



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(6): 3755-3756
© 2022 TPI
www.thepharmajournal.com
Received: 12-03-2022
Accepted: 21-06-2022

SS Munje
Department of Entomology,
Regional Research Centre
(Soybean), Dr. Panjabrao
Deshmukh Krushi Vidyapeeth,
Akola, Maharashtra, India

S Nichal
Department of Entomology,
Regional Research Centre
(Soybean), Dr. Panjabrao
Deshmukh Krushi Vidyapeeth,
Akola, Maharashtra, India

HH Dikey
Department of Entomology,
Regional Research Centre
(Soybean), Dr. Panjabrao
Deshmukh Krushi Vidyapeeth,
Akola, Maharashtra, India

AN Warghat
Department of Entomology,
Regional Research Centre
(Soybean), Dr. Panjabrao
Deshmukh Krushi Vidyapeeth,
Akola, Maharashtra, India

Corresponding Author:
SS Munje
Department of Entomology,
Regional Research Centre
(Soybean), Dr. Panjabrao
Deshmukh Krushi Vidyapeeth,
Akola, Maharashtra, India

Seasonal population of important pests of soybean with its abiotic complex and the effect of various climatic factors

SS Munje, S Nichal, HH Dikey and AN Warghat

Abstract

At the research field, Regional Research Centre, Amravati, Dr. P.D.K.V., Akola (Maharashtra) has examined the population dynamics of insect pests of soybeans and their relationship to abiotic factors. *Spodoptera litura*, *Spilarctia obliqua*, *Thysanoplusia orichalcea*, *Obereopsis brevis*, *Bemisia tabaci*, and *Melanagromyza sojae* incidence observations were noted at weekly intervals. Based on observations and a study of the relationships between insect incidence and weather parameters, it was discovered that stem flies with 100% infestation showed a significant negative correlation with minimum temperature and that their maximum damage (100% infestation, 33.84%) was highly significant and negatively correlated with evaporation. Wind speed and *S. obliqua* incidence had a substantial positive correlation. Thus, evaporation and low temperature had a negative correlation with stem fly incidence, whereas wind velocity was found to have a positive link with *S. obliqua* incidence.

Keywords: Insects, seasonal incidence, soybean, weather parameters

Introduction

Soybean [*Glycine max* (L.) Merrill] has become one of India's most important rainy-season crops, covering 10.7 million hectares (Anonymous, 2013) ^[1]. Insect pest damage is a significant limiting factor in attaining the yield potential of improved soybean cultivars. Throughout the crop season, insect and pest populations fluctuate due to abiotic and biotic factors. Knowing the seasonal occurrence of significant insect pests would undoubtedly aid in the formulation of management plans. The blue beetle (*Cneorane* sp.), green semilooper (*Chrysodeixis acuta* Walker), and girdle beetle (*Obereopsis brevis* Swedenborg) are among the most common soybean pests in central India. The purpose of this study was to investigate the seasonal occurrence of important insect pests and their relationship to weather variables. Field trials were conducted in a completely randomised block design at the Regional Research Station, Amravati (Maharashtra) during the *Kharif* season of 2020-21 with four widely used soybean cultivars: JS-9305 and JS-335. Three times in 6 m x 3 m plots, the experiment was repeated.

Materials and Methods

Following the recommended agronomical measures, the soybean crop was grown. For the purpose of recording the incidence of sucking pests, observations were made on a random sample of 10 plants at weekly intervals. Each plant was given three leaves, one from the top, centre, and bottom. The total number of larvae was recorded at five sites each one metre long for foliage feeders such as the Green semilooper, Tobacco leaf eating caterpillar, and Hairy caterpillar. For girdle beetle, count the number of total plants and girdle beetle plants in a one-meter region at least 3 to 5 times and estimate the percent damage out of the total plants per metre. At three locations, count the total number of plants and the number of plants that succumbed to stem fly infestation.

Data pertaining to the weather parameters namely, minimum and maximum temperatures, rainfall and relative humidity were obtained from AICRP on Soybean, Regional Research Center (Dr. PDKV), Amravati. To measure the degree of closeness of the linear relationship between the insect populations and the weather parameters Pearson's correlation coefficient was worked out.

The infestation of Girdle beetle *Obereopsis brevis* (Swed.) was observed from 31st to 36th MW

in the range of 0.00 to 1.5 per cent. The infestation of Stem fly was recorded from 31st to 38th MW in the range of 20 to

70.00 per cent. Bio-agents viz. Lady Bird beetle was observed in the range of 1.00 to 3.00 per plant during 32nd to 35th MW.

Table 1: Correlation of weather parameter with incidence of Soybean pests.

Weather Parameter	SL	Correlation	S. litura	Correlation	G. beetle	Correlation	Stem fly	Correlation	Whitefly	Correlation
Simple Correlation values										
Temp										
Max	-0.523	NS	-0.81	NS	0.53	NS	0.36	NS	-0.33	NS
Min	-0.590	NS	-0.83	NS	0.41	NS	0.94	NS	0.30	NS
Rainfall	0.494	NS	0.67	NS	-0.61	NS	-0.18	NS	0.68	NS
Humidity Morning	0.104	NS	0.67	NS	-0.61	NS	0.05	NS	0.65	NS

Results and Discussion

The incidence of aphids in this year was negligible. The incidence of White fly was observed from 32st MW and it was continued up to 37th MW. Maximum population of White fly (0.40/leaf) was recorded during 37th MW when the maximum temp. (33.4 °C) and min. temp. (22.40 °C) was recorded with precipitation received during that MW is 32.66 mm. The incidence of jassids was recorded in the range of 0.00 to 0.13 per leaf. The incidence of semilooper was observed from 31st MW to 34th MW in the range of 0.2 to 0.2 larvae/mrl. Tobacco leaf eating caterpillar infestation noticed from 31st MW and it was continued up to 34th MW in the range of 0.4 larvae/mrl. The infestation of Girdle beetle was observed from 31st to 36th MW in the range of 0.00 to 1.5 per cent. The infestation of Stem fly was recorded from 31st to 38th MW in the range of 20 to 70.00 per cent. Bio-agents viz. Lady Bird beetle was observed in the range of 1.00 to 3.00 per plant

during 32nd to 35th MW.

The incidence of semilooper *Chrysodeixis acuta* (Wlk) was observed from 31st MW to 34th MW in the range of 0.2 to 0.2 larvae/mrl. Maximum population of semilooper (0.2 larvae/mrl) was recorded during 31st to 34th MW. Tobacco leaf eating caterpillar *Spodoptera litura* (Fabr.)

Infestation noticed from 31st MW and it was continued up to 34th MW in the range of 0.4 larvae/mrl. Maximum population of Tobacco leaf eating caterpillar was recorded during 31st to 34th MW (0.4 larvae/mrl).

Due to sporadic rains in the first fortnight of August (30th and 31st MW) and continuous rains in the second fortnight (32nd and 33rd MW), accompanied with cloudy weather, insufficient sunlight and high humidity, the crop protection measures were badly affected. This leads to an outbreak of stem fly, girdle beetle and medium incidence of semi-looper and lower incidence of *Spodoptera* larvae in some pockets.

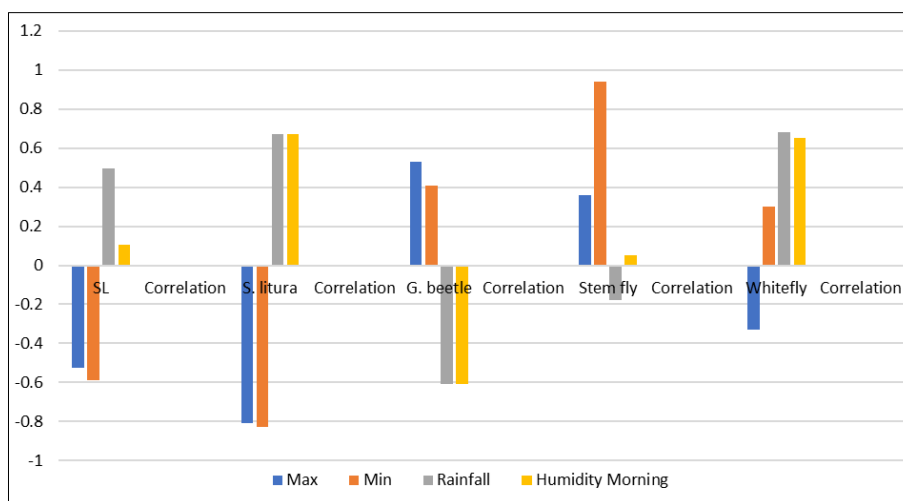


Fig 1: Correlation of weather parameter with incidence of insect pest of Soybean in year 2020-21

References

- Anonymous. Agricultural Statistics At a Glance 2012, Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, 2013. <http://eands.dacnet.nic.in>
- Chaturvedi S, Singh KJ, Singh OP, Duley MP. Seasonal incidence and damage of major insect pests of soybean in Madhya Pradesh. Crop Research (Hisar). 1998;15(2 and 3):260-4.
- Gupta AK, Singh KJ, Singh OP. Insect pest complex of soybean in Madhya Pradesh. Annals of Plant and Soil Research. 2000;2(1):73-6.
- Singh OP. Annual progress report (Entomology), All India Co-ordinated Research Project on Soybean, RAK College of Agriculture, Sehore, 1998.
- Singh OP, Singh KJ. Yield response to girdling by the girdle beetle, *Obereopsis brevis* (Swed.) on different plant parts of soybean. Tropical Agriculture. 1996;73(1):77-9.
- Rajpoot NS, Choudhary RK. Seasonal Incidence of Major Insect-pests of Soybean (*Glycine max* L.) and their Correlation with Weather Parameters, Soybean Research. 2015;13(1):94-98.