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# SEASONAL INCIDENCE OF MAJOR SUCKING INSECT PESTS OF GROUNDNUT (*ARACHIS HYPOGEA* L.)

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## ABSTRACT

An field experiment to study the incidence and losses caused by the insect pests of groundnut (*Arachis hypogea* L.) was conducted at the instructional farm of Rajasthan College of Agriculture, Udaipur during *kharif*-2014. Incidence of aphid, *Aphis craccivora* Koch; jassid, *Empoasca kerri* Pruthi; thrips, *Scirtothrips dorsalis* Hood and tobacco caterpillar, *Spodoptera litura* Fab. were recorded throughout the growing season. The incidence of aphids, jassids and thrips commenced in the second week of August. Population of aphids, jassids and thrips touched their peak in the third, second and fourth week of September with a mean population of 8.60 aphid, 7.50 jassid and 4.0 thrips/3 leaves, respectively. The incidence of tobacco caterpillar, *S. litura* commenced in the first week of September and peaked in the fourth week of September (1.25 larvae/plant) Only the tobacco caterpillar exhibited negative and significant correlation with relative humidity.

**Key words:** Groundnut, insect pests and incidence.

## INTRODUCTION

Groundnut (*Arachis hypogea* L.) is also known as peanut, earthnut, monkey-nut and goobers. It forms the world's largest source of edible oil and ranks 13$^{th}$ among the food crops and is also 4$^{th}$ most important oilseed crop of the world (Ramanathan, 2001). It is cultivated in tropical and subtropical countries, the major neing India (26%), China (19%) and Nigeria (11%). In India, it is mainly grown in the southern and north-western states *viz.*, Gujarat, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra, and Madhya Pradesh, which occupy about 90 percent of the groundnut area in the country. Groundnut ranks first in oilseed production of 17.70 lakh tones and is grown in area of 14.40 hectares with a productivity of 814 kg ha$^{-1}$ (Anonymous, 2009). In Rajasthan, groundnut is cultivated in 3.97 lakh hectares with the production of 6.16 lakh tons. Groundnut is a prominent source of dietary protein and lipids and often provides cash income (Pedgam *et al.*, 1990). The seed contains 47-53 per cent oil, 18 per cent carbohydrate, 25 mg calcium, 401 mg phosphorus and 2.1 mg iron per 100 gm of raw kernel. It contain vitamins like thiamine ($B_1$) 1.14 mg, Riboflavin ($B_2$) 0.13 mg, niacin 17.2 mg per 100 gram of kernel. It can supply about 5.6 calories per gram. The major insect pests infesting groundnut are the white grub (*Holotrichia consanguinia* Blanchard) and termite (*Odontotermes obesus* Rambur) under ground while groundnut aphid (*Aphis craccivora* Koch), leaf miner (*Stomopteryx nertara* Meyrick), stem borer (*Sphenoptera perotetti* Camron), Bihar hairy caterpillar (*Spilosoma oblique* Walker), tobacco caterpillar [(*Spodoptera litura* (Fab.)], red hairy caterpillar (*Amcacta albistriga* Butler) and jassid (*Empoasca kerri* Pruthi) are the surface feeding insect pests of groundnut (Atwal and Dhaliwal, 2008).

## MATERIALS AND METHODS

The experiment to study the seasonal incidence of insect pests in groundnut was laid out, at the instructural farm Rajasthan College of Agriculture, Udaipur, during *kharif* 2014. To study the seasonal incidence of insect pests *viz.*, aphid (*Aphis craccivora* Koch), Jassid (*Empoasca kerri* Pruthi), thrips (*Megalurothrips sjostedti*) and tobacco caterpillar (*Spodoptera litura* Fab.) an experiment was laid out in plots each measuring 4m × 3m (12 sq. m.). The groundnut variety GG-2 was grown under natural conditions without spraying any insecticide. Row to row and plant to plant spacing of 50 cm and 10 cm was maintained, respectively. Five plants in each plot were selected randomly and tagged to record the observations throughout the experimental period. Population of different insect pests *viz.,* aphid (*Aphis craccivora* Koch), jassid (*Empoasca kerri* Pruthi), thrips (*Megalurothrips sjostedti* Hood) and tobacco caterpillar

**Table 1. Seasonal incidence of major insect pests in groundnut variety "GG-2" during *kharif*, 2014**

| SMW | Dates of Observation | Abiotic factors | | | | | | | Mean Population | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Temperature (°C) | | | Relative Humidity (%) | | | | Thrips | Aphids | Jassids | Tobacco caterpillar |
| | | Maximum | Minimum | Mean | Maximum | Minimum | Mean | Rainfall (mm) | | | | |
| 32 | 06/8/2014 | 27.8 | 23.9 | 25.85 | 86.6 | 76 | 81.3 | 47.2 | 2.25 | 3.25 | 2.00 | 0 |
| 33 | 13/8/2014 | 29.6 | 23.5 | 26.55 | 80 | 65.4 | 72.7 | 0.2 | 2.75 | 4.75 | 1.75 | 0 |
| 34 | 20/8/2014 | 32.9 | 23.4 | 28.15 | 86.1 | 66.6 | 76.35 | 40.8 | 2.50 | 4.00 | 2.75 | 0 |
| 35 | 27/8/2014 | 31.8 | 23 | 27.4 | 87.4 | 67.3 | 77.35 | 31.6 | 2.25 | 6.80 | 3.25 | 0 |
| 36 | 03/9/2014 | 29.1 | 22.8 | 25.95 | 89.3 | 76.1 | 82.7 | 165.2 | 2.00 | 4.25 | 4.50 | 0.25 |
| 37 | 10/9/2014 | 28.7 | 21.4 | 25.05 | 92.4 | 82.9 | 87.65 | 94.8 | 1.25 | 6.80 | 7.50 | 0.50 |
| 38 | 17/9/2014 | 32.5 | 19.8 | 26.15 | 84.1 | 52 | 68.05 | 0 | 2.50 | 8.60 | 6.50 | 0.75 |
| 39 | 24/9/2014 | 31.8 | 19.4 | 25.6 | 80.1 | 48.4 | 64.25 | 0 | 4.00 | 5.25 | 6.50 | 1.25 |
| 40 | 01/10/2014 | 33.9 | 20 | 26.95 | 80.7 | 38.4 | 59.55 | 0 | 2.75 | 4.00 | 5.75 | 1.00 |
| 41 | 8/10/2014 | 34.4 | 18.1 | 26.25 | 79 | 34 | 56.5 | 0 | 2.00 | 4.20 | 3.25 | 0.75 |
| 42 | 15/10/2014 | 32.5 | 17.6 | 25.05 | 75.6 | 32.4 | 54 | 0 | 0.50 | 3.20 | 1.75 | 0.25 |
| Coefficient of correlation (r) for population and Maximum Temperature | | | | | | | | | 0.117 | 0.000 | 0.041 | 0.463 |
| Coefficient of correlation (r) for population and Minimum Temperature | | | | | | | | | 0.200 | -0.010 | -0.264 | -0.690* |
| Coefficient of correlation (r) for population and Mean Temperature | | | | | | | | | 0.377 | -0.012 | -0.270 | -0.292 |
| Coefficient of correlation (r) for population and Maximum Relative Humidity | | | | | | | | | -0.082 | 0.385 | 0.357 | -0.318 |
| Coefficient of correlation (r) for population and Minimum Relative Humidity | | | | | | | | | -0.005 | 0.218 | 0.073 | -0.548 |
| Coefficient of correlation (r) for population and Mean Relative Humidity | | | | | | | | | -0.022 | 0.260 | 0.138 | -0.507* |
| Coefficient of correlation (r) for population and Total Rainfall | | | | | | | | | -0.267 | -0.025 | 0.172 | -0.317 |

* Significant at 5% level of significance. The sap sucking insect pests wre reeorded from 3 leaves/plant, tobacco catarpillar on aperplant basis.

(*Spodoptera litura* Fab.) were recorded at weekly intervals on the five randomly selected plants in each plot during morning hours (6:30-8:30 am) when most of the insect species remain less active. The aphid population was counted on 3 leaves per plant. The population of jassid and thrips was counted on three leaves per plant by gently holding the leaf between the two halves of a petriplate and both nymphs as well as adults were counted within it. Weekly data on relative humidity and temperature were recorded and to study the influence of key abiotic factors on the pest incidence, simple correlation was worked out between the population and meteorological factors.

## RESULTS AND DISCUSSION

The study revealed that incidence of aphid, *A. craccivora* commenced in the second week of August and the population attained its peak during the third week of September. In the present investigation it was found that increase in the relative humidity favours aphid multiplication, while increase in temperature and rainfall had adverse effect on the multiplication of the aphid. Population of aphid declined after second week of October. Similarly, the incidence of jassid, *E. kerri* commenced in the second week of August and touched its peak in the second week of September. The jassid exhibited a non-significant negative correlation with temperature while positive and non-significant with relative humidity and rainfall. Population of jassids declined after second week of October. The incidence of thrips, *S. dorsalis* commenced in the second week of August and touched its peak in the fourth week of September. In the present investigation it was fount that temperature favours the multiplication of the thrips, while relative humidity and rainfall had adverse effect on population build up of thrips. The incidence of tobacco caterpillar *S. litura* commenced in the first week of September and touched its peak in the fourth week of September. The tobacco caterpillar exhibited a negative and significant correlation with relative humidity, while negative and non-significant correlation with temperature and rainfall. The findings of present investigation are in close agreement with the findings of Kenchaiah and Porte (1989) who observed higher incidence of thrips during September, which might be due to local weather conditions that prevailed during the study period. Ranga Rao and Wightman (1994) observed higher incidence of *S. litura* initiated by heavy rainfall after the dry spell.

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