



INSECT PESTS AND DISEASES OF COMMERCIAL TREE SPECIES IN KENYA: STATUS AND MANAGEMENT

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Presentation Outline

Section 1

- Pests of Major Plantation Tree Species in Kenya
- Management Options

Section II

- Diseases of Major Plantation Tree Species in Kenya
- Management Options

- Challenges in pests and diseases management
- Conclusion and recommendations
- Way Forward

Introduction

- **Forest plantations are owned by the government, large/private companies and woodlots owned by individual farmers.**
- **Increasing demand for wood and its products has created an impetus for investment in commercial forestry.**
- **Key species in commercial forestry in Kenya include; Pinus, Eucalyptus, Cupressus, Grevillea, Casuarina and Melia species.**
- **For maximum productivity in Commercial forestry investments an Inventory of Pests and diseases for commercial tree species and their management options is an important tool.**



Introduction Cont'd

- A desktop review and compilation of the information from various sources and consultation with regional experts for this tool development.
- The purpose of this document is to collate the available information on insect pests and diseases of major commercial forestry tree species and their management options.
- The report provides information on insect pests or diseases, symptoms of its damage, possible management strategies to help stakeholders identify and mitigate the pests.
- The document plays a key role in guiding tree growers and foresters on issues of insect pests and diseases in commercial forestry.



Major Insect Pests Documented In Kenya

Eucalyptus snout beetle, *Gonipterus scutellatus*



Adult beetle



Damaged leaves and shoots

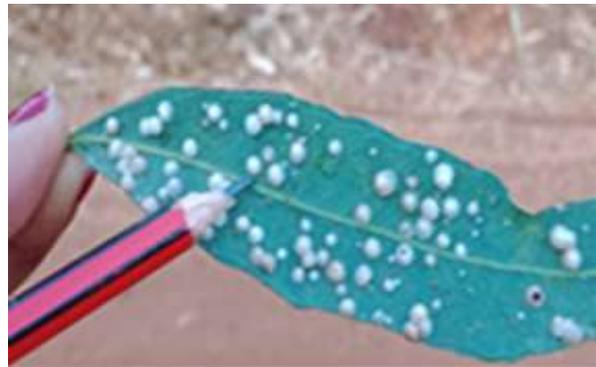


Anaphes nitens

Red Gum Lerp Psyllid, *Glycaspis brimblecombei*



Adult and eggs



Damage on leaves



Adult wasp *Psyllaephagus bliteus*

Blue Gum Chalcid, *Leptocybe invasa*



Adult Chalcid



Damage on leaves and Canopy



Megastigma spp.

Winter Bronze Bug, *Thaumastocoris peregrinus*



Eggs, Nymphs and Adult bug



Adult *Cleruchoides noackae*

Cypress Aphid, *Cinara cupressivora*



Colony of aphids on twigs



Browning Cypress tree canopy



Pauesia juniperorum

Pine Woolly aphid, *Pineus boernerii*



Woolly aphid on pine shoots

Black pine aphid, *Cinara cronatii*



Section II

Diseases of Major Commercial Tree Species in Kenya

- Environmental and management changes result in disease occurrence in plants
- Disease reduce both quality and quantity of expected goods and services
- The actual value of losses have not been quantified in Kenya due to lack of a coordinated system for the same

Types of Tree Diseases by Growth Stages

- Seeds: Seed rots, molds, poor germination
- Seedlings: leaf, root and stem diseases
- Mature trees: stem, branch, twigs, flower and fruit diseases
- Construction materials: stains, rots, brown and white rots

Major Diseases of Commercial Tree Species

Seeds and seedlings



Fusarium rots



Clean germinating Melia seeds



Powdery mildews on Eucalyptus



Damping off of pine seedlings in a nursery

Casual agent: Species of Pythium, Fusarium, Botrytis, Rhizoctonia and Alternaria

Armillaria root rot disease is a global problem



P. patula infected by Armillaria sp.



Armillaria on Cypress



Armillaria on *P. radiata*

Management option

- Use fungicide treatments
- Infected trees removed including the stumps.
- Remove infected material

Major current diseases of Eucalyptus ...1

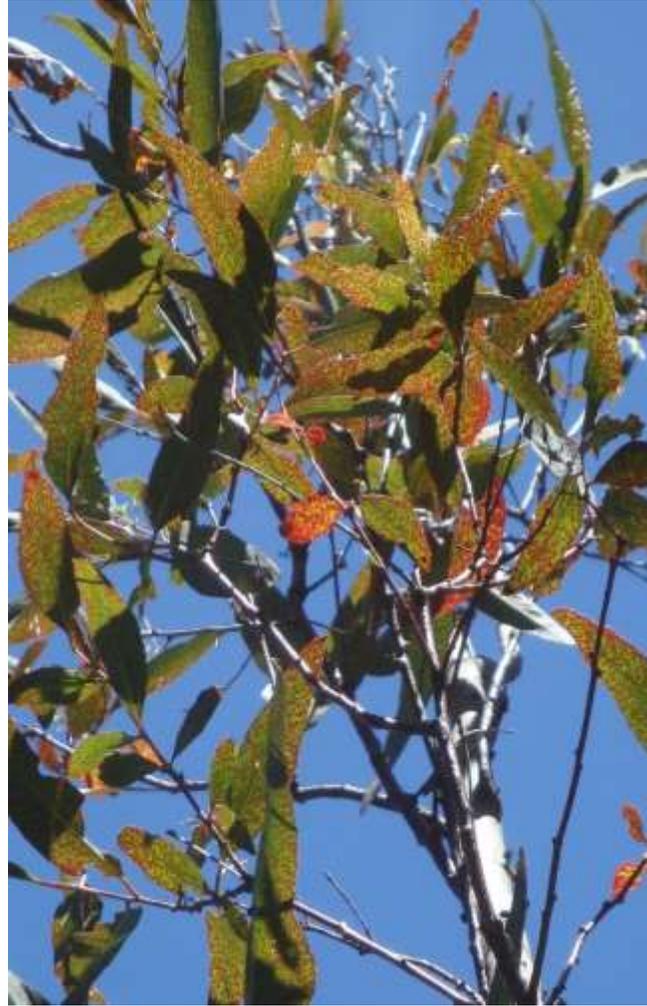


Botryosphaeria canker

Management options

- Mainly through cultural practices: removal of infected material
- Sterilize tools from one tree to another during management
- Match tree species to suitable sites;
KEFRI_Gatsby Species Site Matching App (KEFRIApp)
- Disease resistant varieties

Teratosphaeria canker of Eucalyptus clones...2



Spread from SA through clonal materials

Canker Diseases in Eucalyptus Plantations ...3



Cracked, flaring bark caused by *C. austroafricana* on older *E. grandis*



Pycnidia of *C. austroafricana* on bark of *Syzygium cordatum*



Black perithecia of *C. austroafricana* with exuding spores at the necks

Chrysoporthe canker disease causes death of Eucalyptus in plantations

- Reported on Syzygium species in Kwale within the same region

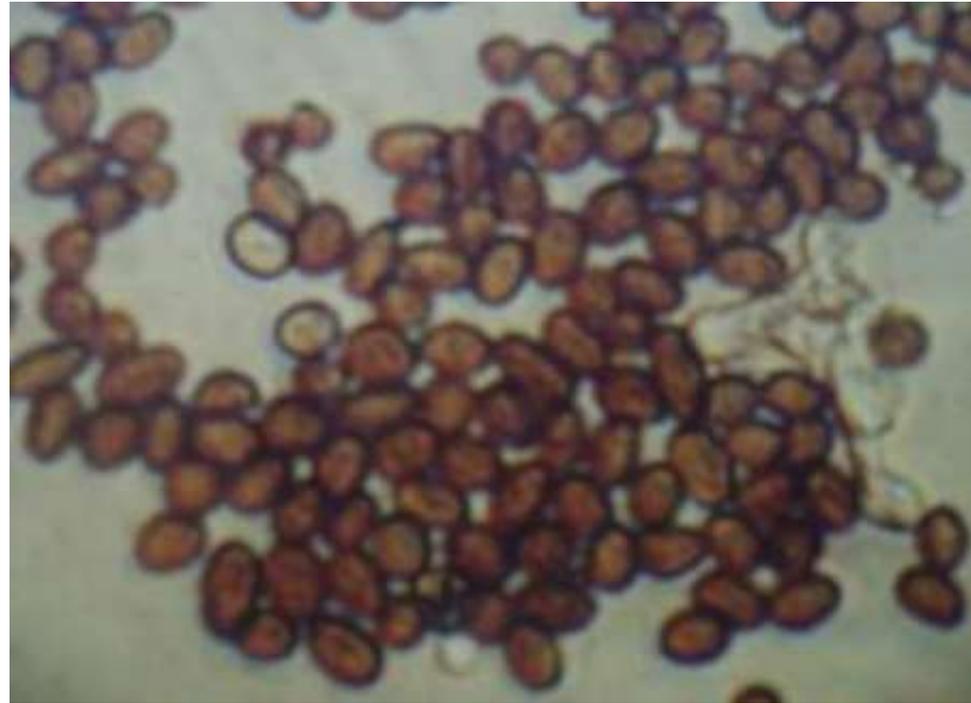
Management option

- Use tolerant hybrid clones/species

Casuarina Diseases



Bark blister disease on *C. equisetifolia*



Trichosporium vesiculosum spores

Casuarina wilt (Bark blister disease)

First reported in Kenya in 1995 on an International provenance trial in Malindi Kilifi County
Management option

Bamboo diseases: Not a serious threat



Healthy



Blights



Dieback



Molds



Stem cankers

Challenges in IPM strategies implementation for Commercial forestry in Kenya

- Inadequate capacity in identification and prevalence levels of some key diseases not yet identified and determined.
- Management options of some key pests and disease not known or not implemented.
- Narrow active ingredient termiticides range for use against termite management; need to explore more
- Low understanding of population dynamics and economic impact of some pests/disease therefore inadequate management options
- Few host resistant studies of key pests/diseases to guide management strategies
- Inadequate sharing of information with quasi-related institutions to fast track IPM strategies
- Lack of funding of IPM research activities and development of management options.
- Lack of implementation of phytosanitary measures and free movement of planting materials within the region to help in spread and invasion

Conclusions and recommendations

- A wide range of economically important insect pests and diseases have been reported on commercial tree species in Kenya and their impacts need to be quantified
- Increased emergence of exotic insect pests/diseases in the country in the last two decades can limit the success of commercial forestry, therefore intensive IPM is necessary
- Create awareness on appropriate management strategies such as cultural methods, classical biological control, chemical control and use of resistant host trees
- Institute close collaboration between the private forestry sector players and research on insect pests and diseases.
- Need for resources to implement KEFRI IPM strategy 2018-2022 for the development of technologies that are geared towards the identification and implementation of sustainable management strategies for pests and diseases in commercial forestry in Kenya.

Way Forward

- KEFRI to continue development of effective and appropriate management strategies for emerging pests and diseases to mitigate economic losses.
- Create awareness and information dissemination on insect pests and diseases to stakeholders in commercial forestry through available decision support systems.
- Need to establish a National Forest Health Centre at KEFRI to coordinate Forest Health programs in Kenya.
- KEFRI to continue conducting research and development activities with stakeholders for sustainable commercial forestry.
- Private commercial forestry sector to contribute research funds on development and implementation of management strategies of insect pests and diseases through a cooperative programme

THANK YOU FOR LISTENING

