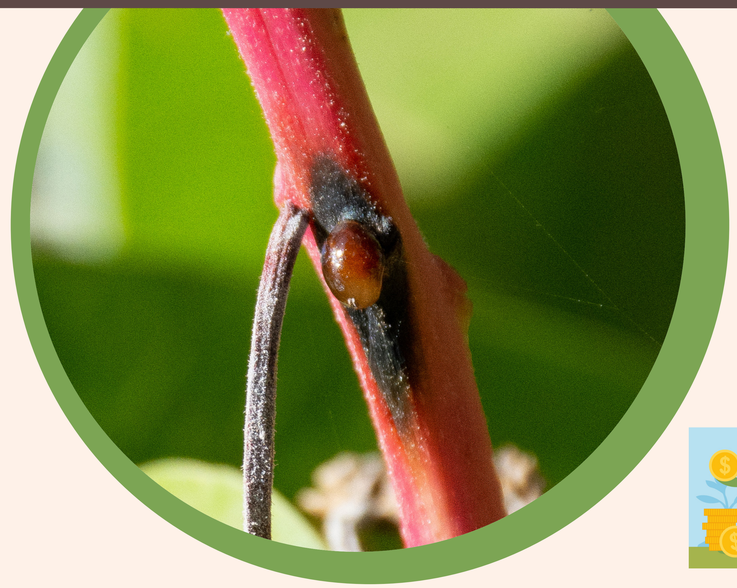
Regreening Africa

TREE PESTS AND DISEASES:
A CRISIS FOR AGROFORESTRY-BASED RESTORATION IN RWANDA

Background information

- In 2011, Rwanda committed to restoring 2 million hectares of degraded and deforested land in a global effort by 2030 — it seemed like a daunting task.
- By 2018, Rwanda, along with South Korea, Costa Rica, Pakistan, and China, was regarded one of the leading countries in the world with its successful restoration program.
- In line with national targets, the RA project has similar ambitious goals of restoring & transforming degraded ecosystems.
- The realization of this goal is through tree planting and FMNR. Tree planting is the main approach, and a large amount of high-quality germplasm is required!
- Multiple tree species are being promoted, but farmers have a strong preference for exotic species including food tree species e.g mango, avocado, citrus spp, and tree tomato- for financial and food reasons.



Despite strong background in restoration program, major challenges

- Availability of diverse tree species seeds is limited, posing the risk of restoration based only on a handful of species.
- Recent outbreaks of native and non-native pests and diseases affecting trees, more on fruit trees, jeopardize restoration efforts and pose a threat to livelihoods and food security.

This is expected to worsen due to climate change, increased trade, porous borders, poor quality germplasm, human movement & intensified agriculture to meet food and cash demands of a growing population

Joint efforts are needed, regionally and nationally to build capacity to combat this menace

Design Technical Implementation (DTI) intervention

Capacity building of:

- ToTs (WVR technical team and cooperative leads) in partnership with RAB- Rwanda Agriculture Board, ICRAF GHU- ICRAF Germplasm Health Unit. RFA-NTSC-Rwanda water and Forest Authority (RFA) National Tree Seed Centre (NTSC), with aim to understand the impact, identification and mitigation tree pest and diseases.
- ToTs (WVR technical team and cooperatives leads) in partnership with RFA-NTSC on quality seed sourcing and procurement, with aim of quality sourcing of germplasm and linkages to local seed center
- Field Visit to fruits orchards for pest and disease assessment and discussion with farmers.
- From 2 trainings, 19 ToTs have been trained, such trainings will be replicated to increase knowledge through multiplier effect

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Some of pests and diseases observed on farms

- Native and non-native pests and disease with wide host range were observed on farms.
- Some of pests and diseases observed threatening main trees species on farms include:
  - Mealybugs on *Markhamia lutea*, *Mangifera indica* and *Citrus spp*.
  - Aphids on citrus spp and tree tomato
  - Fruit fly and scale insects on mango
  - Canker and termite damage on *Grevillea robusta*
  - Mosaic virus on cassava and tree tomato
  - Anthracnose on mango and tree tomato
  - Scab disease on Avocado
  - From lit review, there is occurrence of bio invasions of bronze bug and eucalyptus gall wasp on eucalypts.

Pest and disease observed on farms

Mango with mealybugs

Larva of citrus butterfly feeding on citrus leaves

Anthracnose on Tamarillo

Mango fruit damage by fruit fly

Whiteflies on Tamarillo leaves

Scale insects on Mango fruit

Some of root causes for the pests not controlled

Different ways pests spread

- Spread of new pests e.g mealy bug and mosaic viruses- Spread through markets and material exchange

Poor farm management

- Outbreaks going unnoticed due pest have multiple hosts
- Limited knowledge of pest management solutions
- Farmers do not follow advice
- Lack of practical solutions

Poor quality planting material

- Counterfeit chemicals
- Poor soil fertility, nutrient management and tree management
- Misuse of chemical and over-reliance on one chemical over time
- Seeds and other vegetative material spread of mosaic virus in tree tomato could be attributed to sharing of diseased planting material

Lack of collective action

- An effective management of some pests requires concerted effort and collective action

Climate change

Grevillea robusta

Resinous canker

Termite damage on bark

What are key gaps?

- Knowledge gap on pesticide use
- Insufficient surveillance and pest risk assessment
- Lack of baseline studies on impact of pest and diseases
- Lack of incorporation of tree health strategy in restoration programs
- Insufficient information on current status of trees health,
- Outbreaks going unnoticed
- Low uptake of IPM
- Poor quality planting material
- Poor farm management
- Difficulty recognizing pest and disease
- Undocumented pest of indigenous trees
- Lack of collective action in management

Recommendations

- Document pests and diseases of Agroforestry trees and develop mitigation strategies
- Promotion of sustainable models to reach out to farmers with pest and disease management services
- Strengthen the capacity of agriculture extension services
- Introduction of cost-efficient information systems to detect and monitor pests and disease
- Enhancing linkages with relevant government agencies e.g. RAB, CABI, ICIPE
- Incorporate tree health in tree-based strategies
- Collaborate and partner with other pest management initiatives
- Training and capacity building

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