

POPULATION DYNAMICS OF GRAM POD BORER, *HELICOVERPA ARMIGERA* (HUBNER) INFESTING CHICKPEA IN RELATION TO CLIMATIC FACTORS IN VARANASI

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ABSTRACT : A field experiment on population dynamics of gram pod borer *Helicoverpa armigera* (Hubner) infesting chickpea in relation to climatic factors in Varanasi was conducted at Agriculture Research Farm, Banaras Hindu University, Varanasi to know the peak larval populations of Gram Pod Borer during the *Rabi* seasons of 2015-16 and 2016-2017. The result of the investigation on population dynamics of chickpea gram pod borer *Helicoverpa armigera* (Hubner) in relation to weather factors revealed that the pest first commenced from 5th standard week (1.26) larvae m⁻¹. After that larval population gradually increased and attained the peak in 8th standard week (10.16) larvae m⁻¹ in February and in March, it was in 11th standard week (8.86) larvae m⁻¹ in 2015-2016. In next experimental year similar trend was observed pest first appeared from 4th standard week (1.10) larvae m⁻¹ in January. After that larval population gradually increased and attained the peak in 9th standard week (10.22) larvae m⁻¹ in February and in March, it was in 11th standard week (12.76) larvae m⁻¹ in 2016-2017. After, it statistical analysis was done and correlated the larval population with abiotic factors.

Key words : Chickpea, population dynamics, *Helicoverpa armigera*, weather parameters.

INTRODUCTION

Chickpea (*Cicer arietinum* L.) is the premier pulse crop of Indian sub-continent. India is the largest chickpea producer as well as consumer in the world. Chickpea is the most important pulse crop of India and occupies 7.1 million ha with production of 5.75 million tones, accounting for 30.9% and 39.9% of total pulse area and production respectively (Anonymous, 2006). Chickpea seed has 38-59% carbohydrate, 24% protein, 3% fiber, 4.8-5.5% oil, 3% ash, 0.2% calcium and 0.3% phosphorus. There are many abiotic and biotic factors responsible for low productivity. Insect pest are the major constraints for low productivity of chickpea under biotic factors. Pod borer, *Helicoverpa armigera* (Hubner) (Lepidoptera: Noctuidae) is the most prominent insect species that causes major economic damage to this crop. It is highly polyphagous pest attacks over 182 plants species including both widely grown and economically important crops as cotton, maize, tobacco, pigeon pea, chickpea and tomato etc. (Gowda, 2010). The best way to overcome this situation is to destroy the pest at initial stage life cycle. Hence an attempt was made to investigate the incidence of the pest in relation to abiotic factors.

MATERIALS AND METHODS

The experiment was conducted during 2015-16 and 2016-17 at Agriculture Research Farm, Banaras Hindu

University, Varanasi. The chickpea variety Pusa 362 was grown as sole crop in 100m² plot. All recommended agronomic practices were adopted for the *Rabi* season. Larval population of *H. armigera* was counted 1 L m⁻¹ row length at full flowering stage and podding stage in each plot. The data thus recorded, was tabulated and mean weekly populations was calculated to draw conclusions. Weekly meteorological data were obtained from department of Agronomy Institute of Agricultural Sciences, BHU, Varanasi to correlate the larval population with abiotic factors. Relationship between number of larvae and meteorological variables was worked out using simple correlation analysis. Simple correlation coefficient analysis were done using following formula :

$$r = \frac{\sum dn.dy}{\sqrt{\sum_{N^n} d^2 x_i \times \sum_{N} d^2 y}}$$

r : Correlation coefficient

Y : Population

Xi : Weather parameter

N : Number of observations

Σ : Summation