



FOREST LANDSCAPE RESTORATION PROJECT

ACIAR ASEM/2016/103 Enhancing Livelihoods through Forest & Landscape Restoration



YOLANDA MANGAOANG

COMMON TREE NURSERY PEST AND DISEASES IN BILIRAN PROVINCE

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FOREWORD

The National Greening Program of the Philippine Government is a great stride toward rehabilitating the denuded watersheds in the country. The program under the Aquino administration was launched in 2011 and aimed to plant 1.5 billion trees in 1.5 million hectares of land. There are however many challenges facing the current program that need to be addressed some of which include pests and diseases affecting the germplasms or planting stocks in the tree nurseries. Thus, the work of Prof. Yolanda Mangaoang is very helpful to address such problem. She did a considerable assessment on this aspect within the Island of Biliran specifically on the identification of the prevailing pests and diseases, their characteristics and local control strategies. I therefore highly recommend the humble work of Prof. Mangaoang for the readers to get insights on how to eliminate or control the existing pests and diseases within tree nurseries in Biliran.

YAKAL

(*Shorea astolysa* Foxw.)

12.1 Mite Injury in Yakal



Causal Agent: Gall mites

Damage: Curling of leaves, browning and gall formation on the underside, yellowing of upper surface

Underlying Factors: Overcrowding of plants; poor ventilation; shading; over mature plants; weedy condition in the nursery; dusty conditions and hot weather

Management Options: Observe sanitation; maintain proper spacing of seedlings; avoid dense canopy that will provide habitat for gall mites; spray with forceful jet of water on the underside of leaves to dislodge mites; heavy infestation calls for chemical application

10.4 Hopper Damage



Causal Agent: Leafhoppers

Damage: Stippling of the leaves characterized by white pale spots and vein necrosis due to feeding

Underlying Factors: Too dense canopy and overcrowding of plants; dry conditions; hot weather; weedy surroundings

Management Options: Practice sanitation of surroundings; eliminate weedy areas around nursery; water plants adequately preferably in the morning; observe row spacing of pots; provide trap plants or attractants to divert hoppers from nursery seedlings

TO-OG

(Petersianthus quadrialatus (Merr.))

11.1 Mirid Bug Damage

Causal Agent: Mirid bug, *Helopeltis*

Damage/Symptom: Membranous, necrotic circular spots on the shoots

Underlying factors: Luxuriant succulent growth; overcrowding; weedy areas

Management Options: Remove weeds that serve as alternate hosts; avoid excessive fertilization; provide sticky traps



INTRODUCTION

One attribute of a high quality tree seedling reared in the nursery is its being free from pests and diseases. A healthy seedling will have a good head start when out planted in the field. Because it is healthy and strong, the seedling can better withstand adverse conditions in the course of its growth and development in the plantation. Knowledge of pests and diseases occurring in the nursery is vital for their prevention and control.

Pest refers to any living organism that causes damage on crops, trees, or properties of man. This could be an insect or any arthropod, weed, vertebrate pest, mollusk, or disease-causing organism called pathogen such as bacterium, fungus, virus, and nematode

Damage caused by pests in tree nurseries can affect seedling growth in various ways. Arthropod pests such as insects consume plant tissues leading to loss of plant parts, holes, bores, tunnels, galleries, or suck plant sap resulting to drying and withering of plant parts. Pathogens like fungi, viruses, bacteria, and nematodes cause disease, which interferes with plant physiological processes resulting into symptoms such as leaf spots, rots, wilts, yellowing, mosaic, and others. Weeds cause damage by means of competition for light, nutrients, water, and space or they may serve as alternate hosts for many pests. Vertebrate pests and mollusks attack sown seeds or young seedlings by direct feeding.

It is important to note that aside from pests, non-living agents may also cause injury or stress to crops and trees leading to their unhealthy state. Extreme environmental factors such as too low or too high temperature, water deficit and high moisture stress, low or intense sunlight levels, nutrient deficiencies and toxicities, among others, can either directly compromise plant health or constitute underlying factors that enhance development of biotic diseases.

Many pest and disease problems can be prevented or controlled through careful monitoring and early detection procedures. Recognition of pests and diseases and their corresponding damage is an integral part of monitoring and detection of severity and/or incidence and forms a basis for the choice of effective nursery management options.



AURI

(*Acacia auriculiformis* A.Cunn. ex Benth.)

1.1 Powdery Mildew



Causal Organism: Fungus, *Oidium sp.*

Symptoms: Patches of white or gray cottony superficial growth, sometimes entirely covering leaf surface

Underlying Factors: Hot dry weather; cool nights; shaded conditions; overcrowding of seedlings; poor ventilation

Management Options: Avoid overcrowding to provide adequate air circulation; minimize shade and provide sufficient sunlight; avoid over fertilization; apply fungicide if severe; practice sanitation by burying infected leaves

1.2 Thrips Damage

Causal Agent: Thrips

Symptoms: Curling and elongation of shoots, scabby texture, leaf deformation

Underlying Factors: Overcrowding, luxurious growth; shading; cool, dry conditions

Management Options: Maintain wider spacing; avoid high N fertilization; provide adequate sunlight exposure and water



NARRA

(*Pterocarpus indicus* Willd.)

10.2 Narra Orange Leafspot



Causal Agent: Fungus

Symptoms: Tiny orange, rust-like flecks evenly distributed on leaf surface, severe infection leads to drying and dropping of leaves

Underlying Factors: Poor sunlight exposure; too close spacing, high relative humidity; and poor sanitation

Management Options: Provide moderate exposure to sunlight; avoid crowding of plants to maintain optimum relative humidity and ventilation; maintain sanitation; and dispose infected leaves properly

10.3 Narra Tar Spot

Causal Agent: Fungus, *Phyllachora pterocarpi* H. Syd.

Symptoms: Tiny, circular, raised, single, superficial, black dot-like stromata on leaf surface accompanied by yellowing

Underlying Factors: Wet leaves during night time; dense canopy; shaded leaves; poor ventilation

Management Options: Avoid excessive watering at night; maintain adequate ventilation; provide moderate exposure to sunlight



MANGIUM

(*Acacia mangium Willd.*)

9.1 Red Spider Mite Damage



Causal Agent: Red spider mites

Damage/Symptoms: Red scabby lesions on leaves

Underlying Factors: Hot and dry conditions, too close spacing; poor ventilation; weedy areas that serve as habitat

Management Options: Observe proper spacing of seedlings; provide adequate water to plants; avoid over mature plants; apply forceful jet of water to dislodge mites; remove weedy areas

AURI

(*Acacia auriculiformis A.Cunn. ex Benth.*)

1.3 Scale insect



Causal Agent: Scale insect

Damage symptoms: Drying of affected areas, water-stressed, slow growth

Underlying Factors: Warm weather, shaded condition, succulent plants

Management Option: Removal of infested parts; expose seedlings to diffused sunlight; avoid shading; harden plants to better resist scales attack

NARRA

(*Pterocarpus indicus Willd.*)

10.1 Narra Black Ray Leafspot



Causal Agent: Fungus, *Aldona stella nigra* Rac.

Damage/Symptoms: Round yellow spots on the leaves, becoming brown and dry as they enlarge and developing black raylike fungal stromata; severe infection leads to defoliation

Underlying Factors: Frequent watering leading to high humidity; too close spacing; poor ventilation, accumulation of defoliated infected leaves on the ground

Management Options: Practice sanitation; observe proper spacing between seedlings to insure ventilation; provide moderate exposure to sunlight; removal and burning of infected leaves; apply commercial fungicides at recommended dosage

BAGALUNGA

(*Melia dubia Cav. (Meliac)*)

2.1 Scale insect



Causal Agent: Fungus, *Pestalotia* sp.

Symptoms: Irregular necrotic spots with gray center, yellowing, defoliation

Underlying Factors: High relative humidity; wet leaf surface at night time; poor ventilation; shading; infested soil

Management Options: Avoid watering in the late afternoon that will leave the leaf surfaces wet at night; improve seedling nutrition; observe sanitation; place seedlings on raised beds to avoid splashing of spore-infested soil; application of fungicides in severe cases

BAHAI

(*Ormosia calavensis* Azaola ex Blanco)

3.1 Thrips



Causal Agent: Thrips

Damage: Galls on the leaves, becoming necrotic and creating holes when severe

Underlying Factors: Weedy condition, overcrowding; close spacing and varied plant heights; dry and dusty condition; over mature plants

Management Options: Removal of coarse vegetation; avoid overcrowding, put nursery away from dusty roads; provide adequate water

DAO

(*Dracontomelon dao* (L.) Blume)

4.1 Leafspots

Causal Agent: Fungus, *Pestalotia* sp.

Symptoms: Tiny circular gray spots with dark border, black dot-like specks at the center

Underlying Factors: Wet condition, spore-infested soil, poor ventilation, shading

Management Options: Avoid overwatering, provide diffuse sunlight and adequate ventilation, remove fallen infected leaves from the ground



MAHOGANY

(*Swietenia microphylla* King)

8.1 Mahogany Bacterial Leafspot



Causal Agent: Bacterium

Symptoms: Water-soaked, round to angular, black spots with yellow halo

Underlying Factors: Frequent watering; high N fertilization; overcrowding; shading; poor ventilation

Management Options: Maintain optimum humidity and ventilation; avoid excessive fertilization; provide ample exposure to light; maintain row spacing of seedlings and sanitation

8.2 Mahogany Leaf Scorch

Causal Agent: Too much exposure to sunlight

Damage: Sunscalding, burning of leaves

Underlying Factors: Luxuriant growth due to high N fertilization; sudden prolonged exposure to sun

Management Options: Avoid excessive fertilization; provide moderate exposure to sunlight at seedling stage



GMELINA

(*Gmelina arborea* Roxb.)

6.2 Mite Damage



Causal Agent: Mites

Damage: Pale yellow to white areas on leaves due to sucking mites

Underlying Factors: Too much shade, hot, dry and dusty condition, weedy areas, crowding of plants

Management Options: Apply water on the pathways; provide moderate exposure to sunlight; maintain optimum spacing; eliminate weedy areas; apply insecticidal soap during heavy infestation

IPIL-IPIL

(*Leucaena leucophala* L.)

7.1 Psyllids Damage



Causal Agent: Psyllids

Damage: Folding and drying of affected leaves, discoloration and defoliation

Underlying Factors: Warm weather, succulent shoots, close spacing, poor aeration

Management Options: Maintain optimum spacing, provide ventilation, adequate water

FALCATA

(*Paraserianthes falcataria* (L.) Nielsen)

5.1 Mealybug & Sooty Mold Manifestation



Causal Agent: Mealybugs and sooty mold

Symptoms: Drying of affected parts, scorched appearance, accompanied by presence of sooty mold or dark mildew living on the honeydew secretions by mealybugs

Underlying Factors: Warm weather; over watering; and over fertilization

Management Options: Remove mealybugs by handpicking if light infestation; spray with insecticidal soap or any short-lived natural pesticide if heavy infestation; provide optimum fertilization and adequate watering

GMELINA

(*Gmelina arborea* Roxb.)

6.1 Grasshopper Damage



Causal Agent: Grasshopper

Damage: Circular cuts along leaf margin

Underlying Factors: Weedy areas harboring herbivorous insects, lush growth due to high N fertilization conducive to feeding insects; dense canopy promotes feeding; warm sunny weather favors population

Management Options: Remove weedy areas and coarse vegetation surrounding nursery; maintain optimum spacing between seedlings; sort seedlings according to size to avoid hiding places for the insects; harden seedlings to provide better resistance to attack; provide optimum shade; maintain plants that harbor natural enemies such as zinnia, marigold and periwinkle