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# Management Techniques for Papaya Mealy Bug and Pink Mealy Bug in Mulberry

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## Introduction

Mulberry is the primary food plant of silkworm which feeds only on the fresh mulberry leaves of specific quality based on its age. Different element is responsible for victorious in silkworm rearing, mulberry leaf alone plays the vital role, accountable to 38.2 %. The mulberry cultivation plays an important role in influence the cost of production of cocoons quality and quantities of silk. It is estimated that about 60% of the cost of cocoon production goes to mulberry leaf production. Similarly, 70% of the silk produced by silkworm is directly derived from the protein of mulberry leaf. About 20-25 % of crop loss occurs by combined incidence of pests and diseases. There are two sap feeders pest to suppress the mulberry leaf on quality and quantity.

1. Pink mealy bug : *Maconellicoccus hirsutus* (Pseudococcidae, Hemiptera.)
2. Papaya mealy bug : *Paracoccus marginatus* (Pseudococcidae, Hemiptera.)

## 1. Pink mealy bug (Pseudococcidae, Hemiptera.)

It is commonly called as hibiscus mealy bug or pink mealy bug or greenish mealy bug. It is the major pest and popularly known as **'hard to kill'** pest. The first report of *M. hirsutus* in association with mulberry dates back to 1908, serious quantitative and qualitative loss has been observed in recent years especially in Karnataka and Tamil Nadu.

## Biology:

The mealy bug lays the eggs in a loose cottony terminal ovisac. Freshly laid eggs are orange in colour, smooth and oval with slightly tapering ends. The eggs turn pink before they hatch. The mealy bug completes its life cycle in 23 to 29 days. The pest occurs throughout the year on mulberry plants.

## Seasonal incidence:

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Mealy bug infestation of mulberry occurs throughout the year. However they attain the status of pest from March – August. Peak infestation can be observed during **April – June**.

**Type of damage**

- Nymphs and adults suck the cell sap from tender leaves and buds.
- Nutritive value of leaves, leaf yield and plant height are drastically reduced.

**Symptoms**

- Malformation of the apical shoots, retarded growth, wrinkling and curling of the affected leaves, become dark green in colour.

- Leaves become pale yellow on severe infestation
- Affected portions become brittle.
- Symptoms are collectively called as Tukra (Bushy top) disease

**Management:**

**Mechanical control:**

Clip off the infested portion by secateurs, collect in a polythene bag and destroy by burning. This will help in reducing the chances of recurrence of pest. This practice may be followed when the silkworms attain 4th age.

**Biological control:**

Release predatory lady bird beetles *Cryptolaemus montrouzieri* @ 250 adult beetles or *Scymnus coccivora* @ *500 adult beetles i*n two equal splits at an interval of 6 months.

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**Chemical control:**

Spray 0.2% DDVP 76% EC (@ 2.5 ml/lit water) 15–20 days after pruning. Safety period: 15 days.

**2. Papaya mealy bug : *Paracoccus marginatus***

**(Pseudococcidae, Hemiptera.)**

- Commonly called as papaya mealybug
- It is a new record (Jan 2009) in Coimbatore
- Exotic in origin
- Invasive on wide variety of commercial crops
- Causing serious economical damage to mulberry
- Affected 1500-2000 acres of mulberry, reduced brushing capacity by 80-90%

**Biology**

- Small to medium sized, yellow coloured insects with mealy or waxy coating.
- Oval to elongate insects with terminal or waxy filaments. Have well developed legs and antennae
- Eggs are yellow in colour and laid in sac (400 – 500 egg) covered with white wax. Egg period is 7-14 days.
- Nymphs are yellow with 4-5 in stars and live for a month.
- First instars nymph is referred to as "Crawler". Upon hatching it moves out and selects tender portions and starts feeding.
- Female has four developmental stages (egg – nymph I – nymph II - Adult) and live for about 50-60 days.
- Male has six developmental stages (egg - nymph I – nymph II – pre pupa - pupa - adult)
- Females are wingless and adult male has a pair of membranous wings; but short lived; die after mating.

**Symptoms and damage**

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- Apical portions are affected initially. Thereafter it spreads all over the plant affecting even woody regions.
- Malformation of affected portion due to toxin injected during feeding.
- Stunted growth of leaf and plant; yellowing of leaves
- Sooty mould on leaves & plants due to honey dew secretions of the pest.
- Movement of ants in the vicinity which help in spread of the mealy bugs.
- It spreads through many ways *i.e.*, planting materials, infested materials, weeds, ants, wind and water.

**Management**

- Regular monitoring on mulberry field
- Removal & burning of affected portions to avoid further spread
- Removal of weeds in and around the mulberry garden
- Spot application of pesticides at initial stage of occurrence.
- Immediately after pruning spray 0.2% a.i. DDVP over the pruned shoots and soil around the stem. Second spray of 0.1% a.i. Rogor after 10 days of pruning
- Third spray of 0.2% a.i. DDVP or neem formulation @ 3ml / 10 lit mixed in 0.5% soap solution – 10 days after second spray.
- Release coccinellid predators - *Cryptolaemus montrozeuri* or *Scymnus coccivora* @ 250 - 300 beetles / acre, a week after second spray.
- CSRTI, Mysore – Release of solitary nymphal parasitoids like *Anagyrus loecki, Pseudleptomastix mexicana* & *Acerophagus papayae* @ 250-300 adults / acre.

**Papaya mealy bug**

**Coccinellid predator**

***Acerophagus papayae***