



Research Article

Variability of Thermal Indices and Peak Mango Hoppers Incidence under Subtropical Conditions

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ABSTRACT

A 3-year study with 20-35 years old mango orchards of *cv. Dashehari* was conducted to study the mango hoppers and their thermal requirement association. Hopper populations significantly varied across seasons within a year. Lower populations (0.69-1.15 hoppers sweep⁻¹) were recorded during 2011-12 as compared to higher populations of 1.32-4.03 hoppers sweep⁻¹ during 2013-14. The highest population was observed during 10-22 standard meteorological week in each season coinciding with reproductive phase of mango. Thermal indices *viz.*, growing degree days, heliothermal units and photothermal units were applied to estimate the peak hopper population in Lucknow region. A total of 1000°Cd GDD, 9265.2 HTU and 15169.5 PTU were required to reach the peak hopper incidence with significant linear relationships. These regression equations were explained up to 80-90% variations in mango hopper populations. The association between mango hoppers and thermal indices could be used for prediction of peak incidence in Lucknow region for taking up timely management practices.

Key words: Mango hopper, Thermal indices, Correlation, Regression model

Introduction

Mango (*Mangifera indica* L.) is an important commercial fruit crop in India and it covers nearly 2.51 M ha area and produce 18.43 Mt fruits with a productivity of 7.3 Mt ha⁻¹ (NHB, 2014). In India, Uttar Pradesh contributes major share in production (23.3 %) and majority of livelihood of farmers in Malihabad region of Uttar Pradesh is dependent on mango cultivation. However, productivity is very low due to effects of several biotic and abiotic factors (Adak *et al.*, 2012). Among biotic factors, insect pests affects considerably to the mango crop by feeding on all parts of the plant. Among the pests, mango hoppers are causing about 60 per cent of yield loss (Kumar *et al.*, 1985).

The thermal index plays a pivotal role in assessing and predicting pest weather interactions, biophysical variables in different crops (Srivastava *et al.*, 2011; Narjary *et al.*, 2013; Adak *et al.*, 2013; Suresh *et al.*, 2013; Selvaraj *et al.*, 2014). Thermal indices may also be used in predicting the occurrence and infestation of pest (Srivastava and Prajapati, 2012). The aim of this study was to develop thermal indices based regression models for prediction of hoppers in mango orchard under Lucknow conditions.

Materials and Methods

Data on the hoppers occurrence on mango leaves panicle⁻¹ trunk⁻¹ were recorded on weekly basis from five randomly selected trees by net sweeping method and expressed as number of hoppers sweep⁻¹ and collected from mango orchards of CISH, Rehmankhhera farm Lucknow,

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