

## Forewarning Calendars for the major pests of Mulberry in West Bengal

Forecasting system for insect pests in Mulberry -ecosystem is a boon that provides opportunity to forewarn the farmers about possible outbreaks of pests creating awareness and taking timely action for management by mechanical means, biological means and finally by chemical pesticides, when planned effectively cuts down the cost of production and serves as a tool in precision farming. Forecasting calendars have become an essential tool and cornerstone of IPM.

Based on the pest incidence data collected at CSR&TI, Berhampore, and four sericultural districts of West Bengal viz. Murshidabad, Birbhum, Nadia and Malda. District-wise forewarning Calendars for the major pests of mulberry (Whiteflies, Mealy bug and Thrips) were developed to disseminate among the stakeholders for implementing prophylactic control and ecofriendly IPM.

Whiteflies were found infesting mulberry mainly from August to November. This pest inflicts a leaf yield loss of 1630 kg/ha/season (24%) in West Bengal. Symptoms are chlorosis, leaf curl and sooty mould. Economic Threshold Level (ETL) for whitefly is 20 nos./ plant. Install yellow sticky traps @ 60 nos./ acre (size 24" x 12") (sticky trap is yellow polythene sheet smeared with grease, fixed in two bamboo sticks). Release of native predator, *Brumoides suturalis* (Fab.) @500 pairs /acre. Spraying of 1.5% Neem oil or 0.1% dichlorvos or 0.015% thiamethoxam reduces the whitefly infestation with the safe period of 14 days.

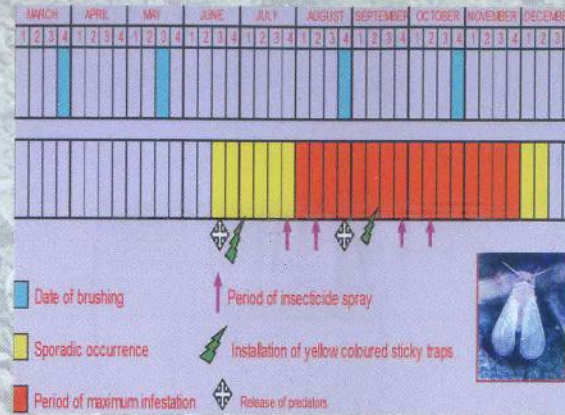
Mealy bug, is prevalent in mulberry during summer and pre-monsoon seasons. The symptoms are collectively called "Tukra". The leaf yield considerably declines both in quality and quantity causing a leaf yield loss ranging from 8 to 40% in West Bengal depending upon the intensity of infestation. ETL - 10 nos./ shoot. Tukra infested portions of mulberry should be mechanically plucked and burnt. Spray Neem oil 2% /0.1% dimethoate with a safe period of 14 days, when ETL crosses 10 nos./shoot/ tukra infestation reaches 10%. Conservation and release of predators are proven effective.

Thrips infestation in mulberry occurs during dry summer months (Mar-June) with leaf yield loss to the tune of 25%. Prolonged dry spells beyond June, would further augment the severity of infestation by the pest. Symptoms: leaf blotches, boat shaped leaves, premature leaf fall. ETL - 20 thrips/ leaf. Removal of alternate hosts and water spray can reduce severity. Spray 1.5% Neem oil or 0.1% dimethoate or 0.015% thiamethoxam with a safe period of 14 days when population crosses ETL.

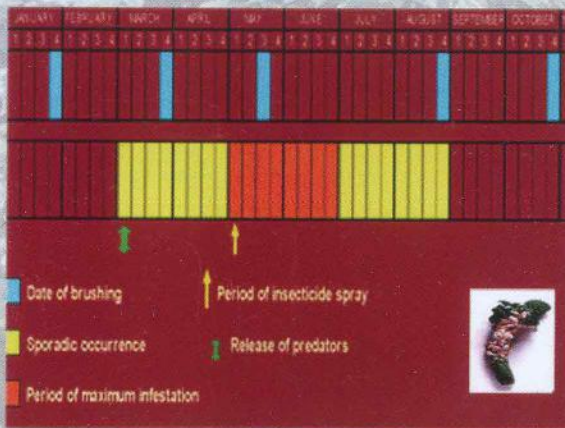
Based on the brushing schedule, districtwise forewarning calendars indicating the predicted period of maximum pest infestation and the time of initiation of control measures (mechanical, biological and chemical).

## Forewarning calendars for Murshidabad and Birbhum

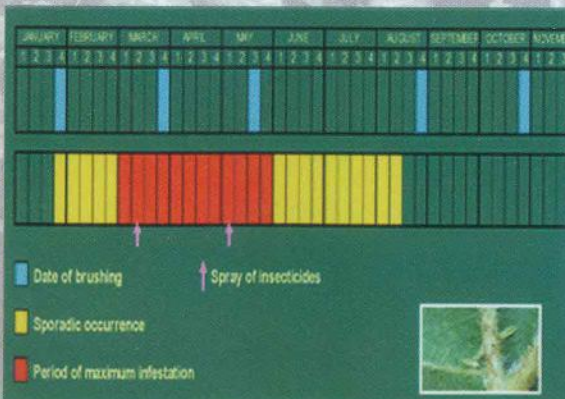
### Whitefly



### Mealy bug

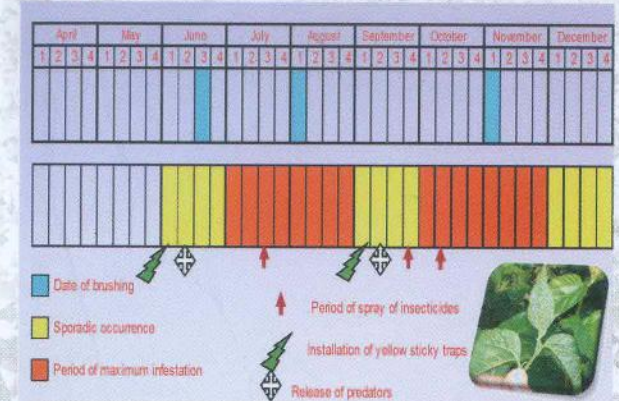


### Thrips

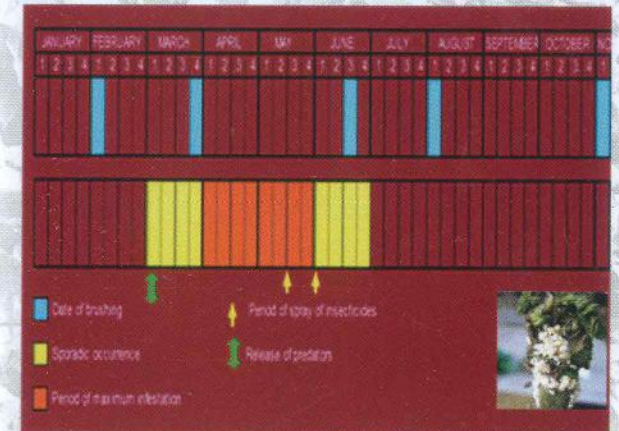


## Forewarning calendars for Malda

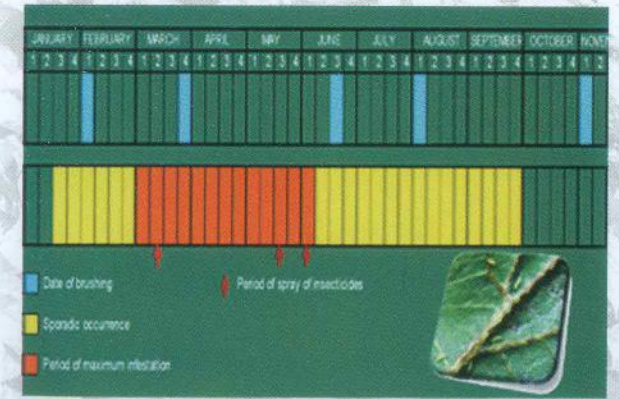
### Whitefly



### Mealy bug

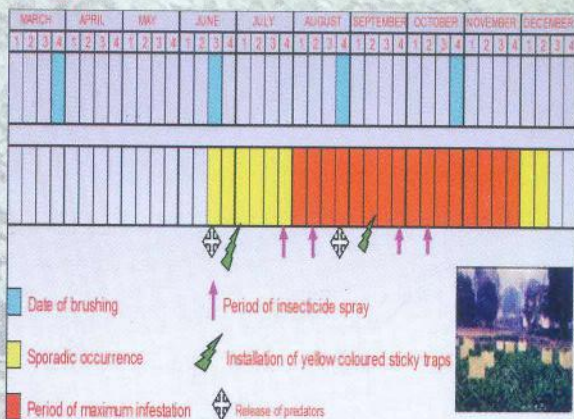


### Thrips

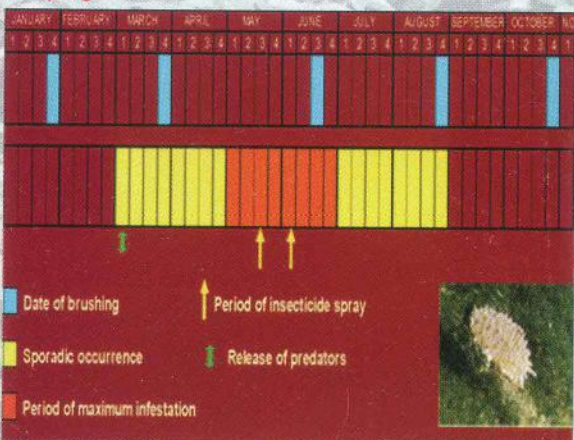


## Forewarning calendars for Nadia

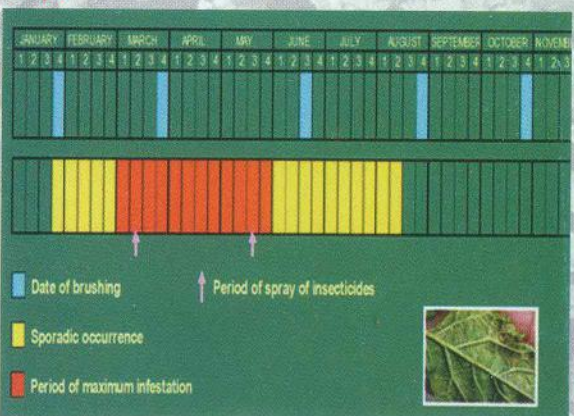
### Whitefly



### Mealy bug



### Thrips



## GENERAL RECOMMENDATIONS AND PRECAUTIONS TO FARMERS

1. Strict observation of precautionary measures prior to application, while diluting, during application, after application of pesticides to be followed
2. Prior planning (prevention of waste, uniform coverage of the target area and avoiding hazards).
3. Spray should be done to cover the lower surface of the leaves when the pest feeds during early morning hours of the week as mentioned in the forewarning calendars with respect to the brushing dates.
4. Must be aware and strictly observe the safe period of recommended pesticide dose. Avoid use of sprayed leaves before completion of safe period.
5. Regular visits to the mulberry garden, identification of the life stages of the pest and counting of the pest population for assessing that whether it has crossed ETL.
6. Conservation of natural enemies of all the pests in the mulberry ecosystem should be emphasised to maintain ecological balance. Awareness need to be created about the native predators/ parasitoids to combat pest problems.

### Symptoms of pesticide poisoning in silkworm

Vomiting of the digestive juice, swinging of the anterior half of the body, shortening of the body due to loss of the body fluid, muscle contraction, and paralysis followed by death of the silkworm.



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Dr. S.Nirmal Kumar, Director

Central Sericultural Research & Training Institute  
Central Silk Board, Ministry of Textiles, Govt. of India  
Berhampore – 742101, Murshidabad, West Bengal  
Tel.: (03482) 251046 EPABX: 253962 / 63 / 64,  
FAX: +91 3482 251233 / +91 3482 224890  
E-mail: csrtiber.csb@nic.in / csrtiber@gmail.com  
Website: www.csrtiber.res.in

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N.Lalitha, M.V. Santhakumar, S.K.Mukhopadhyay,  
M.Patnaik, U.K.Bandhopadhyay, A.K.Saha, and  
S.Nirmal Kumar

Central Sericultural Research and Training Institute  
ISO 9001: 2008 Certified  
Central Silk Board  
Ministry of Textiles, Govt. of India  
Berhampore, West Bengal