

Seasonal incidence of defoliators in urd bean (*Vigna mungo* L. Hepper) and their correlation with meteorological parameters

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SUMMARY

A total of sixteen insect-pests were recorded on *Vigna mungo* at different stages of crops growth during Kharif 1997 and 1998. Out of these, six defoliators viz., *Atractomorpha* sp., *Epilachna vigintioctopunctata*, *Monolipta signata*, *Mylocerus* sp., *Spilarctia obliqua* and *Spodoptera litura*, were observed to infest urd bean. The populations of grass hopper, epilachna beetle, leaf webber, were negatively correlated with minimum and maximum temperature and positively correlated with relative humidity and rainfall during both the years.

Key words :

Incidence,
Defoliators,
Vigna mango

Black gram [*Vigna mungo* (L) Hepper] is an important pulse crop. Among the major problems known to limit the yield of this pulse, incidence of insect pests are the main constrains. It has been reported that 18 species of insect pests infest on urd bean (Lal *et al.*, 1980). Out of these, five insect pests viz., *Spodoptera litura* Fab. *Madurasia Obscurella* Jac., *Empoasca kerri* Pruthi, *Aphis craccivora* Koch; *Spilarctia obliqua* Walk. and *Euchrysops cnejus* Fab. have been recorded as the major pests on urd bean (Kumar *et al.*, 1998). Keeping this in view, the present study was undertaken to know the seasonal incidence of defoliators in urd bean and their correlation with meteorological parameters.

MATERIALS AND METHODS

A field experiment was conducted at Student's Instructional Farm of N.D. University of Agriculture Science, Kumarganj, Faizabad (U.P.) during Kharif 1997 and 1998. The urd bean variety PU-19 was sown in 3rd week of August during both the years. The experiment was layout in RBD having 6x5m² with three replications, 45x25cm distance between row to row. Recommended agronomical practices were adopted to raise a good crop. Meteorological data were collected from the

Department of Meteorology of this University. Observations on damage caused by defoliators were recorded on 10 randomly selected plants, at weekly interval from germination to harvesting stage of the crop. Defoliators were recorded by number of larvae per plant except grasshopper in which nymphs and adults were counted. Adult population of defoliators viz., beetles and weevils were recorded on leaves and branch of each plant.

RESULTS AND DISCUSSION

Data of Table 1, 2 show the peak population of grass hopper, epilachna beetle, leaf webber, grey weevil, Bihar hairy caterpillar and tobacco caterpillar were found 39 standard weeks with mean 3.00, 2.13, 1.05, 1.16, 3.50 and 2.45 population per plant during Kharif 1997 while during Kharif 1998 the peak population was found 40 standard week for grass hopper, epilachna beetle, leaf webber, grey weevil with mean 3.10, 0.83, 2.47, 1.42 and 41. In the similar finding Monobrullah *et al.* (2007) reported that *Spodoptera litura* infestation was from vegetative to crop maturity stage of the crop. Table 3 shows that the population of *Atractomorpha* sp. was significant negatively correlated with minimum temperature (-0.942), relative humidity (-0.874) during Kharif 1997 while also significant negatively correlated with

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Table 1: Incidence of flower feeders and tissue borer on urd bean during Kharif 1997

Stand weeks	Defoliators (population/plant)						Aboitic parameters			
	Grass hopper	Epilachna beetle	Leaf webber	Grey weevil	Bihar hairy cater piller	Tobacco caterpillar	Temperature (0°)		Relative humidity (%)	Rainfall (mm)
							Min.	Max.		
35	0.70	0.00	0.00	0.00	0.00	0.00	25.42	30.65	85.20	127.9
36	1.01	0.83	0.20	0.00	0.00	0.00	24.60	29.70	87.30	17.4
37	1.40	1.81	0.43	0.30	1.10	0.45	25.40	28.50	80.50	119.0
38	2.07	2.45	0.62	0.62	2.48	1.30	24.50	33.20	73.40	23.8
39	3.00	2.13	1.05	1.16	3.50	2.45	20.90	30.30	77.80	00.0
40	1.97	1.07	0.84	1.23	2.40	4.10	20.30	30.60	71.25	00.0
41	0.85	1.00	0.55	1.14	1.60	2.15	19.70	31.30	72.70	18.2
42	0.42	0.60	0.32	0.42	0.78	0.00	17.10	27.10	72.40	0.00

Table 2 : Incidence of flower feeders and tissue borer on urd bean during Kharif 1998

Stand weeks	Defoliators (population/plant)						Aboitic parameters			
	Grass hopper	Epilachna beetle	Leaf webber	Grey weevil	Bihar hairy cater piller	Tobacco caterpillar	Temperature (0°)		Relative humidity (%)	Rainfall (mm)
							Min.	Max.		
37	0.83	0.00	0.00	0.00	0.00	0.00	25.42	30.9	79.9	14.0
38	1.05	0.40	1.17	0.00	0.00	0.00	25.3	32.0	85.6	45.4
39	2.05	0.67	1.30	0.00	2.20	1.23	24.9	33.2	77.4	30.0
40	3.10	0.83	2.47	1.42	4.50	2.15	24.6	30.8	83.6	00.0
41	1.97	0.45	1.63	1.00	3.27	3.45	24.8	33.1	72.5	00.0
42	1.15	0.33	0.85	0.70	3.05	2.65	24.4	32.1	43.5	44.4
43	0.80	0.00	0.67	0.43	2.60	1.27	21.2	31.0	74.2	00.0
44	0.50	0.00	0.33	0.21	1.17	0.00	15.3	30.1	65.2	0.00

Table 3 : Correlation coefficient between abiotic factors and incidence of defoliators on urd bean

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.		
(A)	Flower thrips								
1.	<i>Atractomorpha</i> spp.	-0.924**	0.188	-0.874*	-0.694	-0.776*	-0.299	-0.809*	-0.404
2.	<i>Epilachna vigintioctopunctata</i>	0.034	0.093	-0.229	-0.337	-0.381	-0.487	-0.107	-0.537
3.	<i>Monolipta signata</i>	0.070	-0.266	-0.305	-0.253	0.536	0.505	0.502	0.178
4.	<i>Myllocerus</i> spp	-0.481	0.154	-0.663	-0.631	0.404	0.727*	0.001	0.092
5.	<i>Spilarctia obliqua</i>	-0.655	0.247	-0.773*	-0.609	0.042	0.131	-0.293	-0.445
6.	<i>Spodoptera litura</i>	-0.390	0.113	-0.540	-0.480	0.100	0.517	-0.385	-0.311

minimum temperature (-0.776) and R.H. (-0.809). Kumar *et al.* (2007) reported that the population of grass hopper was positively correlated with maximum temperature and rainfall. The population of *Myllocerus* sp. was significant positively correlated with maximum temperature (0.727) during Kharif 1998. The population of *Spilarctia obliqua* was significant negatively correlated with relative humidity (0.773) during Kharif 1997. Singh and Singh (1993) had also reported that the increase in *Spilarctia obliqua* population was positively correlated with temperature and negatively with relative humidity.

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