Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 7, Issue, 12, pp.23444-23446, December, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

SEASONAL INCIDENCE OF SAPOTA FRUIT BORER, *Phycita erythrolophia* HAMPSON ON SAPOTA

***,[1]Vijayaraghavendra, R. and [2]Basavanagoud, K.**

[1]Department of Entomology, PJTS Agricultural University, College of Agriculture, Rajendranagar, Hyderabad-500030, Telangana, India
[2]Department of Entomology, College of Agriculture, UAS Dharwad-580005, Karnataka

ARTICLE INFO

Article History:
Received 25th September, 2015
Received in revised form
16th October, 2015
Accepted 28th November, 2015
Published online 21st December, 2015

Key words:
Sapota fruit borer,
Phycita erythrolophia,
Seasonal incidence,
Weather.

ABSTRACT

Studies on seasonal incidence of sapota fruit borer, *Phycita erythrolophia* Hampson (Pyralidae: Lepidoptera) infesting sapota *Manilkara achras* (Mill.) Forsberg were carried out in sapota orchard of Agriculture College, Dharwad, University of Agricultural Sciences, Dharwad, Karnataka, India during 2013–2014. Observations were recorded from four sapota genotypes *viz.,* Cricket ball, Kalipatti, DSH-1 and DSH-2. The fruit borer was active throughout the year with a varying degree of infestation. Among four different genotypes of sapota, the incidence of fruit borer damage was more in cricket ball (10.24 %) followed by Kalipatti (9.64 %) varieties whereas on hybrids it ranged from 7.33 to 8.07 per cent. Across the genotypes, the mean percentage of fruit damage was ranged from highest incidence of 16.42 % in March and lowest in August 3.79 %. Pest incidence was more during dry period i.e. from November to April and less during rainy season (July to October). A study on correlation of fruit borer with weather parameters indicated that there was a significant and positive correlation between fruit borer damage and maximum temperature in all genotypes. Rest of the weather factors *viz.,* minimum temperature, relative humidity and rain fall had no influence on pest population during the period of study.

***Citation*:** Vijayaraghavendra, R. and Basavanagoud, K. 2015. "Seasonal incidence of sapota fruit borer, *Phycita erythrolophia* Hampson on Sapota", *International Journal of Current Research*, 7, (12), 23444-23446.

INTRODUCTION

Sapota (*Manilkara achras* (Mill.) Farsberg, syn. *Achras zapota* Linn.) belongs to family Sapotaceae is a native of Mexico. It is called by several names such as Chiku, Sapodilla, Zapata or Sapodilla plum in different regions. It is one of the most adoptable tropical fruit crops and it has been found to thrive under varied soil and climatic conditions. It is popular in Sri Lanka, India, Jamaica, Philippines, Central America and Southern Florida. The fruit was introduced during 1888 in a village Gholwad of Thane district of Maharashtra in India. India is considered to be the largest producer of sapota in the world and it is being cultivated in an area of about 163.9 thousand ha with a production of 1495.0 metric tonnes (Anon., 2014). Major sapota producing states are Karnataka, Gujarat, Maharashtra, Tamil Nadu, Kerala, Uttar Pradesh, Haryana, Punjab and West Bengal. Out of the total fruit production in India, Karnataka ranks first contributing 25 per cent of total production of sapota (Anon., 2014). The total area of sapota grown in Karnataka is about 31.7 thousand ha with an annual production of 373.7 lakh metric tonnes with a productivity of 11.8 metric tonnes per ha (Anonymous, 2014).

***Corresponding author: Vijayaraghavendra, R.** Department of Entomology, PJTS Agricultural University, College of Agriculture, Rajendranagar, Hyderabad-500030, Telangana, India.*

Among the various factors affecting the yield of fruit crop damage caused by insect pests is important. More than 25 insect pests attack sapota (Butani, 1979). Among the different pests, bud borer, mid rib folder, chiku moth, Leaf miner and fruit flies are considered as major pests of sapota. Sapota fruit borer is a major and regular pest causing damage to the sapota crop under North Karnataka districts like Bagalkot, Belgum Dharwad, Vishwanath *et al*., 1978 at Agriculture college, Dharwad reported that sapota fruit borer *Phycita erythrolophia* a predominant species causing considerable damage to flower buds and fruits of sapota. Similarly Patil (1986) experiment was carried out in silver jublee orchard, Agriculture college, Dharwad that early instars larvae of sapota fruit borer, *P. erythrolophia* feeds on flower buds whereas the later instars cause damage to fruits by boring into pulp and due to its continuous feeding the excretary pellets got entrapped in silken web, thus resulting in premature fruit fall and pest was found active throughout the year.

MATERIALS AND METHODS

To study the seasonal incidence of sapota fruit borer, observations were done in sapota new orchard of Agriculture College, Dharwad, University of Agricultural Sciences, Dharwad, Karnataka, India. Observations were recorded from

four sapota genotypes *viz.,* Cricket ball, Kalipatti, DSH-1 and DSH-2. No insecticidal application was done during the period of study. The observations were recorded at 15 days intervals from June 2013 till May 2014. Five medium sized trees from different genotypes were selected randomly. From each of the tree, ten twigs having fruits were selected and in each twig all the fruits were observed for the incidence of fruit borers. The number of total damaged fruits per twig of each variety was counted for computing the percentage of infestation. Mean percentage of fruits damaged by fruit borer was worked out on different genotypes by using formula. In order to study the effect of weather parameters, the simple correlation coefficients were worked out.

$$\text{Per cent fruits damaged} = \frac{\text{Number of damaged fruits}}{\text{Total number of fruits observed}} \times 100$$

pellets are seen on bored holes (Plate). Usually one larva was found in each affected fruit. Larva in its entire period feeds on fruits only but sometimes early larval instars rarely feeds on flower buds. Through this exit hole the fungus as well as ants enters inside the fruits and the fruit becomes unfit for consumption. Due to the infestation of this pest, quality of the fruit deterorates and hence the market price goes down and farmers also lose their goodwill in the market. Among four different genotypes (Table 1) of sapota, the incidence of fruit borer damage was more in cricket ball (10.24 %) followed by Kalipatti' (9.64 %) varities whereas on hybrids it ranged from 7.33 to 8.07 per cent. These results are in line with the findings of Patil (1986) who recorded lowest infestation in Kalipatti (29.4 %). The Cricket ball (35.2 %) and Calcutta round (35.4 %) recorded more infestation.

Table 1. Seasonal incidence of sapota fruit borer, *Phycita erythrolophia* during 2013-14 on Different genotypes

S.No.	Month	Fortnight	Per cent fruit damage to fallen flower buds				Mean
			Cricket Ball	Kalipatti	DHS-1	DHS-2	
1	June-2013	I	12.33	9.93	7.41	8.33	7.87
2		II	5.61	7.50	6.54	5.28	
3	July	I	5.40	6.53	5.26	6.07	5.33
4		II	5.22	4.85	4.01	5.30	
5	August	I	5.16	3.52	2.81	4.48	3.79
6		II	4.26	3.63	2.63	3.85	
7	September	I	3.58	4.07	3.09	3.15	3.86
8		II	4.87	5.24	3.80	3.09	
9	October	I	6.13	8.78	4.18	4.07	5.99
10		II	7.89	6.41	7.91	2.56	
11	November	I	10.22	7.75	6.76	5.82	8.44
12		II	13.46	8.23	8.29	7.02	
13	December	I	11.11	9.64	7.52	8.18	9.18
14		II	10.82	11.25	6.38	8.52	
15	January-2014	I	13.82	11.61	9.54	9.91	11.39
16		II	12.74	11.85	11.25	10.37	
17	February	I	17.56	13.32	12.26	10.55	13.76
18		II	15.29	14.13	14.58	12.40	
19	March	I	19.25	17.91	13.95	16.50	16.42
20		II	17.23	16.58	14.36	15.55	
21	April	I	14.81	15.26	13.95	8.07	11.60
22		II	10.52	14.30	9.80	6.12	
23	May	I	9.30	8.63	8.15	5.33	8.24
24		II	9.25	10.50	9.28	5.50	
	Mean		10.24	9.64	8.07	7.33	

Table 2. Correlation co- efficient between sapota fruit borer, *Phycita erythrolophia* and weather parameters during 2013-14

Weather data / Varieties	Maximum temperature (^{o}c)	Minimum temperature (^{o}c)	Morning Relative humidity (%)	Evening Relative humidity (%)	Rain fall (cm)
Cricket ball	0.597**	-0.450*	-0.874**	-0.878**	-0.668**
Kalipatti	0.750**	-0.253	-0.865**	-0.868**	-0.689**
DHS-1	0.742**	-0.221	-0.880**	-0.865**	-0.618**
DHS-2	0.432*	-0.404	-0.738**	-0.752**	-0.521**

** Correlation is significant at the 0.01 level (2-tailed)
*Correlation is significant at the 0.05 level (2-tailed)

RESULTS AND DISCUSSION

The larva of sapota fruit borer, *P. erythrolophia* damages by boring into fruits and feeding on pulp. A bored hole is seen on sapota fruits and due to continuous feeding the excretory

Across the genotypes, the mean percentage of fruit damage in different months ranged from 3.79 to 16.42. Highest incidence of 16.42 per cent was noticed in March whereas it was lowest in August (3.79 %).

PLATE: Symptoms of damage, larva of *Phycita erythrolophia* on sapota fruit

Further the data reveals that the pest incidence was more during dry period i.e. from November to April and less during rainy season (July to October). Patil (1986) reported that lowest incidence of fruit borers (9 to 15 %) was observed from first fortnight of March to second fortnight of May and maximum incidence (37 %) during first fortnight of November. This finding contradicts to present studies, it may be due to variation in the incidence of the pest, genotype grown, climatic factors. In the present study more damage of fruit borer was noticed during dry season and in the remaining season pest activity was less. Whereas the pest occurrence coinsides with peak crop harvesting periods (March to June).

The correlation studies (Table 2) made between the incidence of fruit borer, *P.erythrolophia* and weather parameters showed that there was a significant and positive correlation between fruit borer damage and maximum temperature in all the four genotypes (r= +0.59 (Cricket ball), 0.75 (Kalipatti), DHS-1 (0.75) and DHS-2 (0.43)). Whereas it was significantly but negatively correlated with morning and evening relative humidity and rainfall. Patil (1986) reported that all four climatic factors (Maximum and minimum temperature, relative humidity and rainfall) showed no significant correlation with populations of fruit borers.

Conclusion

The activity of fruit borer observed throughout the year with peak activity during March. There was no influence of weather factors on fruit borer population except maximum temperature.

REFERENCES

Anonymous, 2014, Indian Horticultural Data Base, *National Horticultural Board*, Gurgaon, India, pp. 125.

Butani, D.K., 1979, Insect and Fruits. Periodical Expert Book Agency, Delhi. pp. 87-94.

Patil, R. H., 1986, Studies on insects infesting sapota *(Achras sapota L.)* with special reference to biology and chemical control of flower bud borers. *M.Sc. (Agri.) Thesis*, Uni. Agric. Sci., Dharwad.

Vishwanath, B. N., Rangaswamy, H. R., Govindan, R. and Sulladamath, V, V., 1978, New flower bud borer *Phycita* sp. (Lep: Phycitidae) on sapota. *Curr. Res.,* 7: 208.

****