Short Communication

Seasonal incidence and heat unit requirement of Jassid, *Empoasca kerri* Pruthi in groundnut under Saurashtra conditions

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Jassids, *Empoasca kerri* Pruthi is one of the most important sucking pests of groundnut. It damages by sucking of the cell sap from the leaves, succulent vegetative tips and pegs of the groundnut plant with their sucking type of mouthparts, as a result the leaves become yellow and the plant growth remain stunted which results in heavy yield losses. The damage caused by jassids depends on population of damaging stage of insect, crop growth stage, cropping pattern in the area and climatology etc. (Patel and Patel, 1983).

Groundnut, variety GG-7 was sown at Main Oilseeds Research Station, Junagadh Agriculture University, Junagadh during kharif 2008. The crop was grown in a plot size of 20 x 20 m and divided into ten quadrates of 2 X 2m. The crop under the experiment was kept free from pesticides throughout the season. The observations on population of jassid were recorded on ten randomly selected plants in each quadrate by examining three leaves per plant (top, middle and bottom regions of plant) at weekly interval after two weeks of germination till the harvest of the crop. The periodical data on jassid population were correlated and step wise regressed with meteorological the parameters. The base temperature was taken 10oC for the calculation of GDD. The correlation and regression analysis was carried out by using SAS enterprise guide 4.2.

Fluctuation in E. Kerri population in groundnut

The results presented in Table 1 revealed that the population of jassid ranged from 1.70 to 4.20 jassid nymphs/ 3 leaves/plant during kharif season. The incidence of the pest commenced from the 3rd week of sowing i.e. the 3rd week of July (1.80 jassid nymphs/3 leaves/plant), which gradually increased and attained a first peak (4.20 jassid nymphs/3 leaves/plant) during the 2nd week of September i.e. the 10th week of sowing. Later on, the population declined slightly, and then increased gradually reaching to second peak (3.90 jassid nymphs/3 leaves/plant) during the 1st week of October. Later on, the population decreased to 2.70 nymphs/3 leaves/ plant in the 3 rd week of October i.e. 16th week of sowing and disappeared.

The data for jassid population, weekly GDD and accumulated growing degree days were presented in Table 1. The 125 weekly GDD were required to initiate the jassid population in groundnut. The population of jassid increased with increase in heat unit and attained the peak (4.20 jassid/3leaves/plant) when accumulated GDD was 948 degree days (GDD 125 degree days). Then after, the pest population started declining with the decrease in weekly GDD and it disappeared at 104 weekly GDD.

Looking to the weekly GDD or heat units, it could be concluded that the increase in heat units after during rainy season after 3rd week of sowing of groundnut in Gujarat, the population of jassid also increased and attained the peaks. It means the hot and humid weather condition favours the development of jassid in groundnut crop.

The correlation co-efficient values presented in Table 1 indicated that population of jassid exhibited highly significant negative correlation with wind speed (r = -0.752), rainy day (r = -0.663) and significant positive correlation with mean bright sunshine hours (r = 0.616). Pest population showed significant negative correlation with evening relative humidity (r = -0.520) and rainfall (r = -0.058). On the basis of the stepwise regression analyses, the following equation was fitted for year under study:

$$Y = 5.8764 + 0.0125\,X_1 - 0.4783\,X_2 - 0.1740\,X_3 + 0.0165\,X_4 - 0.3021\,X_5$$
$$(R^2 = 0.7360^*)$$

* Significant at 5 %,

X_1 = Afternoon relative humidity (%),

X_2 = Wind speed,

X_3 = Mean Bright sunshine hour,

X_4 = Rainfall (mm),

X_5 = Rainy days

The prediction equation indicated that an increase in one unit of wind speed, mean bright sunshine hours and rainy days decreased the jassids population by 0.4783, 0.1740 and 0.3021 per 3 leaves per plant, respectively.

Table 1: Effect of abiotic factors on population of jassid (E. kerri) on groundnut during 2008-09

Std Wk	Weeks after sowing	Mean No. of jassid/3 leaves/ plant	Max. Temp.	Mini. Temp.	Mean Temp.	Morning RH %	Evening RH %	Mean RH %	Wind speed (km/h)	Mean bright sunshine hour	Evapo ration (mm)	Rainfall (mm)	Rainy days	GDD	Accu- mulated GDD
28	2nd	0.0	31.2	25.6	28.4	85	71	78.0	9.2	0.0	3.2	1.5	5	35	35
29	3rd	1.8	33.2	25.2	29.2	86	67	76.5	9	0.4	4.9	1.3	2	125	160
30	4th	1.8	30.9	24.8	27.8	93	79	86.0	5.3	1.7	2.7	33.6	6	115	275
31	5th	1.7	29.6	24.6	27.1	94	80	87.0	7.1	0.7	2.5	4.9	7	110	385
32	6th	1.8	28.6	24.4	26.5	94	87	90.5	7.5	0.0	1.9	7.4	7	106	491
33	7th	2.2	28.1	24.3	26.2	94	83	88.5	7.1	0.1	1.7	4.1	6	104	594
34	8th	3.1	30.7	23.9	27.3	90	64	77.0	5.3	1.4	3.3	0.4	3	111	706
35	9th	3.6	32.5	23.9	28.2	87	59	73.0	5.5	4.7	4.2	0.0	0	118	823
36	10th	4.2	33.9	24.5	29.2	85	54	69.5	4.8	4.4	4.6	0.0	0	125	948
37	11th	3.0	31.1	23.8	27.4	86	58	72.0	6.1	2.6	3.7	63.4	6	112	1061
38	12th	2.5	29.5	24.2	26.8	93	73	83.0	5.5	1.9	2.2	9.2	2	108	1168
39	13th 14th	3.4	31.8	22.9	27.3	88	62	75.0	4.2	6.9	4.3	0.0	0	111	1280
40	15th	3.9	33.5	23.4	28.5	86	53	69.5	3.5	6.9	4.2	0.0	0	119	1399
41	16th	3.0	35.7	21.8	28.7	77	39	58.0	3.6	9.4	4.8	0.0	0	121	1521
42	17th	2.7	37.1	20.1	28.6	68	29	48.5	2.9	9.3	5.2	0.0	0	104	1625
Correlation			0.395	%0.439	0.207	%0.213	%0.524*	%0.436	%0.753**	0.618*	0.465	%0.060*	%0.060	%0.666**	0.727** 0.714**

N=15

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The unit increase in afternoon relative humidity and rainfall increased the jassids population to the tune of 0.0125 and 0.0165 jassids per 3 leaves per plant, respectively. The values of coefficient of determination (R^2) revealed that the weather parameters under study contributed 73.60 per cent variation in jassids population during the year 2008 in groundnut.

Jayanthi *et al.* (1993) noted that population of jassids showed positivie correlation with sunshine hours and negative correlation with wind velocity. Baraiya (2000) reported that jassid population had significant positive correlation with mean bright sunshine hours and negative correlation with wind velocity. Singh *et al.* (1990) found that jassid population had negative correlation with relative humidity and rainfall. It has been observed that heavy rainfall reduced the infestation of jassid in peanut in Gujarat (Anonymous, 1973). Thus, present findings are more or less in agreement with the work carried out by earlier workers.

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