

Population dynamics of sap feeders in urd bean [*Vigna mungo* (L.) Hepper] and their correlation with abiotic factors

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SUMMARY

A field experiment was conducted during *Kharif* 1997 and 1998 to time out the sixteen insect pests population associated with urd bean [*Vigna mungo* (L.) Hepper] at different stages of crop grown stages. Out of these five sap feeders viz., *Bemisia tabaci*, *Empoasca* sp. *Dysdercus koennigii*, *Gurgara mixta*, *Leptocoris acuta* and *Nezara viridula*. were observed to infest in urd bean. The population of whitefly was negatively correlated and jassid, red cotton bug, phalsa bug, gundhi bug and green bug were positively correlated with minimum, maximum temperature, relative humidity and rainfall during both the years.

Key words :
Incidence,
Defoliations,
Vigna mango

Black gram [*Vigna mungo* (L.) Hepper] also known as urd bean is one of the important pulse crops grown throughout India. In India, total area under urd bean cultivation is 3.15 m ha with production and productivity of 1.31 million tonnes and 4.73 kg, respectively. Among the major problems known to limit the yield of urd bean, incidence of insect pests are main constraints. Black gram is attacked by more than twenty insect pests species in India. (Nayer *et al.*, 1976). Keeping this in view, the present study was under taken to know the population dynamics of sap feeders and their correlation with abiotic factors.

MATERIALS AND METHODS

A field experiment was conducted at Student's Instructional Farm of N.D. University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during *Kharif* 1997 and 1998. The trials were conducted on urd bean cv. PU-19 and sown 3rd week of August in the both the years. The experiment was laidout in RBD having 6x5M² plot size, 45x25 cm distance between row to row with three replications. Recommended agronomical practices were done to raise a good crop. Meteorological data were collected from the Meteorology Department of this University. Observations on damage caused by sap feeders were recorded

on 10 randomly selected plants, at weekly interval from germination to harvesting stage of the crop. Sap feeders were recorded by counting the number of nymphs and adults per plant.

RESULTS AND DISCUSSION

Table 1, 2 reveal that the peak population of whitefly, jassid, red cotton bug, phalsa bug, gundhi bug and green bug was 39th standard week with mean 4.50, 4.30, 1.22, 1.4, 1.10 and 0.84 population per plant during *Kharif* 1997 while during *Kharif* 1998 the whitefly, jassid, red cotton bug, phalsa bug, gundhi bug and green bug was 40th standard week with mean 7.20, 3.33, 2.25, 0.90, 1.35, and 2.15 population per plant. Rao *et al.* (2006) have reported the seasonal incidence of *Spodoptera litura* only on fenugreek not on urdbean.

Table 3 reveals that the population of whitefly was significant negatively correlated with minimum temperature (-0.924), relative humidity (-0.874) and rainfall (-0.694) during *Kharif* 1997 while also significant negatively correlated with minimum temperature (-0.776) and relative humidity (-0.809) during *Kharif* 1998. Kumar *et al.* (2007) reported that the population of whitefly had significantly positive correlation with maximum temperature, R.H. and rainfall.

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Table 1: Incidence of sap feeders on urd bean during Kharif 1997

Standard weeks	Sap feeders (Population/plant)						Meteorological parameters			
	White fly	Jassid	Red cotton bug	Phalsa bug	Gundhi bug	Green bug	Temperature (0°)		Relative humidity (%)	Rainfall (mm)
							Min.	Max.		
35	0.87	0.93	0.30	0.00	0.00	0.00	25.42	30.65	85.20	127.9
36	1.30	1.93	0.57	0.33	0.33	0.37	24.60	29.70	87.70	17.4
37	2.30	2.97	0.40	0.67	0.65	0.46	25.40	28.50	80.50	119.0
38	3.67	3.87	0.67	0.83	0.97	0.73	24.50	33.20	73.40	23.8
39	4.50	4.30	1.22	1.40	1.10	0.84	20.90	30.30	77.80	00.0
40	3.13	2.00	0.80	1.32	0.93	0.52	20.30	30.60	71.25	00.0
41	3.33	1.77	0.37	1.23	0.83	0.41	19.70	31.30	72.70	18.2
42	1.30	0.87	0.00	0.40	0.36	0.33	17.10	27.10	72.40	0.00

Table 2: Incidence of sap feeders on urd bean during Kharif 1998

Standard weeks	Sap feeders (Population/plant)						Meteorological parameters			
	White fly	Jassid	Red cotton bug	Phalsa bug	Gundhi bug	Green bug	Temperature (0°)		Relative humidity (%)	Rainfall (mm)
							Min.	Max.		
37	1.67	0.30	0.00	0.00	0.00	0.15	25.4	30.9	79.9	14.0
38	2.15	1.43	0.35	0.15	0.50	0.45	24.3	32.0	85.6	45.4
39	4.83	2.33	1.00	0.44	0.87	0.66	24.9	33.2	72.4	30.0
40	7.20	4.00	2.25	0.90	1.35	2.15	24.6	30.8	83.6	00.0
41	6.97	3.33	1.50	0.54	1.00	1.00	24.8	33.1	72.5	00.0
42	4.15	3.10	0.87	0.33	0.72	0.45	24.4	32.1	73.5	44.4
43	3.00	2.05	0.50	0.16	0.43	0.30	21.2	31.0	74.2	00.0
44	2.67	1.40	0.20	0.00	0.15	0.20	15.3	30.1	65.2	0.00

Table 3 : Correlation coefficient between meteorological parameters and incidence of sap feeders on urd bean (*V. mungo* L. Hepper)

Sr. No.	Insect pests	Abiotic factors Kharif 1997				Abiotic factors Kharif 1998			
		Temperature (0°)		R.H. (%)	Rainfall (mm)	Temperature (0°)		R.H. (%)	Rainfall (mm)
		Min.	Max.			Min.	Max.		
1.	<i>Bemisia tabaci</i> Genn	-0.924*	-0.214	-0.874*	-0.694*	-0.776*	-0.299	-0.809*	-0.404
2.	<i>Empoasca</i> spp.	-0.202	0.526	-0.543	-0.460	-0.258	0.177	0.187	-0.366
3.	<i>Dysdercus koenigii</i> Fab.	0.251	0.435	-0.114	-0.175	0.154	0.465	-0.160	-0.181
4.	<i>Gurgara mixta</i> Buckton	0.117	0.460	-0.02	-0.343	0.239	0.212	0.164	-0.323
5.	<i>Leptocoris acuta</i> Thumcb	-0.056	0.096	-0.163	-0.386	0.426	0.334	0.329	-0.323
6.	<i>Nezara viridula</i> Linn	-0.044	0.470	-0.477	-0.507	0.334	0.084	0.379	-0.243

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