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## 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 36<sup>th</sup> SW and continued up to 42<sup>nd</sup> SW. The maximum and minimum population of whitefly was recorded in 41<sup>st</sup> SW (4.9 whitefly/cage) and 36<sup>th</sup> SW (3.6 whitefly/cage), respectively. The overall population of jassid ranged from 3.6 (42<sup>nd</sup> SW) to 4.7 (39<sup>th</sup> SW) jassid/cage. The thrips population recorded from 38<sup>th</sup> SW to 42<sup>nd</sup> SW and had highest population of 1.2 thrips/5 plants during 41<sup>st</sup> SW. Lowest population of thrips was recorded in 38<sup>th</sup> 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  $\beta$ -carotene per 100g of split *dal* <sup>[1]</sup>. 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 <sup>[2]</sup>. The foliage and stem are also a good source of fodder for live stock 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 (*Megalurothrips distalis*), gram pod borer (*Helicoverpa armigera*) and legume pod borer (*Maruca vitrata*) <sup>[3]</sup>. Whitefly (*Bemisia tabaci*), jassid (*Empoasca kerri*) and flower thrips (*Caliothrips indicus*) are the major sucking insect pests of eastern Uttar Pradesh <sup>[4]</sup>. 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 <sup>[5]</sup>. 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 <sup>[6]</sup>. 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]'.

**Materials and Methods**

Population dynamics was studied by collecting the data of following insects in three farmers' field of village Pithla. Whitefly and jassid population were recorded with the help of rectangular cage 45 cm long, 30 cm wide and 90 cm height according to the growth stage of plant. Observations were taken at 7 days interval starting from 20 days after sowing till harvesting on 5 randomly selected plants in each field between 5-7 a.m. in *Kharif* 2017. Thrips population was recorded at weekly intervals on 5 randomly selected plants starting with 50% flowering till harvest in terms of number/plants.

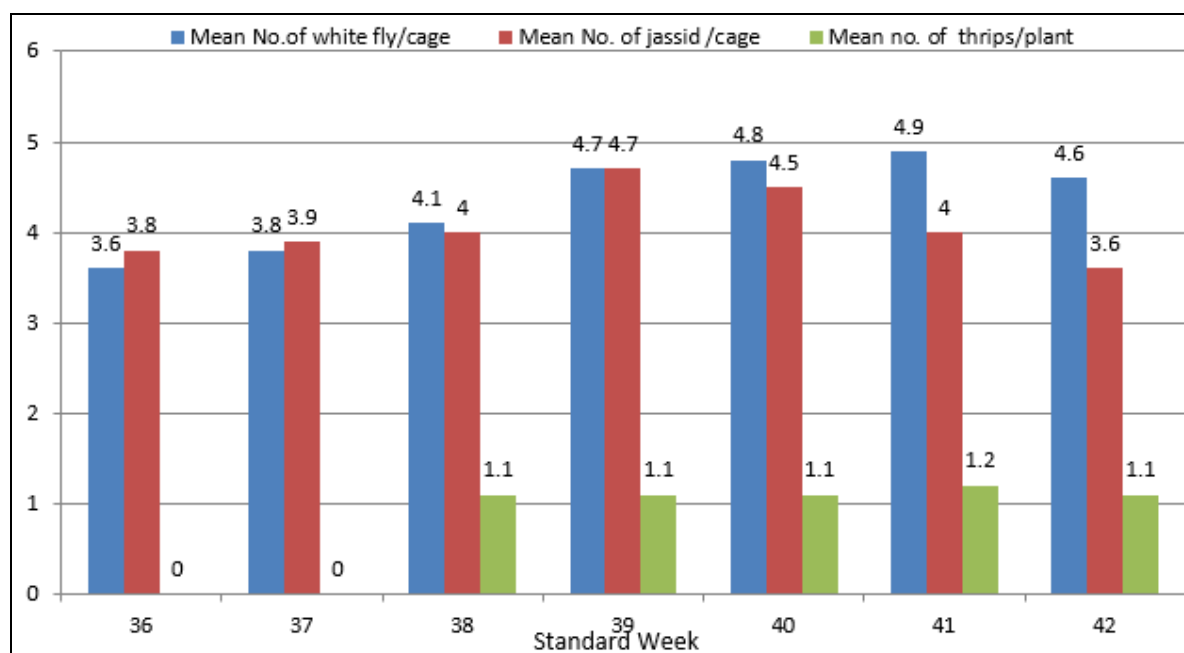
## Results and Discussion

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 36<sup>th</sup> SW and continued up to 42<sup>nd</sup> SW (1<sup>st</sup> week of September to 3<sup>rd</sup> week of October). The maximum population of 4.9 whitefly/cage were recorded during 41<sup>st</sup> 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 36<sup>th</sup> SW and continued up to 42<sup>nd</sup> SW (1<sup>st</sup> week of September to 3<sup>rd</sup> week of October).

The pest population increased from 36<sup>th</sup> SW (3.8 jassid/cage) to 39<sup>th</sup> SW (4.7 jassid/cage) and declined thereafter up to 42<sup>nd</sup> 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 38<sup>th</sup> SW (1.1 thrips/plant) and remained upto 42<sup>nd</sup> SW. The maximum population of 1.2 thrips/plant was recorded during 41<sup>st</sup> 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 35<sup>th</sup> SW ranging from 0.2-1.2/flower (Table 1, Fig. 1)

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

SW	Mean no. of white fly/cage	Mean no. of jassid /cage	Mean no. of thrips/plant	Abiotic factors			
				Temperature		Relative humidity (%)	Rainfall (mm)
				Min. (°C)	Max. (°C)		
36	3.6	3.8	0.0	26.0	34.0	80.1	49.4
37	3.8	3.9	0.0	26.7	34.7	78.7	0.0
38	4.1	4.0	1.1	25.8	32.7	84.8	88.2
39	4.7	4.7	1.1	25.2	33.1	82.4	20.6
40	4.8	4.5	1.1	24.8	33.8	79.9	0.0
41	4.9	4.0	1.2	23.9	33.0	79.1	0.0
42	4.6	3.6	1.1	21.4	33.7	71.7	0.0



**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

## Conclusion

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

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