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Seasonal Incidence of Citrus Leaf Miner (*Phyllocnistis citrella* Stainton) in Trans Yamuna Region of Allahabad, India

S. B. Mane[*], Sasya Nagar and P. S. Kolhe
Department of Entomology
Sam Higginbottom Institute of Agriculture Technology and Sciences, Allahabad-211007
*Corresponding Author E-mail: satishmane9595@gmail.com

ABSTRACT

Seasonal incidence of citrus leaf miner (phyllocnistis citrella Stainton) in Trans Yamuna region experiment research work was conducted at Horticultural field, SHIATS, Allahabad during Kharif 2015, were the first peak was observed during first week of October 2015 i.e.in 40 MW when incidence was 26.78 percent infested leaves. Average influencing in temperature of the earlier week was 36.42^oC and 27.80^oC maximum and minimum respectively, humidity 90.71 percent and 47.14 percent maximum and minimum, respectively and rainfall of 0.20mm, Wind velocity 1.71 Km/hr and Sunshine 7.17 hr/day. Second peak of incidence was observed during 41during second week of October 2015 with 24.94 percent infested leaves. Average influencing temperature of earlier week was 35.77 and 27.82^oC maximum and minimum, respectively, humidity 90.00 percent and 51.57 percent maximum and minimum respectively and rainfall of 0.00mm, Wind velocity 1.56 Km/hr and Sunshine 8.68 hr/day.

Key words: *Citrus leaf miner, Incidence, Influence, Temperature, Meteorological week*

INTRODUCTION

Citrus is a globally cultivated fruit crop, which includes orange, sweet orange, acid lime and other related species of citrus. In India amongst the fruit crop citrus occupies third position with respect to area and production. In India area under citrus fruit crop is about 1078 thousand hectare and its production is 111.47 lack tons. It occupies 14.93 per cent area to the total fruit area and 10 per cent production to the total fruit production in India. Productivity of citrus is 12.52 MT. per hectare. The leading state in citrus production is Andhra Pradesh and gets first rank with 39.46 per cent from total production of India[2].

In Uttar Pradesh especially Jhansi, Hamirpur, Lalitpur, Chitrakoot, Agra, Banda & Allahabad districts are leading in citrus production[1]. The leaf miner creates its incidence on the young developing leaves and forms zig zag mines by the larvae by feeding on the inner green matter of the leaves, particularly during night time. This damage adversely affects the photosynthetic activities of the plant.

As a result, plant health, fruit quality and yields are affected. The pest completes its life cycle in 2 to 3 weeks and 9 to 13 generations in a year. Information regarding the seasonal incidence and population dynamics is an important tool for developing pest management strategies against this pest. Periods of no incidence, initiation of incidence, low incidence, peak incidence etc. carry important meaning for deciding the time for adoption of management tactics. Therefore, an observation on the seasonal incidence of citrus leaf miner around the year was recorded to assess the critical time of the pest incidence to adopt management practices. Although the abundance of citrus leaf miner is influenced mainly by temperature and short periods of rains[4]. This has indicated that the incidence of leaf miner is influenced by the ecological factors. If so, information would be of significant importance in predicting the period of expected incidence which would also serve as prediction model. With this view, correlations between pest incidence and the weather parameters i.e. temperature, humidity, rainfall and rainy days, have been worked out. This information would also be useful to

inform the citrus growers for the expected incidence based on the ecological conditions and to adopt the management practices in time.

MATERIAL AND METHODS

Grown up trees of Citrus (kinnow) were made available in the orchard of Horticulture Department, SHIATS, Allahabad (UP), India. Meteorological data on the minimum and maximum temperature, Minimum and maximum humidity, rainfall, rainy days, Sunshine (hrs./day), Wind Velocity (km/hr) etc. were obtained from the Department of Meteorology, SHIATS, Allahabad (UP), India, for the period under study. For recording seasonal incidence, weekly observations were recorded from August to October 2015 (31 to 43 MW) on the randomly selected ten trees of Citrus (kinnow) from each tree; four twigs from four sides of the tree were plucked. Total leaves and infested leaves on each twig were counted. Observations, so recorded were pooled for mean incidence from which per cent leaves infested were worked out. The data on per cent infestation of citrus leaf miner was calculated by adopting the following formula,

$$\text{Per cent Leaves Infestation} = \left(\frac{\text{Infected Leaves} \times 100}{\text{Total Leaves}} \right)$$

The results obtained from field observations was analysed statistically as per Gomez and Gomez (1984) for RBD and parenthesis of square root transformation. The significance was referred to 'F' tables of Fisher and Yates.

RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below:

Table 1: Meteorological Data and Infestation of Citrus Leaf Miner at Weekly Intervals during August-October 2015

Weeks	Infestation (%)	Temp		Humidity		Rainfall	Wind velocity (Km/ hr)	Sunshine (hr / day)
		Max	Min	Max	Min			
31	7.07	35.97	27.74	92.45	53.42	5.00	1.33	5.34
32	8.96	34.22	27.42	92.35	52.36	0.00	1.25	5.12
33	10.20	33.12	27.55	92.45	55.25	1.00	1.24	4.52
34	11.26	33.22	27.00	92.85	58.28	12.48	1.28	4.80
35	14.36	35.45	27.42	90.71	54.85	11.85	2.22	5.74
36	15.86	36.42	27.20	89.71	45.42	0.00	2.55	7.97
37	18.36	37.48	27.37	86.71	47.14	0.00	1.68	8.70
38	20.35	35.65	28.05	86.28	55.71	0.60	2.17	7.11

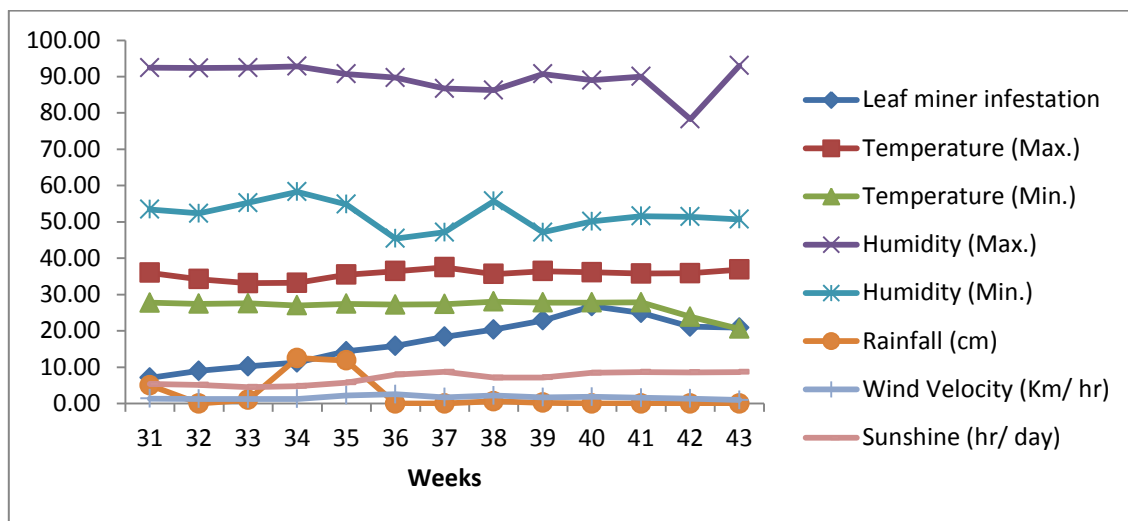| 39 | 22.86 | 36.42 | 27.80 | 90.71 | 47.14 | 0.20 | 1.71 | 7.17 |
40	26.78	36.11	27.80	89.00	50.14	0.00	1.84	8.45
41	24.94	35.77	27.82	90.00	51.57	0.00	1.56	8.68
42	21.12	35.85	23.88	78.28	51.40	0.00	1.35	8.57
43	20.89	36.85	20.57	93.00	50.71	0.00	0.96	8.65

Fig 1: Graphical representation of seasonal incidence of Citrus leaf miner

Two peaks of incidence were recorded during *Kharif* 2015 research work. The first peak was observed during first week of October 2015 *i.e.* in 40 MW when incidence was 26.78 percent infested leaves. Average influencing in temperature of the earlier week was 36.42°C and 27.80°C maximum and minimum respectively, humidity 90.71 percent and 47.14 percent maximum and minimum, respectively and rainfall of 0.20mm, Wind velocity 1.71 Km/hr and Sunshine 7.17 hr/day. Second peak of incidence was observed during 41during second week of October 2015 with 24.94 percent infested leaves. Average influencing temperature of earlier week was 35.77 and 27.82°C maximum and minimum, respectively, humidity 90.00 percent and 51.57 percent maximum and minimum respectively and rainfall of 0.00mm, Wind velocity 1.56 Km/hr and Sunshine 8.68 hr/day. These results are in agreement with the results reported by Saadanny *et al.*[5].

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