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Effect of abiotic factors on population dynamics of *Tetranychus urticae* Koch on brinjal crop

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Abstract

An experiment was conducted during March 2010 to August 2010 at the Pili Kothi farm of T.D. College Jaunpur to study the abundance of mite population *Tetranychus urticae* on brinjal crop. The highest population was recorded in the month of May and lowest population was recorded in the month of March. A positive correlation was observed between population and temperature and negative correlation was observed between population with rain fall and relative humidity.

Key words- *Tetranychus urticae*, brinjal

Introduction

Insect pest infestation is one of the limiting factors for accelerating yield potential of brinjal. The crop is prone to damage by various mites and insect pests. Now a days mite are posing serious problem in brinjal crop. Gupta (1991) reported that average yield loss in vegetable as whole in India is 20-25 per cent by plant feeding mites. Rai and Singh (1997) have been reported 25-30 per cent loss in brinjal crop in Varanasi. Pillai and Palaniswami (1985) reported that the red spider mite *Tetranychus urticae* usually feed on the lower surface of leaf. Mites suck cell sap and chlorophyll from the leaves and appear as stipple which later gives the leaves silvery or yellowish appearances. Eventually the leaves become completely yellowish brown and finally die or fall off. Among the injurious mites reported on brinjal *Tetranychus urticae* is one of the important mite pests and has been reported all over India (Gupta,1993). Therefore keeping in view the problem of mite on brinjal crop present investigation was carried out to study the *Tetranychus urticae* population on brinjal in relation to abiotic factors.

Materials and Methods

The present investigation was carried out during March 2010 to August 2010 at agriculture farm, T.D. College, Jaunpur to study the population fluctuation of *Tetranychus urticae* on brinjal crop. The brinjal plants were found infested by mite from March 2010 to August 2010 which has kept free from any pesticidal treatments. For record of the population, 10 leaves from each plant were plucked randomly from lower, middle and upper canopy at weekly intervals. These leaves were kept in polythene bags and brought to the laboratory for examination of mites under stereoscopic microscope. They were kept in refrigerator at temperature of 5-10 °C which make mite inactive for easy counting. The leaf areas (2.5 cm²) of both the sides were checked and post embryonic stages of mites were recorded. The temperature, relative humidity and rain fall were also recorded.

Results and Discussion

Regarding mean number of mite population during March to August 2010 are presented in table 1. The results shows that maximum population of *Tetranychus urticae* was recorded in the month of May where as the minimum population were recorded in the month of March.

Table-1 Effect of abiotic factors on population fluctuation of *Tetranychus urticae* on brinjal crop during March to august 2010

Month	Mean population of mite 2.5cm ² /10 leaves	Mean Temperature (°C)	Mean Relative Humidity (%)	Total rain fall (mm)
March	6.05	29.89	40.04	0.0
April	66.08	36.54	29.19	0.0
May	104.47	39.67	40.01	2.1
June	94.02	34.76	45.15	2.25
July	85.48	31.02	72.27	49.84
August	32.57	29.82	79.31	57.93

Factor	Correlation coefficient	Regression coefficient
Population vs Temp.	0.811	12.908
Population vs R.H.	-0.18283	-0.6868
Population vs Rainfall	-0.32825	-0.373

The results show that the temperature increases the population of mite increased. Therefore a positive correlation found between mite population and temperature. It was concluded that population of mite was found increasing with increase in temperature. However negative correlation was observed between population of mite with rain fall and relative humidity. It is evident from the table that the mite population was found till the crop was present in the field. Several workers have also studied about *Tetranychus urticae* population. Lall and Mukherjee (1980) found that climatic factors viz, temperature, relative humidity and rain fall exerts a greater influence on population build up of phytophagus mites. Lall (1982) found that increase in population of *Tetranychus cinabarinus* was significantly correlated with decrease in humidity and significantly correlated in increase in temperature. Similer findings have been reported by Masis and Aguilar (1990) they found that high population density of *Tetranychus urticae* was positively correlated with temperature and low precipitation. Mishra *et al.* (1990) also found high population density of mite was positively correlated with temperature.

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