



## SEASONAL INCIDENCE OF MAJOR INSECT PESTS OF MUNGBEAN

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### ABSTRACT

A field experiment conducted during the kharif 2018 evaluated the seasonal incidence of insect pests of mungbean. The results revealed occurrence of major sucking insect pests viz., whitefly *Bemisia tabaci* (Genn.), leafhopper *Empoasca kerri* Pruthi, aphid *Aphis craccivora* Koch from vegetative stage to maturity stage. The lepidopterans viz., tobacco caterpillar *Spodoptera litura* (F.) and blue butterfly *Lampides boeticus* L., were observed from reproductive to maturity stage. Maximum incidence of *B. tabaci* was -at 9.70 nymphs and adults/ cage, *E. kerri* at 4.97 nymphs and adults/ plant, *A. craccivora* at 2.17 nymphs and adults/ plant, *S. litura* at 0.33 larvae/ plant and *L. boeticus* at 0.37 larvae/ plant and during the 39<sup>th</sup> standard week. Incidence of *B. tabaci*, *A. craccivora*, *S. litura* and *L. boeticus* showed significant positive correlation with maximum temperature, ( $r=0.79, 0.76, 0.82$  and  $0.85$ , respectively; *B. tabaci* with rainfall and *S. litura* with evening relative humidity showed a significant negative correlation ( $r=-0.76, -0.81$ , respectively).

**Key words:** Mung bean, sucking pests, lepidopteran pests, seasonal incidence, weather parameters, correlation coefficients, temperature, rainfall, relative humidity

Mung bean (*Vigna radiata* L. Wilczek) is an important pulse crop in India after chickpea and pigeon pea (Ved et al. 2008). It Hussain et al., 2011), and its productivity in India is 629 kg/ ha. It is also consumed as fresh sprout, seeds used for making soups, bread and biscuits (Sehrawat et al., 2013). The low productivity of mung bean in Madhya Pradesh may be attributed to a wide variety of factors, among which insects is of paramount importance. A number of insects have been recorded on mung bean, and In India, 64 species of insect pests reported (Lal, 2008). The present study evaluates the effects of weather parameters viz. max. temp.(°c), min. temp. (°c), sunshine (hrs), rainfall (mm), morning RH (%), evening RH (%), wind speed (km/hr) and evaporation (mm) on the incidence of major sucking and lepidopteran insect pests in mung bean..

### MATERIALS AND METHODS

The experiment was carried out on “Virat” variety sown at the breeder seed production unit, College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, Madhya Pradesh, India during kharif 2018-19. P in aplot size of 20x 10 m<sup>2</sup> was followed with a row to row and plant to plant spacing of 30 x 10 cm, and all agronomic practices were adopted except the pest control measures. Observations on insect pests were recorded from randomly selected 10 plants at weekly

interval, starting from 15 DAS (days after sowing) and continued till the crop maturity. Sucking insect pests *Aphis craccivora* (Koch.) and *Empoasca kerri* Pruthi were observed on 3 compound leaves viz., top, middle and bottom; *Bemisia tabaci* (Genn.) population was recorded by using cage method. The lepidopterans *Spodoptera litura* (F.) and *Lampides boeticus* L., were recorded on 10 randomly selected plants by counting the number of larvae/ plant. Incidence of these pests was correlated with weather parameters; maximum and minimum temperature (°C), sunshine (hrs), rainfall (mm), morning and evening RH (%), wind speed (km/ hr) and evaporation (mm). Regression equations were developed for the ones with significant impact (Snedecor and Cochran, 1967).

### RESULTS AND DISCUSSION

The major insects that attack during the vegetative stage (15 DAS i.e. 35 SMW) were *B. tabaci*, *A. craccivora* and *E. kerri*, and these infestations persisted up to maturity 41<sup>st</sup> SMW (Sahoo and Patnaik, 1994; Nath,1994; Singh and Kalra, 1995; and Dar et al., 2002 *S. litura* and *L. boeticus* were observed at reproductive stage, which were active till maturity; the former was observed from 36 DAS (38- 41 SMW) agreeing with earlier reports of Sujayanand et al. (2021); and the latter from 29 DAS (37 to 41 SMW). Irulandi and

Balasubramanian (1999), Ebadah (2002) and Sarkar et al. (2008) also studied seasonal incidence of insect pests of mungbean.

During kharif 2018, the population dynamics of these pests were recorded and correlated with weather factors. *Bemisia tabaci* appeared during 35<sup>th</sup> SMW (1.07 whiteflies/ plant) and remained active till maturity of the crop (4.20 whiteflies/ plant), with peak of 9.70 whiteflies/ plant being in 39<sup>th</sup> SMW. This observation corroborates with that of of Chandra et al. (2021). With *B. tabaci* a significant positive correlation ( $r=0.79$ ) was observed with maximum temperature, while a significant negative correlation ( $r=-0.76$ ) was observed with rainfall; regression equations being  $\hat{Y}=0.786x-18.841$  and  $\hat{Y}=-0.03x+6.4866$  respectively. These agree with those of Tamang et al. (2017). *E. kerri* appeared on on 35<sup>th</sup> SMW (0.40 adults/ plant), continued till 41<sup>th</sup> SMW with peak (2.17 adults/ plant) being eon 39<sup>th</sup> SMW. Yadav and

Singh (2006) developed forecasting models for *E. kerri* and *B. tabaci*. *Aphis craccivora* appeared on the 35<sup>th</sup> SM, continued till 41<sup>st</sup> SMW, with a peak (4.97 aphids/ plant) on the 39<sup>th</sup> SMW; correlations revealed a significant positive correlation ( $r=0.76$ ) with maximum temperature, and regression equation was  $\hat{Y}=0.4229x-10.203$ , agreeing with the findings of Bairwa and Singh (2017). *S. litura* appeared on the 38<sup>th</sup> SMW (0.17 larvae/ plant), continued till 41<sup>st</sup> SMW, with a peak (0.33 larvae/ plant) on the 39<sup>th</sup> SMW; its incidence showed a significant positive correlation ( $r=0.82$ ) with maximum temperature, and a significant negative one ( $r=-0.81$ ) was with evening RH, and the regression equations were  $\hat{Y}=0.04x-1.0887$  and  $\hat{Y}=-0.0084x+0.7277$ , respectively. *Lampides boeticus* appeared on the 37<sup>th</sup> SMW, continued till 41<sup>st</sup> SMW with a peak of 0.37 larvae/ plant during the 39<sup>th</sup> SMW; a significant positive correlation ( $r=0.76$ ) was observed with maximum temperature, and regression equation was  $\hat{Y}=0.0454x-1.2188$  (Table 1, 2).

Table 1. Seasonal activity of insect pests of mung bean- Jabalpur (kharif, 2018-19)

SMW	Period of observations	Incidence				
		Sucking insect pests (Nymphs and adults)/ plant			Lepidopteran insect pests (larvae/ plant)	
		<i>Bemisia tabaci</i>	<i>Empoasca kerri</i>	<i>Aphis craccivora</i>	<i>Spodoptera litura</i>	<i>Lampides boeticus</i>
35	27 Aug-2 September	1.07	0.73	0.40	0.00	0.00
36	3-9 September	3.07	1.67	0.77	0.00	0.00
37	10-16 September	5.07	2.37	1.33	0.00	0.03
38	17-23 September	7.23	3.87	1.70	0.17	0.17
39	24-30 September	9.70	4.97	2.17	0.33	0.37
40	1-7 October	6.73	4.27	1.73	0.27	0.30
41	8-17 October	4.20	1.57	0.70	0.20	0.20

SMW= Standard Meteorological Week

Table 2. Correlation coefficients- incidence of insect pest vs. weather factors

Weather factors	Incidence of insect pests									
	<i>B. tabaci</i> (cage method)		<i>A. craccivora</i> / plant)		<i>E. kerri</i> / plant		<i>S. litura</i> / plant		<i>L boeticus</i> / plant	
	r	byx	r	byx	r	byx	r	byx	r	byx
Max. Temp.(°c)	0.79*	0.78	0.76*	0.42	0.74NS	–	0.82*	0.78	0.85*	0.79*
Min. Temp. (°c)	-0.13 NS		-0.07NS		0.02NS		-0.53NS		-0.50NS	
Sunshine (hrs)	0.72NS		0.65NS		0.67NS		0.70NS		0.73NS	
Rainfall (mm)	-0.76*	-0.03	-0.67NS		-0.69NS		-0.60NS		-0.62NS	
Morning RH (%)	-0.53NS		-0.42NS		-0.42NS		-0.67NS		-0.67NS	
Evening RH (%)	-0.73NS		-0.69NS		-0.66NS		-0.81*	-0.008	-0.83NS	
Wind speed (km/ hr)	-0.59NS		-0.56NS		-0.53NS		-0.75NS		-0.79NS	
Evaporation (mm)	0.72NS*		0.66NS		0.71NS		0.57NS		0.62NS	

r = Correlation; byx = Regression equation; NS-Non significant

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