



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2019; 7(1): 03-05

© 2019 JEZS

Received: 02-11-2018

Accepted: 05-12-2018

Anil Kumar

Department of Entomology,
T.D.P.G. College, Jaunpur,
Uttar Pradesh, India

MK Tripathi

Department of Entomology,
T.D.P.G. College, Jaunpur,
Uttar Pradesh, India

Umesh Chandra

Department of Entomology,
N.D. University of Agriculture
and Technology Kumarganj,
Ayodhya, Uttar Pradesh, India

Ram Veer

Department of Entomology,
N.D. University of Agriculture
and Technology Kumarganj,
Ayodhya, Uttar Pradesh, India

Correspondence**Anil Kumar**

Department of Entomology,
T.D.P.G. College, Jaunpur,
Uttar Pradesh, India

Seasonal incidence of *Helicoverpa Armigera* on chickpea crop in Eastern region of Uttar Pradesh

Anil Kumar, MK Tripathi, Umesh Chandra and Ram Veer

Abstract

Helicoverpa armigera is a polyphagous insect pest commonly known as gram pod borer. Present experiments were conducted at the Agriculture Farm, Department of Entomology, Tilak Dhari Post Graduate College, Jaunpur during *Rabi* 2010-11 and 2011-12. The observations were recorded both year randomly selected plants at weekly interval from vegetative to maturity stage. The highest mean larval populations 5.60 per square meter in the first year were observed during the 48th standard week and in the second year it is 6.2 per square meter were observed during the 11th standard weeks. However, lowest mean larval population 0.40 per square meter in the first year were observed during the 14th standard week and in second year it is 0.90 per square meter were observed during the 1st standard week.

Keywords: Pod borer, incidence, larvae and chickpea

Introduction

Chick pea (*Cicer arietinum* L.) commonly known as gram or Bengal gram, is an important pulse crop cultivated globally. It plays an important role in the vegetarian diet as a major source of protein. It is consumed as a green vegetable, dal, chhole, germinated breakfast food and powder to prepare sweets and many other relishing dishes. Its leaves are consumed both raw and cooked to take advantage of malic acid, citric acid, mineral matter and fiber, all of which are of medicinal value. The grain consists of 52-70% carbohydrates, 18-22.2% protein. Besides, it is a rich source of calcium, iron, Vitamin C (green stage) and 'B₁'.

The crop occupies 8.74 million hectares with a production of 7.35 million tonnes and productivity with 8.41 q/ha in India (Anonymous, 2010) [1]. Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharashtra, Gujarat, Andhra Pradesh, and Karnataka are the major chickpea producing states sharing over 95% area. Various factors responsible for low production and productivity of chick pea are poor genetic base, weeds, diseases and insect pests. Major insect-pests of chickpea are cutworm (*Agrotis ipsilon* Hufnagel), gram pod borer (*Helicoverpa armigera* Hubner), gram semilooper (*Autographa nigrisigna* Walker), aphid (*Aphis craccivora* Koch) and tur pod bug (*Clavigralla gibbosa* Spinola) (Sithanatham *et al.*, 1984) [6].

Gram pod borer, *Helicoverpa armigera*, is considered as a notorious pest of chickpea. It also attacks pigeon pea, moong bean, lentil, soybean okra, maize, berseem, sunflower, sorghum, tobacco and tomato. Besides gram pod borer, it is also known as cotton bollworm, gram caterpillar, tomato fruit worm and tobacco bud worm. Pod borer is the most serious insect pest of Chickpea. Percent larval survival and pupation were the maximum on chickpea as compared to other host plants (Ullah *et al.* 2015) [7].

Gram pod borer, *Helicoverpa armigera* (Hubner) (Lepidoptera: Noctuidae), a global and polyphagous pest equipped with multivoltine, diapauses is magnified due to its attack on reproductive stages, primarily on fruiting bodies, highly mobile and nocturnal in nature spread quickly in wide areas, found to cause economic damage to several cultivated crops *viz.*, chickpea, pigeonpea, tomato, chilli, okra, etc throughout the year in India and sub-continent. The pest lays eggs on chickpea seedlings at second and third leaf stage of crop in Orissa. Its larvae appeared on chickpea crop after 15 days of germination at Dharwad, Karnataka. Singh and Ali (2006) [4] reported *H. armigera* larvae found active throughout the chickpea crop period at Faizabad, Uttar Pradesh (Singh *et al.* 2015) [5].

Materials and Methods

The present investigations were carried out at the Agriculture Farm, Department of Entomology, Tilak Dhari Post Graduate College, Jaunpur during *Rabi* 2010-11 and 2011-12. Population dynamics of *H. armigera* on chickpea was studied on variety Avarodhi by raising crop following recommended agronomical practices.

Larval population of *Helicoverpa armigera* was counted per square meter on five randomly selected plants per plot from first appearance to till harvest the crop. *Helicoverpa armigera* (Hub.) Observations were recorded at weekly intervals between 7-9 AM.

Results and Discussion

The data on larval population of *Helicoverpa armigera* during

Rabi 2010-11 have been presented in table -1 and 2011-12 have been presented in table -2. It is evident from the table 1 & 2 that the larval activity continued throughout the crop season. The larval population twice, first from 46 to 49th standard weeks and second from 11 to 13th standard weeks in year 2010-11 and during the 2011-12 first since 46 to 49th standard weeks and second from 10 to 14th standard weeks. The highest mean larval populations 5.60 per square meter in the first year were observed during the 48th standard week and in the second year it is 6.2 per square meter were observed during the 11th standard weeks. However, lowest mean larval population 0.40 per square meter in the first year were observed during the 14th standard week and in the second year it is 0.90 per square meter were observed during the 1st standard week.

Table 1: Seasonal incidence of *Helicoverpa armigera* Hub. in chickpea during *Rabi* season 2010-11

Standard week	Mean larval population per square meter	Weather Parameters			
		Temperature °C		Relative humidity (%)	Rain fall (mm)
		Minimum	Maximum		
46	2.8	15.7	29.5	76.75	001.2
47	4.4	14.7	25.2	74.10	000.0
48	5.6	11.5	26.1	70.4	000.0
49	4.9	9.2	25.8	68.4	000.0
50	4.2	8.5	24.3	66.95	000.0
51	2.5	5.8	23.64	69.45	000.0
52	2.1	5.64	27.57	81.6	000.0
1	2.0	3.5	15.3	84.95	001.3
2	0.8	2.5	14.3	85.7	000.0
3	1.0	5.2	22.1	57.45	000.0
4	1.6	4.6	19.5	77.8	001.3
5	2.1	6.0	23.7	70.55	000.0
6	2.5	7.4	26.2	65.4	000.0
7	2.8	11.4	25.2	74.45	007.5
8	3.5	8.2	25.2	67.60	001.4
9	3.9	10.5	27.0	61.85	005.0
10	2.8	8.6	25.3	68.55	008.9
11	1.4	12.1	31.4	53.45	000.0
12	1.0	14.0	35.1	42.60	000.0
13	0.6	15.8	33.8	46.90	000.0
14	0.4	14.7	35.8	36.50	000.0

Table 2: Seasonal incidence of *Helicoverpa armigera* Hub. in chickpea during *Rabi* season 2011-12

Standard week	Mean larval population/ square meter	Weather Parameters			
		Temperature °C		Relative humidity (%)	Rain fall (mm)
		Minimum	Maximum		
46	2.1	15.1	32.6	72.2	000.0
47	3.5	13.7	33.5	72.2	000.0
48	4.8	10.1	21.2	65.9	000.0
49	5.7	10.9	29.8	70.7	000.0
50	4.0	9.8	29.1	85.5	000.0
51	3.0	5.5	28.8	84.0	000.0
52	1.8	5.1	27.8	65.5	000.0
1	0.9	11.5	26.4	83.7	059.8
2	1.0	13.0	27.6	82.1	000.0
3	1.5	7.9	19.7	77.2	000.0
4	2.1	5.5	22.2	71.5	000.0
5	2.6	5.0	23.0	72.5	000.0
6	2.0	6.6	22.5	74.7	015.2
7	2.4	8.6	24.3	67.7	005.2
8	1.8	11.0	27.0	74.8	000.0
9	3.2	9.8	28.4	68.7	000.0
10	4.5	10.8	28.0	69.6	000.0
11	6.2	10.7	28.4	61.3	004.2
12	5.3	13.2	32.1	52.0	000.0
13	4.1	14.9	35.8	42.1	000.0
14	2.2	19.0	36.5	50.2	000.0

The highest mean larval populations 5.60 per square meter in the first year were observed during the 48th standard week and in the second year it is 6.2 per square meter were observed during the 11th standard weeks. However, lowest mean larval population 0.40 per square meter in the first year were observed during 14th standard week and in second year it is 0.90 per square meter were observed during the 1st standard week. The present studies are also in accordance with the findings of Dubey *et al.* (1995) [3] who studies the population dynamics of gram pod borer and peak activity in February and March of gram pod borer. The present studies are in partial agreement with the findings of Chatar *et al.* (2010) [2] who reported that pest appeared from 2nd week of December and attend a peak of 3.12 larvae/plant during the 2nd week of January. The pest was active during the last week of December to 3rd week of January.

References

1. Anonymous. AICRP on chickpea Project Coordinators Report, IIPR, Kanpur, 2010, 32-33.
2. Chatar VP, Raghvani KL, Joshi MD, Ghadge SM, Deshmukh SG, Dalave SK. Population dynamics of pod borer, *Helicoverpa armigera* (Hubner) infesting chickpea, International Journal of Plant Protection. 2010; 3(1):65-67.
3. Dubey OP, Odak SC, Gargav VP. Population dynamics of gram pod borer. JNKVV Res. J. 1995; 27(1):59-63.
4. Singh R, Ali S. Seasonal incidence of *H. armigera* and *Compotatish chlorideae* on chickpea. Annual plant protection science. 2006; 14(4):234-235.
5. Singh D, Singh SK, Vennila S. Weather parameters influence population and larval parasitization of *Helicoverpa armigera* (Hübner) in chickpea ecosystem, Agricultural research communication centre, Legume Research. 2015; 38(3):402-406.
6. Sithanatham S, Tuhan O, Hariri G, Reed W. The impact of winter sown chickpea on insect pests, and their management. In Proceedings of a workshop on Ascochyta blight and Winter Sowing of Chickpea. ICARDA. 4-7 May 1984. Aleppo, Syria, 1984, 179-187.
7. Ullah F, Ali M, Ahmad S, Badshah H. Impact of light traps on population density of gram pod borer, *Helicoverpa armigera* (Hub.) and its larval parasitoid (*Campoletis chlorideae* Uchida) in Rod Kohi area of Dera Ismail Khan, Pakistan, Journal of Entomology and Zoology Studies. 2015; 3(2):203-207.