

POPULATION DYNAMICS OF MAJOR PEST INFESTING SORGHUM IN BUNDELKHAND REGION OF INDIA

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ABSTRACT : Sorghum is one of the most important crops for food and fodder. Various pests attacked the crop and these varies regionally and seasonally. Considering the above point of view, a field experiment was conducted at Rani Lakshmi Bai Central Agricultural University, Jhansi for monitoring major insect pest to study their population dynamics and correlate with the weather parameters (Maximum temperature, minimum temperature, morning humidity, evening humidity and rainfall). The crops were observed to have maximum infestation of sorghum shoot fly, sorghum midge and fall armyworm showing its peak population at 31 Standard meteorological week (SMW)(2.23/plant), 37 SMW (18.47/panicle) and 36 SMW (1.90 / plant), respectively. The shoot fly population doesn't show significant relation with weather variables. However, the population of sorghum midge showed significant positive correlation with maximum temperature and non-significant relation with other weather factors. Also, fall armyworm population have been found to be in positive relation with maximum temperature significantly and negatively significant correlated with morning relative humidity, evening relative humidity and rainfall.

Key words : Sorghum, shootfly, sorghum midge, fall armyworm, weather parameters.

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INTRODUCTION

Sorghum occupies an important place, having a great potential for food and fodder. The millets including sorghum are gaining much importance nowadays. The crop is grown around the globe as the crop is the dietary staple food for millions of people in many countries. However, the production is being hindered by various biotic and abiotic factors. Amongst biotic factors, insect pests are of major concern. Nearly 150 insect species have been reported as pests on sorghum, of which sorghum shoot fly (*Atherigona soccata*), stem borers (*Chilo partellus*, *Busseola fusca*, *Eldana saccharina*, and *Diatraea* spp), armyworms (*Mythimna separata*, *Spodoptera frugiperda* and *S. exempta*), shoot bug (*Peregrinus maidis*), aphids (*Schizaphis graminum* and *Melanaphis sacchari*), spider mites (*Oligonychus* spp), grasshoppers and locusts (*Hieroglyphus*, *Oedaleus*, *Aliopus*, *Schistocerca* and *Locusta*), sorghum midge (*Stenodiplosis sorghicola*), head bugs (*Calocoris angustatus* and *Eurystylus oldi*) and head caterpillars (*Helicoverpa*, *Eublemma*, *Cryptoblabes*, *Pyroderces*) are the pests attacking sorghum worldwide. Amongst

these, insects like sorghum shoot fly, sorghum midge, fall armyworm, stem borer, leaf hoppers etc was observed in the Bundelkhand area of Uttar Pradesh. The activity of the pests varies from season to season and region to region with the difference in their weather factor (Priyanka *et al*, 2018; Anandhi *et al*, 2020). Monitoring of insect pest population forms an important component of pest management. With this background in view, the present investigations were undertaken to observe the population dynamics of major pests of sorghum and correlate their population with the weather variables (temperature, humidity and rainfall).

MATERIALS AND METHODS

An experiment was carried out at research farm of Rani Lakshmi Bai Central Agricultural University, Jhansi during Kharif 2020 under rainfed in natural condition. For monitoring the pest population, local variety of sorghum crop was sown on first week of July with a spacing of 45 × 15 cm in a plot size of 5 × 5 m² following the recommended package and practices. No plant protection chemicals were applied during the experiment. The

seasonal incidence of *Contarinia sorghicola* differs regionally according to climatic conditions (Patel and Jotwani, 1986).

Population dynamics of *Spodoptera frugiperda*

The population of *S. frugiperda* first appeared at 32 SMW (standard meteorological week) (Table 1) with the intensity 0.51 larva per plant. The population gradually increased till 36 SMW, attending its peak with a value of 1.90 larva/ plant and thereafter starts declining till harvesting stage. The population of *S. frugiperda* was observed to have significant positive correlation with maximum temperature. Similar result of positive significant correlation of *S. frugiperda* with maximum temperature was reported by Anandhi *et al* (2020) in maize. The positive correlation of maximum temperature with other lepidopteran pests in different crops like *Earias vittella* on lady's finger (Archunan *et al*, 2018) and *Spodoptera litura* on groundnut (Mahalingam *et al*, 2003) was reported. In the present study, it was observed to have negative relation of *S. frugiperda* with morning relative humidity, evening relative humidity and rainfall (Table 2). Inclining the rainfall intensity decreases the larval population as the first and second instar larvae might have washed out. The light and heavy rainfall destroyed numerous number of instar larva of *S. frugiperda* (Waddill *et al*, 1981). These results are found in line with those of Mitchell *et al* (1991). As the incidence of the insect varies upon the weather parameters of the locality, there is a need to consider climatic factors of the region while implementing the integrated pest management strategies.

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