SEASONAL ABUNDANCE OF MAJOR INSECT PESTS OF SESAME AND THEIR RELATIONSHIP WITH ABIOTIC FACTORS

Sanju Piploda*, Akhter Hussain, Priyanka and Ajay Kumar Yadav

Department of Entomology, S.K.N. College of Agriculture, Jobner, Sri Karan Narendra Agriculture University, Jobner-303 329, India.
*e-mail : sanjujaat9785@gmail.com

(Received 10 February 2023, Revised 17 March 2023, Accepted 27 March 2023)

ABSTRACT: Investigation of the Seasonal abundance of major insect pests of sesame was carried out at the Agronomy Farm, of S.K.N. College of Agriculture, Jobner (Rajasthan), India. The insect pests, viz., leaf roller and capsule borer, Antigastra catalaunalis (Dup.), leafhopper, Orosius albicinctus Distant, and whitefly Bemisia tabaci Genn. were recorded as major insect pests of sesame. The initiation of the leaf roller and capsule borer population was recorded in the 34th standard meteorological week (SMW). However, the initiation of the leafhopper and whitefly population was recorded in the 33rd SMW. The peak of leaf roller and capsule borer, leafhopper and whitefly population was recorded in 36th SMW (7.20 leaf roller and capsule borer/ five plants, 7.48 leafhopper/ three leaves and 8.28 whitefly/ three leaves, respectively), when the minimum temperature, maximum temperature, and relative humidity was 22.9°C, 33.8°C and 83 per cent, respectively. The population of leaf roller and capsule borer had a significantly negative correlation with maximum temperature and relative humidity (r = -68 and r = -0.69, respectively). The minimum temperature and rainfall had a non-significant correlation (r = 0.38 and r = 0.28, respectively) with the leaf roller and capsule borer population. The population of leafhopper and whitefly had positive and significant correlation with minimum temperature (r = 0.72 and r = 0.71, respectively) and relative humidity (r = 0.67 and r = 0.67, respectively) but non-significant correlation with maximum temperature (r = 0.07 and r = 0.09, respectively) and rainfall (r= 0.19 and r= 0.17, respectively) with leafhopper and whitefly populations.

Key words: Correlation, leaf roller and capsule borer, leafhopper, sesame, whitefly.

INTRODUCTION

Sesame, Sesamum indicum L. known as the ‘queen of oilseeds is the oldest oilseed crop in the world cultivated throughout India. Its seeds contain 52-57 per cent oil and 25 per cent protein (Smith et al, 2000). The pest attack tolls a heavy loss (25 to 90%) in seed yield. As many as 67 insect pests of different categories are recorded damaging the sesame crop from germination to maturity. The crop is attacked by 29 species of insect pests in different stages of its plant growth (Biswas et al, 2001). The sesame leaf roller and capsule borer, A. catalaunalis is an important pest because this attacks the crop in all the growth stages after about two weeks of emergence (Suliman et al, 2004). The attack is more severe during dry seasons and after the initiation of flowering. Antigastra catalaunalis feeds on tender foliage by webbing the top leaves, bores into the capsule and shoots (Narayanan and Nadarajan, 2005). This insect pest causes 10-70 per cent infestation of leaves, 34-62 per cent of flower buds/ flowers, and 10-44 per cent infestation of capsules resulting in up to 72 per cent loss in yield (Aahirwar et al, 2010).

Nymphs and adults of some sucking insect pests, viz., leafhopper and whitefly suck the cell sap from leaves, flowers and pods. This leads to leaf curling of leaf margin downwards, reddening of leaf margins, stunted growth of the plants, sickly appearance of the crop, and subnormal growth of the leaf tissue occurs. The peculiar yellow spots are found on the upper surface of leaves affected by whitefly. Leafhoppers and whitefly are also responsible to transmit phyllody and leaf curl diseases in sesame, respectively (Aahirwar et al, 2010).

Balikai et al (2019) reviewed the work on the development of models to predict insect pest populations based on weather factors. A suitable understanding of the population dynamics of leaf roller and capsule borer
Sharma (2017), who also reported that the population of leafhoppers commenced from the second week of August and its population reached to a maximum in the last week of August. To provide a sound base for the management of leafhopper, *O. albicinctus*, a quantitative estimation of population dynamics was carried out in relation to abiotic factors of the environment, viz., minimum and maximum temperature, relative humidity, and rainfall under the prevailing set of agroclimatic conditions. The correlation coefficient revealed that the infestation of leafhoppers on sesame crop showed a positive significant correlation with minimum temperature and relative humidity, while a non-significant correlation with maximum temperature and rainfall (Table 1). Patidar (2010) and Prajapat (2018) reported that the population of leafhoppers showed a positive significant correlation with minimum temperature and a non-significant correlation with maximum temperature corroborating the present findings. Venkanna and Balikai (2015) reported that minimum temperature correlated positively and significantly with the leafhopper [Amrasca biguttula biguttula (Ishida)] population at 4 \( (r = 0.530^*) \) weeks lead time in Arka Anamika and at 1 \( (r = 0.537^*) \) and 4 \( (r = 0.531^*) \) weeks lead time in Mahyco hybrid No.-55, respectively, supporting the present investigation. Choudhary et al (2015), Sharma (2017) and Prajapat (2018) also observed that the incidence of leafhopper population had a positive significant correlation with relative humidity also corroborates the present investigation.

**Whitefly, Bemisia tabaci**

Similarly, the whitefly population commenced in the 33rd SMW and the first observation was recorded on 16th August 2019. Initially, the population of whitefly was low (4.36/ three leaves). The population gradually increased and reached the peak in 36th SMW (8.28/ three leaves), when the minimum temperature, maximum temperature, and relative humidity were 22.9°C, 33.8°C and 83 per cent, respectively. A gradual decline in the pest population was evident thereafter and again increased in the 39th SMW with 6.64/ per three leaves and observed in traces, thereafter (Table 1). The present findings corroborate with that of Ahirwar and Banerjee (2009), Gangwar et al (2014), Choudhary et al (2015) and Sharma (2017) who reported that the population of whitefly commenced from the second week of August and its population reached a peak in the fourth week of August, however, Ahirwar and Banerjee (2009) and Mishra et al (2015) also reported that the population of whitefly commenced from the first week of August and its population reached a peak in the third week of August also corroborate the present investigation. Sharma (2017) and Prajapat (2018) reported that the population of whitefly showed a positive significant correlation with minimum temperature and relative humidity, while a non-significant correlation with rainfall, which corroborates with the present findings. Patidar (2010) also observed a positive significant correlation between minimum temperature and the incidence of the whitefly population which conforms with the results of the present investigation. Kotikal et al (2011) reported that morning relative humidity recorded a positive and significant correlation with all sucking pests (aphids, thrips, mealy bugs, and whiteflies) and mites at two weeks lead time in pomegranate. That means if the morning relative humidity increases then the population of sucking pests could be higher during the next two weeks. This also supports the results of the present investigation.

**CONCLUSION**

The population of leaf roller and capsule borer, *A. catalaunalis*, showed a significant and negative correlation with maximum temperature and relative humidity. Whereas it had a non-significant correlation with minimum temperature and rainfall. The correlation worked out between the population of leafhopper, *O. albicinctus*, whitefly *B. tabaci*, and weather parameters revealed a significant relationship with minimum temperature and relative humidity. Whereas, there was a non-significant correlation between the maximum temperature and rainfall with pest population.

**REFERENCES**


