



SEASONAL INCIDENCE OF *HELIOTHIS ARMIGERA* (HUBNER) IN GRAM CROP

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Abstract

The gram pod borer, *H. armigera* started appearing on gram crop during the third week of December during both years. The population of *Heliothis armigera* on peak (6.50 and 6.25 larvae/5plant) in second week of February in both peak years, respectively. The pest population was found positively correlated with mean temperature and negatively correlated with mean relative humidity.

Key words : Seasonal incidence, gram pod borer, *Heliothis armigera*.

Introduction

Chickpea (*Cicer arietinum* L.) is one of the most widely cultivated *rabi* pulse crop in India. Due to its high nutritional value and ability of nitrogen fixation, it makes an important component of vegetarian diet. Owing to its ability to fix atmospheric nitrogen, gram is suitable for crop rotation (Kudale *et al.*, 2002). Commonly known as gram or Bengal is considered as the “King of Pulses”. Grain legumes play an important role in overcoming the quantitative and qualitative protein requirement for large parts of humanity (Bhati and Patel, 2001).

The pest appears throughout the year on different crop, depending upon the cropping pattern. The pod borer has been recorded on over 20 crops and 180 wild hosts in India (Derek and Russell, 1999) including feed on pigeonpea, cotton tomato, groundnut, okra and sunflower etc. In India (Rote and Thakkar, 2001).

Materials and Methods

The study on seasonal incidence of *Heliothis armigera* in gram crop was carried out at Agronomy Farm, Rajasthan College of Agriculture, Udaipur (Rajasthan), India. Gram crop (varity-Dahod Yellow) was sown on 15 October, 2001 and 16 October 2002. Row to row and plant to plant distance was maintained 30 cm and 10 cm respectively. Plot was kept 2.7 × 4.2 (11.34

sq.m.). To assess the incidence of *Heliothis armigera*, five plants were randomly selected and tagged. From these tagged plants weekly observation were taken on number of larvae per plant. Weekly data on relative humidity and temperature were obtained from the meteorology observatory for the experiment period during both years. The pest population were correlated with various weather parameters *viz.*, mean temperature and mean relative humidity by using simple correlation formula:

$$R_{x_1y_1} = \frac{X_1Y_1 \frac{(\sum X_1)(\sum Y_1)}{n}}{\sqrt{\left[\sum X_1^2 - \frac{(\sum X_1)^2}{n} \right] \left[\sum Y_1^2 - \frac{(\sum Y_1)^2}{n} \right]}}$$

Where:

$R_{x_1y_1}$ = Simple linear correction coefficient

X_1 = Metrological parameter (Independent variable)

Y_1 = Incidence of pest (dependent variable)

N = Number of observations

Results and Discussion

In order to provide a sound base for management schedule, quantitative aspect for population function of key pest of gram pod borer, *Heliothis armigera* was

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Table 1 : Mean weekly incidence of *H. armigera* on gram crop together with environmental abiotic factors during *rabi* (two years).

Month	I Year						II Year					
	Date of observation	Standard weather week	Mean larval pop" per 5 plants	Mean Temperature (°C)	Mean relative humidity (%)	Date of observation	Mean larval pop" per 5 plants	Mean temperature (°C)	Mean relative humidity (%)			
December	17.12.01	51	0.50	17.55	60.0	17.12.02	1.00	20.35	52.5			
	24.12.01	52	1.00	15.70	56.0	24.12.02	0.50	16.95	58.5			
January	01.01.02	1	1.25	15.45	59.0	01.01.03	1.00	14.15	64.5			
	08.01.02	2	1.25	16.80	61.0	08.01.03	1.50	15.15	50.0			
	15.01.02	3	2.00	16.00	61.5	15.01.03	2.75	15.65	45.5			
	22.01.02	4	3.50	14.15	60.5	22.01.03	4.25	19.30	51.0			
	29.01.02	5	5.00	18.25	53.0	29.01.03	4.50	17.05	62.5			
February	05.02.02	6	5.50	14.45	59.0	05.02.03	5.25	17.85	53.0			
	12.02.02	7	6.50	16.60	63.0	12.02.03	6.25	18.20	46.5			
	19.02.02	8	6.25	20.35	57.5	19.02.03	5.50	18.90	51.5			
	26.02.02	9	6.25	21.55	50.5	26.02.03	5.25	22.35	41.5			
March	05.03.02	10	4.25	21.85	48.5	05.03.03	4.50	19.35	33.5			
	12.03.02	11	3.00	23.10	54.0	12.03.03	3.25	22.25	39.5			
	19.03.02	12	2.75	26.10	47.5	19.03.03	1.50	25.25	35.0			

r_1 0.182 r_1 0.146
 r_2 -0.179 r_2 -0.223

r_1 = Coefficient of correlation between mean temperature and population.

r_2 = Coefficient of correlation between mean relative humidity and population.

worked out under the prevailing agro-climate condition at Udaipur (Rajasthan), India.

During both years the incidence of *Heliothis armigera* on gram crop commenced during third week of December (when the crop was at flowering stage) in the 51 standard week with 0.50 and 1.0 larvae/5 plants, respectively.

The population of *Heliothis armigera* increase rapidly and reached to the peak of 6.50 larvae/5 plants in the second week of February (7th standard week) when the mean temperature and relative humidity were 16.60°C and 63.00 per cent respectively, thereafter the population started declining and reached to 2.75 larvae/5 plants in 3rd week of March (12th standard week) in first year.

The maximum incidence of 6.25 larvae/plants was recorded in second week of February (7th standard week) during this period, the mean temperature and relative humidity were 18.20°C and 46.50 RH, respectively. The population then started declining and reached to 1.50 larvae/5 plants in third week of March (12 standard weeks) in second year.

The increase in larval population of *Heliothis armigera* was positively correlated with mean temperature ($r = +0.182$ and $r = +0.146$) and negatively correlated with mean relative humidity ($r = -0.179$ and $r = -0.223$) in both years. However, the correlation was non-significant.

The present finding is also in close conformity with the finding of Dakwale and Singh (1980), who also studied the incidence of *Heliothis armigera* and reported pest in January and reached its peak in February. Yadav *et al.* (1986) also reported that peak period of infestation of *Heliothis armigera* was from December to February on chickpea and the pest almost become inactive in the month of May. Ravi and Verma (1997) reported that the incident of *Heliothis armigera* started by first week of

January and found its peak in the months at March. Further, Rao *et al.* (2001) reported the incidence of *Heliothis armigera* chickpea and noticed the pest 38 days after sowing. The peak population of pest was recorded on 87 days old crop during the month of January.

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