Biological Forum – An International Journal **14(1): 941-943(2022)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Estimation of White Grub Population and their Infestation in Groundnut at Jaipur Region

Tara Yadav[1*] and A.S. Baloda[2]
[1]Ph.D. Scholar, Division of Entomology,
Rajasthan Agricultural Research Institute, Durgapura, Jaipur, (Rajasthan), India.
[2]Director and Network Coordinator, AINP on Soil Arthropod Pests,
Rajasthan Agriculture Research Institute,
Durgapura, Jaipur, S.K.N.A.U., Jobner, (Rajasthan), India.

(Corresponding author: Tara Yadav)*
(Received 08 November 2021, Accepted 08 January, 2022)
(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: The light trap studies were conducted at five different locations, *viz.* Jaipur, Phagi, Amer, Chomu and Shahpura in Jaipur district of Rajasthan during *kharif* seasons of 2018 and 2019. At survey locations the maximum mean grub population in the soil was observed at Chomu tehsil (4.30±0.36 /ft^3) followed by Jaipur tehsil (4.00±0.44 /ft^3) and Phagi tehsil (2.75±.55 /ft^3) at 100 per cent frequency with mean per cent infestation of 44.39, 38.95 and 35.57 per cent, respectively due to white grub. Minimum mean grub population (2.45±0.53 /ft^3) as well as percent infestation (27.44%) due to white grub was observed at Shapura tehsil.

Keywords: Mean grub population, percent infestation, frequency and survey locations.

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) belongs to family Fabaceae and is ranked 2nd in oilseed crop in India. It is the most important food and cash crop of our country. India is the second largest producer as well as consumer of groundnut in the world after China. Groundnut is cultivated on about 4.81 mha in India, with an average annual production of 6.69 million tonnes (Anonymous, 2019). White grub is the serious pest of groundnut crop (Anitha *et al*. 2006). They belong to Scarabidae family of order Coleoptera (Singh and Mishra, 2003)**.** They feed on humus in ground containing to the root system of crops (Koppenhofer and Fuzy, 2003). White grub or May-June beetle is devastating and annoying insect pest all over creation (Theurkar *et al*., 2013). Parvez and Srivastava (2010) described coleopteran fauna in agro-ecosystem of Western Rajasthan and reported 18 species belonged to five major families' *viz*., Scarabaeidae, Coccinellidae, Curculionidae, Meloidae and Elateridae. It causes considerable destruction to trees like neem (*Azadirachta indica*), khejari (*Prosopis cineraria*) *etc*. Beetles also defoliate shrubs, ornamental plants and fruit trees. *Holotrichia consanguinea* is the predominant species in Rajasthan, Gujarat, Haryana, Punjab, Bihar and Uttar Pradesh followed by *M. insanabilis* whereas, *H. serrata* is the most destructive in states like, Karnataka, Tamil Nadu, Maharashtra and Andhra Pradesh (Chauhan, 2007; Kumar *et al*. 2017). *H. consanguinea* is an important insect pest in rainy season of light sandy soils (Dashad *et al*. 2008; Murthy, 2020). The genus *Holotrichia* includes the major species of white grubs inflicting significant damage to groundnut cultivation.

MATERIALS AND METHODS

The survey was conducted from Jaipur's adjoining areas, *viz*. Jaipur, Amer, Phagi, Chomu and Shahpura tehsils during *kharif*, 2018 and 2019. Data on latitude and longitude were recorded using Global Positioning System (GPS).

Description of sampling locations:

S. No	Location	Latitude	Longitude	Altitude (m)
1.	Jaipur	26.922070°N	75.778885°E	431
2.	Amer	26.9879°N	75.8542°E	453
3.	Phagi	26.5784°N	75.5684°E	383
4.	Chomu	27.16275°N	75.7048°E	413
5.	Shahpura	27.7710°N	69.3272°E	364

Observation: During the peak infestation of white grub in groundnut field, the wilted plants and those that had died prematurely were uprooted and the soil around these plants was searched for larvae. Sampling sites were selected randomly by throwing a one square feet quadrant over ones shoulder, with no two sampling pits overlapping. Pit sampling was done and a sample consisted of one cubic feet of soil, carefully dug by a shovel and searched for larval stage. Ten samples were taken during the observation. At the same time as larval samples were collected, data on damage were also assessed in the crop. The averages of all observations were worked out and plotted to draw conclusions.

$$\% \text{ Plant mortality } = \frac{\text{Initial plant population - Final plant population}}{\text{Initial plant population}} \times 100$$

RESULTS AND DISCUSSION

The highest mean grub population in the soil was recorded at Chomu tehsil (4.30±0.36 /ft^3) followed by Jaipur (4.00±0.44 /ft^3) and Phagi tehsil (2.75±.55) at 100 per cent frequency with mean per cent infestation of 44.39, 38.95 and 35.57 per cent, respectively. The lowest mean grub population (2.45±0.53) as well as per cent infestation (27.44%) caused by white grub was observed at Sahapura tehsil followed by amer tehsil with infestation (29.76%) (Table 1 & Fig. 1).

Table 1: Infestation and abundance of white grub in surveyed locations groundnut.

Location	Grub population /ft^3 in 2018		Grub population /ft^3 in 2019		Overall Grub population/ ft^3	Infestation (%)		Overall Infestation (%)
	Mean±SE	Frequency (%)	Mean±SE	Frequency(%)		2018	2019	
Chomu	4.10 ± 0.35 (2-5)	100	4.50 ± 0.37 (3-6)	100	4.30±0.36	45.48 (28.21-83.72)	43.31 (29.73-68.97)	44.39
Shahpura	2.30 ± 0.50 (0-5)	80	2.60 ± 0.56 (0-5)	80	2.45±0.53	26.30 (0.00-44.83)	29.19 (0.00-52.78)	27.74
Phagi	2.70 ± 0.58 (0-5)	90	2.80 ± 0.53 (0-5)	100	2.75±0.55	34.52 (15.63-68.29)	36.63 (17.24-93.33)	35.57
Amer	2.70 ± 0.50 (0-5)	90	2.70 ± 0.40 (2-5)	90	2.70±0.45	29.40 (0.00-51.72)	30.13 (0.00-51.35)	29.76
Jaipur	3.90 ± 0.46 (2-6)	100	4.10 ± 0.41 (2-6)	100	4.00±.44	37.72 (28.13-75.00)	40.18 (25.58-67.50)	38.95

Values in parentheses are range values Data are mean of ten samples at each location

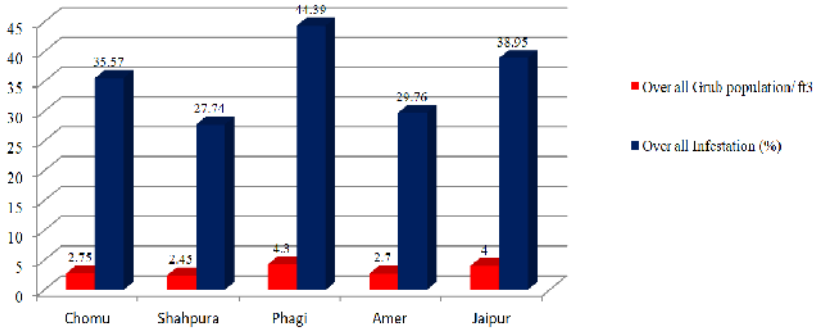

Fig. 1. Whitegrub infestation and their abundance in groundnut crop in surveyed locations.

The maximum mean grub population in soil was observed at Chomu tehsil (4.30±0.36 /ft^3) followed by Jaipur (4.00±0.44 /ft^3) and Phagi tehsil (2.75±.55) at 100 per cent frequency with mean per cent infestation of 44.39, 38.95 and 35.57 per cent respectively due to white grub. Minimum mean grub population (2.45±0.53) as well per cent infestation (27.44%) due to white grub was observed at Sahapura tehsil. The results are acoordance with the findings of scientists (Chauhan, 2007; Bhattacharyya *et al.* 2017; Bhawane

et al. 2012; Chadra and Gupta, 2012; Dadmal, and Khadakkar, 2014; Nagal, 2017) resulted that the plant mortality in groundnut crop was highly positive significantly correlated with white grub population in soil.

Plate 1. White grub infested field.

Acnowdlogements. The author is grateful to Network Coordinator (Dr,. A.S. Baloda) of All India Network Project on Soil Arthropod Pests, RARI, Durgapura for providing all necessary facilities.

REFERENCES

Anitha, V., Rogers, D.J., Wightman, J. and Ward, A. (2006). Distribution and abundance of white grubs (Coleoptera: Scarabaeidae) on groundnut in Southern India. *Crop Protection*, 25(8): 732-740.

Anonymous (2019). Directorate of Economics and Statistics, DAC & FW.

Bhattacharyya, B., Gautam, H., Pujari, D., Bhagawati, S., Mishra, H., Gogoi, D. and Debnath, H. (2017). Species diversity and relative abundance of scarab beetle fauna in Assam, Northeast India. *Journal of Entomology and Zoology Studies*, *5*(1): 711-716.

Bhawane, G. P., Mamlayya, A. B., Wagh, S. R. and Chaugule, A. K. (2012). Diversity of white grub beetles and their host range from Northern Western Ghats, from Kolhapur district (MS) India. *The Bioscan*, *7*(4): 589-596.

Chandra, K. and Gupta, D. (2012). Diversity and relative abundance of Pleurostict Scarabaeidae (Coleoptera) in Achanakmar-Amarkantak biosphere reserve, Central India. *World Journal of Zoology*, *7*(2): 147-154.

Chauhan, R. (2007). Studies on the emergence of white grubs and their management in groundnut. A thesis submitted for M.Sc. (Ag.) to CCS Haryana Agricultural University, Hisar.

Dadmal, S. M. and Khadakkar, S. (2014). Revision of *Holotrichia* hope (Scarabaeidae: Melolonthinae) in different agro-climatic zones of Maharashtra (India). *Journal of Entomology and Zoology Studies*, *2*(3): 50-58.

Dashad, S. S., Rahul, C. and Chaudhary, O. P. (2008). Emergence of different species of white grub beetles in relation to abiotic factors based on light trap catches. *Research on Crops*, *9*(3): 688-691.

Koppenhofer, A. M. and Fuzy, E. M. (2003). *Steinernema scarabaei* for the control of white grubs. *Biological control*, *28*(1): 47-59.

Kumar, P. V., Sreedevi, K. and Singh, S. (2017). Notes on major white grub species associated with groundnut crop ecosystem in Rajasthan, Andhra Pradesh, India. *Journal of Entomology and Zoology Studies*, *5*(5): 607-613.

Murthy, K.S. 2020. Diversity and abundance of scarabaeid beetles in South India. *Journal of Entomology and Zoology Studies*, *8*(4): 1078-1082.

Nagal, G. (2017). Distribution and Abundance of White Grub on Groundnut in North-West Region of Rajasthan. A thesis submitted for Ph.D. (Ag.) to S.K.N.A.U., Jobner.

Parvez, P. and Srivastava, M. (2010). A short-term surveillance of coleopteran fauna in an agro-ecosystem near Bikaner (Western Rajasthan), India. *Biological Forum*, *2*(1): 23-29.

Singh, M. P. and Mishra, P.N. (2003). White grubs in hilly and mountain agro ecosystem of Uttaranchal. *Indian Farming*, *1*(1): 20-23.

Theurkar, S. V., Ghadage, M. K., Madan, S. S., Bhor, G. L. and Patil, S. B. (2013). Occurrence of white grubs in groundnut growing area of Khed Taluka, part of Northern Western Ghats, MS, India. *Research Journal of Recent Sciences*, *2*(1): 1-6.

How to cite this article: Tara Yadav and A.S. Baloda (2022). Estimation of White Grub Population and their Infestation in Groundnut at Jaipur Region. *Biological Forum – An International Journal*, *14*(1): 941-943.