

Original Research Article

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Seasonal Incidence of Tobacco Leaf Eating Caterpillar and Leaf Miner of Groundnut (*Arachis hypogaea* L.)

V.K. Nigude, S.A. Patil, P.B. Mohite and A.S. Bagade*

Department of Agril. Entomology, College of Agriculture, Kolhapur, Mahatma Phule Krishi Vidyapeeth, Rahuri – 413722, India

*Corresponding author

ABSTRACT

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Seasonal Incidence of Tobacco leaf eating caterpillar and Leaf miner of groundnut (*Arachis hypogaea* L.) was studied during July to October 2016, at Research farm, College of agriculture, Kolhapur. Groundnut crop was infested by Tobacco leaf eating caterpillar (*Spodoptera litura* Fab.), Leaf miner (*Aproaerema modicella* Deventer). The study revealed that the incidence of Tobacco leaf eating caterpillar started in 3rd week of August; and Leaf miner 1st week of August. The population of Tobacco leaf eating caterpillar (*Spodoptera litura*), the population started increasing slowly and reached to its peak in the 35th MW corresponding to September 1st week 3.93 larvae/mrl. The population of Leaf miner (*Aproaerema modicella*). The infestation started increasing slowly and reached to its peak in the 34th MW corresponding to August 4th week 19.00 per cent. The population of Tobacco leaf eating caterpillar was showed negatively non-significant with rainfall and positively significant with temperature and relative humidity. The Leaf miner population was negatively non-significant with temperature and positively significant with relative humidity and rainfall.

Introduction

Groundnut (*Arachis hypogaea* L.) is an annual legume crop, also known as peanut, earthnut, monkey– nut and goobers. It forms the world's largest source of edible oil and ranks 13th among the food crops and is also 4th most important oil seed crop of the world.

It is grown in tropical and subtropical countries. Cultivated groundnut has been reported to from South America (Weiss, 2000). It is infested by many insect pests, among them *Spodoptera litura* (F.) and leaf

miner, *Aproaerema modicella* Deventer are two important defoliators of the crop. *Spodoptera* is a ubiquitous, polyphagous, multivoltine, lepidopterous pest that feeds on 112 cultivated crops across the world (Moussca *et al.*, 1960). *Spodoptera* is a destructive pest that damages groundnut crop extensively by defoliating the plants and thus reducing the photosynthetic capacity of the plant.

The *Spodoptera* moths are found primarily active during night and due to its high mobility, female ovipositing on a wide range

of host plants, which promotes or even ensures survival of *Spodoptera* over a broad range of environmental conditions (Chelliah, 1985). The groundnut leaf miner, *A. modicella* is an oligophagous pest and feeds only on leguminous host plants and a serious pest of groundnut during both rainy and post rainy season in India and on both groundnut and soybean in South and South East Asia. The leaf miner is considered as the most important insect pest of groundnut in India and particularly in rainfed situations (Ayyar, 1963; Nair, 1975; Reddy, 1988).

Materials and Methods

The experiment was conducted during Kharif 2016 at College of agriculture, Kolhapur to investigate the Seasonal Incidence of Tobacco leaf eating caterpillar and Leaf miner of Groundnut (*Arachis hypogaea* L.) Variety TAG – 24 was sown under natural conditions without spraying the insecticides in plot size 3.0 m x 1.80 m with 30 cm row to row and 10 cm plant to plant spacing.

The population of *S. litura* and Leaf miner were recorded at weekly intervals during morning hours between 7.00 am to 9.00 am on five randomly selected and tagged in each plot by using sampling techniques given by Yeotiker *et al.*, (2015). For *S. litura* number of larvae observed per meter row length in each plot was recorded at three places and mean was reported in per meter row length and Leaf miner. Five plants were tagged in each plot. Number of leaflets and damaged leaflets were recorded and presented in the form of per cent infestation.

Results and Discussion

The mean population of Tobacco leaf eating caterpillar (*Spodoptera litura*) and Per cent infestation of Leaf miner (*Aproarema modicella*) has been presented in Table 1.

Tobacco leaf eating caterpillar, *Spodoptera litura* (Fab.)

The data presented in the Table 1 and depicted in Figure 2 clearly indicated that the *S. litura* incidence was first appeared in the 33rd MW corresponding to the August 3rd week with mean population of 3.82 larvae/mrl. The population started increasing slowly and reached to its peak in the 35th MW corresponding to September 1st week (3.93 larvae/mrl) when the maximum temperature was 28.1°C, morning relative humidity 90 per cent and 1.01 mm rainfall. The population of the *S. litura* declined steadily thereafter from 3.67 at 36th MW corresponding to September 2nd week.

The correlation coefficient was compared between the *S. litura* population and weather parameters. The analysis indicated in the Table 2 revealed that *S. litura* population was negatively non-significant with rainfall (-0.33) and positively significant with temperature (0.00) and relative humidity (0.52).

Leaf miner, *Aproarema modicella* (Deventer)

The data presented in the Table 1 and depicted in Figure 2 clearly indicated that the leaf miner incidence first appeared in the 31st MW corresponding to the August 1st week with mean infestation of 6.50 per cent. The infestation started increasing slowly and reached to its peak in the 34th MW corresponding to August 4th week (19.00 per cent) when the maximum temperature was 27.2°C, morning relative humidity 89 per cent and 27.1 mm rainfall.

The infestation of the leaf miner declined thereafter from 16.00 per cent at 35th MW corresponding to September 1st week to 13.00 per cent at 38th MW corresponding to September 4th week.

Table.1 Seasonal incidence of *Spodoptera litura* and Leaf miner in groundnut variety TAG –24 during *kharif*, 2016

SMW	Date	Temperature	Humidity	Rainfall	<i>S. litura</i>	Leaf miner
No.		(°C)	(%)	(mm)	(mrl)	(Per cent infestation)
31	30 July -5 Aug	25.00	89.00	166.7	0.00	6.50
32	6 Aug–12 Aug	25.80	92.00	100.4	0.00	10.50
33	13 Aug–19 Aug	26.70	88.00	16.7	3.82	18.50
34	20 Aug–26 Aug	27.20	89.00	27.1	3.84	19.00
35	27 Aug–2 Sept	28.10	90.00	01.1	3.93	16.00
36	3 Sept –9 Sept	28.50	83.00	01.9	3.67	16.50
37	10 Sept–16 Sept	28.30	85.00	17.9	2.50	14.00
38	17 Sept – 23	26.00	86.00	44.0	0.00	13.00
39	24 Sept– 30 Sept	29.10	83.00	01.5	0.00	0.00
40	1 Oct – 7 Oct	28.50	82.00	02.7	0.66	0.00
41	8 Oct–14 Oct	30.70	82.00	29.9	0.33	0.00
42	15 Oct–21 Oct	31.90	81.00	0.0	0.00	0.00
43	22 Oct– 28 Oct	31.70	76.00	0.0	0.00	0.00

Table.2 Correlation coefficient between abiotic factors and population of *S. litura* and Leaf miner of groundnut

Parameters	<i>S. litura</i>	Leaf miner
Temperature	0.00608	-0.41249
Humidity (%)	0.526198*	0.743646*
Rainfall (mm)	-0.337089	0.05277*

* Significant at 5 per cent level.

The correlation coefficient indicated in the Table 2 revealed that leaf miner infestation was negatively non-significant with temperature (-0.41) and positively significant with relative humidity (0.74) and rainfall (0.05).

These results are in line with the findings of Kharub *et al.*, (1993) who reported that the peak incidence of *S. litura* on groundnut appeared after 41st MW having maximum temperature 33.8 0C and relative humidity 61 per cent. Similar finding was reported by Yotikar *et al.*, (2015) who reported that the continuous and heavy rainfall received during the season did not allow the population of *S. litura* to build up. Also Kasana *et al.*, (1996) reported that the population of *S. litura* on

cauliflower declined in second half of October and he further attributed the fluctuation in the population to unfavourable weather conditions. These findings are in conformity with the results of Pazhanisamy and Hariprasad (2014) who revealed that minimum temperature showed significant positive correlation with incidence of leaf miner.

Similarly, Lewin *et al.*, (1979) reported positive correlation of temperature with leaf miner incidence. Logiswaran and Mohanasundaram (1985) stated that rainfall was not correlated with mean number of larva/plant of *A. modicella*. Gadad *et al.*, (2013) studied the influence of weather parameters on incidence of leaf miner

indicated a negative as well as significant relationship with morning relative humidity.

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