POPULATION DYNAMICS OF *HELICOVERPA ARMIGERA* ON SOYBEAN

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ABSTRACT

This study on the population dynamites of pod borer *Helicoverpa armigera* (Hubn.) on soybean revealed that it appeared from 29th Standard meteorological week (SMW) (0.40± 0.10 three leaves/ plant). It increased and reached its peak level of 2.67± 0.17/ 3 leaves/ plant during 33rd SMW. The declining trend was observed and reached 0.60± 0.13/ 3 leaves/ plant during 40th SMW. The peak infestation was 48% during 35th SMW. The incidence exhibited non-significant positive correlation with maximum (r= 0.227) and minimum temperature (r= 0.335) and evening relative humidity (RH) (r=0.315); and a significant positive one with morning RH (r= 0.599) and significant negative one with rainfall (r= -0.42). The sunshine was found to be negatively and non-significantly correlated (r = -0.069).

Key words: *Helicoverpa armigera*, infestation, incidence, relative humidity, temperature, rainfall, sunshine hours, correlation coefficients, seasonal incidence

Soybean (*Glycine max* (L.) Merrill) is one of the most important and widely grown oil seed crops in the world. Successful production in soybean cropping systems is hampered due to the incidence of several insect pests. Among these pests, *Helicoverpa armigera* (Hubn.) is a major pest of soybean (Naseri et al., 2009) as with many crops attacking >60 plant species belonging to more than 47 families (such as soybean, cotton, sorghum, maize, sunflower, groundnuts, cowpea, tomato and green pepper) (Zalucki et al., 1994). *Helicoverpa* can attack soybeans at any stage from seedling to pod ripening but are most likely to attack flowering/ podding/ pod fill stages. This noctuid pest is distributed eastwards from southern Europe and Africa through the Indian subcontinent to Southeast Asia, and hence to China, Japan, Australia and the Pacific Islands. This study evaluates its population dynamics at Wadura, Sopore, Kashmir.

MATERIALS AND METHODS

The study was done with the soybean variety "Shalimar Soybean 1" at the FoA, Wadura, Sopore following standard package of practices except pest control. The larval incidence was recorded at weekly intervals from sowing (DAS) up to the last picking of pods. These observations were made from 25 randomly selected plants, and % plant infestation and

pod damage was computed. Meteorological data for maximum and minimum temperature (^{0}C), morning and evening relative humidity (%), sunshine (hours) and rainfall (mm) were obtained from the Meteorological observatory of Division of Agronomy, FoA, Wadura Sopore. The larval incidence data were correlated with weather factors using SPSS software.

RESULTS AND DISCUSSION

The incidence of *H. armigera* on soybean during kharif 2020 commenced from 29th standard meteorological week (SMW) (0.40± 0.10/ 3 leaves/ plant); and this reached its peak of 2.67± 0.17/ 3 leaves/ plant during 33rd SMW. Thereafter it declined to 0.60± 0.13/ 3 leaves/ plant during 40th SMW. These results are in line with those of Shivaraju et al. (2011) that the larval activity commenced from 35-40 days after sowing. Motaphale et al. (2019) observed its peak incidence during August. The results revealed that incidence exhibited positive, non-significant correlation with maximum temperature (r= 0.227), minimum temperature (r= 0.335) and evening RH (r=0.315); while it was a positive, significant correlation with morning RH (r= 0.599) and a negative but significant one with rainfall (r= -0.42) while sunshine was found to be negatively correlated (r = -0.069). The regression analysis as depicted in Fig. 1 reveal that the weather
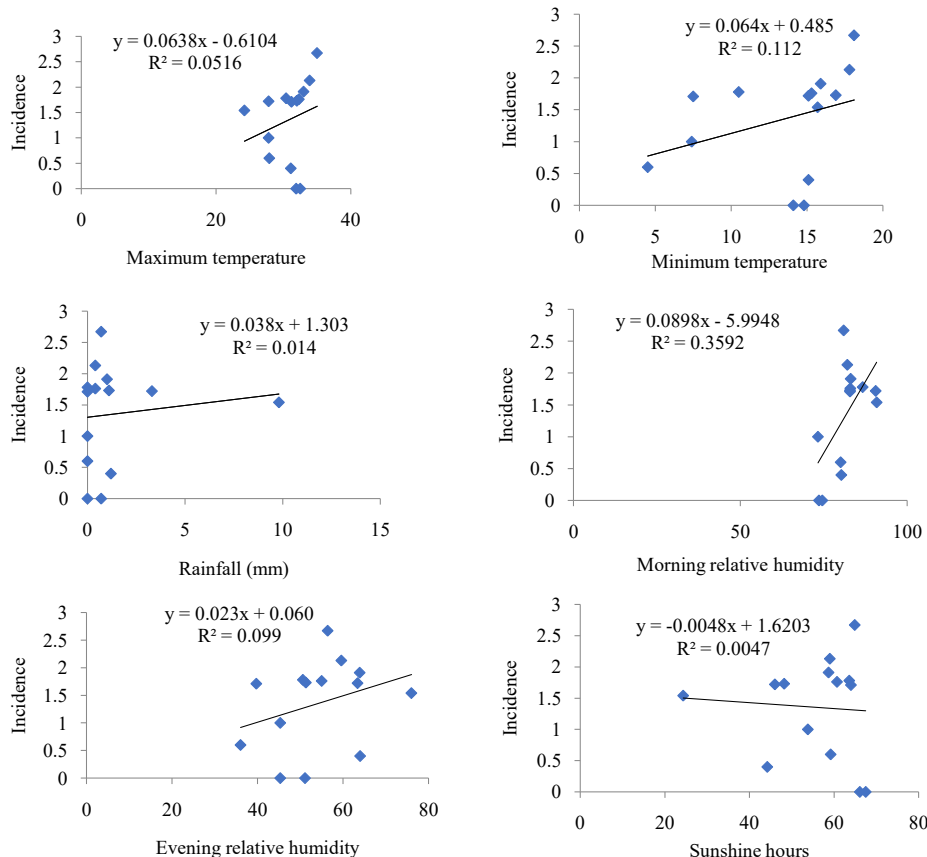
Fig. 1. Population dynamics of *H. armigera* on soybean

factors showed significant effect on the incidence, implying that factors contribute to 61% of incidence. Brahman et al. (2018) reported a positive correlation with maximum and minimum temperature, morning (r = 0.017) and evening RH (r = 0.339) and a non-significant negative one with rainfall. Bangale et al. (2019) observed that the incidence was positively correlated with RH and a negative one with sunshine hours. Mehto et al. (1985) reported a negative non-significant association with bright sunshine hours in cowpea. The pod damage by *H. armigera* in soybean started from 29th SMW and showed an increasing trend up to 35th SMW, and declined thereafter reaching a minimum at 40th SMW. Maximum pod damage (40%) was observed during 35th SMW and pod damage started declining and lowest pod damage (4%) was observed during 40th SMW (Fig. 1).

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