

Short Communication

Influence of weather parameters on pests of cashew in Konkan

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Cashew, *Anacardium occidentale* L. belonging to family *Anacardiaceae*, having great economic value is mostly grown in the east and west coast of India. The increasing demand for cashew kernel both in international and domestic markets lead to rapid expansion of cashew crop acreage, apparently the insect-pest problems also increased that affect pace of the production despite an increase in the area (Mahapatro, 2008). More than 180 insect-pests infesting cashew reported from India, of which 47 species were observed infesting cashew in the Konkan, Maharashtra (Sundararaju, 1993; Godase *et al.*, 2005). Tea mosquito bug, *Helopeltis antonii*, Signoret is the most serious pest of commercially grown cashews in India, with crop losses 30–40 per cent (Devasahayam and Nair, 1986). Also lepidopteran pests, especially apple and nut borer causes 20 to 60 per cent damage at fruiting stage while leaf miner attacks on freshly emerged leaves with damage more than 25 per cent reported on cashew (Dharmaraju *et al.*, 1974; Pillai, 1979). Therefore, present investigation was undertaken to understand the influence of weather parameter on the cashew pests.

The study on influence of weather parameters on the incidence of cashew pests were carried out at the Central Experimental station (CES), Wakawali, Dapoli during 2012-14. A block comprising 40 trees of cultivar, Vengurla–4 was selected. Of which, 10 trees were selected randomly for recording observations on the tea mosquito bug, apple and nut borer and leaf miner incidence. The selected plot was kept unsprayed through the study period. Twenty five uniform tender shoots were selected all around four directions (north, east, south and west) randomly on each selected tree. The observation on tea mosquito bug infestation in 0-4 scale was recorded fortnightly on selected shoots/ panicles (Ambika and Abraham, 1979). The data thus obtained were converted into per cent incidence using formula (Godase *et al.*, 2005).

$$\text{Percent shoots or panicles damaged} = \frac{\text{Sum of all numerical score}}{\text{Max. Score} \times \text{No. of shoots/panicles observed}} \times 100$$

Table 1 : Seales of bug infection

Score	Description of the damage
0	No lesions / streaks
1	1 to 3 necrotic lesions / streaks
2	4 to 6 coalescing or non-coalescing lesions / streaks
3	Above 6 coalescing or non-coalescing lesions / streaks
4	Lesions / streaks confluent or wilting affected shoots / panicles

The apple and nut borer incidence recorded by selecting 50 fruits at a pebble and mature nut stage were observed randomly for the presence of apple and nut borer infestation. The per cent infestation on each selected tree was worked out by recording the total number of healthy and infested fruits. Similarly, 25 shoots were randomly selected from all along the periphery of plant canopy to record the infestation of leaf miner. Total numbers of healthy and infested leaves by leaf miner per shoots were recorded and per cent incidence was worked out. The data pertaining to per cent incidence of tea mosquito bug, apple and nut borer and leaf miner were subjected to correlation analysis with different meteorological parameters.

The average data of two years (2012-14) of cashew pest, tea mosquito bug, apple and nut borer and leaf miner is presented in Fig. 1. Tea mosquito bug incidence coincides with the emergence of new flush during October. With the advent of new flush on cashew the incidence raised quickly from first fortnight of November to second fortnight of December in both years. However, the peak incidence of pest was noticed in first and second fortnight of January under the study period. Thereafter, pest incidence started declined and disappeared after April. A slight outbreak was observed only during June second fortnight to July first fortnight of rainy season vegetative flush. The incidence of apple and nut borer was recorded during the fruiting season from February to April along with peak incidence in first

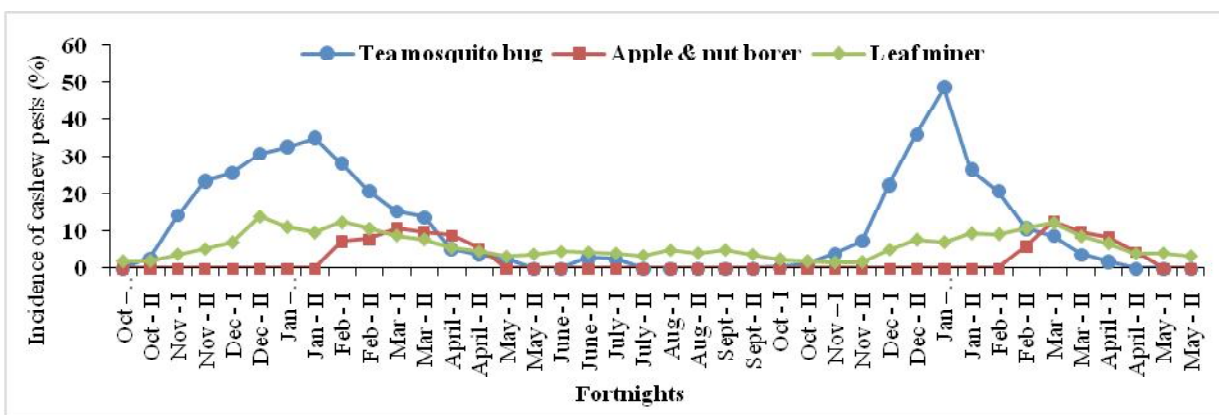


Fig 1: Population fluctuation of pests infesting cashew in Konkan, Maharashtra (2012-2014)

Table 2: Correlation coefficient of pest of cashew in relation to weather parameter

Weather parameters	Tea mosquito bug	Apple and nut borer	Leaf miner
Maximum temperature (°C)	-0.165	0.145	0.105
Minimum temperature (°C)	-0.783**	0.071	-0.816*
Morning relative humidity (%)	0.304	0.077	0.081
Evening relative humidity (%)	-0.665**	-0.150	-0.592*
Bright sun shine (Hours)	0.182	0.826**	0.414*
Rainfall (mm)	-0.342	×	-0.317*

*, ** significant at 0.05 and 0.01 level, respectively. Tea mosquito bug df= 14, Apple and nut borer df= 4, Leaf miner df= 38

fortnight of March. Later on, it decreased and disappeared after April. Leaf miner incidence was recorded throughout the study period with peak incidence during the second fortnight of December. However, incidence was varied as per flush and new shoots emerged on cashew.

Correlation with weather parameter was worked with cashew pest and are represented in Table 2. It is evident that the incidence of tea mosquito bug exhibited a significant negative correlation with minimum temperature ($r = -0.783$) and evening relative humidity ($r = -0.665$). Whereas, maximum temperature ($r = -0.165$), morning relative humidity ($r = -0.304$), rainfall ($r = -0.342$) and bright sunshine hours ($r = 0.182$) had non-significant correlation with incidence of tea mosquito bug. Apple and nut borer showed a significant and positive correlation with bright sunshine hours ($r = 0.826$), whereas, maximum and minimum temperature, morning and evening relative humidity showed non-significant correlation with the pest. However, no rainfall noticed during the infestation period of apple and nut borer, hence, no correlation was obtained. Leaf miner had a significant negative correlation with minimum temperature ($r = -0.816$), evening relative humidity ($r = -0.592$) and rainfall ($r = -0.317$). However, bright sunshine hours ($r = 0.414$)

showed significant positive correlation with incidence of leaf miner.

The present study revealed that minimum temperature and evening relative humidity had a major impact on population dynamics of tea mosquito bug which is in the agreement with findings Rao *et al.*, (2002) who observed negative correlation with minimum temperature, evening relative humidity and rainfall while it has positive correlation with sunshine hours. Correlation study with leaf miner and weather parameter are in coherence with the findings from Bhubaneswar that reported the negative correlation with rainfall (Anonymous, 2013).

REFERENCES

- Ambika, B. and Abraham, C.C. (1979). Bio-ecology of *Helopeltis antonii* Signoret (Miridae: Heteroptera) infesting cashew trees. *Entomon*, 4: 335-342.
- Anonymous, (2013). Annual Report - All India Coordinated Research Project on Cashew. Directorate of Cashew Research. Puttur, Karnataka. pp.126.
- Devasahayam, S. and Nair C.P.R. (1986). The mosquito bug, *Helopeltis antonii* Sign. on cashew in India. *J. Plant. Crops* 14:1-10.

- Dharmaraju, E., Rao, P.A. and Ayyanna, T. (1974). A new record of *Nephopteryx* sp. as an apple and nut borer on cashew in Andhra Pradesh. *J. Res. Andhra Pradesh Agric. Univ.*, 1:198.
- Godase, S.K. Bhole, S.R. and Patil, B.P. (2005). Population fluctuation studies of tea mosquito (*Helopeltis antonii* Sig.) on cashew and its relation with weather parameters. *J. Agrometeorol.*, 7:107-109.
- Mahapatro, G.K. (2008). *Helopeltis* management by chemicals in cashew: A critical concern. *Indian J. Entomol.*, 70(4): 293-308.
- Pillai, G.B. (1979). Pest control of cashew. *Indian Farming* (March). 25-28.
- Rao, G.S.L., Raju, H.V.P., Puttaswamy, G.T.T., Krishnakumar, K.N. and Tony, X. (2002). Forecasting tea mosquito bug (*Helopeltis antonii*) of cashew (*Anacardium occidentale* L.). *J. Agrometeorol.*, 4:45-52.
- Sundararaju, D. (1993). Compilation of recently recorded and some new pests of cashew in India. *The Cashew*, 7:15-19.

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