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SEASONAL INCIDENCE OF TOBACCO CATERPILLAR, *SPODOPTERA LITURA* (FAB.) INFESTING SOYBEAN, *GLYCIN MAX* L.

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ABSTRACT

The present investigation on seasonal incidence of tobacco caterpillar (*Spodoptera litura* Fab.) infesting soybean (*Glycin max* L.)" cultivar JS93-05 was conducted during *Kharif* season 2012 at Agricultural research farm, SHIATS, Allahabad. The occurrence of tobacco caterpillar commenced from 33rd standard week (August third week) with an average population of larvae 0.42 larvae/plant. The tobacco caterpillar population increased and gradually reached its peak level of larvae 4.42 larvae/plant at 38th standard week (September third week) there after declined trend was observed as relative humidity decreased. It was found that tobacco caterpillar population increased with increasing relative humidity and positively correlated with relative humidity.

Key words : Seasonal incidence, tobacco caterpillar, population, peak, larvae.

INTRODUCTION

Soybean [*Glycine max* (L.) Mirrill] is unique crop with high nutritional value, providing 40 per cent protein and 20 per cent edible oil besides minerals and vitamins. It is playing an important role in augmenting both the production of edible oil and protein simultaneously under the circumstances in which the shortage of these commodities being experienced by India. It also supports many industries; soybean oil is used as raw material in manufacturing antibiotics, paints, varnishes, adhesives, lubricants etc. Soybean meal is used as protein supplement in human diet, cattle and poultry feed (Alexander, 1974).

The U.S., Argentina, Brazil, China, India, Paraguay and Canada are the world's largest soybean producers and represent more than 90% of global soybean production. U.S. is largest soybean producer in the world *(USDA 2011).* Soybean is one of the most important crops of the India cultivated over an area of 106.948 lakh ha., production 126.775 lakh MT with yield 1185 kg/ha (Anonymous, 2012). The important soybean raising states are Madhya Pradesh, Maharashtra, Rajasthan, Andra Pradesh, Karnataka, Chhattisgarh and Gujarat. Madhya Pradesh is largest producer of soybean in India *(SOPA, 2012).*

Soybean crop regularly suffers heavy damage from stem fly, white fly, jassids, thrips and leap eating caterpillars.*Spodopteralitura* (Fab.) is reported cause damage to soybean. The larvae damage by voracious feeding on foliage as well as by nibbling pods in the field (Srivastava*et al.,* 2007).

The tobacco caterpillar (*Spodoptera litura* Fab.) is a serious and regular pest in Madhya Pradesh. It damages soybean from mid August to October in *kharif.* Higher population was noticed in Dharwad and Belgaum districts of Karnataka and the pest was active during grand growth stage of the crop (Patil, 2002).

MATERIAL AND METHODS

The present investigation was conducted at the Crop Research Field of department of Plant Protection Sam Higginbottom Institute of Agriculture, Technology and Sciences (Deemed-to-be-University) Allahabad, Uttar Pradesh during 2012. For studying seasonal incidence of *S. litura,* plot size of 3 x 5 m^2 were prepared at the five different places in the research farm. The population of tobacco caterpillar was recorded from 5 plants, randomly selected and tagged from each plot.

The data obtained were transformed to corresponding arc sine square root values Statistical analysis was done to test the level of significance and to compare the treatments. In present experiment for correlation and occurrence tobacco caterpillar *(Spodoptera litura* Fab.) with the abiotic factors the

formula used in correlation co-efficient

$$r_{xy} = \frac{\Sigma XY - n\,\bar{x}\,\bar{y}}{\sqrt{x^2 - nx^{-2}}\sqrt{y^2 - ny^{-2}}}$$

Where,

x = mean of 1st factor

y = Mean of 2nd factor

n = total no. of observations

r = correlation coefficient ranges between + 1 to -1

After correlating significant and non significant is seem through t-test value of n- 2 degrees of freedom.

$$t = \frac{\sqrt{n-2}}{\sqrt{1-r^2}} \quad \text{With } (n-2) \text{ d.f.}$$

The data were subjected to statistical analysis of variance. The f-test was used to determine the significant difference.

RESULTS AND DISCUSSION

The seasonal incidence of tobacco caterpillar infesting soybean presented in Table 1. The presence of larvae of tobacco caterpillar could be noticed for the first time in 33 standard week at the minimum temperature of 27.05^{0}C, maximum temperature of 33.82^{0}C, relative humidity minimum 34.57%, maximum 84.57%, rainfall 10.14 mm, wind velocity 2.30 k/hr and 3.11(hr/day) sunshine's, the population at above periods of observation was 0.42 larvae/plant. The maximum population 4.42 larvae/plant was recorded in 38th standard week at a minimum temperature of 26.62^{0}C, maximum temperature of 31.68^{0}C, relative humidity minimum 46.57%, and maximum 90.85%, rainfall 20.70 mm, wind velocity 1.70 k/hr and 4.25(hr/day) sunshine. Netam *et al.* (2013) recorded the density of lepidopterous caterpillars increased gradually with peak incidence of larvae during the last week of august. Nadaf and Kulkarni (2006) recorded the peak incidence of tobacco caterpillar eggs and larvae during the first fortnight of October.

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Table 1. Seasonal incidence of tobacco caterpillar of soybean during kharif season 2012.

S.No.	Standard week	Larvae/ plant	Temp		Humidity		Rainfall	Wind velocity (k/hr)	Sunshine (hr/day)
			Max	Min	Max	Min			
1	29	0	34.50	26.91	83.00	33.57	7.55	4.09	3.45
2	30	0	33.17	26.52	85.71	44.71	15.97	2.51	3.25
3	31	0	33.38	26.85	88.71	46.28	15.11	2.88	3.22
4	32	0	34	27.20	88.57	35.42	14.00	3.04	1.94
5	33	0.42	33.82	27.05	84.57	34.57	10.14	2.30	3.11
6	34	1.71	33.88	27.05	84.57	34.57	1.04	3.11	5.11
7	35	2.14	34.54	27.37	84.14	32.57	8.45	2.78	5.31
8	36	3.85	34.14	26.97	87.42	35.14	13.17	1.78	5.25
9	37	4.00	33.51	26.62	92.85	44.00	15.63	1.69	5.02
10	38	4.42	31.68	26.62	90.85	46.57	20.70	1.70	4.25
11	39	3.28	34.37	26.91	76.42	33.85	0.00	1.03	6.94
12	40	2.14	36.05	27.02	76.00	30.85	2.60	2.38	7.91
13	41	1.85	36.97	26.00	81.57	30.71	0	1.56	9.30
14	42	0.71	35.60	24.88	81.57	33.85	0	1.16	9.31
15	43	0	35.45	20.77	85.14	30.57	0	1.37	9.20
		R	-0.232	0.286	0.130	0.180	0.188	-0.462	0.160
		t=	-0.859	1.075	0.474	0.660	0.691	-1.876	0.584
		F- test	NS	S	S	S	S	NS	S

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