# PEST AND DISEASE MANAGEMENT IN MELIA DUBIA

*Melia dubia* belonging to Meliaceae family is a fast growing native tree species introduced in plantation forestry in recent times. Due to its straight growth, it is preferred by plywood industries. It also finds use in paper, match industries and as timber. *Melia dubia* grows in all types of soils and is a deciduous tree growing up to 30 meters. Trees can be harvested from 5th year onwards. Large scale plantation programmes have been initiated by State Forest Departments and tree growing farmers in Tamil Nadu and Karnataka. *M. dubia* is reported to be free from termites. However, large scale raising of seedlings in nursery and plantations revealed incidence of various pests and diseases.

## Insect pests of *Melia dubia*

### Red spider mite *Tetranychus urticae* (Tetranychidae)

A sporadic pest feeding on plant sap. Adults are caramine red colour mites occurring underneath the leaves. Presence of chlorotic spots which coalesce into pale patches indicates the presence of mite infestation. There will be extensive webbing underneath the leaves. Leaves start drying from the edges and slowly wither away. Occurrence is from June to November.

**Management**: Infested leaves can be hand plucked and destroyed if the pest is at low to medium level. Application of 10% Neem oil and soap solution emulsion pointed towards the underside of the leaves can reduce the population level. 2.5 ml of Dicofol per liter of water can be applied during severe infestation. Application of Derrimax 0.3 ml/lit of water can also control the mites.

### *Ascotis selenaria* (Lepidoptera : Geometridae)

Larvae are dull green or dark brown looper with marking over the body. Adult is a grey moth with black dots over the wings. Sporadic occurrence during May, July, August and October, November results in loss of leaves and stunted growth of seedlings. *Prosopis juliflora, Peltophorum ferruginium, terminalia* sp. are alternate hosts for the pest. Prosopis trees are the most preferred host.

**Management** : Lopping the branches or eliination of Prosopis trees from the vicinity can control the incidence of *Ascotis*. Application of 0.05% Monocrotophos or 0.076% Dichlorvos can control the pest. Install Light traps with white lights soon after the rains to trap the adult.

### *Ferrisia virgata* (Hemiptera: Pseudococcidae)

Small oval shaped scales with white waxy fibre like secretions attach to the body. Groups of scale insect can be seen attached to the leaves and stem occasionally. Sap feeding results in partial or complete wilting and dieback of infested seedlings. Occurrence is during February to May.

**Management** : During low level infestations the scales can be scrapped off manually with a pair of sticks. Management measures are application of Neem oil and tobacco leaf extract mixture directed towards the underside of the leaves or spray of 0.06% dimethoate or 0.05% methyl demeton or Acetamiprid @ 0.3 g/l.

### *Parlatoria* sp. (Hemiptera: Diaspiedae)

This scale attacks the young plants all above ground parts of the trees particularly the bark of the stem and leaves. Severity of this pest leads to drying up of the plants. The female are 1.25 - 1.5 mm long and 0.5 to 0.7mm wide; sub rectangular with rounded corners, slightly membranous, elongate and oval whereas the males are red and winged. Occurs from February to April

**Managment:** During severe infestation 0.065% dimethoate or 0.05% methyl dematon can be sprayed.

### Thrips (Phleothripidae: Thysanoptera)

Regular pest, occurring throughout the year, both adults and nymphs feed on the sap and scrap off tissue of unfolding young leaves leading to curling and chlorosis of young terminal leaves. A single adult individual usually settles down in an unopened tender, terminal leaf bud. It lays eggs and a colony of hundreds of individuals is developed within a short span of time. Though the tender leaf grows in size, the leaf remains folded due to the continuous feeding of thrips. The folded leaf provides an ideal shelter for the thrips to survive. The infestation of this insect can be recognized by the typical nature of leaf folding. Feeding by thrips results in twisting and curling of young leaves and the affected leaves ultimately fall. The damaged leaves are also characterized by numerous, irregular, yellowish mottled areas with total absence of chlorophyll leading to leaf drying and shedding or stunted growth of seedlings.

**Management** : As a prophylactic measure regular monitoring throughout the raising period is required. Application of 5% NSKE every 10 -15 days interval is effective. In nursery, bed arrangement alternatively with

Red spider mite - *Tetranychus urticae*

Chlorosis on leaves due to mite feeding

Scale insects - *Ferrisia virgata*

*Ascotis selenaria* larva

Leaf miner

other species can be tried to reduce the spread of the pest. Suitable microbial formulations of *Verticillium lecanii* can be applied to bring down the population. 0.06% dimethoate or 0.01% imidacloprid or 0.076% Dicholrvos can be sprayed.

### *Bormia variegate* Moore. (Lepidoptera: Geometridae)

Adult moth is whitish-gray or pale colour with wing expands of about 2 inches. Caterpillars know as a looper occur in two colours, green with dark or pale yellowish brown lines. Young larvae feed on foliage gregariously. Fecal matter at the base of the trunk is an indicative of the presence of the pest. The larvae consume the entire green tissues of leaf leaving only the mid vein and some basal portion of leaf. It occurs in two seasons - May July and October December.

**Management:** 0.05% monocrotophos or 0.076% dichlorvos can be sprayed. Small number of larvae can be hand collected and destroyed if the population is at low to medium level.

### *Empoasca sp.* (Hemiptera: Cicadellidae)

Nymphs and adults suck the sap of the leaves resulting in chlorosis or discoloration of leaves. Nymphs and adults rest closely pressed to the surface of leaves. Occurrence is from February to April.

**Management:** Light trap or sticky traps can be used to attract and kill the nymps and adults. Spraying of 0.1 % Dimethoate or 0.15% DDVP on leaves can be attempted.

### LEAF MINER

Seasonal pest, larva is a leaf minor and cause white zigzag lines on leaf during January to February. The larva lives between the two epidermal layers of the leaf inside the tunnel resulting in premature shedding of the leaves slow or stunted growth, loss of leaves, partial or complete drying of seedlings. Adult is a minute moth and silvery grey in color.

**Management :** Once the white patches start appearing on leaves of the seedlings, such leaves could be hand collected and destroyed by burning with debris or dried leaves. 0.06% of Dimethoate or 0.05% of Monocrotophos can be given as a prophylactic spray. If new leaves show the patches or blotch, spraying can be repeated after 15 days of first treatment.

### *Myllocerus tenuicornis Faust.* (Coleoptera: Curculionidae)

Metallic green to brown in colour with blackish markings or ridges. Adult feed on the leaves. Severe feeding results in defoliation of tender foliage of young seedlings and saplings. Period of occurrence is June to September.

**Management:** Botanicals: 10% neem oil emulsion when adults are first observed in seedlings can limit the damage on leaves. Spraying of chemicals monocrotophos 0.05% or 0.076% dicholrvos can bring down the population.

### Plant Bug

### *Dasynus* sp

Nymphs and adults aggregate at the growing shoot tip and feed on the sap resulting in necrosis and drying of leading shoot tip. Pest occurs throughout the year. Adults and nymphs in nursery beds can be collected by insect net and killed by burning with debris or dried leaves. 0.06% of Dimethoate or 0.05% of Monocrotophos can be given as a prophylactic spray. 0.02% Cypermethrin can be used if many bugs are noticed in the plants. If new shoot tips show the patches or blotch, spraying can be repeated after 15 days of first treatment.

### Fruit Feeder

### *Carpophilus* sp

Black beetle regularly feed on fallen fruit pulp during January February. Grubs also feed on the pulp.

**Management :** Fruits can be collected as soon as it falls on the ground. This will avoid adult beetles from laying eggs on fruits.

### Seed Feeder

### *Bruchus sp.*

Brown beetle found feeding on seeds during storage. Gubs and adults feed on seeds.

**Management :** Treating seeds with 15% Neem oil or neem formulation like 0.09% Nimbecidine or 80% dry neem seed powder before seed storage can control the pest. Pesticides like Dichlorvos (0.06%) and Monocrotophos (0.05%) can also be used.

*Thrips*

Defoliator
*Boarmia variegata*

Grubs and adult of *Carpophyllus* sp. infesting *M dubia* fruits

Bruchus sp.

Seeds damaged by Bruchus sp.

## PEST CALENDAR

| Probable pest infestation level | L - LOW | M-MEDIUM | HIGH |
|---|---|---|---|

| PEST | INJURY | MONTHS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | J | F | M | A | M | J | J | A | S | O | N | D |
| *Red spider mite (Tetranychus urticae)* | Sap feeding | L | | L | | | M | M | H | H | H | H | M |
| Leaf feeder (*Ascortis selenaria* ) | Defoliation | | | | | M | M | M | | | H | H | |
| Scale insects (*Ferrisia virgata)* | Sap feeding | L | L | M | M | M | | | | M | M | M | |
| Thirps | Sap feeding | L | L | L | L | L | L | H | H | L | M | M | L |
| Leaf miner | Mining | L | L | | | | | | | | | | |
| Plant bug *Dasynus* sp. | Sap feeding | M | L | | | | | | | | L | H | M |
| *Boarmia variegata* | Defoliation | | | | | M | M | M | | | H | H | |
| *Carpophyllus sp.* | Fruit feeding | L | L | | | | | | | | | | |
| *Bruchus* sp. | Seed feeding | | | M | M | M | | | | | | | |
| *Araecerus fasciculatus* | Seed feeding | | | L | M | M | | | | | | | |
| *Parlatoria* sp. | Sap feeding | | | | | | | | | | | L | H |
| *Myllocerus* | Sap feeding | L | L | L | | | M | M | M | | L | L | |

*Dasynus* sp bug

Branch tip drying due to *Dasynus* sp feeding

*M. dubia* plant attacked by *Parlatoria* sp.

Winged Male *Parlatoria* sp

*Empoasca sp* and feeding damage on leaves

*Myllocerus* beetle

### Nursery level disease of *Melia dubia*

#### Leaf blight disease

Caused by the pathogen *Colletotrichum sp.* affected plants show symptoms like decaying of leaf tip in nurseries. Infestation happens in one month old seedlings. Application of Bavastin spray on the leafs (0.1%- 0.1 gm in 100ml water) can manage the disease problem.

### Disease infestation in *Melia dubia* plantations

#### Leaf blight disease

Occurring during 6-12 months of growth, infected plants show symptoms like decaying of leaf tip. *Helminthosporium* sp. and *Alternaria* sp. are responsible for the disease. Indofil M-45 or Blitox fungicide application can control the problem.

#### Root rot disease

Caused by *Fusarium* sp six month old seedlings show yellow color leaves which fall leading to drying of plant. *Sclerotium* sp. infestation also results in oozing in the root region.

Drenching the root zone with Bavastin (0.1%) solution can manage the problem. Removal of affected plants and use of *Trichoderma viride* and *Pseudomonas fluorescens* is effective.

## DISFIGURATIONS IN THE TREE DUE TO PATHOLOGICAL PROBLEMS

Gall Formation

Bunchy top

Fusarium root rot

| Do's | Don'ts |
|---|---|
| ✣ Follow the species based threshold | ✣ Do not use chemical pesticides indiscriminately go by Calendar basis, follow mixture specifications and avoid overdoses |
| ✣ Monitor the trees / seedlings at regular intervals for pests and diseases | ✣ Avoid spraying when natural enemies are active |
| ✣ Follow recommended dosage of pesticide or fungicide | ✣ Do not spray chemicals when there is insufficient pest population |
| ✣ Always use protective clothing while application of pesticide or fungicide | ✣ Do not eat/smoke while handling pesticides |
| ✣ Strictly follow safety periods prescribed for different chemicals. | ✣ Do not keep chemicals accessible to children/pets |
| ✣ Use appropriate equipment for application of pesticide or fungicide | ✣ Do not use biopesticides in combination with chemicals |
| ✣ Always use selective and safe chemicals | |
| ✣ Augment natural enemies | |

The Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore is a National Research Institute under the Indian Council of Forestry Research and Education (ICFRE).

IFGTB envisions a wood secure society. The Institute primarily aims to carry out research to improve productivity of forest tree species through conventional breeding programmes and biotechnological interventions. The major areas of research include tree improvement, breeding, planting stock improvement, marker assisted selection, genomics, clonal propagation, agroforestry systems, climate change research, integrated disease and pest management, seed handling and testing, eco restoration and conservation.

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*Stem canker and gummosis in Melia dubia*