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Seasonal incidence of major insect pests infesting groundnut (*Arachis hypogaea* L.)

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Abstract

Groundnut (*Arachis hypogaea* L.) is an important oilseed crop, but its productivity is considerably affected by insect pests. This investigation studied the seasonal incidence of major insect pests infesting groundnut during the Kharif season of 2023 at the Rainfed Agriculture Research Farm, Narayan Bagh, Department of Entomology, Institute of Agricultural Sciences, Bundelkhand University, Jhansi, Uttar Pradesh. Groundnut variety GAUG-10 was sown during the first week of July, and observations on insect pest incidence were recorded at weekly intervals throughout the crop period on five tagged plants. The seasonal occurrence and population fluctuations of major insect pests were recorded along with associated coccinellid predators. Tobacco caterpillar appeared from the 32nd standard meteorological week (SMW) and reached a maximum population of 1.56 larvae per plant during the 37th SMW. Aphid incidence commenced during the 31st SMW and attained a peak population of 9.86 aphids per three leaves during the 38th SMW. Leafhopper population increased during the crop period and reached 5.32 hoppers per plant during the 37th SMW. Leaf miner incidence increased during the later crop stages and recorded a maximum population of 2.10 active larvae per plant during the 38th SMW. Thrips appeared during the 31st SMW and reached a maximum population of 3.64 adults per top bud during the 37th SMW. The coccinellid population was first observed during the 33rd SMW and increased to 2.50 adults per plant during the 38th SMW. The study revealed distinct seasonal fluctuations in the populations of major insect pests, with higher pest activity generally occurring during the middle to later stages of the crop. The findings provide useful information on the seasonal occurrence and peak activity periods of major insect pests and associated natural enemies, which may assist in timely monitoring and development of effective pest management strategies in groundnut.

Keywords: Groundnut, *Arachis hypogaea*, seasonal incidence, population dynamics, insect pests

Introduction

Groundnut (*Arachis hypogaea* L.) is an important leguminous oilseed crop widely cultivated in tropical and subtropical regions. It is an important source of plant-based protein, healthy fats, vitamins, minerals and dietary fibre and also contributes to sustainable agriculture through biological nitrogen fixation. Groundnut is an economically important crop in India, where it occupies a major position among oilseed crops. (Jakhar *et al.*, 2020; Kumar *et al.*, 2019) [2, 5].

Insect pests are among the major constraints to groundnut production, causing considerable yield losses both in the field and during storage. Climate change is significantly altering insect populations, with far-reaching consequences for ecosystems, agriculture, and human health (Yadav *et al.*, 2025b) [13]. Groundnut (*Arachis hypogaea* L.) is an important oilseed and food legume crop cultivated widely in tropical and subtropical regions, valued for its edible seeds, high oil content, protein, and nutritional importance (Zeven & Zhukovsky, 1975). Groundnut is attacked by several insect pests, including foliage feeders, pod borers and soil-inhabiting pests such as white grubs and termites. Inappropriate pest management practices and favourable environmental conditions may further aggravate pest incidence and result in significant crop losses. (Ekta Joshi 2020) [3, 15].

Among the soil-dwelling insect pests, white grubs (Coleoptera: Scarabaeidae) are considered one of the major constraints to groundnut production in several regions. In the Saurashtra region of Gujarat, *Holotrichia consanguinea* is regarded as a key soil-dwelling pest of

groundnut. For the management of these pests, farmers rely on the use of synthetic pesticides to provide effective and quick suppression, but their indiscriminate and prophylactic use has resulted in pest resistance evolution (Yadav *et al.*, 2026). Biopesticides, including entomopathogenic fungi and bacteria, offer promising, eco-friendly pest management options (Yadav *et al.*, 2025a) [12]. The larvae cause serious damage by feeding on roots, resulting in wilting and mortality of young plants and reduced pod production. The presence of one grub/m² may cause 80-100 per cent plant mortality. (Yadav and Sharman 1995; Kapadia *et al.* 2010) [4, 10, 11].

The third instar causes maximum damage, and the larvae may also feed on developing pods, resulting in direct yield losses. Adult collection and insecticidal application are among the major management tactics followed against white grub species. Therefore, evaluation of effective insecticides is essential for developing suitable management strategies against white grub in groundnut. (Raodeo *et al.*, 1976; Patel, 2020) [8, 9].

Considering the economic importance of groundnut and the potential yield losses caused by insect pests, the present study was undertaken to investigate the seasonal incidence and population dynamics of major insect pests infesting groundnut in relation to prevailing environmental conditions, to generate information useful for developing effective and timely pest management strategies.

Materials and Methods

The present investigation entitled “Seasonal Incidence of Major Insect Pests Infesting Groundnut” was conducted during the Kharif season of 2023 at the Rainfed Agriculture Research Farm, Narayan Bagh, Department of Entomology, Institute of Agricultural Sciences, Bundelkhand University, Jhansi, Uttar Pradesh. The experimental site was located at 25°27' N latitude and 78°36' E longitude, at an altitude of approximately 178.37 m above mean sea level. The region has a subtropical and semi-arid climate with an average annual rainfall of 900-1200 mm. Groundnut variety GAUG-10 was sown during the first week of July 2023 in a field measuring 12 × 7.5 m², with a spacing of 30 × 10 cm between rows and plants. The field was prepared by deep ploughing, harrowing, cultivation and planking, and well-decomposed farmyard manure was incorporated at 25 t ha⁻¹ before sowing. Irrigation and intercultural operations were carried out as required, including weeding and earthing up. The crop was regularly monitored from establishment to harvest for the occurrence and abundance of insect pests. Weekly observations were recorded at regular intervals throughout the crop season to determine the seasonal incidence and population dynamics of major insect pests infesting groundnut. Representative plants were selected from the experimental field, and pest populations were recorded using suitable sampling units according to the nature and feeding behaviour of individual pests. The period of pest appearance, weekly population fluctuations and peak pest activity were determined from the recorded observations. Concurrently, weekly meteorological data, including maximum and minimum temperature, relative

humidity and rainfall, were recorded during the crop period. The relationship between the seasonal pest population and prevailing weather parameters was subsequently analysed using appropriate statistical methods to determine the influence of meteorological factors on the population dynamics of insect pests.

Results and Discussion

The weekly observations recorded on five tagged plants throughout the crop period revealed that the population of tobacco caterpillar commenced from the 32nd standard meteorological week (SMW) with 0.21 larvae per plant, which gradually increased and reached a peak of 1.56 larvae per plant during the 37th SMW. The incidence of aphids started in the 31st SMW with 0.31 aphids per three leaves and gradually increased to a peak population of 9.86 aphids per three leaves during the 38th SMW. The first incidence of leafhopper was recorded with a population of 1.10 hoppers per plant, which gradually increased and reached 5.32 hoppers per plant during the 37th SMW. The incidence of leaf miner commenced during the 32nd SMW with 0.65 larvae per plant, and the population gradually increased, reaching a maximum of 2.10 active larvae per plant during the 38th SMW. The incidence of thrips was first recorded during the 31st SMW, with a population of 0.93 adults per top bud, which gradually increased under favourable weather conditions and reached a peak of 3.64 adults per top bud during the 37th SMW. The population of coccinellids was first recorded during the 33rd SMW, with 0.68 adults per plant, and subsequently increased with the availability of prey, reaching a maximum of 2.50 adults per plant during the 38th SMW of 2023.

The seasonal occurrence of tobacco caterpillar, aphid, leafhopper, leaf miner and thrips observed in the present study indicates that their population fluctuations were closely associated with crop growth stage and prevailing environmental conditions. The findings for tobacco caterpillar were in agreement with Mishra *et al.* (2021), who also reported a similar seasonal pattern of occurrence in groundnut. Likewise, the observed seasonal activity of aphids was supported by the findings of Yadav *et al.* (2012), indicating a comparable period of population build-up [6].

The population fluctuation of thrips observed during the crop period was also comparable with the findings of Gocher and Ahmad (2019) and Nayak *et al.* (2019) [1, 7], who reported seasonal variation in thrips population associated with prevailing weather conditions. The increase in coccinellid abundance towards the later crop stages may be attributed to the increased availability of prey, particularly aphids and other soft-bodied insect pests. The occurrence of natural enemies corresponding with pest abundance suggests their potential role in regulating pest populations in the groundnut ecosystem. Overall, the observed variation in insect pest populations during the crop period emphasizes the influence of crop stage and environmental conditions on pest activity and provides useful information for determining appropriate periods for monitoring and timely pest management.

Table 1: Seasonal incidence data of the insects infested on groundnut during the Kharif season 2023.

SMW	Tobacco caterpillar Per Meter row	Aphid Per 3leaves	Leaf hopper /3 Leaves	Leaf miner per plant	Ladybird beetle per plant	Thrips top bud leaves
29	0	0	0	0	0	0

30	0	0	0	0	0	0
31	0	0	0	0	0	0.93
32	0.12	0.50	0	0.65	0	1.1
33	0.23	0.98	1.1	0.85	0.68	1.56
34	0.36	1.42	1.25	1.1	0.93	2.1
35	0.54	4.51	1.69	1.26	1.1	2.64
36	1.11	2.13	2.65	0.69	1.56	2.3
37	1.56	4.36	5.41	0.86	2.1	3.64
38	1.06	9.86	3.21	2.1	2.5	2.06
39	0.96	6.35	2.55	0.88	1.46	0.5
40	0.57	5.54	1.46	0.76	1.06	1.54
41	0.43	3.22	2.11	0.68	0.86	0.82
42	0.25	2.10	1.1	0.94	0.5	0.55
43	0.16	1.1	0.85	0.33	0.33	0.33

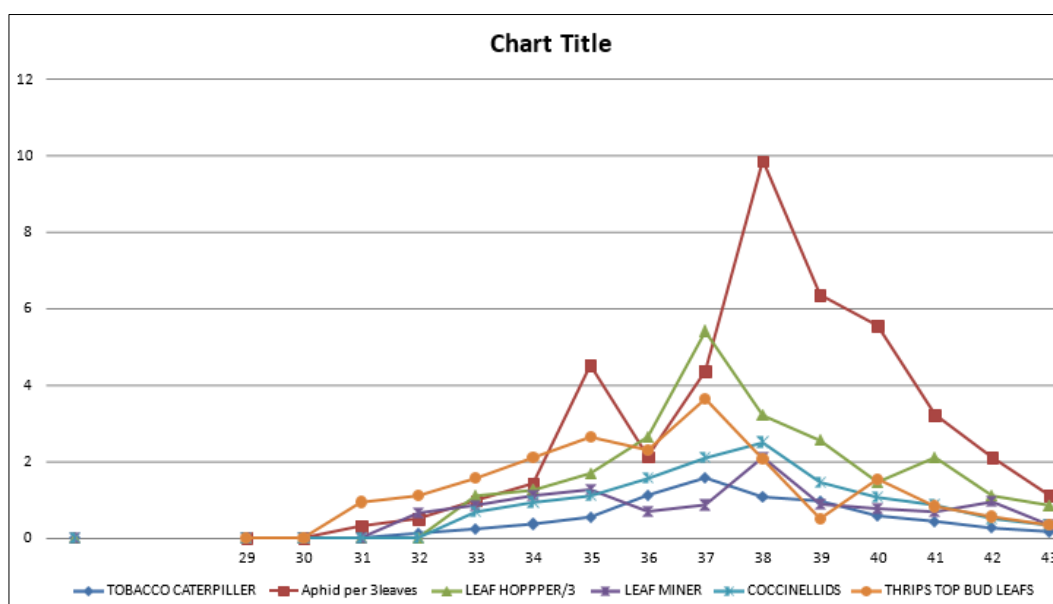


Fig 1: Graphical representation of seasonal incidence of insect pests during the crop period of groundnut in the kharif season 2023

Table 2: Data of weather parameters in the experimental field during the kharif Season 2023

SMW	T max	T min	RH1	RH2	Rainfall	Evaporation
	(OC)	(OC)	%	%	Mm	mm
29	36.2	27.1	83	62	4.8	5
30	36.6	25.9	76	66	4.6	5.4
31	32.6	25.4	88	80	123.4	3.8
32	33.4	24.7	85	66	65	4.5
33	34.9	25.2	83	70	3.8	4.8
34	34.4	25.1	86	68	58.8	4.2
35	35.4	24.6	84	62	0	5.7
36	34.4	24.5	87	76	119.9	4.8
37	33.7	24.7	90	73	66	3.4
38	34.4	24.5	85	66	3.4	4.4
39	35.9	23.4	87	69	0	4.4
40	35.9	20.6	80	48	0	4.9
41	37.1	21.4	77	42	0	5.4
42	33.5	18.3	87	68	5.4	3.9
43	33.2	16.7	84	66	0	3.8

Conclusion

The present study on the seasonal incidence of major insect pests infesting groundnut revealed considerable variation in the occurrence and population levels of major insect pests during the crop period. Tobacco caterpillar appeared from the 32nd SMW and attained its maximum population during the 37th SMW. Aphid incidence commenced in the 31st SMW and reached its peak during the 38th SMW. Leafhopper was first observed during the crop period and attained its maximum population during the 37th SMW, while leaf miner activity increased during the later crop

stages and reached its highest level during the 38th SMW. Thrips appeared from the 31st SMW and recorded its maximum population during the 37th SMW. The population of coccinellids was recorded from the 33rd SMW and increased up to the 38th SMW, indicating their occurrence along with the availability of insect prey. Overall, the study demonstrated distinct seasonal patterns in the incidence and population dynamics of major insect pests and the associated coccinellid predator in groundnut, providing useful information for timely monitoring and development of effective pest management strategies.

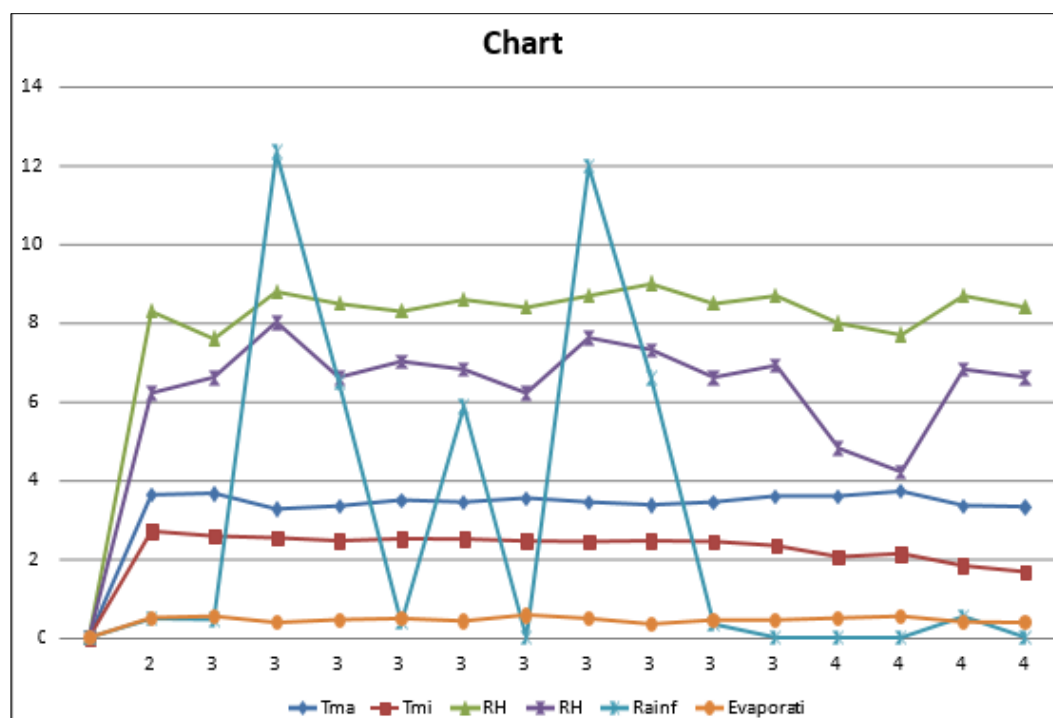


Fig 2: Graphical presentation of data of weather parameters at the experimental field in the crop period during the kharif season 2023

References

- Gocher S, Ahmad S. Seasonal incidence of major sucking insect pests of groundnut in relation to weather parameters of semi-arid region of India. *International Journal of Current Microbiology and Applied Sciences*. 2019;8(8):1106-1111.
- Jakhar BL, Baloda AS, Saini KK, Yadav T. Evaluation of some insecticides as seed dresser against white grubs in groundnut crop. *Journal of Entomology and Zoology Studies*. 2020;8(3):1468-1469.
- Joshi [initials]. Major insect-pests of groundnut and their control measures. *Research Today*. 2020;2(5):193-197.
- Kapadia MN, Butani PG, Jethva DM, Virani VR, Beria NN. Management of white grub, *Apogonia rauca* (Feb.) in groundnut. *Annals of Plant Protection Sciences*. 2010;18(1):86-89.
- Kumar GVS, Chowdary LR, Sarada O. Seasonal incidence of major insect pests of groundnut and their natural enemies in relation to meteorological parameters. *The Journal of Research ANGRAU*. 2019;51(2):26-36.
- Mishra AK, Kerketta A, Awasthi AK, Chaure NK, Shukla RK. Seasonal incidence of tobacco caterpillar (*Spodoptera litura* Fab.) on groundnut (*Arachis hypogaea* L.) and its correlation with different abiotic factors. *Journal of Pharmacognosy and Phytochemistry*. 2021;10(2):1456-1459.
- Nayak TK, Deole S, Shaw SS, Mehta N. Seasonal incidence of sucking insect pests infesting groundnut crop at Raipur (Chhattisgarh). *Journal of Entomology and Zoology Studies*. 2019;7(6):83-87.
- Patel TM, Baraiya KP, Kaneria PB, Jadav AH. Efficacy of insecticides against white grub, *Holotrichia consanguinea* infesting groundnut. *AH Journal of Entomology and Zoology Studies*. 2020;8(4):759-762.
- Raodeo AK, Deshpande SV, Deshpande AD, Puri SN. A large-scale campaign for the control of white grub *Holotrichia serrata* F. in Maharashtra state. *PANS*. 1976;4:223-228.
- Yadav CPS, Sharma GK. Indian white grubs and their management. All India Coordinated Research Project on White Grubs, Technical Bulletin No. 2. Indian Council of Agricultural Research; 1995.
- Yadav K, Divyadarshan R, Sudam DA, Bachaspati S, Swain SK, Raj SS, *et al*. Integrated pest management: A holistic approach to sustainable agriculture and ecosystem health. *Uttar Pradesh Journal of Zoology*. 2026;47(1):162-174.
- Yadav K, Gangwar B, Yadav A, Yadav T. Bioefficacy of selected indigenous products and biopesticides against eggplant shoot and fruit borer (*Leucinodes orbonalis* Guenée). *Journal of Entomological Research*. 2025;49:967-970.
- Yadav K, Yadav AK, Bala B. Impact of climate change on insects. In: Yadav AK, Tiwari S, Yadav P, Singh S, Tiwari M, editors. *Frontier in entomological science*. EdTech Publications; 2025. p. 29-44. ISBN:9789347510298.
- Yadav PC, Sharma US, Ameta OP, Padiwal NK. Seasonal incidence of major sucking insect pests of groundnut (*Arachis hypogaea* L.). *Indian Journal of Applied Entomology*. 2012;26(1):57-59.
- Zeven AC, Zhukovsky PM. Dictionary of cultivated plants and their centres of diversity: Excluding ornamentals, forest trees and lower plants. Centre for Agricultural Publishing and Documentation; 1975.