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## Seasonal incidence of major Lepidopteran insect pests on chickpea (*Cicer arietinum* Linn.)

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#### Abstract

A study on seasonal incidence of Lepidopteran insect pests viz., cut worm (*Agrotis ipsilon*), semi-looper (*Autographa nigrisigna*) and pod borer (*Helicoverpa armigera*) on chickpea was carried out at Student's Instructional Farm of Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.), India during *Rabi*, 2019-20. Weekly observation on these pests starting from germination to harvest of the crop showed that cut worm, semi-looper and pod borer were damaging the crop at different stages. The cut worm infestation was started from 45<sup>th</sup> SW and maximum population was recorded on 47<sup>th</sup> SW (2.60/m<sup>2</sup>). The larval population of semi-looper was recorded for the first time on 49<sup>th</sup> SW and maximum population of larvae was on 8<sup>th</sup> SW (0.50 larvae/plant). The larval population of pod borer was started from 48<sup>th</sup> SW and continued till the harvesting of the crop with maximum larval population 3.60/plant at 10<sup>th</sup> SW. Larval population of cut worm showed non-significant positive correlation with maximum temperature, minimum temperature and relative humidity. Larval populations of semi looper showed non-significant negative correlation with maximum temperature, minimum temperature and rainfall while relative humidity had positive correlation. Larval populations of pod borer showed non-significant positive correlation with maximum temperature while minimum temperature, relative humidity and rainfall had non-significant negative correlation.

**Keywords:** Seasonal, incidence, Lepidopteran, chickpea, *Cicer arietinum* Linn.

#### Introduction

Chickpea (*Cicer arietinum* Linn.) has been an imperative part of Indian agriculture when you consider that time immemorial due to its intrinsic value with inside the use of better protein, nitrogen solving capacity, varied makes use of and indispensability as an opportunity crop for crop diversification. Chickpea seed comprise approximately 20-22% of protein, carbohydrates 60 in line with cent. The vicinity beneathneath chickpea cultivation in India is set 10.56 m ha with manufacturing of 11.23 m. tonnes and productiveness 1063 kg/ ha. The vicinity in Uttar Pradesh beneathneath chickpea is 0.5 m. ha and manufacturing is set 0.059 m. tonnes with a median yield of 1156 kg/ha. Chickpea is cultivated in various agro-ecological niches along with rainfall and irrigated combined and mono-crop, low and excessive enters situations and is subjected to diverse biotic and abiotic stresses. Uncertain and erratic rainfalls create one of the maximum bold obstacles amongst abiotic stresses. One of the maximum realistic ways of growing chickpea manufacturing is to decrease losses resulting from primary insect pests, critical amongst them are pod borer (*Helicoverpa armigera* Hubner), Cut worm (*Agrotis ipsilon* Hufnagel) and the semi-looper (*Autographa nigrisigna* Walker). Pod borer, is thought to be the important thing pest because of excessive duplicate rates, a quick technology on flip over, extensive genetic range takes place vicinity and a capacity to withstand, metabolize and keep away from poisonous chemicals. The yield losses in chickpea because of *H. armigera* turned into mentioned as 10-60 in line with cent with inside the regular climate circumstance (Vaishmpayan and Veda, 1980) [5]. Pod borer are getting the primary pests in chickpea developing regions of Uttar Pradesh inflicting monetary losses to the chickpea growers. A very scanty record is to be had at the pod borer insect pests infesting in chickpea beneathneath this region. There is a want of examine along with, seasonal occurrence, correlation research and their management.

#### Materials and Methods

Seasonal incidence was studied by collecting the data of major lepidopteran insect pests of chickpea at weekly intervals in three farmers field at Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.), India, area jurisdiction during *Rabi*, 2019-20. Larval population of cut worm was recorded as number of larvae/square meter (under the soil near cut plant) at seedling stage.

Semi-looper and gram pod borer populations were recorded in terms of number of larvae/plant starting with vegetative stage to till harvest of the crop. Weekly meteorological data during crop period was collected from Agro-meteorological observatory of the University. The correlation between number of larvae and meteorological variables viz., minimum temperature, maximum temperature, relative humidity and rainfall was worked out using simple correlation analysis.

### Results and Discussion

Weekly observations of major insect pests on chickpea starting from germination to harvest of the crop showed that only three lepidopteran insect pests viz., cut worm (*Agrotis ipsilon* Hufnagel), semi-looper (*Autographa nigrisigna* Walker) and pod borer (*Helicoverpa armigera* Hubner) caused damage to chickpea crop at different stages. It is evident from the data presented in Table 1 that the cut worm activity started with germination and continued though at varying level throughout the vegetative stage of the crop. The presence of cut worm could be noticed for the first time in 45<sup>th</sup> standard week (SW) (0.80 larvae/sq.m) at a minimum temperature of 15.5 °C, maximum temperature of 29.7 °C and relative humidity 74.0 per cent. The population of cut worm larvae were increased gradually and reached at peak level at 47<sup>th</sup> SW (2.60 larvae/sq.m.). After that the population was declined and reached to level of 0.20 larvae/sq.m at 51<sup>th</sup> SW at a minimum temperature of 8.5°C, maximum temperature of 17.6°C and relative humidity 82.7 per cent.

It is also evident from the data that the semi-looper activity started at vegetative stage and continued till maturity stage of the crop. The presence of larvae of semi-looper could be noticed for the first time in 49<sup>th</sup> SW at a minimum temperature of 9.7°C, maximum temperature of 24.9°C and relative humidity 70.7 per cent. The populations at above period of observations were 0.10 larvae/plant. The population of larvae fluctuated various times due to climatic conditions and reaches to higher level of 0.50 larvae/plant at 8<sup>th</sup>SW.

Data presented in Table 1 also reflected that *H. armigera*

activity started at vegetative stage and continued till harvesting stage of the crop. The presence of mean larval populations of *H. armigera* noticed for the first time in 48<sup>th</sup> SW (0.30 larvae/plant) at a minimum temperature of 14.2 °C, maximum temperature of 28.5 °C and relative humidity 77.5 per cent. The maximum population was observed during 10<sup>th</sup> SW (3.60 larvae /plant) at a minimum temperature of 9.1 °C, maximum temperature of 23.4 °C and relative humidity 71.9 per cent. These findings are partial agreement with findings of Singh *et al.* (2020) [4] who reported that the population of *H. armigera* appeared on 4<sup>th</sup> week of November (1.15 larvae/5 plants) i.e. 47<sup>th</sup> Standard Meteorological Week (SMW) and reach its peak (15.10 larvae/5 plants) during 52<sup>nd</sup> SMW i.e. last week of December. The pest population gradually decreased (0.8 larvae/5 plants) in the 3<sup>rd</sup> week of February i.e. 7<sup>th</sup> SMW.

To know the effect of abiotic variables on the population of insects pests, simple correlation analysis was carried out. The results of the analysis have been presented in Table 2 revealed that larval populations of cut worm had non significant positive correlation with maximum temperature (0.230), minimum temperature (0.078) and relative humidity (0.111) while population showed non significant negative correlation with rainfall (-0.252). Larval populations of semi looper showed non significant negative correlation with maximum temperature (-0.296), minimum temperature (-0.327) and rainfall (-0.083) while relative humidity had positive correlation (0.213) with semi looper population. Besides, larval populations of pod borer showed non significant positive correlation with maximum temperature (0.059) while minimum temperature (-0.056), relative humidity (-0.349) and rainfall (-0.185) had non significant negative correlation. These findings are in accordance with the findings of Raghuwanshi and Garg (2013) [3] who found that the population of male moths had a non significant positive correlation with maximum and minimum temperature as well as relative humidity and rainfall.

**Table 1:** Incidence of insect pests in chickpea during *Rabi* 2019-20

SW	Mean no. of cut worm larvae/sq.m.	Mean no. of semi looper larvae/plant	Mean no. of pod borer larvae/plant	Abiotic factors			
				Temp(°C)		RH (%)	Rainfall (mm)
				Max.	Min.		
44	0.00	0.00	0.00	30.7	20.1	77.8	0.0
45	0.80	0.00	0.00	29.7	15.5	74.0	0.0
46	1.20	0.00	0.00	29.4	13.1	81.6	0.0
47	2.60	0.00	0.00	27.2	12.5	75.4	0.0
48	1.80	0.00	0.30	28.5	14.2	77.5	0.0
49	1.20	0.10	0.20	24.9	9.7	70.7	0.0
50	0.60	0.30	0.10	23.1	11.2	74.4	2.0
51	0.20	0.00	0.10	17.6	8.5	82.7	0.0
52	0.00	0.00	0.30	19.7	8.7	84.7	2.0
1	0.00	0.00	0.00	19.3	9.1	75.7	7.8
2	0.00	0.10	0.40	16.5	8.2	85.4	1.0
3	0.00	0.20	0.30	18.6	10.2	86.1	2.0
4	0.00	0.40	0.80	20.5	6.4	78.2	0.0
5	0.00	0.20	1.20	21.8	7.3	74.2	0.0
6	0.00	0.20	1.50	19.1	8.6	81.2	0.0
7	0.00	0.00	2.90	22.8	8.8	67.3	0.0
8	0.00	0.50	0.80	25.4	12.4	76.5	2.0
9	0.00	0.30	2.30	26.8	14.0	72.6	0.0
10	0.00	0.10	3.60	23.4	9.1	71.9	2.0
11	0.00	0.20	2.50	26.8	14.7	72.3	1.0
12	0.00	0.00	2.70	29.5	15.7	68.4	1.0
13	0.00	0.00	1.70	31.9	16.6	54.2	0.0

14	0.00	0.00	0.10	28.4	16.7	68.1	8.0
15	0.00	0.00	0.70	36.6	18.7	50.4	0.0

**Table 2:** Correlation coefficient between insect pests and abiotic factors in chickpea

Insects	Max. Temp. (°C)	Min. Temp. (°C)	RH (%)	Rainfall (mm)
Cut worm	NS (0.230)	NS (0.078)	NS (0.111)	NS (-0.252)
Semi-looper	NS (-0.296)	NS (-0.327)	NS (0.213)	NS (-0.083)
Pod borer	NS (0.059)	NS (-0.056)	NS (-0.349)	NS (-0.185)

## Conclusion

Weekly observation on major insect pests of chickpea starting from germination to harvest of the crop revealed that only three lepidopteran insect pests *viz.*, cut worm (*Agrotis ipsilon* Hufnagel), semi-looper (*Autographa nigrisigna* Walker) and pod borer (*Helicoverpa armigera* Hubner) are damaging at different stages of the crop. The cut worm infestation was started from 45<sup>th</sup> SW and continued up to 51<sup>th</sup> SW. The maximum population was recorded on 47<sup>th</sup> SW (2.60/sq. m). Larval populations of cut worm showed non significant positive correlation with maximum temperature, minimum temperature and relative humidity while population showed non significant negative correlation with rainfall. The larval population of semi-looper was recorded for the first time on 49<sup>th</sup> SW and continued up to 11<sup>th</sup> SW and showed non significant negative correlation with maximum temperature, minimum temperature and rainfall while relative humidity had non significant positive correlation with larval population. The maximum population of larvae was recorded on 8<sup>th</sup> (0.50 larvae/plant). The population of pod borer larvae was started from 48<sup>th</sup> SW and continued till the harvesting of the crop. The maximum larval population (3.60/plant) was recorded on 10<sup>th</sup> SW. Pod borer population showed non significant positive correlation with maximum temperature while minimum temperature, relative humidity and rainfall had non significant negative correlation.

## Reference

1. Agnihotri JJM. Relationship of certain abiotic factors and the incidence of gram pod borer, *Helicoverpa armigera* (Hub.) in chickpea at Pantnagar. International Journal of Basic and Applied Agricultural Research 2015;13(2):250-253.
2. Kumar V, Mahla MK, Lal J, Singh B. Effect of abiotic factors on the seasonal incidence of fruit borer, *Helicoverpa armigera* (Hub.) on tomato with and without marigold as a trap crop. Journal of Entomology and Zoology Studies 2017;5(2):803-807.
3. Raghuvanshi MS, Garg VK. Influence of abiotic factors on the pheromone catches population of gram pod borer, *Helicoverpa armigera* (Hubner) in chickpea. Journal of Insect Science (Ludhiana) 2013;26(1):42-44.
4. Singh G, Dwivedi RK, Shukla A. Study of Biology and Effective Management of Gram Pod Borer, *Helicoverpa armigera* Hub on Field Pea. Int. J Curr. Microbiol. App. Sci 2020;9(9):2725-2729.
5. Vaishampayan SM, Veda OP. Population dynamics of gram pod borer (*Helicoverpa armigera*) in chickpea at Pantnagar (U.P.). Indian J Pl. Prot 1980;15:39-41.