Studies on population dynamics of sucking insect pests whitefly (Bemisia tabaci), jassid (Empoasca kerri) and thrips (Caliothrips indicus) on mungbean [Vigna radiata (L.) Wilczek]

Anuj Shakya, Pankaj Kumar, Ankur Prakash Verma, Amit Raj and Pankaj Batham

Abstract
Population dynamics studies on sucking insect pests viz., whitefly (Bemisia tabaci), jassid (Empoasca kerri) and thrips (Caliothrips indicus) of mungbean [Vigna radiata (L.) Wilczek] were carried out at Genetics and Plant Breeding Research Farm of Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (UP), India during Kharif 2017. The weekly observation of sucking insect pests of mungbean recorded from 20 days after sowing till harvest. Population of whitefly and jassid were observed from 36th SW and continued up to 42nd SW. The maximum and minimum population of whitefly was recorded in 41st SW (4.9 whitefly/cage) and 36th SW (3.6 whitefly/cage), respectively. The overall population of jassid ranged from 3.6 (42nd SW) to 4.7 (39th SW) jassid/cage. The thrips population recorded from 38th SW to 42nd SW and had highest population of 1.2 thrips/5 plants during 41st SW. Lowest population of thrips was recorded in 38th SW (1.1 thrips/5 plants).

Keywords: Mungbean, whitefly, jassid, thrips and population dynamics

Introduction
Mungbean [Vigna radiata (L.) Wilczek] is also known as green gram which belongs to the family Fabaceae (leguminosae). It is a primary source of protein, carbohydrates, vitamin for human being. It contains 24.5% protein, 59.9% carbohydrate, 75 mg calcium, 8.5 mg iron and 49 mg β-carotene per 100g of split dal [1]. In India, the area under mungbean was 3.83 mha with production 1.60 million tonnes and productivity 418 kg/ha. In Uttar Pradesh, the area under mungbean was 51000 ha with production 33000 tonnes and productivity 666 kg/ha [2]. The foliage and stem are also a good source of fodder for livestock as well as a green manure. Mungbean is grown in summer and Kharif season in northern India. The most serious insect pests attacking on mungbean includes whitefly (Bemisia tabaci), bean thrips (Megalorrhithus distalis), gram pod borer (Helicoverpa armigera) and legume pod borer (Maruca vitrata) [3]. Whitefly (Bemisia tabaci), jassid (Empoasca kerri) and flower thrips (Caliothrips indicus) are the major sucking insect pests of eastern Uttar Pradesh [4]. Whitefly (Bemisia tabaci) is a vector of Mungbean Yellow Mosaic Virus (MYMV) and even low population densities B. tabaci is capable for wide range of transmission of MYMV [5]. Pest appearance, population fluctuation, infestation rate and crop yield are very much dependant on sowing time. Most of the farmer usually sown mungbean just after harvesting of Rabi crops without considering optimum sowing dates [6]. The present study was done to observe the ‘Studies on population dynamics of sucking insect pests whitefly (Bemisia tabaci), jassid (Empoasca kerri) and thrips (Caliothrips indicus) on mungbean [Vigna radiata (L.) Wilczek]’.
Results and Discussion
The field experiments were carried out at farmers’ fields on this aspect revealed that three insect pests (whitefly, jassid and thrips) were observed at different growth stages of the mungbean crop. Whitefly population started from 36th SW and continued up to 42nd SW (1st week of September to 3rd week of October). The maximum population of 4.9 whitefly/cage were recorded during 41st SW. The overall population of the whitefly ranged from 3.6 to 4.9 whitefly/cage. The present findings are partial agreement with Yadav N.K. and Singh P.S. (2015) [7] they reported that the population of whitefly in Kharif season on mungbean were ranging from 0.2-5.2/cage.

The population of jassid initiated from 36th SW and continued up to 42nd SW (1st week of September to 3rd week of October). The pest population increased from 36th SW (3.8 jassid/cage) to 39th SW (4.7 jassid/cage) and declined thereafter up to 42nd SW (3.6 jassid/cage). The overall population of the jassid ranged from 3.6 to 4.7 jassid/cage. The present results are in line with the findings of Singh Raj and Kalra VK (1995) [8] they observed that the peak population of E. kerri (nymphs & adults) was 6.40 per plant. The thrips population appeared from 38th SW (1.1 thrips/plant) and remained up to 42nd SW. The maximum population of 1.2 thrips/plant was recorded during 41st SW. The present findings are partial agreement with the findings of Yadav N.K. and Singh P.S. (2015) [7] they reported that the population of thrips appeared in 35th SW ranging from 0.2-1.2/flower (Table 1, Fig. 1).

<table>
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<tr>
<th>SW</th>
<th>Mean no. of whitefly/cage</th>
<th>Mean no. of jassid/cage</th>
<th>Mean no. of thrips/plant</th>
<th>Temperature</th>
<th>Relative humidity (%)</th>
<th>Rainfall (mm)</th>
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<td>Max. (°C)</td>
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Fig 1: Mean population of sucking pests in mungbean during crop season Kharif 2017. X axis shows standard week and Y axis shows no. of population.

Table 1: Population dynamics of sucking pests in mungbean at 3 farmers’ field

Conclusion
Whitefly and jassid population was observed during whole crop period i.e. 36th SW to 42nd SW. The maximum population of whitefly and jassid was recorded in 41st SW (4.9 whitefly/cage) and 39th (4.7 jassid/cage), respectively. The thrips population recorded from 38th SW to 42nd SW and had highest population during 41st SW (1.2 thrips/plant). The overall population of the thrips ranged from 1.1 to 1.2 thrips/plant.

References
5. Sastry KSM, Singh SJ. Field evaluation of insecticides