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Seasonal incidence of green semilooper, *Chrysodeixis acuta* Walker on *Sesbania rostrata* and it's correlation with different abiotic factors

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Abstract
The field experiment was conducted during *kharif* 2021 at Instructional farm of BTC College of Agriculture and Research Station, Bilaspur, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.). The studies revealed that the first appearance (0.20 larvae/mrl) of green semilooper on *Sesbania rostrata* was observed during the 34th standard week in vegetative stage, which continued to build up with intermediately up and downs and reached maximum (1.80 larvae/mrl) during last week of October in early pod formation stage and observed up to early maturity stage of crop. The correlation studies revealed that population of green semilooper was exhibited significant positive correlation with maximum temperature (r = 0.569) and all other weather parameters were non- significantly correlated with population of green semilooper.

Keywords: Green semilooper, seasonal incidence, correlation, abiotic factors

Introduction
Sesbania is a pantropically dispersed genus with roughly 50 species. It belongs to the Fabaceae family, subfamily Papilionoideae (Polhill and Souza, 1981) [6]. *Sesbania* spp. is found in Asia, including India, Malaysia, Indonesia and the Philippines. *S. speciosa*, *S. grandiflora*, *S. Sesban* (L.), *S. bispinosa* (Jacq.), *S. cannabina* (Retz.), *S. aculeata* and *S. rostrata* are among the many *Sesbania* species found in India (Bhat, 2003) [1]. *S. rostrata* is native to tropical West Africa and grows naturally in marshes, floodplains and pool edges throughout the tropics. It is commonly known in India as dhaincha, jantar, and manila agathi, and it has nodules on its stem, branches and roots. *Sesbania* plants with well-nodulated roots can fix up to 90% of nitrogen (Pareek *et al*., 1990) [5]. To boost soil fertility, *S. rostrata* is usually utilized as a green manure (CABI, 2013) [2]. With 1,25,000 plants/ha, a healthy crop can produce 817 t/ha dry matter containing 150-245 kg/ha nitrogen, and seed output is roughly 0.5-2 t/ha (Evans and Rotar, 1987) [3]. No systematic information is available in the state of Chhattisgarh as well as in India regarding its area, production, and productivity. There is no record of yield loss due to damage from insect pests in the *Sesbania* crop till now.
Sesbania rostrata's low productivity can be attributed to a number of factors. Insect pests are one of the key biotic constraints producing significant production loss in *Sesbania rostrata*. Leaves, flowers, pods and seeds are among the foods they eat. Leaf Webbers, stem borers and other leaf feeders are insect pests that may affect *Sesbania* and limit their productivity as crops. Some reports from India indicate severe defoliation as a result of insect population increases that may be confined geographically and temporally. Caterpillars have severely defoliated *S. grandiflora* in Florida (Evans and Rotar, 1987) [3].
Hence, the present investigation were undertaken to study the Seasonal incidence of Green semilooper, *Chrysodeixis acuta* Walker on *Sesbania rostrata* and it's correlation with different abiotic factors in the prevailing agro conditions of Chhattisgarh plain.

Materials and Methods
The experiment was conducted at Instructional Farm of BTC CARS, Bilaspur, a constituent college of Indira Gandhi Krishi Vishwavidyalaya, Raipur (Chhattisgarh). To study the Seasonal incidence of Green semilooper, *Chrysodeixis acuta* Walker on *Sesbania rostrata* during *kharif* 2021, *Sesbania rostrata* sowing in the plot size of 10 m × 10 m with planting distance of 40 cm × 20 cm during second week of August with following all the improved

recommended package of practices for raising the crop except plant protection measures. To record the observation on larval population green semilooper infesting *Sesbania rostrata* crop, three randomly selected spots of one meter row from the seasonal plot with leaving border rows. Weekly observations were taken after sowing till its harvest; average number of caterpillars found per meter row was carried out (Sonule *et al*., 2019) [8]. The weekly meteorological data on temperature, relative humidity, rainfall and sunshine hours were also recorded for whole of the cropping season from the meteorological observatory located at BTC CARS, Bilaspur (C.G.). The obtained data were correlated with various abiotic factors and correlation coefficients were worked out as suggested by Snedecor and Cochran, (1967) [7]. The graphical representation was applied to depict the seasonal incidence of the green semilooper. (Fig. 1)

Table 1: Seasonal incidence of green semilooper, *Chrysodeixis acuta* Walker on *Sesbania rostrata* at Bilaspur during *Kharif* 2021

SMW	Date of observation	Mean population (no.) of Green semilooper
34	24/08/2021	0.20
35	31/08/2021	0.33
36	07/09/2021	0.67
37	14/09/2021	0.93
38	21/09/2021	1.07
39	28/09/2021	1.20
40	05/10/2021	1.47
41	12/10/2021	1.53
42	19/10/2021	1.73
43	26/10/2021	1.80
44	02/11/2021	1.13
45	09/11/2021	0.60
46	16/11/2021	0.47
47	23/11/2021	0.07
48	30/11/2021	0.00

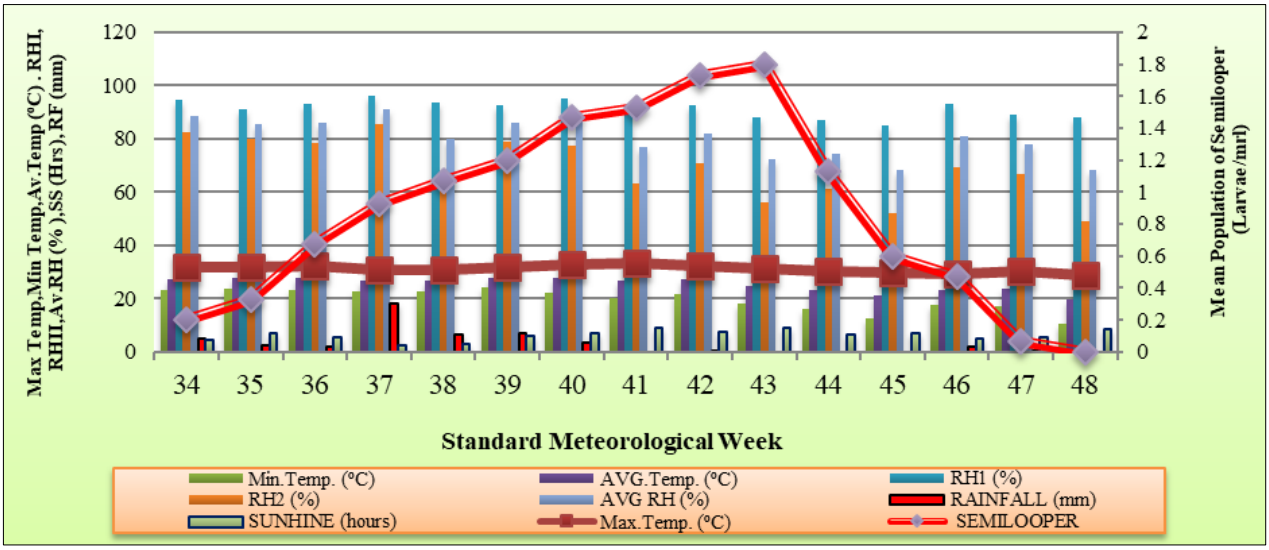

Fig 1: Seasonal incidence of Green semilooper, *Chrysodeixis acuta* Walker on Sesbania rostrata

Table 2: Correlation (r) and regression (byx) coefficient between meteorological parameters and population of green semilooper on *Sesbania rostrata*

Meteorological parameters	Green Semilooper	
	r	byx
Maximum Temperature(ºC)	0.569*	0.250
Minimum Temperature (ºC)	0.302	-
Average Temperature (ºC)	0.386	-
Morning RH (%)	0.116	-
Evening RH (%)	-0.001	-
Average RH (%)	0.026	-
Sunshine (Hrs.)	0.301	-
Rainfall (mm)	0.015	-

*Significant at 5%

Results and Discussion

The seasonal incidence of green semilooper was observed on *Sesbania rostrata* starting from last week of August 2021 to last week of November 2021 at weekly interval (Fig.1). The first incidence of green semilooper was recorded on *Sesbania rostrata* crop in the last week of August (34th SMW) with an overall larval population ranged from 0.07 to 1.8 larvae/mrl. The larval population (1.8 larvae/mrl) attained peak during the last week of October (43rd SMW). The weather conditions prevailed during this period were maximum (31.4ºC), minimum (18.08ºC) and average (24.74ºC) temperatures, morning (88.28%), evening (56.28%) and average (72.28%) relative humidity, sunshine hours (9.14 hrs.) and rainfall (0). The green semilooper population was started declining during second week of November (45th SMW) and reached to its lowest during last week of November (47th SMW). Correlation co-efficient was worked out between the number of green semilooper and the weather factors *viz*., temperature (maximum and minimum), relative humidity (morning and

evening), rainfall and sunshine hours (Table 1). The correlation studies of green semilooper with different weather parameters showed a significant positive correlation with maximum temperature (r = 0.569) and all other weather parameters were non- significantly correlated with population of semilooper. The regression equation between green semilooper and maximum temperature (y = 0.250x - 6.942, R^2 = 0.324) depicts that every unit increase in maximum temperature, the infestation level increases by 0.250 units (Fig. 2).

The correlation studies showed that the incidence of green semilooper was affected only by temperature, which indicated that the increase in temperature increasing the population of green semilooper. The present findings on green semilooper infestation on *Sesbania rostrata* are in line with those of Nayak, (2019), who reported a non-significant relationship between several weather factors and insect population in groundnut crop, but not with maximum temperature.

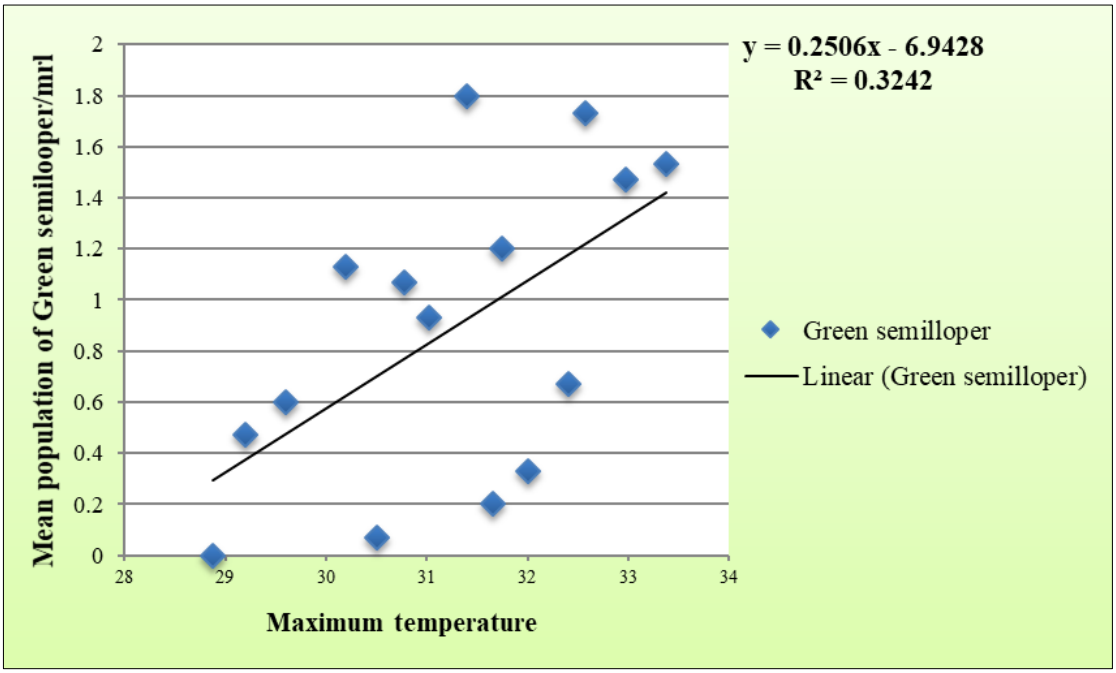

Fig 2: Regression of green semilooper infestation on maximum temperature

Conclusion

The seasonal incidence studies of the pest revealed that the first appearance (0.20 larvae/mrl) of green semilooper on *Sesbania rostrata* was observed during the 34th standard week in vegetative stage, which continued to build up with intermediately up and downs and reached maximum (1.80 larvae/mrl) during last week of October in early pod formation stage and observed up to early maturity stage of crop.

The correlation studies between the population of green semilooper and various weather parameters showed significant positive correlation with maximum temperature (r = 0.569) and all other weather parameters were non-significantly correlated with population of green semilooper.

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