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Effect of climatic factors on incidence of jassid, *Empoasca kerri* (Pruthi) infesting groundnut

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ABSTRACT

Seasonal incidence of groundnut jassid, *Empoasca kerri* was studied during summer 2014-15, at College of Agriculture, Junagadh Agricultural University, Junagadh. Groundnut crop was infested by jassid, *Empoasca kerri*. The study revealed that the incidence of jassid started in 2nd week of March which gradually increased and touched its peak during 3rd week of April and then decreased in 4th week of May. Relative humidity showed significant negative correlation with jassid population. Minimum temperature, mean temperature, evaporation and bright sunshine hours showed positive correlation with jassid population whereas, maximum temperature, morning relative humidity, mean relative humidity and wind speed showed negative correlation with jassid population.

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INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is an annual legume crop, also known as peanut earthnut, monkey–nut and goobers. It forms the world' largest source of edible oil and ranks 13th among the food crops and is also 4th most important oilseed crop of the world. Groundnut oil is considered as stable and nutritive as it contains just the right proportion of Oleic and Linoleic acids (Mathur and Khan, 1997). The seed contains upto 50 per cent of a non-drying oil, 40-50 per cent fat, 20-50 per cent protein and 10-20 per cent carbohydrate (Mehta, 2002). More than 100 species of insect and mites are known to attack groundnut (Nandagopal, 1992). Among the various insect pests attacking this crop, jassid commonly known as leaf hopper, causes extensive damage and it is found to be serious on groundnut crop. Leaf hoppers are the major pest of importance on groundnut crop specially when raised under summer conditions and bunch varieties are severely infested

(David and Ramamurthy, 2011).

Leafhoppers suck the sap from the leaves and petioles and mainly it prefers the first three terminal leaves and feeding symptoms induce yellowing of foliage that begins at the tip, known as hopper burn (Khan and Hussain, 1965). A heavy infestation on young plants causes stunting and leaf tip turn yellow with a typical 'v-shape' marking. The jassid, besides causing direct damage to the crop by sucking the sap, is also responsible for the causing bud necrosis viral diseases. The low densities of leaf hoppers are sufficient enough to incur huge damage; hence, it is necessary to understand the dynamics of the population build-up of this vector for effective management practices. So, a study had been carried out on population dynamics of jassid on groundnut at Junagadh Agriculture University, Junagadh during summer season of 2014-15.

MATERIAL AND METHODS

Investigations on population dynamics of jassid infesting groundnut and their relation to weather parameters was conducted during summer 2014-15 on groundnut variety GG-2 was sown at Instructional Farm, College of Agriculture, Junagadh Agricultural University, Junagadh. The crop was grown in a plot size of 20 m × 20 m and divided into five quadrates of 1 m × 1 m, keeping 30 cm × 10 cm between row to row and plant to plant spacing. All the other agronomical practices were adopted as per the recommendations. The crop was kept free from pesticides throughout the season. The population of jassid was recorded at weekly intervals during morning hours between 7.00 am to 9.00 am on five randomly selected and tagged plants from each quadrate (1 m × 1 m) by examining three quadrifoliate leaves per plants (top, middle and bottom regions of plant). The data were subjected to statistical analysis and correlation co-efficient was worked out.

RESULTS AND DISCUSSION

The data presented in Table 1 clearly indicated that the population of jassid was ranging from 0.04 to 5.24 nymphs/3 leaves/plant. The incidence of jassid commenced in the 10th standard meteorological week (SMW) *i.e.* 3rd week after sowing. Initially the nymphal population was recorded 0.76 nymphs/3 leaves/plant, which was gradually increased and

Table 1: Seasonal incidence of jassid in groundnut variety GG-2 during summer, 2014-15

Standard week	Week after sowing	Mean No. of nymph/3 leaves/plant	Temperature (°C)			Relative humidity (%)			Wind speed (km/hr)	Bright sun shine hours	Evaporation rate (mm)
			Maxi.	Mini.	Mean	Morn.	Even.	Mean			
9	2	0	31.5	15.6	23.6	64	29	46.5	5	8.9	7
10	3	0.76	34.6	16.6	25.6	75	41	58	4.5	8.6	6.3
11	4	0.92	36.5	18.3	27.4	57	25	41	5.7	9.8	8.8
12	5	1.4	36.0	17.9	26.95	80	23	51.5	5	10.3	8.1
13	6	3.92	36.8	20.2	28.5	71	19	45	6.6	10.1	8.9
14	7	4.4	38.3	20.9	29.6	76	22	49	5.7	10	9.4
15	8	3.76	37.3	19.8	28.55	79	25	52	5.4	9.9	8.5
16	9	5.24	38.1	23.4	30.75	79	34	56.5	6.2	9.7	8.7
17	10	3.96	41.1	23.7	32.4	59	16	37.5	6	10	10.9
18	11	3.08	40.1	24	32.05	86	28	57	6.8	10.4	9.9
19	12	2.48	40	24.9	32.45	74	35	54.5	8.4	10.4	11
20	13	1.56	37.9	24.6	31.25	89	49	69	8.5	10	9.4
21	14	0.04	40.9	24.6	32.75	90	44	67	7.7	10	11
22	15	0	40.6	25.4	33	88	41	64.5	8.7	9.4	10.3
23	16	0	39.9	26	32.95	83.4	46.4	64.9	9.2	9	10.3

Table 2 : Correlation between weather parameters and jassid, *E. kerri* population on groundnut

Name of pest	Temperature (°C)			Relative humidity (%)			Wind speed (km/hr)	Bright sun shine hours	Evaporation (mm)
	Max.	Min.	Mean	Morn.	Even.	Mean			
Jassid, *E. kerri*	-0.04855	0.07631	0.12405	-0.178448	-0.58802*	-0.42207	-0.26499	0.50645	0.08351

n= 15 * Significant at 5% level (r= 0.514) ** Significant at 1% level (r= 0.641)

attained a peak of 5.24 nymphs/3 leaves/plant during 16th standard meteorological week *i.e.* 9th week of sowing (3rd week of April). Thereafter, it started to decline slightly and then it decreased towards maturity of the crop with 0.04 nymphs/3 leaves/plant during 21th standard weather week *i.e.* 14th week of sowing. Baraiya (2000) reported that the activity of jassid was noticed throughout the crop season, but it was found more active during later stage of the crop. Thus, the results of present investigation are in confirmation with the past report.

The correlation co-efficient values presented in Table 2 indicated that population of jassid showed significant negative correlation with evening relative humidity (r=-0.58802). However, pest population showed positive correlation with minimum temperature (r=0.07631), mean temperature (r=0.12405), bright sunshine hours (r=0.50645), evaporation (r=0.08351) and negative correlation with maximum temperature (r=-0.04855), morning relative humidity (r=-0.178448), mean relative humidity (r=-0.42207) and wind speed (r=-0.26499). In the present investigation it was found that minimum temperature, mean temperature, bright sunshine hours and evaporation favour multiplication of the jassid population, while maximum temperature, morning relative humidity, mean relative humidity and wind speed had adverse effect on population build up of jassids. Thus, present findings are in agreement with the work carried out by Singh *et al.* (1990).

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