Research Paper :

Population dynamics of white flies, *Bemicia tabaci* Genn. on brinjal

P.D. MANE AND S.N. KULKARNI

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See end of the article for authors' affiliations

Correspondence to :
P.D. MANE
Department of Entomology, Marathwada Agricultural University, PARBHANI (M.S.) INDIA

SUMMARY

Field experiment was conducted during *Kharif* season of 1996 to study the population dynamics of white flies, (*Bemicia tabaci* Genn.) on brinjal. With increase in temperature and humidity, there was increase in the population of white flies and *vice-versa*. Number of rainy days exhibited highest positive direct effect and evening relative humidity showed highest negative direct effect on the population of white flies.

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A general view of the pest problem of brinjal in India reveals that, this crop is attacked by number of pests, *viz*., shoot and fruit borer (*Leucinodes orbonalis* Guen.), epilachna beetle (*Epliachna vigintioctopunctata* Fab.), jassid (*Amrasca biguttula biguttula* Ishida), aphid (*Myzus persicae* Saunder), thrips (*Thrips tabaci* Lindemann) and white flies (*Bemicia tabaci* Gennadius). *Bemicia tabaci* is one of the sucking pests of brinjal. Ohnesorge *et al.* (1980) studied the spatial distribution of *Bemicia tabaci* on eggplant and reported that the final instar larvae occurring only on the oldest leaves. Population dynamics of *Bemicia tabaci* on tomato and egg plant were also studied by Ohnesorge (1981). Sharma and Batra (1955) observed that the population of white fly was in its peak in the month of October on brinjal and cotton. Similarly they also quoted the causes of outbreak *viz*., prolonged rainy period and the injudicious spraying of insecticides. Present investigations have been undertaken to study the population dynamics of *Bemicia tabaci* on brinjal in different meteorological weeks.

MATERIALS AND METHODS

The experiment was laid out in unprotected plot with net plot size 5m x 5m in *Kharif* season of 1996-97, at the Horticultural Research Scheme, Department of Horticulture, College of Agriculture, Marathwada Agricultural University, Parbhani. Recommended agronomic practices were followed. The seedlings grown on raised beds were transplanted in the main field after one month. Transplanting was done on the flat beds with 60 x 60 cm spacing. Healthy and vigorous seedlings were preferred for transplanting. Protective irrigation was given immediately after transplanting and thereafter irrigations were given at an interval of 15 days.

Population of white flies was recorded at weekly interval since transplanting from six leaves *i.e.* (two each from top, middle and bottom canopy). Observations on population of white flies were subjected to $\sqrt{x} + 0.5$ transformation.

RESULTS AND DISCUSSION

Data on population of white flies is presented in Table 1. It is revealed from the data that the incidence of white fly was firstly noticed when the temperature was 25.5^0c and

Table 1 : Population dynamics of white flies in *Kharif* season 1996-97

Obs. No.	Date of obs.	Meteo. weeks	No. of white flies/plant	Temperature ^{0}C		Humidity (%)		Rainfall (mm.)	No. of rainy days	Bright sun. hours	Evaporation (mm.)	Wind veloc. (Km/hr)
				Max.	Min.	Am.	Pm.					
1.	09.08.96	32	1.22 (1.31)	29.2	21.8	82	60	20.7	3	3.0	4.1	8.0
2.	16.08.96	33	1.50(1.41)	31.1	22.6	84	58	87.6	2	5.0	4.7	5.6
3.	23.08.96	34	1.86(1.53)	29.6	22.2	90	70	66.4	5	4.3	3.1	3.9
4.	30.08.96	35	2.18(1.63)	28.9	21.8	91	67	76.4	4	5.0	3.8	6.9
5.	06.09.96	36	2.84(1.82)	30.1	22.0	90	66	102.8	4	5.0	3.8	3.0
6.	13.09.96	37	3.12(1.90)	31.1	22.2	91	63	136.5	3	7.2	3.6	3.5
7.	20.09.96	38	3.68(2.04)	30.5	20.8	89	54	73.4	2	8.8	4.7	5.0
8.	27.09.96	39	2.46(1.72)	32.7	21.8	87	52	23.6	2	8.6	4.6	4.0
9.	04.10.96	40	3.78(2.06)	29.7	22.2	91	65	113.2	5	5.8	3.7	5.7
10.	11.10.96	41	2.36(1.69)	31.5	16.3	76	41	0.0	0	10.7	6.7	3.2
11.	18.10.96	42	2.17(1.63)	31.2	16.5	76	44	6.1	1	8.4	5.5	4.6
12.	25.10.96	43	2.06(1.60)	29.6	21.4	88	68	55.4	3	6.8	3.0	3.6

The average population throughout season (2.43)

Figures in parenthesis are $\sqrt{x + 0.5}$ values

Table 2 : Conbined direct and indirect effect of the abiotic factors on the populations of white flies recorded in *Kharif* season 1996-97

Abiotic factor	Temperature (^{0}C)		% RH		Rainfall (mm.)	No. of rainy days	Bright sunshine (hours)	Evaporation (mm.)	Wind veloc. (Km/hr)	Correlation r-values
	Max.	Min.	Mor.	Even.						
Temp. (Max.)	-1.148	0.410	0.448	0.806	0.319	0.780	-0.812	-0.686	0.571	0.128
Temp. (Min.)	-0.324	0.908	0.758	0.752	0.627	0.679	-0.629	-0.738	0.229	0.034
% RH. (Mor.)	-0.091	0.194	0.233	0.195	0.187	0.188	-0.096	-0.191	-0.002	0.439*
% RH. (Even.)	2.167	-2.558	-2.581	-3.085	-2.091	-2.823	2.330	2.946	-0.428	0.007
Rainfall (mm)	-0.18	0.449	0.523	0.440	0.650	0.414	-0.236	-0.400	-0.050	0.501*
No.of rainy (days)	-0.721	0.793	0.856	0.970	0.676	1.060	-0.784	-0.922	0.211	0.158
Bright sunshine (hrs)	0.612	-0.600	-0.357	-0.654	-0.315	-0.640	0.866	0.589	-0.474	0.417
Evaporation	-0.400	0.545	0.551	0.640	0.413	0.583	-0.456	-0.670	0.064	0.033
Wind velocity	0.214	-0.108	0.005	-0.059	0.033	-0.085	0.235	0.041	-0.430	0.310

* indicates significance of values at P=0.05

relative humidity was 71%, (32nd meteorological week). Highest population (3.78 white flies per plant) was recorded at 25.9^{0}c temperature and 78% RH. In first week of October (40th meteorological week). The population of white fly was declined at 23.9^{0}C temperature and 58.5% RH. in 2nd week of October (41st meteorological week). The Population of white fly ranged between 1.22 to 3.78 per plant throughout crop growth period. Bhattacherjee (1990) was also recorded similar trend on soybean in respect of white fly.

The relation between weather parameters and population of white flies was studied, path analysis was performed to the correlation, combined effects as well as direct and indirect effect of weather parameters on incidence of white flies during *Kharif* season of 1996-97, were worked out. The results of direct-indirect effects and correlation with abiotic factors on white fly population are presented in Table 2. It is observed that number of rainy days exhibited highest positive direct effect. Evening relative humidity showed highest negative direct effect followed by maximum temperature. Morning relative humidity, rainfall and bright sunshine hours showed significantly positive correlation where as evaporation and wind velocity showed non-significantly negative correlation with white fly population. Latpate (1987) reported significantly negative correlation between all weather factors and population of white flies on cotton. Similarly, Borad (1991) found positive effect of maximum temperature and sunshine hours on white fly population and negative

effect of all other climatic factors.

In general, it can be concluded that, with increase in temperature and humidity, there is increase in the population of white flies and *vice versa*.

Authors' affiliations:
S.N. KULKARNI, Department of Entomology, Marathwada Agricultural University, PARBHANI (M.S.) INDIA

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