Advances in Bioresearch
Adv. Biores., Vol 10 (2) March 2019: 91-94

Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.10.2.9194

Advances in Bioresearch

ORIGINAL ARTICLE

Incidence Pattern of Important Pests in the Okra (*Abelmoschus esculentus*) (L.) Moench ecosystem in relation to the ecological parameters under Gangetic Alluvial Plains of West Bengal, India

Mainak Bhattacharyya
Department of Agricultural Entomology
Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal.
Email: mainakbckv24@gmail.com

ABSTRACT

Okra (Abelmoschus esculentus) (L.) Moench is grown throughout India and is considered to be very much important for a number of reasons including its yield potential and nutritive value. A number of insect pests are observed to damage Okra plants. To find out the incidence pattern of important pests in okra , 2 replicated RBD trials was conducted from March to May, 2010 at the District Seed Farm of Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, West Bengal. The mean population of adults jassids per leaf were observed which showed lowest of 9.06 per leaf in 09.04.2010 and the highest being recorded on 10.05.2010 which was 20.28 per leaf. Nevertheless, nymph jassids population was least on 31.03.2010 which was 14.28 per leaf and reached to its peak to 30.56 per leaf on 10.05.2010. The mean population of Red spider mites / 2 sq.cm on leaf surfaces was calculated which showed lowest population of 23.52 per 2 sq.cm of leaf surface on 31.03.2010 and the highest being recorded on 10.05.2010 which was 58.82 per 2 sq.cm of leaf surface. However, mean population of Earias vitella per plant was found to be lowest on 31.03.2010 which was 7.38 per plant and highest population recorded was 10.22 per plant on 10.05.2010. The correlation studies of mean populations of adult jassids, jassids nymphs, Red spider mites and Earias vitella with the ecological parameters were studied . The correlation studies of mean population of adult jassids with the maximum temperature showed r = - 0.52 where as with min temperature the r value showed to be - 0.27. The mean population of jassid nymphs showed r = - 0.55 and r = - 0.27 when it was correlated with the maximum and minimum temperature. However, the correlation studies of mean population of red spider mites per 2 sq.cm of leaf with maximum and minimum temperature showed r = - 0.46 and - 0.37 respectively. Also, correlation studies of the mean population of Earias vitella per plant with the maximum temperature showed r = - 0.55 and with minimum temperature r = -0.27. Nevertheless, correlation studies of the pest complexes with the Relative humidity showed r value for adult jassids to be -0.48, for jassid nymphs r = - 0.16. Mean population of Red spider mites/ 2 sq.cm of leaf when correlated with the relative humidity showed r = - 0.26 whereas, correlation study of mean population of Earias vitella with relative humidity showed r = - 0.04.

Keywords: Correlation study , ecological parameters, jassids, okra , nymphs, red spider mite.

Received 15.01.2019 Revised 14.01.2019 Accepted 01.03.2019

How to cite this article:
Mainak Bhattacharyya. Incidence Pattern of Important Pests in the Okra (*Abelmoschus esculentus*) (L.) Moench ecosystem in relation to the ecological parameters under Gangetic Alluvial Plains of West Bengal, India. Adv. Biores. Vol 10 [2] March 2019: 91-94

INTRODUCTION

Several insect pests attack the Okra plant from the vegetative stage till its maturity. Among these pests, the shoot and fruit borer , *Earias vitella* (F) (Noctuidae; Lepidotera) , *Amrasca biguttula biguttula* (Ishida) (Cicadellidae; Hemiptera) and *Tetranychus urticae* (Koch) (Tetranychinae; Acari) are potentially the important pests of okra. For the study of the incidence pattern of pests in okra ecosystem , okra seeds were sown in 21 plots each of size 4m X 3m . As regard to fertilizers and manure, half the dosage of N and full of P, K and FYM were applied as basal dressing while the other half of N was given as topdressing at 30 DAS [1-7]. The sowing was done in lines on 20th March, 2010 with spacing of 50 cm at rows and 30 cm

between plants. The entired experiment was conducted in summer (March to May, 2010) at The District Seed Farm of Bidhan Chandra Krishi Viswavidyalaya , Mohanpur, Nadia , West Bengal.

MATERIAL AND METHODS

The number of damaged shoots caused by *Earias vitella* out of the total shoots were recorded at an interval of 3 days starting from 10 DAS. The number of flower buds as damaged were also recorded out of total buds in 5 plants selected randomly . For ascertaining population of jassids and red spider ite , 5 plants were selected at random from the middle rows of each plot and tagged at the beginning. Populations of the jassids nymphs and adults were taken at approximately 3 days interval from 10 days after sowing . Observation of the number of jassid nymphs and adults and red spider mite were taken from the upper, middle and lower leaves of 5 plants selected at randomly. Mean population of the shoot and fruit borer per plant, jassid nymphs and adults per leaf and read spider spider mites per 2 sq cm on leaf surface was calculated. The mean population data of the pests were hence correlated with the ecological parameters like maximum temperature, minimum temperature and relative humidity collected from the Department of Agricultural Meteorology and Physics, Bidhan Chandra Krishi. Viswavidyalaya , Mohanpur, Nadia , West Bengal.

RESULTS AND DISCUSSIONS

The mean population of adults jassids per leaf were observed which showed lowest of 9.06 per leaf in 09.04.2010 and the highest being recorded on 10.05.2010 which was 20.28 per leaf. Nevertheless, nymph jassids population was least on 31.03.2010 which was 14.28 per leaf and reached to its peak to 30.56 per leaf on 10.05.2010. The mean population of Red spider mites / 2 sq.cm on leaf surfaces was calculated which showed lowest population of 23.52 per 2 sq.cm of leaf surface on 31.03.2010 and the highest being recorded on 10.05.2010 which was 58.82 per 2 sq.cm of leaf surface. However, mean population of *Earias vitella* per plant was found to be lowest on 31.03.2010 which was 7.38 per plant and highest population recorded was 10.22 per plant on 10.05.2010.

Table.(1) suggests the incidence pattern of some major pests of Okra during the period from 31.03.2010 to 10.05.2010 in the Gangetic alluvial plain of West Bengal. It could be seen from Table.(1) that the mean population of adult jassids per leaf was 9.06 (minimum) on 09.04.2010 when the maximum and minimum temperature were 40°C and 24.3°C respectively and the relative humidity was 98%. The mean population gradually increased and it reached peak on 10.05.2010 when the population was 20.28 per leaf under the maximum and minimum temperature of 36.3°C and 26.5°C respectively and relative humidity was 97% with rainfall of 31 mm. The jassid nymphs showed overall increase in the mean population per leaf of okra plants when the population was lowest on 31.03.2010 when the maximum temperature was 37°C and minimum temperature was 26.7°C with relative humidity 95% and the population recorded was 14.28 per leaf and the highest population recorded was 30.56 per leaf on 10/05.2010 when the maximum and minimum temperature was 36.3°C and 26.5°C respectively and relative humidity being 97%. Mean population of red spider mite per 2 sq cm leaf surface and *Earias vitella* per plant also showed increasing trends with highest population being recorded on 10.05.2010 and least population being observed on 31.03.2010.

The correlation studies of mean populations of adult jassids, jassid nymphs, red spider mites and *Earias vitella* with the ecological parameters were studied and presented in the Table (3) . The correlation studies of mean population of adult jassids with the maximum temperature showed r = -0.52 where as with minimum temperature the r value showed to be - 0.27. The mean population of jassid nymphs showed r = - 0.55 and r = - 0.27 when it was correlated with the maximum and minimum temperature. However, the correlation studies of mean population of red spider mites per 2 sq.cm of leaf with maximum and minimum temperature showed r = - 0.46 and - 0.37 respectively. Also, correlation studies of the mean population of *Earias vitella* per plant with the maximum temperature showed r = -0.55 and with minimum temperature r = - 0.27. Nevertheless, correlation studies of the pest complexes with the Relative humidity showed r value for adult nymphs to be - 0.36, for jassid nymphs r = -0.16. Mean population of Red spider mites/ 2 sq.cm of leaf when correlated with the relative humidity showed r = - 0.26 whereas, correlation study of mean population of *Earias vitella* with relative humidity showed r = - 0.04.

Table 1: Incidence pattern of some major pests of Okra during the period from 31/3/2010 to 10/05/2010.

Date of observations	Mean Population per leaf		Mean population of Red Spider mites/2 sq.cm of leaf surfaces.	Mean population of *Earias vitella* per plant
	Adult jassids	Jassid nymphs		
31.03.2010	9.12	14.28	23.52	7.38
03.04.2010	10.34	14.92	25.76	8.02
06.04.2010	10.62	14.84	27.00	7.74
09.04.2010	9.06	15.30	30.72	7.96
12.04.2010	13.36	18.14	32.48	8.06
15.04.2010	16.48	20.58	36.00	8.32
18.04.2010	17.06	21.16	40.54	8.40
21.04.2010	17.76	22.94	45.26	8.40
24.04.2010	18.14	21.38	48.60	8.52
27.04.2010	18.60	23.32	50.58	8.74
01.05.2010	18.38	26.12	52.74	8.98
04.05.2010	18.60	26.62	53.50	9.30
07.05.2010	19.32	28.30	56.08	9.52
10.05.2010	20..28	30.56	58.82	10.22

Table 2. Ecological parameters corresponding to the date of observations of the pests.

Date of observations	Maximum Temperature (°C)	Minimum Temperature (°C)	Relative humidity(%)	Rainfall (mm)
31.03.2010	37.0	26.7	95	0
03.04.2010	36.0	26.3	95	0
06.04.2010	38.3	26.2	97	0
09.04.2010	40.0	24.3	98	0
12.04.2010	37.0	26.5	95	0
15.04.2010	36.0	27.7	92	0
18.04.2010	37.0	27.0	94	0
21.04.2010	38.4	27.5	96	0
24.04.2010	37.0	27.3	92	0
27.04.2010	36.6	19.8	87	24
01.05.2010	37.0	23.0	89	0
04.05.2010	35.0	24.0	94	2
07.05.2010	34.0	24.5	98	0
10.05.2010	36.3	26.5	97	31

Table (3). Correlated value of mean population of adult jassids, jassid nymphs per leaf, red spider mites per 2 sq cm on leaf surfaces, *Earias vitella* per plant with ecological parameters .

Pests (Mean population)	*r values*		
	Maximum temperature	Minimum temperature	Relative humidity
Adult jassids	-0.52	-0.27	-0.48
Jassid nymphs	-0.55	-0.27	-0.16
Red Spider Mite	-0.46	-0.37	-0.26
Earias vitella	-0.55	-0.27	-0.40

CONCLUSION

The investigation was conducted in the field to study the incidence pattern of *Earias vitella, Tetranychus urticae* and *Amrasca biguttula biguttula* as well as the correlation of the mean population of these pests with the ecological factors during the year 2010. The damage of *Earias vitella* initially started after the larvae bored into the apical shoots resulted in their drooping. With the formation of buds, flowers and fruits the larvae migrated there and bored through them. Moderate to high population of jassids were noticed at the undersurface of the leaves. High population of red spider mites were noticed at flower buds, leaves and fruits of the okra plant.

ACKNOWLEDGEMENT

I would like to thank my parents and sister for their love, affection and support. I would also like to show my heartiest gratitude to my teachers and my friends of Department of Agricultural Entomology and Department of Agricultural Meteorology and Physics , Bidhan Chandra Krishi Viswavidyalaya , Mohanpur, Nadia , West Bengal.

REFERENCES

1. A. Adilakshmi, D.M. Korat and P.R.Vaishnau, (2007).Effect of organic and inorganic fertilizers on insect pests infesting okra.Karnataka J. Agric. Sci., 21(2), pp287-289
2. Adams, C.F. (1975). Nutritive value of American foods in common units, U.S. Department of Agriculture,Agric Handbook, 425, pp 29.
3. Borssum Waalkes, I. van (1966). Malesian Malvaceae revised. Blumea 14(1): pp.1-251.
4. Hamon, S., and A. Yapo, (1985). Perturbations induced within the genus *Abelmoschus* by the discovery of a second edible okra species in West Africa. Act Hortic.182:pp.133-144.
5. Kuhro R, Ghafoor A, Mahmood A, Khan MS, Andleeb S,Bukhari M et al. (2012).Assessment potential of predatory spiders in controlling the cotton jassid (Amrasca devastans) under laboratory and field conditions. J.Animal & Plant Scie, 2012; 22(3):pp.635-638.
6. Singh Y, Aastik Jha, Savita Verma, Mishra VK, Singh SS. (2013). Population dynamics of sucking insect pests and its natural enemies on okra agro-ecosystem in Chitrakoot region, African Journal of Agricultural Research. 8(28):pp.3814-3819.
7. Srinivasa AG. (1993). Seasonal incidence, loss estimation and management of leaf hopper, *Amrasca biguttula biguttula* Ishida (Homoptera: Cicadellidae) on Cotton.M. Sc (Agri). Thesis, University of Agricultural Sciences, Dharwad (India),