

Humid thermal ratio as a tool to assess mango thrips dynamics under subtropical climatic condition

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Abstract

Weather factors play an important role in occurrence of thrips on mango. Keeping this in view, the present investigation was set out to assess the thrips population dynamics using humid thermal index, based on data sets from 22 fixed plot mango orchards in and around Lucknow. Results revealed that the highest thrips population of 3.36/panicle was recorded in Kakori (Fixed plot -I) orchard, which was followed by 2.4 and 2.06 at CISH III block and Kanar (Fixed II) respectively during the year 2013, whereas corresponding values were 4.05, 3.08 and 2.50 at CISH Block III, CISH Bolck II and Allupur respectively during 2014. The frequency distribution explained that the thrips population of <2 /panicle was widely distributed with highest frequency level. The humid thermal ratio ranged from 1.44 to 2.27 and 1.20 to 2.34 during 2013 and 2014 respectively across standard meteorological weeks. The peak thrips incidence was 6.18 /panicle during 2013 and 4.67/panicle during 2014, the corresponding values of humid thermal ratio were 1.47 and 2.05 respectively. The positive correlation was found between humid thermal ratio and thrips population dynamics during 2013 ($r = 0.52^{**}$) and 2014 ($r = 0.72^{**}$). Pooled data showed significant and positive correlation between humid thermal ratio and thrips population. Pooled analysis had explained up to 94 per cent of variation with exponential model (Thrips population = $0.007e^{2.77841TR}$, $R^2 = 0.94^{**}$) and suggested that this index might be used in understanding the mango thrips population dynamics under subtropical environmental condition.

Key words

Humid thermal ratio, Mango thrips, Regression analysis, Seasonal abundance

Introduction

Abiotic factors seem to influence large variation in the thrips population dynamics. In general, growth, development and occurrence of thrips on any crop is temperature and relative humidity driven, and also influenced by factors like growing season, cultivation practices and sampling methods. Chang (1997) observed that the distribution and dynamics, behavior, habits and ecology of thrips was influenced by prevailing weather conditions. Even the variations of single species or different species of thrips population may vary either on same genotypes or on different mango cultivars. Furthermore, within canopy microclimatic conditions have contributed to the wide differences in occurrence of this pest on mango

(Aliakbarpour and Rawi, 2012). Thrips attack both vegetative, as well reproductive parts of the mango. Among the phenological stages of mango, blooming, flower maturation and fruiting stages have been identified as crucial phenophases for thrips incidence and its prevention strategies (Lin *et al.*, 2015). Higgins (1992) and Pena *et al.* (2002) also reported that heavy infestation of mango thrips on flower panicles, drastically reduce the fruit production and quality. For management of thrips, growers are routinely practicing indiscriminate use of synthetic insecticides and subsequently, either directly or indirectly posing a threat to environmental safety (Desneux *et al.*, 2007). However, need based application of the insecticides is desirable in order to avoid pollution related hazards (Kandakoor *et al.*, 2014).