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Influence of weather parameters on population dynamics of whitefly *Bemisia tabaci* (Gennadius) in okra *Abelmoschus esculentus* (L.) Moench

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Abstract
In this study, the field trial was conducted to determine the population dynamics, at the Central field, Department of Entomology SHUATS, Allahabad during *kharif* 2016. The whitefly was noticed when the crop was in vegetative stage. The infestation of whitefly on okra commenced from August 4th week (35th SMW) 1.40 whiteflies/3leaves, which gradually increased and reached to its peak 12.53 whiteflies/ 3leaves in the October 3rd week (42nd SMW) at 35.05^{0}C and 25.70^{0}C maximum and minimum temperatures, 89.70% and 51.80% morning and evening relative humidity and 00.00 mm rainfall. As soon as the fruiting started, the incidence of this insect pest started to decline and disappeared during November 4th week (48th SMW). That showed significant positive correlation with Sunshine (r= 0.601) while remaining abiotic factors showed non-significant effect.

Keywords: influence, okra, population dynamics, weather parameters, whitefly

Introduction
Okra (*Abelmoschus esculentus* L. Moench), also known as lady's finger or bhendi, belongs to family Malvaceae and is an important crop grown throughout the year. Besides India, it is grown in many tropical and subtropical parts of the world. Tender fruits are used as vegetables or in culinary preparations as sliced and dried pieces. It is also used for thickening gravies and soups, because of its high mucilage content. The roots and stems of okra are used for cleaning cane juice Chauhan 1972 [3]. In India, okra is commercially grown in the states of Gujarat, Maharashtra, Andhra Pradesh, West Bengal, Bihar, Orissa, Jharkhand, Uttar Pradesh, Tamil Nadu, Karnataka, Haryana, Punjab and Assam. In Maharashtra, okra occupies a prominent position among vegetables covering an area of 19,000 ha with an annual production of 224 thousand metric tons Anonymous 2011 [1]. Okra crop is susceptible from early stage to maturity. Among the wide array of insect pests infesting okra crop, the sucking pests which are, aphid, *A. gossypii* (Glover), leafhopper *A. biguttula biguttula* (Ishida), and whitefly, *B. tabaci* (Gennadius), were reported to be quite serious during all stages of the crop growth Channabasavanna 1981 [2] and Singh *et al*., 1987 [11]. Okra (*Abelmoschus esculentus* L.) is one of the widely grown vegetable crop Javed *et al*., 2009 [5]. India ranked first in production in world; major okra producing Indian sates are Uttar Pradesh, Bihar, Odisha, West Bengal, Andhra Pradesh, Karnataka and Assam with average production of okra in India is about to 57.84 lakh tons and productivity 11.6 tons/ha during 2010-11 Pal *et al*., 2013 [9]. Thus in the present investigation an attempt has been made to record the population dynamics of whitefly help to take up effective management.

Materials and Methods
The experiment was conducted during *kharif* season 2016 at the Central Field of "Sam Higginbottom University of Agriculture, Technology and Sciences" Allahabad, Uttar Pradesh, India, laid in a Randomized Block Design (RBD) with three replications and eight treatments, using variety VNR-22 (Komal) in a plot size of (2m x 1m) at a spacing of (45x30cm) with recommended package of practices. For recording population dynamics of the whitefly, the observations were taken from 3 leaves i.e., from top, middle and lower portion of the five randomly selected plants. While recording observations on whitefly, the leaves was gently turned and counted. The data was statistically analyzed by correlation analysis between weather parameters and whitefly.

Results and Discussion

The population dynamics of *Bemisia tabaci* on okra during *kharif* season 2016. The whitefly was noticed when the crop was in vegetative stage. The data presented in (Table 1) revealed that the infestation of whitefly on okra commenced in the August 4th week (35th SMW) 1.40 whiteflies/3leaves i.e. four weeks after sowing which gradually increased and reached to peak 12.53 whiteflies/3leaves in the October 3rd week (42nd SMW). That showed significant positive correlation with Sunshine (r= 0.601) while remaining abiotic factors showed non-significant effect. These observations are in close agreement with Ghosh 2014 reported that peak incidence of *Bemisia tabaci* on okra during 42nd-43rd standard meteorological week. Also this is in close agreement with earlier works of Mohapatra 2008 who reported that maximum activity of *Bemisia tabaci* during October corroborate with the observations of Jayaswal and Sundharmurthy 1992 [6] and Shrama *et al*., 2004 [10]. Similarly, Leite *et al*., 2005 [7] reported that adult population peaked in September and nymph presented two peaks the first in August and second in October.

From the critical analysis of the present findings it can be concluded that Whitefly commences in the week of August and reaches peak in the month of October.

Table 1: Population dynamics of whitefly, *Bemesia tabaci* (Gennadius) during *Kharif* season in 2016.

Standard week	Whitefly/3 leaves	Temperature (^{0}c)		Humidity (%)		Rainfall (mm)	Wind Velocity (km/hr)	Sunshine (hr/day)
		Max.	Min.	Morning	Evening			
32	0.00	33.80	27.14	88.20	55.40	4.30	1.28	5.10
33	0.00	33.10	27.00	91.70	56.70	25.90	2.22	2.70
34	0.00	34.40	27.10	88.70	55.70	6.20	2.55	5.60
35	1.40	35.80	27.20	90.50	53.40	6.90	1.68	5.00
36	4.06	35.10	27.20	87.80	53.80	0.60	2.20	8.00
37	6.26	35.20	27.20	89.40	54.20	4.90	1.20	8.30
38	7.13	33.20	26.87	89.14	62.50	1.10	0.80	6.60
39	9.73	30.20	26.20	89.40	66.20	8.02	0.60	5.20
40	10.4	34.60	26.60	87.40	53.80	6.30	2.20	7.40
41	11.67	34.40	26.30	89.80	52.20	1.40	1.01	8.50
42	12.53	35.05	25.70	89.70	51.80	0.00	0.80	8.70
43	10.60	34.30	24.80	90.20	53.70	0.00	1.01	8.70
44	8.86	33.90	19.80	90.70	54.40	0.00	1.08	8.50
45	6.80	33.14	18.20	91.80	55.70	0.00	1.02	6.90
46	4.30	32.70	16.90	91.40	53.80	0.00	0.60	8.50
47	2.40	31.90	15.30	92.00	48.50	0.00	0.60	8.40
48	0.00	29.50	15.15	92.80	54.00	0.00	0.50	6.30
	r=	0.204	0.162	-0.262	0.088	-0.349	-0.303	0.601
	F- test	NS	NS	NS	NS	NS	NS	S
Table value = (2.144)								

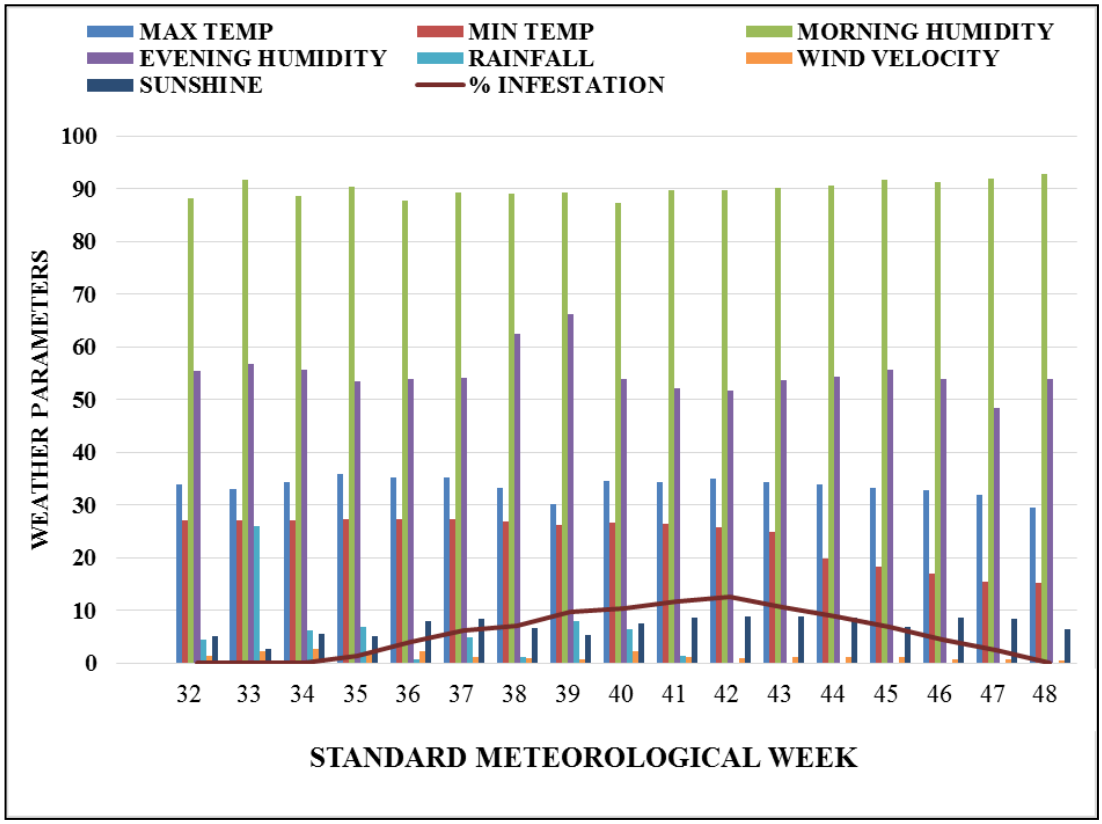

Fig 1: Population dynamics of whitefly, *Bemesia tabaci* (Gennadius) during *Kharif* season in 2016

References

1. Anonymous. Indian Horticulture Data Base. Ministry of Agriculture, Government of India, Gurgaon, 2011, 1-296.
2. Channabasavanna GP. Contributions to Acarology Society of India, Bangalore, 1981, 256.
3. Chauhan DVS. Vegetable production in India. 3rd Ed., Pub. Ram Prasad and Sons, Agra, 1972.
4. Ghosh SK. Incidence of white fly (*Bemisia tabaci* Genn.) and their sustainable management by using biopesticides. Proceedings of the 4th ISOFAR Scientific Conference. 'Building Organic Bridges', at the Organic World Congress, Istanbul, Turkey, 2014, 623-626.
5. Javed H, Aziz MA, Leghari RAK. Resistance in different okra (*Abelmoschus esculentus* L.) cultivars against American bollworm (*Helicoverpa armigera* Hub.). *J. agric. Res*. 2009; 47:433-438.
6. Jayaswal AP, Sundaramurthy VT. Achievements in insect management in cotton. In : Achievements of All India co-ordinated Cotton Improvement Project, A. K. Basu and S. S. Narayanan (eds.). Silver jubilee. 1992, 17-19.
7. Leite GLD, Picanço M, Jham GN, Moreira MD. Whitefly population dynamics in okra plantations. Pesq. agropec. *bras*. 2005, 40(1).
8. Mohapatra LN. Population dynamics of sucking pests in hirsutum cotton and influence of weather parameters on its incidence in western Orissa. J. Co. Res. Dev. 2008; 22(2):192-194.
9. Pal S, Maji TB, Mondal P. Incidence of insect pest on okra, *Abelmoschus esculentus* (L) Moench in red lateritic zone of West Bengal. J Pla. Prot. Sci. 2013; 5:59-64.
10. Sharma PD, Jat KL, Takar BL. Population dynamics of insect-pests on American cotton in Haryana. J Cotton Res. Dev. 2004; 18:104-106.
11. Singh J, Singh RK, Mukherjee IN, Singh RN, Agarwal L. Mites of agricultural importance and their management in India. In: Recent Advances in Entomology (Eds. Mathur, Y. K., Bhattacharya, A. K., Pandey N. D., Upadhyay, K. D. and Srivastava, J. P.). Gopal Prakashan. Kanpur, 1987, 170-185.