SUNSHINE AGRICULTURE
e-Newsletter

ISSN (E): 2583 – 0821

Sun. Agri.:e- Newsletter, (2024) *4*(9), 21-23

Article ID: 332

The Health of *Melia Dubia*: Understanding Disease Dynamics

Pradyumna Deshmukh[1], Prabhat Tiwari[1], Prasad Sonwalkar[2] Praveen H[3] & Varsha Shekhawat[1]

[1]Department of Silviculture & Agroforestry, College of Horticulture and Forestry,
[2]Department of Fruit Science, College of Horticulture and Forestry
[3]Department of Agronomy, College of Agriculture,
Rani Lakshmi Bai Central Agricultural University, Jhansi-284003

Open Access

Available online at
http://sunshineagriculture.vitalbiotech.org/

Article History
Received: 15. 08.2024
Revised: 17. 08.2024
Accepted: 21. 08.2024

This article is published under the terms of the Creative Commons Attribution License 4.0.

INTRODUCTION

Melia dubia, a rapidly growing tree species in the Meliaceae family, has been newly incorporated into plantation forestry. Plywood companies choose it because of its uniform and consistent growth. It is also used in the paper, match, and lumber industries. Melia dubia flourishes in diverse soil compositions and is a deciduous tree capable of growing up to 30 meters tall. Harvesting of trees might commence after the fifth year. Extensive nurturing of seedlings in nurseries and plantations revealed the existence of numerous pests and diseases.

Malabar neem is facing threats in northern and southern India due to multiple biotic issues, including Melia decrease triggered by fungal infections such *Armillaria fumosa, Botryosphaeria spp., Fusarium oxysporum, Leptographium, and Septoria musiva.* A recent report indicated that fungal wilt caused by *Fusarium solani* damaged around one hundred thousand seedlings in a Forest Nursery in Dehradun. Additionally, root rot disease caused by *Ganoderma spp*. results in the death of the entire tree and significantly diminishes the market value of wood. Various fungal associations, including *Phoma sp., Fusarium moniliformis, Rhizoctonia solani, Lasiodiplodia theobromae*, and *Pythium sp*., as well as nutritional deficits, drought, and insect pest stress, result in significant losses in both nursery and main field crops.

Nursery diseases and control:

Diseases such as collar rot and seedling web blight caused by *Rhizoctonia solani*, as well as leaf spots from *Colletotrichum dematium* and *Cylindrocladium ilicicola*, have been observed on *Melia dubia* seedlings in the nursery. Both pathogens create identical symptoms, with the sickness initially manifesting as little pin prick wounds that are pale brown in colour, which subsequently develop to form circular necrotic lesions.

If the attack is strong, the infection will spread across the entire leaf lamina. Early leaf loss is observed in potted seedlings. Both foliage diseases can be managed by applying Carbendazim at a concentration of 0.1% through foliar spray every two weeks and soil drenching every week.

General management of diseases and pests in seedlings:

- Immerse seeds in fungicide solutions for 12-24 hours prior to planting. Fungicides such as Benlate, Ridomil, Bavistin, and Thiram are used in agriculture.
- Spray the seedlings every 14 days with a diluted solution of sodium hypochlorite or fungicide during the first month, and then as advised by a pathologist.
- Avoid replanting seedlings in a medium where another seedling has perished.

Disorders *Melia dubia* plantations:

Yellowing (Nutrient deficiency):

Symptoms:

- Leaf yellowing and desiccation.
- Slow development results in a slender stem and decreased final wood volume.

Management: Implementing Integrated Nutrient Management (INM) techniques Providing enough irrigation and drainage facilities.

Disease infestation in *Melia dubia* plantations:

1) Fungal wilt (*Fusarium solani*)

Symptoms:

- Yellowing, drooping, and drying of leaves/branches /whole seedling.
- Browning of vascular tissues with no recovery after irrigation.
- Death of seedlings.

Management:

- The soil or potting media used for growing seedlings should be completely dried in the sun to eliminate any infection-causing propagules.
- Installing insect-proof nets around the nursery.
- Apply copper oxychloride 50% WP at a rate of 2 g per litre of water to heavily infected soil.

2) Decline and Dieback

Melia dubia in certain regions of South India experience early decline and dieback, a significant issue attributed to various sources. Drought and inappropriate silvicultural practices are key factors contributing to the early loss of trees.

The causal organisms are *Armillaria fumosa, Botryosphaeria spp., Fusarium oxysporum, Neofusicoccum grevilleae, Leptographium, Septoria musiva and Diaporthe phaseolorum*

Symptoms:

- Defoliation, stem cracking, and bark peeling.
- Desiccation and mortality of mature trees over 15 years old.

- Presence of secondary invaders such as termites, shot hole borers, and fungal fruiting bodies on affected trees.

Management:

- Protect trees from insect or root damage and prevent wounds.
- Lime coating applied to the bases of trees.
- Apply copper oxychloride at a concentration of 2 grams per litre to saturate the soil.
- Implementing integrated nutrient management (INM) approaches. Selecting appropriate place for planting and utilizing host germplasm that is resistant to disease.

3) 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.

Management: lndofil M-45 or Blitox fungicide application can control the problem.

4) Root rot disease:

- *Ganoderma sp.* causes yellowing of leaves in six-month-old seedlings, which then fall off, resulting in plant drying.
- Symptoms include yellowing, wilting, undersized leaves, and dead branches.
- Other signs are slow development and death of lower leaves.
- Infected trees are prone to falling during rainstorms or windy periods.

Management:

- To promote healthy growth, maintain excellent cultural habits by preventing water accumulation around the base of the tree.
- Avoid causing harm to tree trunks and roots, since even minor wounds from mowers and trimmers can lead to infection.
- Elimination of deceased trees, fungal structures, and proper disposal.
- Apply Propiconazole 25% at a rate of 1ml per litre with irrigation water.

CONCLUSION

Melia dubia tree faces threats from several diseases that can adversely affect its health and productivity. Key diseases include leaf spot, root rot, and fungal infections, which may hinder growth and yield. This article focuses on identifying the main pathogens responsible for these diseases, evaluating their effects on tree health, and investigating potential management strategies. By gaining insights into the disease dynamics associated with *Melia dubia*, we aim to promote sustainable cultivation practices and support the long-term success of this economically significant species. Effective disease management will enhance resilience and maximize the benefits derived from Melia dubia in agricultural systems.

REFERENCES

Chavan, S. B., Vishnu, R., Kumar, N., Kumar, D., Sirohi, C., &Handa, A. K. (2021). Melia dubia. *Indian Farming*, *71*(06), 07-11.

Krupalini, V., &Janardhana, G. R. (2024). Diaporthephaseolorum causing dieback disease on Melia dubia cav. in Karnataka state (India). *Archives of Microbiology*, *206*(3), 92.

Pandey, A., Juwantha, R., Chandra, S., Kumar, A., Kannojia, P., Khanna, D., ... & Pandey, S. (2018). First report of Fusarium solani causing wilt of Melia dubia. *Forest pathology*, *48*(1), e12398.

Pest and Disease management in *Melia dubia* plantation- ENVIS Report

Plant diseases in Agroforestry – A Ready Reckoner