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# Seasonal incidence of major insect- pests in soybean (*Glycine max l.)* crop in Shivpuri, Madhya Pradesh

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## ABSTRACT

*Seasonal incidence of insect pest of soybean crop (Glycine max L. Merrill) variety JS-9560 were recorded during kharif season 2015-16 and 2016-17 under UPI trial at KVK Farm. The numbers of plants infested by insect- pest were counted during the study period. Five insect species viz. Girdle beetle (Obereopsis brevis), sucking pests Jassid, (Empoasca kerri), and White flies (Bemisia tabaci). Caterpillar insect Green Semilooper, (Chryrodecxis acuta), Bihar hair caterpillar, (Spodoptera litura), were recorded as the major damaging pest of soybean crop. Damaging infestation was recorded up to 13.5%. The highest mean level of Girdle beetle (9.7 larvae/ meter/ row) was recorded during 3rd week of September 35 SMW and peak activity mean level of sucking insects Jassid, (5.10 larvae/ meter/ row) white flies (7.1 larvae/ meter/ row) 2 nd week of September 36 SMW. The highest mean level of caterpillar insect Bihar hair caterpillar (8.4 larvae/ meter/ row ) and Green Semilooper, (5.8 larvae/ meter/ row) was recorded during last week of August and first week of September 35 SMW.*

## INTRODUCTION

Soybean is one of the most importance commercial legume crop of India. Soybean is mainly grown for their seeds and second largest oil seed after groundnut and mustard. It is excellent source of protein, vitamins, minerals, carbohydrates and known as miracle crop in India. In Indian Scenario, Madhya Pradesh contributes about 67 and 56 percent in total area and production of soybean, respectively in the country and is called as “Soya State”. The soybean crops facing various problems and challenges for decreasing yield at farmers field. Seed yield and seed quality is are being adversely affected by major insect *Walker*) defoliate the plant at seedling and growth stages . The Stem fly (*Melanagromyza sojae Zehnter*), Girdle beetle (Obereopsis *brevis Swed.)* bore the stem and main branches. Hence the experiment was initiated using soybean as test crop. *Walker*) defoliate the plant at seedling and growth stages. The Stem fly (*Melanagromyza sojae Zehnter*), Girdle beetle (Obereopsis *brevis Swed.)* bore the stem and main branches. Hence the experiment was initiated using soybean as test crop.

## MATERIALS AND METHOD

The Experiment was during kharif season 2015-2016 and 2016-2017at RVSKVV, Krishi Vigyan Kendra farm, Shivpuri Madhya Pradesh. The soybean variety JS -9560 was sown in the plot having size 25 $m^2$ with row to row distance 30 cm and fertilizer basal dose NPKS 20:60:20:25 kg $ha^{-1}$. Observations on the incidence of all the insect pests were recorded at weekly intervals starting from the seven days after germination. Method of observation for defoliators was counted ten randomly selected plants one meter /row /length. The number of larvae of Green semilooper**,** Girdle beetle Bihar hair caterpillar, larvae/meter /row sucking pests Jassid, and White flies Caterpillar insect –pests were recorded. Observation of sucking pests population was recorded 20 randomly selected plants insect counts from upper and middle part of each plant.

## RESULTS AND DISCUSSION

The occurrence of insect –pests complex started from last week of July or 21-22 days after sowing. During the observation period some insect species viz. Girdle beetle, Green semilooper, Tobacco caterpillar, White fly, jassids were most damaging insects of soybean crop. These insect –pest caused negligible to serious damage to the soybean crop. The appearance of girdle beetle (0.39 larvae/meter /row) was started in the third week of July 29.The peak mean level of ( 9.7 larvae /meter /row) was noticed during third week of September 37 SMW. The peak activity of girdle beetle was noticed during second week of September with 3.1 number of girdle beetle damage plants per meter per row Netam (2013) reported that the girdle beetle, lepidopterian caterpillar increased gradually with peak

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Table 1: Insect-pest observed on soybean variety JS-9560 during the study period

| S. No. | Common Name | Systematic position | Damaging stage | Mean Range of infestation | Status of peak level Standard meteorological week |
|---|---|---|---|---|---|
| 1. | Girdle beetle | *Obereopsis brevis* (Swed) (Coleoptera : Ceranbycidae) | Grub | 0.39 -9.7 (Grub/ m./row) | 35 SMW |
| 2. | Green semilooper | *Chrysodeixis acuta* (Walker) ( Lepidiptera : Noctuidae) | Caterpillar | 0.2-5.8 (Caterpillar/m./row ) | 35 SMW |
| 3. | Tobacco caterpillar | *Spodotera litura* (Fab) ( Lepidiptera : Noctuidae) | Caterpillar | 0.10-7.8 (Caterpillar/m./row ) | 35 SMW |
| 4. | Whitefly | *Bemisia tabaci* (Gennadius) ( Hemiptera : Aleyrodidae) | Nymph and Adult | 0.2-7.1white fly/plant | 36 SMW |
| 5. | Jassid | *Empoasca kerri* ( Hemiptera : Cicadellidae) | Nymph and Adult | 0.3-5.10 Jassid/plant | 36 SMW |

population of 5.0 larvae per meter per row during the last week of August and seasonal mean (3.22 larvae per /meter per/ row). The Infestation of green semilooper started in the first week of August 31st SMW (4.5 larvae per /meter per/ row). The population of the pest gradually increased up to the peak mean level was recorded 3rd week of August 33 SMW (5.7 larvae per/meter per/ row). Tomar *et al.* (2013) reported that the infestation of green semilooper started in the second week of August an average 0.3 larvae /mrl. The pest gradually increased up to first week of September 8.5 larvae/mrl.

Table 2: Seasonal infestation of defoliators during study period

| Standard meteorological week | *Obereopsis brevis* (Swed) (Coleoptera :Ceranbycidae) | | | *Chrysodeixis acuta* (Walker) ( Lepidiptera : Noctuidae) | | | *Spodotera litura* (Fab) ( Lepidiptera : Noctuidae) | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2015-16 | 2016-17 | Mean | 2015-16 | 2016-17 | Mean | 2015-16 | 2016-17 | Mean |
| 29 | 0.5 | 0.29 | 0.39 | 0.2 | 0.4 | 0.3 | 0.6 | 0.10 | 0.35 |
| 30 | 0.9 | 3.62 | 2.26 | 2.8 | 6.2 | 4.5 | 0.20 | 1.6 | 0.9 |
| 31 | 2.8 | 5.80 | 4.3 | 3.9 | 6.8 | 5.3 | 2.20 | 4.1 | 3.15 |
| 32 | 4.8 | 7.76 | 6.2 | 4.2 | 5.6 | 4.9 | 4.8 | 3.9 | 4.35 |
| 33 | 7.3 | 8.40 | 7.8 | 6.5 | 5.0 | 5.7 | 6.2 | 5.1 | 5.6 |
| 34 | 9.5 | 6.12 | 7.8 | 6.2 | 5.0 | 5.6 | 5.1 | 4.2 | 4.6 |
| 35 | 9.8 | 9.7 | 9.75 | 6.2 | 5.4 | 5.8 | 9.1 | 7.8 | 8.4 |
| 36 | 7.2 | 9.6 | 8.4 | 1.6 | 0.8 | 1.2 | 7.0 | 7.6 | 7.3 |
| 37 | 9.16 | 9.8 | 9.48 | 0.24 | 0.16 | 0.2 | 0.4 | 1.0 | 0.7 |

Population of the pest gradually increased up to third week if August. The attack of Tobacco caterpillar gradually increased and attained the maximum and minimum peak mean level last week of July, first week of August and first week of September 32 SMW (8.4 larvae per /meter per/ row). Followed by (0.10 larvae per /meter per/ row). The pest density increased gradually and attained the peak in the first week of September with 2.1 larvae with a seasonal mean of 0.67 larva per meter row. Thereafter the population of the pest decreased gradually and disappeared due senescence of the crop after the second week of October. Paik *et al.* (2007) Observed that S*. litura* occurred significantly late August in Soybean field. Ramesh Babu *et al.* (2015) carried out an investigation the population of *S. litura* and recorded that these were active from August to mid October and decreased sharply in late October. The sucking pests population density was recorded second week of September 35 SMW (8.5 /plant) and Jassid population peak density was recorded 5.95 /plant at 36 SMW last week of August. The peak activity of sucking pests was recorded during third week of September which was associated with 32.2 ºC maximum and 24.5 ºC minimum temperature 92 % morning and 64 evening relative humidity and 51.0 mm rainfall. Netam *et al.* (2013). Vieira *et al*.

Table 3: Seasonal infestation of sucking pests during study period

| Standard meteorological week | *Bemisia tabaci* (Gennadius) (Hemiptera : Aleyrodidae) | | | *Empoasca kerri* (Hemiptera: Cicadellidae) | | |
|---|---|---|---|---|---|---|
| | 2015-16 | 2016-17 | Mean | 2015-16 | 2016-17 | Mean |
| 29 | 1.6 | 1.0 | 1.3 | 2.6 | 1.4 | 2.0 |
| 30 | 2.0 | 2.4 | 2.2 | 3.2 | 4.2 | 3.7 |
| 31 | 3.6 | 4.1 | 3.8 | 2.9 | 3.2 | 3.0 |
| 32 | 2.1 | 3.9 | 3.0 | 1.0 | 0.26 | 0.6 |
| 33 | 5.2 | 6.9 | 6.0 | 3.9 | 3.4 | 3.6 |
| 34 | 6.0 | 6.1 | 6.0 | 4.6 | 5.10 | 3.3 |
| 35 | 6.2 | 2.1 | 4.6 | 5.2 | 4.79 | 4.2 |
| 36 | 6.0 | 8.2 | 7.1 | 6.2 | 5.7 | 5.95 |
| 37 | 0.2 | 0.1 | 0.2 | 0.4 | 0.2 | 0.3 |

(2011) observed that when white fly occurs in large population the plants weakened by the extraction of large amount of sap, this induces early defoliation and impacts the soybean plant development and yield as observed in some soybean fields. Seasonal incidences of insect pest of soybean crop were observed as the major damaging pests of soybean crop variety JS-9560. The peak activity of major insect pests carried out during first week and second week of September SMW 35 and SMW 36 respectively.

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