478X_2 - 0.064X_3 + 0.166X_4 - 15.458X_5 - 0.567X_6 + 8.952X_7 + 0.000X_8$. The analysis yielded an (R^2) value of 0.87, indicating that weather parameters contributed for 87.00% of the population fluctuation.

Table 4: Multiple linear regression between jassid and weather parameters during Summer 2023-24 and Summer 2024-25

Sr. No	Weather Parameters	Regression coefficient (b)		S.E. (b)		't' values	
		2023	2024	2023	2024	2023	2024
(X1)	T _{max}	4.275	-1.869	1.370	1.886	3.120	-0.991
(X2)	T _{min}	-0.094	2.478	0.598	1.955	-0.157	1.267
(X3)	RH-I	0.693	-0.064	0.317	0.786	2.182	-0.081
(X4)	RH-II	0.042	0.166	0.185	0.444	0.227	0.374
(X5)	Wind speed	19.584	-15.458	8.553	7.793	2.290	-1.984
(X6)	BSS. (hrs)	-2.529	-0.567	0.700	2.027	-3.612	-0.280
(X7)	E _{pan} (mm)	-7.765	8.952	3.455	4.278	-2.248	2.093
(X8)	Rainfall	-0.553	0.000	0.795	0.000	-0.695	65535.000
Intercept (a) 2023 = -190.062, N = 14, F value = 4.711, R ² = 0.88							
Intercept (a) 2024 = 19.739, N = 14, F value = 4.194, R ² = 0.87							

Whitefly (*Bemisia tabaci* Gennadius)

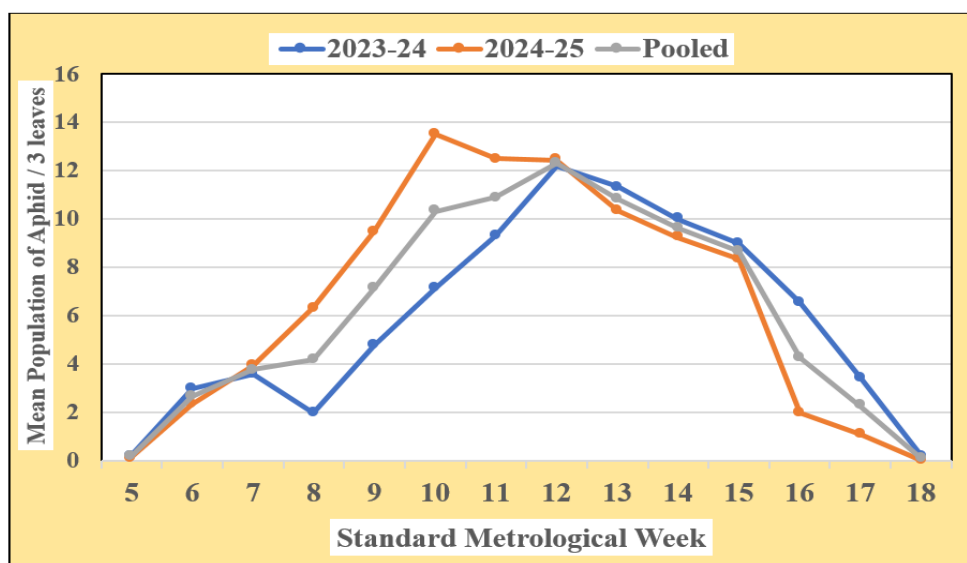
Multiple regression analysis was conducted to quantify the impact of weather factors during Summer 2023-24 and presented in (Table 05)

The regression equation worked out for summer 2023-24 $Y = -19.854 + 0.664X_1 + 0.024X_2 + 0.010X_3 - 0.033X_4 + 8.619X_5 - 0.649X_6 - 2.779X_7 - 0.437X_8$. The coefficient of

determination (R²) was 0.82, indicating that 82.00% of the variation in the whitefly population could be attributed to the weather parameters. The regression equation worked out was for summer 2024-25 $Y = 23.519 - 0.658X_1 + 0.330X_2 - 0.094X_3 - 0.023X_4 - 2.558X_5 - 0.280X_6 + 2.824X_7 + 0.000X_8$. The R² value was 0.93, suggesting a 93.00% dependency on meteorological factors during the second season.

Table 5: Multiple linear regression between whitefly and weather parameters during Summer 2023-24 and Summer 20225

Sr. No	Weather Parameters	Regression coefficient (b)		S.E. (b)		't' values	
		2023	2024	2023	2024	2023	2024
(X1)	T _{max}	0.664	-0.658	0.548	0.304	1.212	-2.163
(X2)	T _{min}	0.024	0.330	0.239	0.315	0.101	1.048
(X3)	RH-I	0.010	-0.094	0.127	0.127	0.076	-0.738
(X4)	RH-II	-0.033	-0.023	0.074	0.072	-0.448	-0.321
(X5)	Wind speed	8.619	-2.558	3.422	1.257	2.519	-2.035
(X6)	BSS. (hrs)	-0.649	-0.280	0.280	0.327	-2.318	-0.855
(X7)	E _{pan} (mm)	-2.779	2.824	1.382	0.690	-2.010	4.092
(X8)	Rainfall	-0.437	0.000	0.318	0.000	-1.373	65535.000
Intercept (a) 2023 = -19.854, N = 14, F value = 2.946, R ² = 0.82							
Intercept (a) 2024 = 23.519, N = 14, F value = 8.397, R ² = 0.93							

**Fig 1:** Seasonal incidence of aphid infesting Okra (Summer 2023-24, Summer 2024-25 and pooled)

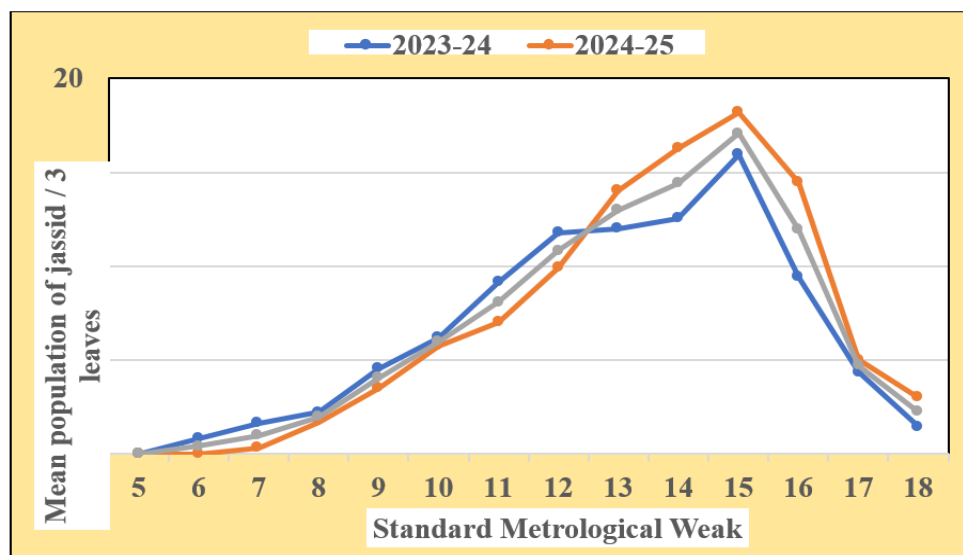


Fig 2: Seasonal incidence of jassid infesting Okra (Summer 2023-24, Summer 2024-25 and Pooled)

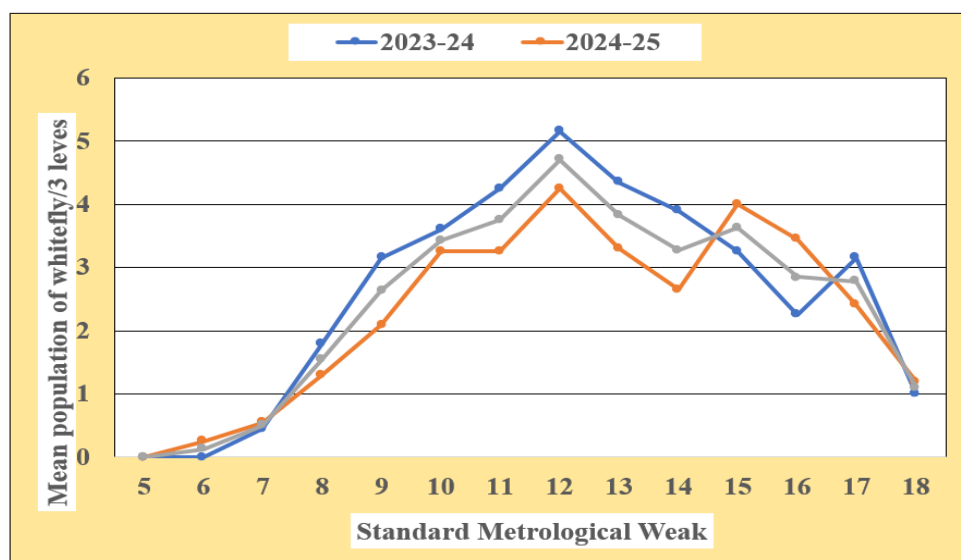


Fig 3: Seasonal incidence of whitefly infesting Okra (Summer 2023-24, Summer 2024-25 and pooled)

Conclusion

The overall results of the present study revealed that, pooled data on both the years in aphid's population was in the range of 0.10 to 12.33 aphids/three leaves/plant while, peak population was observed during 12th SMW, jassid population was in the range of 0.40 to 17.08 jassids/three leaves/plant whereas, peak population was observed during 15th SMW and whitefly population was in the ranges of 0.13 to 4.70 whiteflies/three leaves/plants whereas, peak population was observed during 12th SMW. However, weather parameters play an important role in the incidence of sucking pest on okra crop. The population of jassid, aphid and whitefly were significantly positively influenced by the maximum and minimum temperature.

References

- Butani DK, Verma S. Insect-pests of vegetables and their control-3: lady's finger. Pesticides. 1976;10(7):31-37.
- Chouhan S, Chandrakar G, Nirala YS, Rana N. Seasonal incidence of major sucking insect pest of okra and their correlation with weather parameters. Adv Life Sci. 2016;5(2):384-387.
- Das A, Samanta A, Chatterjee ML. Population dynamics of whitefly on okra and its correlation with weather parameters. J Crop Weed. 2023;19(1):112-117.
- Das R, Saikia DK, Devesh A, Ahmed SS. Succession of major pests and predators in okra (*Abelmoschus esculentus* L. Moench) ecosystem. Int J Curr Microbiol App Sci. 2021;10(1):2174-2183.
- Dhaka SR, Pareek A. Seasonal abundance of sucking insect pests on okra and their correlation with abiotic factors. J Insect Sci. 2021;34(2):123-128.
- Dhandage SR, Bangale SA, Vaja AS, Virani VR. Seasonal incidence of sucking pest of okra and its relationship with weather parameters in summer season. Int J Curr Microbiol App Sci. 2018;7(11):2697-2704.
- Pandey SA, Kostha VK. Effect of the abiotic factors on major insect pests in okra (*Abelmoschus esculentus*) under Chhattisgarh plain. Int J Chem Stud. 2017;5(3):540-544.
- Rawat RR, Sahu HR. Estimation of losses in growth and yield of okra due to recommended insecticides against jassid on okra. Himachal J Agric Res. 1973;24(1-2):85-92.

9. Sarkar PK, Mukherjee AB, Ghosh J. Assessment of loss of bhendi against red spider mite. Environ Ecol. 1996;14:480-481.
10. Shinde BD, Sartake MB, Nemade PW, Sable YR. Bio efficacy of botanical, microbial and synthetic insecticides against okra fruit borer. Pestology. 2007;31(3):19-22.
11. Srinivasa RN, Rajendra R. Joint action potential of neem with other plant extracts against the leaf hoppers, *Amrasca devastans* (Distant) on okra. Pest Manage Econ Zool. 2003;10:131-136.