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Seasonal incidence of cabbage insect pest

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Abstract
An experiment was conducted to observe the seasonal incidence of cabbage insect pests *viz*., cabbage aphid, diamond back moth, cabbage head borer, painted bug, tobacco caterpillar and lady bird beetle on cabbage during *Rabi* season, 2024-25 at college of agriculture, latur, Department of Entomology, Major activity period of diamond back moth (*Plutella xylostella*) population appeared during 7th SMW and the peak incidence during 12th SMW (5.60 larva/plant) and cabbage head borer (*Hellula undalis*) caterpillar population initiated during 10th SMW and reach its peak incidence 15th SMW (7.60 larva/plant) respectively while tobacco caterpillar (*Spodoptera litura*) appeared from 7th SMW to 15th SMW with peak incidence in 12th SMW (3.20 larva/plant). Cabbage aphid (*Brevicoryne brassica*) were observed from 5th SMW to 15th SMW with peak incidence in 11th SMW (23 aphid / 2.5cm^2 leaf area /plant), painted bug (*Bagrada cruciferarum*) appeared from 7th SMW to 15th SMW with peak incidence in 13th SMW (6.50 painted bug/plant). and lady bird beetle (*Coccinella septempunctata*) appeared from 5th SMW to 15th SMW with peak incidence 11th SMW (1.60 LBB/plant) respectively.

Keywords: Cabbage, DBM, Tobbaco caterpillar, head borer, aphid. lady bird beetle, SMW

Introduction
Cabbage (*Brassica oleracea* L. var. *capitata*) is one of the most widely cultivated and consumed cole crops worldwide, valued for its nutritional content—rich in vitamins A, C, and K, minerals, and dietary fiber - and its economic importance as a cash crop. In India, it occupies a significant share of vegetable cultivation, with major producing states including West Bengal, Uttar Pradesh, Maharashtra, and Karnataka. Despite its importance, cabbage is highly vulnerable to insect-pest attack, which poses a major constraint to production. Globally, over 40 insect-pests are reported on cabbage, of which diamondback moth (*Plutella xylostella*), cabbage butterfly (*Pieris brassicae*), tobacco caterpillar (*Spodoptera litura*), semilooper (*Trichoplusia ni*), leaf webber (*Crocidolomia binotalis*), cabbage head borer (*Hellula undalis*), aphid (*Brevicoryne brassicae*), painted bug (*Bagrada cruciferarum*), and flea beetles (*Phyllotreta spp.*) are considered key pests causing substantial yield losses, often up to 52% when unmanaged (Krishnakumar *et al*., 1986) [5]. Pest pressure is particularly severe during the vegetative and head formation stages of the crop, leading to poor marketable quality and economic losses.

Understanding the seasonal abundance and population dynamics of these pests is crucial for designing effective, sustainable pest management programs. Population dynamics studies provide insights into the temporal fluctuations of insect populations and their relationship with environmental factors such as temperature, relative humidity, and rainfall, as well as crop phenology and natural enemy activity. Such knowledge helps to determine critical periods of pest infestation, predict outbreaks, and develop weather-based pest forecasting models. Timely and precise interventions based on these studies can minimize crop damage, optimize pesticide applications, and reduce production costs while safeguarding environmental and human health.

In the Marathwada region of Maharashtra, cabbage is cultivated year-round, creating continuous host availability that favours pest multiplication. Seasonal monitoring of insect pests and their natural enemies under field conditions is therefore essential to generate region-specific data, which can serve as a scientific basis for Integrated Pest Management (IPM) strategies that are both economically viable and ecologically sustainable.

Materials and Methods

Experimental site

The experiment was carried out to document the diversity and abundance of insect species in cabbage ecosystem at the research farm of Department of Entomology, College of Agriculture, Latur, Maharashtra during *Rabi* 2024. Cabbage crop variety 'Pushkar' was raised on an area of 10 m x10 m with all recommended agronomical practices except insecticidal sprays for pest management.

Experimental details

1. Design: Non replicated design
2. Plot size:10 x 10 m
3. Crop: Cabbage
4. Spacing: 45 cm x 30 cm
5. Variety: Pushkar
6. Fertilizer: 200:125:150 NPK kg per ha
7. Season: *Rabi* 2025
8. Plant protection: No plant protection measures

Observations Recorded

Weekly observations were taken starting from 15 days after transplanting until harvest. Five plants per plot were randomly selected and tagged for recording data on:

- **Aphid (*Brevicoryne brassicae*):** Number of aphids counted from 2.5 cm^2 leaf area on two leaves per plant using magnifying lens.
- **Diamondback moth (*Plutella xylostella*):** Number of larvae per plant recorded by direct visual observation.
- **Cabbage head borer (*Hellula undalis*):** Total number of larvae per plant counted weekly.
- **Tobacco caterpillar (*Spodoptera litura*):** Larvae per plant counted visually
- **Painted bug (*Bagrada cruciferarum*):** Number of painted bug per plant counted from weekly
- **Ladybird beetles**: Ladybird beetle was counted on whole-plant basis during each observation.

Results and Discussion

Seasonal incidence of cabbage insect pest

Cabbage aphid (*Brevicoryne brassica* L.)

The incidence of aphids was first observed during the 5th Standard Meteorological Week (SMW) (28 January - 4 February), with an initial population of 5.0 aphids /2.5cm^2 leaf area. Following their first appearance, the aphid population gradually increased and reached its first peak during the 8th SMW, with 13 aphids / 2.5 cm^2 leaf area, when the crop was at the head initiation stage. In the subsequent 9th SMW, the aphid population showed a slight decline. However, two weeks later, the population started increasing again and reached a second peak of 23 aphids/ 2.5cm^2 leaf area during the 11th SMW, when the crop had advanced to the head development to maturity stage. In next i.e. 12th SMW the population low down to 18.50 aphids / 2.5cm^2 leaf area and recorded the third peak of 21.50 aphids /2.5cm^2 leaf area in next i.e. 13th SMW. Thereafter, the aphid population exhibited a decreasing trend toward the end of the season, with 11 aphids / 2.5cm^2 leaf area recorded at harvest.

Present observations were more or less similar with the results of earlier workers. Aslam *et al*. (2007) [2] reported that the population of *B. brassicae* was highest during early to mid-March. Sutnga *et al*. (2024) [13] reported that cabbage aphid population was low at the beginning but gradually started to increase and reached its highest peak in the second week of March. Pal and Singh (2012) [12] reported aphids peak infestation in March. They further reported that the aphid population showed a decreasing trend towards the maturity of the crop. Patra *et al*. (2013) [10] studied population dynamics of cabbage pests at West Bengal for two consecutive years i.e. 2011-12 and 2012-13 and found that aphid population showed steady growth after its first appearance. They also observed two peaks of aphid incidence during both years of study, partially supporting the findings of present study.

Diamondback moth (*Plutella xylostella* L.)

the incidence of diamondback moth was first observed during the 7th Standard Meteorological Week (SMW) (12-18 February), with an initial population of 1.0 larvae/ plant. Following their first appearance, the diamondback moth population gradually increased and reached its peak during the 12th SMW, with 5.60 larvae/ plant, when the crop was in the head development stage. Thereafter, the diamondback moth population exhibited a decreasing trend toward the end of the season, with 1.20 larvae / plant recorded at harvest in the 15th SMW.

Aishvarya *et al*. (2018) reported that the population of *P. xylostela* increased gradually and touched its peak with a mean of 5.2 larvae/plants during third week of December (51st SMW). Riaz *et al*., (2013) [11] recorded that *P. xylostela* infestation on cabbage started soon after transplantation. Thus, the findings of present study are more or less in the line of previous findings.

Cabbage head borer (*Hellula undalis*)

The transplanting of the cabbage was completed in 1st SMW however, the incidence of head borer was first observed during the 10th SMW (5-11 March), with an initial population of 0.60 larvae/plant. Following their initial appearance, the head borer population gradually increased till the harvest and reached to its peak during the 15th SMW, with 7.60 larvae /plant, when the crop was in the harvesting stage.

Ojha *et al*. (2004) [9] reported that the lowest and highest population of head borer, *H. undalis to* the extent of 0.33 and 8.66 larvae / trial during first to last week of October. Garai *et al.* (2024) [4] from West Bengal reported that the head borer incidence showed peak during mid to late stages of cabbage crop as found in present study underscoring the importance of integrating weather-based monitoring systems into pest management strategies.

Tobacco caterpillar (*Spodoptera litura*)

S. litura infestation was not observed for five weeks after transplanting of the seedlings. The incidence was first observed during the 7th Standard Meteorological Week (SMW) (12-18 February), with an initial population of 0.60 larvae/ plant. Following their first appearance, the *S. litura* population gradually increased and reached its peak during the 12th SMW, with 3.20 larvae/ plant, when the crop was in the head development stage. Thereafter, the *S. litura* population exhibited a decreasing trend toward the end of the season, with 1.20 larvae/plant recorded at harvest.

Aishwarya *et al*. (2018) reported that the population of *S. litura* increased gradually and touched its peak with a mean of 3.26 larvae/plants during second week of December (49th SMW). Devjani and Singh (2002) [3] reported that *S. litura* occurred in February- March in late season on cauliflower, partially supporting the present findings. Also, Kumar *et al*. (2023) [7] from Jhansi, Uttar Pradesh recorded a peak of 3.60 larvae) plant in 1st SMW and noted gradual decrease in larval population towards the end of the season. More or less similar results are observed in the present study.

Painted bug (*Bagrada cruciferarum*)

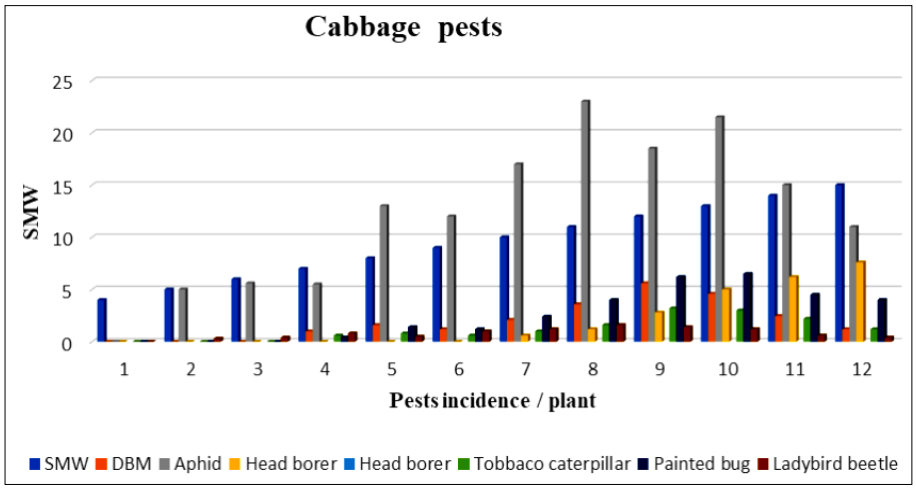
The incidence of painted bug was first observed during the 7th SMW (12 - 18 February), with an initial population of 0.40 painted bugs/ plant. Following their first appearance, with slight changes, the painted bug population gradually increased and reached its peak during 13th SMW, with 6.50 painted bugs/ plant, when the crop was in the head development to maturity stage. Thereafter, the painted bug population exhibited a decreasing trend toward the end of the season, with 4.00 painted bugs/ plant recorded at harvest.

Lal *et al*. (2020) [8] reported that the peak infestation of painted bugs from the last week of February to mid March. Kumar *et al* (2021) [6] reported that first appearance of the *B. hilaris* was observed during second week after transplantation i.e., (MSW52) when the crop age was about 45 days. This pest was present on the crop during the early vegetative stage to the harvesting of the crop. More or less similar results are observed in the present study.

Table 1: Seasonal incidence of cabbage insect pest with meteorological data during in *Rabi* season 2025

SMW	No of pests /Plant						Temperature (°C)		RH (%)		Rainfall (mm)
	Diamond back moth	Aphid/ 2.5 cm^2 leaf area	Head borer	Tobbaco caterpillar	Painted bug	Ladybird beetle	Max	Min	AM	PM	
4	0.00	0.00	0.00	0.00	0.00	0.00	30.2	13.33	87.86	50.14	0.00
5	0.00	5.00	0.00	0.00	0.00	0.30	30.2	11.88	75.57	47.57	0.00
6	0.00	5.60	0.00	0.00	0.00	0.40	30.40	13.4	72.21	41.00	0.00
7	1.00	5.50	0.00	0.60	0.40	0.80	31.94	14.09	60.64	36.35	0.00
8	1.60	13.00	0.00	0.80	1.40	0.50	29.71	14.67	81.71	53.07	0.00
9	1.20	12.00	0.00	0.60	1.20	1.00	32.93	14.73	64.43	39.14	0.00
10	2.10	17.00	0.60	1.00	2.40	1.20	34.84	14.41	61.57	41.43	0.00
11	3.60	23.00	1.20	1.60	4.00	1.60	34.21	17.13	65.29	40.00	0.00
12	5.60	18.50	2.80	3.20	6.20	1.40	34.29	14.5	81.43	24.00	0.00
13	4.60	21.50	5.00	3.00	6.50	1.20	33.76	15.3	81.42	26.57	3.10
14	2.47	15.00	6.20	2.20	4.50	0.60	32.60	15.77	69.57	45.17	10.20
15	1.20	11.00	7.60	1.20	4.00	0.40	38.26	18.99	52.86	34.14	0.00

Source of meteorological data oil research centre, Latur (M.H)



Conclusion

On the basis of result and discussion of the present investigation the following recommendations conclusions are proposed. The highest incidence of DBM was noticed 12th SMW (19-25 March.) in *Rabi* season of during 2025. Maximum infestation of cabbage head borer was observed in 15th SMW (09- 15 April.). Maximum infestation of cabbage aphid was recorded in 11th SMW (12- 18 March). Infestation of tobacco caterpillar was highest in 12th SMW (19 - 25 March). The highest incidence of painted bug was noticed 13th SMW (26-01 April). Maximum population of Ladybird beetle was recorded in 11th SMW (12- 18 March.

References

1. Aiswarya VA, Bhosle BB, Bhede BV. Population dynamics of major Lepidopteran insect pests of cabbage. Int J Curr Microbiol Appl Sci. 2018;6(Special Issue 6):236-239.
2. Aslam M, Razaq M, Ahmad F, Mirza YH. Population abundance of aphids (*Brevicoryne brassicae* L. and *Lipaphis erysimi* Kalt.) on Indian mustard (*Brassica juncea* L.). Afr Crop Sci Soc. 2007;8:935-938.
3. Devjani P, Sharmila M, Singh TK. Changing trend in the insect pest complex of cauliflower in Manipur. Unpublished report; 2010.
4. Garai K. Seasonal incidence and population dynamics of key insect pests in cabbage (*Brassica oleracea* var. *capitata*) in eastern India: The influence of meteorological factors during the Rabi season. Int J Stat Appl Math. 2024;SP-9(4):106-112.
5. Krishnakumar NK, Srinivasan K, Suman LL, Ramchander PR. Optimum control strategy of cabbage pests from a chemical control trial. Prog Hortic. 1986;18:104-110.
6. Kumar A, Monobrullah M, Kishor DR, Kumar R. Documentation of the major insect pests of cabbage and their associated natural enemies in Bihar, north-eastern India. Curr J Appl Sci Technol. 2021;40(25):58-66.
7. Kumar M, Kumar P, Singh S, Kumar A, Pandey A. Population dynamics of insect pests of cauliflower in relation to weather factors. Pharma Innov J. 2023;12(6):2153-2155.
8. Lal J, Swaminathan R, Meena AK, Nagar R. Seasonal incidence of major insect pests of cabbage (*Brassica oleracea* var. *capitata* L.). J Entomol Zool Stud. 2020;8(3):387-391.
9. Ojha PK, Singh IP, Pandey NK. Seasonal incidence of insect pests of cauliflower and population build-up under agro climatic zone-1 of Bihar. Pestology. 2004;28(3):16-18.
10. Patra S, Dhote VW, Alam SKF, Das BC, Chatterjee ML, Samanta A. Population dynamics of major insect pests and their natural enemies on cabbage under new alluvial zone of West Bengal. J Plant Prot Sci. 2013;5(1):42-49.
11. Riaz S, Shakeel A, Ashraf P. Population dynamics of insect pests, parasitoids and predators in cabbage and cauliflower agro-ecosystems. J Ent Res. 2013;37(2):129-137.
12. Singh R. Seasonal history of cabbage aphid, *Brevicoryne brassicae* (Linn.) (Homoptera: Aphididae). J Aphidol. 2012;25-26:69-74.
13. Sutnga J, Shila Devi H, Imtinaro L, Lytan D, Waluniba, Banik S, *et al*. Population dynamics of cabbage aphid, *Brevicoryne brassicae* L. on five Brassica species: cabbage, cauliflower, broccoli, Chinese cabbage and radish. Biol Forum Int J. 2024;16(1):47-52.