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STUDY OF POPULATION DYNAMICS OF MAJOR INSECT PESTS OF OKRA PLANTS.

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ABSTRACT:

The present paper deals with Population dynamics of major insect pest of okra, experiment was carried out in P P N P G college Kanpur. The incidence of leaf hopper, Amrasca biguttula biguttula (Ishida), whitefly, Bemisia tabaci (Genn.) and shoot and fruit borer Earias spp. was registered as major insect pests on okra . The incidence of leaf hopper and whitefly was recorded in 32nd standard meteorological week (SMW). The peak incidence of leaf hopper and whitefly was recorded in 36th SMW in three leaves. The infestation of shoot and fruit borer on shoot was recorded in 32nd SMW, which reached its peak in 36th SMW. The population of leaf hopper, whitefly and lady bird beetle, Menochilus sexmaculatus (Fab.) had significantly positive correlation with minimum temperature and relative humidity, but non-significant with rainfall and maximum temperature. The shoot infestation had non-significant relation with abiotic factors. Infestation of fruits had positive significant correlation with maximum temperature and negative significant with minimum temperature.

KEYWORDS:

POPULATION DYNAMICS, INSECT PESTS, OKRA.

INTRODUCTION

Okra (*Abelmoschus esculentus* L.) commonly known as Bhindi or lady's finger, belongs to family Malvaceae, is a popular vegetable crop due to its high nutritional and medicinal values. The leaf hopper, whitefly and shoot and fruit borer are major insect pests, of okra. A.*biguttula* sucks the cell sap from lower surface of the leaves and injects toxic substance in it, resulting in yellowing and curling of leaf margins and stunted plant growth. The whitefly, A. *tabaci* also sucks the cell sap from the leaves which lowered vitality of the plants. It excretes honeydew on which sooty mould develops, which interferes with the process of normal photosynth- esis. Consequently, the growth of plant is adversely affected. The shoot and fruit borer complex (E. *insulana* and E. *vittella*) is one of the most serious pests of okra. The larvae bore into the terminal growing shoots, floral buds, flowers and fruits of okra, resulting in cessation, withering and drying of infested shoots, tender leaves and heavy shedding of floral buds and flowers. The infested fruits become malformed and are rendered unfit for human consumption as well as for procurement of the seeds. Population dynamics of these insect pests provides not only the information of initiation of the pest but also the peak activity of the particular pest which is used as weak link for pest management strategy. Further, the impact of biotic and abiotic parameters play a vital role in population build-up of insect pest. Therefore, there is a need to understand the population dynamics and impact of various factors on population bulid up.

MATERIALS AND METHODS

To study the population dynamics of major insect pests of okra was selected and tagged the plants. The weight of both healthy and infested fruits was taken separately and level of infestation was worked out in per cent.

The observations on populations of natural enemies *viz*., Coccinellids (*Menochilus sexmeculatus*) corresponding to the populations of insect pests were recorded on the same tagged plants at the same time interval. The observations on natural enemies of pests were recorded soon after their appearance till harvesting of the crop. The crop were remain free from any pesticidal application.

For recording the observations, five plants were randomly selected and tagged in each plot to record the pest populations. The observations of leafhopper and whitefly were recorded at weekly interval right from germination to harvesting of the crop. The population of leafhopper and whitefly was counted before 7.30 AM, when they remained less active by visual count on three leaves, *i.e.* one each from top, middle and computed between population of insect pests, predator and abiotic factors (maximum and minimum temperature, relative humidity and rainfall) by using the formula for calculating correlation coefficient (Gupta, 1996).

RESULTS AND DISCUSSION

Our investigation, leaf hopper, *A. biguttula biguttula*, whitefly, *B tabaci* and shoot and fruit borer, *Earias* spp were noticed as major bottom of tagged plants (absolute counting) All the stages of nymphs and adults of these

pests were taken into account while counting. The leaf hopper and whitefly on upper surface of leaves were counted first and then on lower surface by gentle turning, taking all possible care not to disturb them.

The data on shoot and fruit borer, *Earias* spp. were recorded on five randomly selected and tagged insect pest of okra. Pest population reduced gradually and reached to a level of 1.80 leaf hoppers/ three leaves in the in the plants throughout the crop period by visual count of fourth week of . The data the plant in which the top portion was infested, started after two week of sowing to last picking of the fruits. The per cent shoot infestation was calculated by counting the total number of shoots and the number of infested shoots. In case of fruit borer, the observations were recorded on infestation of fruits both on number and weight basis at each picking starting from 2nd week of September to 4th week of October 2021 to till last picking of fruits.

TABLE 1. POPULATION CORRELATION OF MAJOR INSECT PESTS, *M. SEXMACULATUS* AND ABIOTIC FACTORS

Particulars	Whitefly	Leaf hooper	*M. Sexmaculatus*	Shoots	Fruits
Maximum temperature (^{O}C)	-0.04	-0.04	-0.16	0.42	0.72
Minimum temperature (^{O}C)	0.64	0.63	0.64	0.14	-0.90
Relative humidity (%)	0.63	0.63	0.64	0.04	-0.90
Rainfall (mm)	0.54	0.54	0.53	0.02	-0.40
***M. sexmaculatus* (Nos.)**	**0.94**	**0.95**			

The per cent infestation of fruits on number basis was calculated by counting the infested and healthy fruits separately from presented in Table 1 indicates that the infestation of leaf hopper on okra crop showed non-significant correlation with maximum temperature (r = -0.04) and rainfall (r = 0.54), while significant correlation with minimum temperature (r = 0.63), relative humidity (r = 0.64) and ladybird beetle, *M. sexmaculatus* (r = 0.95). The infestation of whitefly population showed non-significant correlation with maximum temperature (r = -0.04) and rainfall (r = 0.54) while, significant positive correlation with minimum temperature (r = 0.64), relative humidity (r = 0.63) and ladybird beetle, *M. sexmaculatus* (r = 0.95). The population of lady bird beetle on okra crop showed non-significant correlation with maximum temperature (r = -0.16) and rainfall (r = 0.53), while significant correlation with minimum temperature (r = 0.67) and relative humidity (r = 0.65). The population of lady bird beetle showed a significant effect on sucking insect pests, *viz*., leaf hopper and whitefly.

CONCLUSION

The population of leaf hopper, whitefly and lady bird beetle, *Menochilus sexmaculatus* (Fab.) had significantly positive correlation with minimum temperature and relative humidity, but non-significant with rainfall and maximum temperature. The shoot infestation had non-significant relation with abiotic factors. Infestation of fruits had positive significant correlation with maximum temperature and negative significant with minimum temperature.

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