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SEASONAL INCIDENCE OF WHITEFLY *BEMISIA TABACI* (GENN.) ON MUNGBEAN

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ABSTRACT

This study on the seasonal incidence of whitefly *Bemisia tabaci* (Gennadius) on mungbean was done during kharif, 2014. Weekly observations on incidence were made on five randomly selected tagged plants. The results revealed that the first incidence was observed during 22nd standard meteorological week (SMW)- 66.67 whitefly/ plant. This reached at its peak (89.67 whitefly/ plant) during the 34th SMW. Correlation coefficients between incidence and weather factors revealed that maximum temperature had a positive relationship (r = 0.51) while the minimum temperature and relative humidity- RH (morning) revealed a negative one (r = -0.03 and r = -0.52); and RH (evening) and rainfall showed a highly significant but negative correlation.

Key words: *Bemisia tabaci*, mungbean, seasonal incidence, correlation coefficients, weather factors, maximum temperature, relative humidity, population dynamics

Legumes occupy an important place in human nutrition as these are a good source of protein (Kutos et al., 2002). Amongst the kharif pulses, mungbean *Vigna radiata* (L.) R. Wilczek is a major pulse crop and India is the leading producer (Singh Ahlawat, 2005). The losses due to insects and non-insect pests to pulses are of the major factors responsible for low yields (Lal et al.,1980). In Jammu subtropics, 38 insect pests occur on this crop out of which 22 are regular (Tikoo, 1996). The loss due to insect pests in mungbean was estimated to be 34.7% (Asthana et al.,1997). The economically important pests include whitefly *Bemisia tabaci* (Gennadius), aphid *Aphis craccivora* Koch, pod borer, *Maruca testulalis* Geyer, Bihar hairy caterpillar, and *Spilosoma obliqua* Walker. Among these *B. tabaci* is important as it causes damage directly through feeding and indirectly through the transmission of plant pathogenic viruses (Oliveira et al.,2001). The weather factors play a key role in determining the incidence and dominance of a pest or a pest complex (Butani, 1976). Hence, it is necessary to study the population dynamics in relation to weather factors, and this study evaluates the seasonal incidence of *B. tabaci* in mungbean.

MATERIALS AND METHODS

A field experiment was conducted at the Research field, Division of Entomology, Main Campus, Chatha, Jammu during kharif 2014. The seeds were sown in plots of size of 3x 2 m with row to row and plant to plant spacing of 30 and 10 cm, respectively, without manures and fertilizer. The experiment was laid out in randomized block design (RBD) with three replications, and observations made weekly on randomly tagged 5 plant; these were made during morning hours from 2 upper, 2 middle and 2 lower leaves and mean incidence was calculated. These observations were correlated with weather factors- with weekly data on mean temperature (maximum/ minimum °C), mean relative humidity- RH (morning and evening %), and rainfall (mm) obtained from the Agrometeorological Section, Division of Agronomy, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu. These data were subjected to correlation analysis.

RESULTS AND DISCUSSION

The mean seasonal incidence of *B. tabaci* observed on the mungbean is depicted in Fig. 1. These data reveal that first incidence was during the 22nd standard meteorological week (SMW) (66.67 whitefly/ plant); this increased to 76.67 whitefly/ plant during the 23rd SMW, and then declined to 30.33 whitefly/ plant) during the 33rd SMW; then increased again and reached to the maximum of 89.67 whitefly/ plant during 34th SMW at harvest. These results agreement with those of earlier workers (Chaman et al., 2021; Patel et al., 2021). Dar et al. (2002) reported peak incidence during the 25th and 26th SMW on urd bean and mungbean, respectively. Kumar et al. (2004) also reported such changes. Correlation coefficients between weather factors and incidence revealed that maximum temperature had a positive relationship (r= 0.511) while as minimum temperature and mean RH (morning) showed a negative

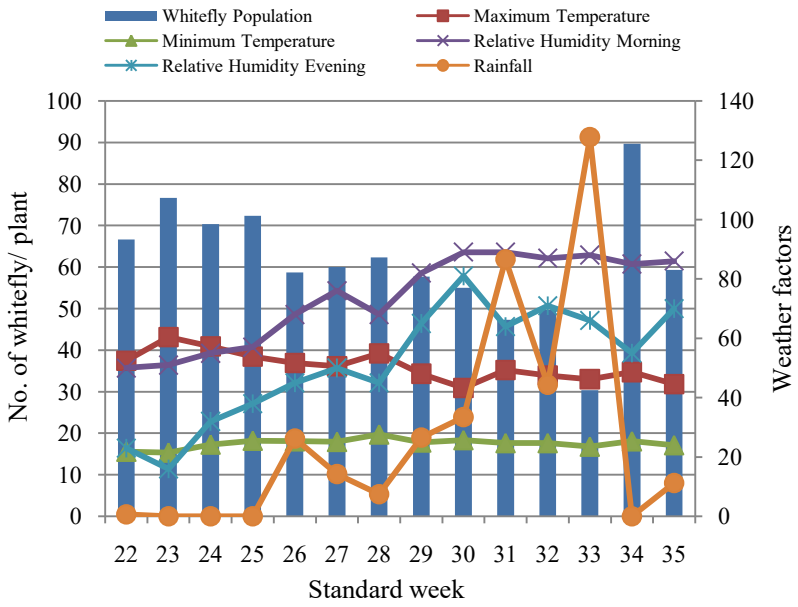

Fig. 1. Seasonal incidence of *B. tabaci* whitefly on mungbean

one (r= -0.039 and -0.524, respectively); similarly RH (evening) also showed a significantly negative relationship (r= -0.568), while rainfall showed a highly significant negative relationship) (r= -0.865). Chaman et al. (2021) observed that temperature exhibited a significantly positive correlation while RH and rainfall did not show any significant correlations Patel et al. (2021) also recorded a significantly positive correlation with maximum temperature and sunshine hours. The regression equation ($Y= 35.522 - 0.098X_1 + 0.219X_2 + 1.054X_3 - 0.864X_4 - 0.347X_5$, where, Y= mean whitefly/ plant, X_1= maximum temperature, X_2= minimum temperature, X_3= RH % morning, X_4=RH% evening and X_5= rainfall) revealed a significant effect (86.30%) of weather factors on incidence of *B. tabaci*. These results corroborate with the findings of Yadav and Singh (2013) on a positive correlation with temperature and sunshine hours, and a negative one with RH. Bashir et al. (2001) observed that rainfall was negatively correlated; Bairwa and Singh (2017) also reported a negatively non-significant correlation between rainfall. Singh and Kumar (2011) reported that minimum temperature and RH had non-significant positive correlation, whereas maximum temperature and rainfall had a non-significant negative one in black gram.

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