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SEASONAL INCIDENCE OF *HELICOVERPA ARMIGERA* ON SUNFLOWER

Gore S H[1]*, More D G[1] and More A V[1]

[1]Experimental Farm, Department of Agricultural Entomology,
College of Agriculture, Latur 413512, Maharashtra, India
*Email: goreshubham612@gmail.com (corresponding author): ORCID ID 0009-0003-5269-2619

ABSTRACT

***Helicoverpa armigera* (Hubner). the sunflower head borer, poses a significant threat as it can cause extensive damage by feeding on flower heads and seeds. Its presence can lead to yield losses. Effective IPM strategies are crucial to mitigate the impact of *H. armigera* infestations and ensure the profitability and sustainability. Monitoring pests is crucial for timely intervention and to minimize crop damage and optimize yields. The present field experiment was carried out during 2021 to study the seasonal incidence of *H. armigera* on sunflower. Result revealed that incidence of *H. armigera* was observed during 50th standard meteorological week which reached to peak during 7th SMW. However, it crossed the ETL during 4th SMW. In relation to weather parameters, *H. armigera* showed positive correlation with maximum temperature (r = 0.557*), while it was negative with evening relative humidity (r = - 0.605*). Further, multiple regression was carried out and it revealed that environmental factors influenced about 70.10% *H. armigera* incidence in sunflower.**

Key words: Capitulum borer, yield loss, correlation, regression, economic threshold level, Helicoverpa armigera, monitoring, weather factors

Sunflower (*Helianthus annuus* L.) belongs to the family Asteraceae. *Helianthus* genus contains 65 different species (Andrew et al., 2013). Sunflower also known as "Surajmukhi" and grown in all the seasons and sunflower oil contains approximately 15% saturated, 85% unsaturated fatty acid (Gonzalez-Martin et al., 2013). Sunflower ranks third in the total area cultivated and fourth in total production FAOSTAT, 2020. In India, during 2021-22 sunflower was cultivated on an area of 2.56 lakh ha with 2.3 lakh tonnes of production and 891 kg/ ha of productivity (FAOSTAT, 2022). In Maharashtra during 2021-2022 sunflower was grown on an area of 26,050 ha with 12,150 tonnes of production (Indiastatagri, 2022). Insect pests and diseases are the major production constraints. As many as 251 insects and acarine species have been recorded on sunflower at global level (Rajamohan et al., 1974). Of these, capitulum borer alone causes up to 50% yield loss by directly inflicting damage to flower buds, ovaries and developing seeds (Lewin et al., 1973). Panchabhavi and Krishnamurthy (1978) reported yield loss of 120 kg/ ha due to *H. armigera* damage in Karnataka. Gore et al. (2021) its economic threshold level was 0.77 larvae/ plant. The present study is on study the seasonal incidence of *H. armigera* found on sunflower.

MATERIALS AND METHODS

The sunflower variety Morden was grown during rabi 2020 on an area of 100 m^2 by adopting the spacing of 60 x 30 cm at the research farm of the Department of Agricultural Entomology, College of Agriculture, Latur following the recommended package of practices. After one week of germination, an observation for *H. armigera* was recorded on weekly basis till harvesting. Ten plants from plot were randomly selected and tagged. Observations of *H. armigera* were recorded on whole plant basis. The data pertaining to seasonal incidence were correlated with weather using WASP 2.0 software.

RESULTS AND DISCUSSION

Figure 1 reveals that infestation of head borer *H. armigera* commenced from about 30 days after sowing and recorded 0.1/ plants during 49th SMW. In next five weeks, the number of *H. armigera* remain steady and thereafter from 3rd SMW population started increasing and reached maximum at 7th SMW i.e., 1.5/ plant.

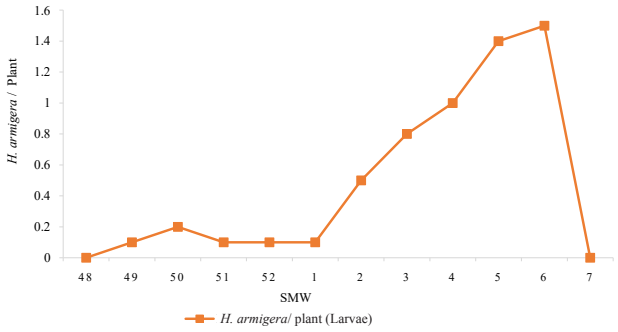

Fig. 1. Seasonal incidence of *H. armigera* on sunflower

Incidence showed positive and significant correlation with maximum temperature (r = 0.557*) while it was negative but significant with evening relative humidity (r = - 0.605*). All other abiotic factors except wind speed (r=0.391) showed negatively non-significant correlation with *H. armigera.* The regression equation worked out was Y= 2.230 + (-0.176) x B1 + (-0.102) x B2 + (0.21) x B3 + (0.006) x B4 + (-0.082) x B5 + (0.073) x B6 + 0.423. It was observed that the abiotic factors contributed for 70.1% of total variation in the incidence of *H. armigera* on sunflower. Rangarajan et al. (1975) studied pest complex of sunflower and reported that *H. armigera* were active in winter season, supporting the findings of present study. Basit et al. (2016) in sunflower reported that *H. armigera* show negative and non-significant correlation with minimum temperature (r= -0.01) as observed in the present study. Kachhawa et al. (2016) in chickpea observed that *H. armigera* was active during entire crop season from 48th standard meteorological week (1.12 and 1.00 larva/ meter row length) to 10th standard meteorological week (0.74 and 0.46 larva/ meter row length) during 2013-14 and 2014-15, respectively. Mean larval incidence of 1.48 and 1.68 larva/ meter row length was observed in 6th and 7th standard meteorological week during 2013-14 and 2014-15, respectively. Ojha et al. (2017) reported that during 2010-11, *H. armigera* in chickpea showed significant positive correlation with maximum temperature (r=0.57*) and negatively non-significant with rainfall (r= -0.27). Sharma et al. (2020) showed non-significant negative correlation with minimum temperature (r= -0.050), relative humidity (r= -0.349) and rainfall (r= -0.063) during rabi 2017-18. Also, during rabi 2018-19 larval population of *H. armigera* showed non-significant negative correlation with minimum temperature (r= -0.403) and rainfall (r= -0.060).

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AUTHOR CONTRIBUTION STATEMENT

Gore S H, More D G and More A V conceptualized and designed the study, conducted the study, analyzed the data, and authored the report under the supervision of More D G.

CONFLICT OF INTEREST

No conflict of interest.

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