Appropriate use of banana ICM production methods as a way for safe conservation and exploitation of *Musa* genetic resources

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Importance of banana in Rwanda

- Grown in all the provinces of Rwanda
- One of the highest consumption in the Region
  - 258 kg per capita per year
- Large occupation of arable land
  - 23% of arable land
- High genetic diversity
  - More than 100 cultivars
- Diversity of use
  - Cooking varieties
  - Beer varieties
  - Dessert varieties
Various constraints to be considered for development of banana sector

Â Poor management/agronomic practices
  » Lack of poor fertilization
  » Inappropriate density
  » Development of weeds

Â Prevalence of pests
  » Banana weevils

Â Effects of diverse diseases
  » BXW
  » Different Mycosphaerella leaf spot diseases
  » Paname disease
ICM methods as the suitable option for improving the production conditions

**Step 1:** assess the field prevailing constraints

**Step 2:** Improving the agronomic practices

- To improve the global health of banana plants
- To increase the productivity
- To maintain the ecological role of banana: erosion control
- To keep the genetic diversity and ensure sustainability
Various components of the evaluated ICM package: banana rehabilitation

- Proper weeding
- Management of suckers’ density
- Appropriate organic fertilization
- Filling the gaps through planting new suckers
- Mulching
- Control of banana weevils through simple trapping systems
- Strict control of vascular diseases
- Integrated management of sigatoka leaf spot diseases
ICM implementation: Proper weeding

- Weeds cause damages to banana health and look
- They compete for nutrients
- They can host pests for banana
- They must be eliminated by weeding
- Their development is then restricted by mulching
Appropriate management of suckers’ density

- High number of suckers increases competition for nutrients
- Their density must be reduced to a maximum of 3 suckers
- All the non-selected suckers are strictly eliminated by physical destruction
Organic fertilization: quality of used fertilizers
Suitable organic fertilization

- Well decomposed manure is incorporated in the tranches and covered by soil
- In case of insufficient manure, chopped pseudostems can be mixed with the few manure
Filling the gaps in the banana plot

• In case of low coverage of the plot, new suckers have to be planted
• Distances between banana plants: 3-4 m
• Holes of 60 cm in depth and 90 cm in diameter are used
Mulching

- Application of mulch is crucial in banana rehabilitation
- Allows control of weeds
- Reduce erosion impact
- Limits damages of drought
- Increases progressively the soil fertility
Weevil control: Traping the adults
Control of BXW

- BXW Control through removal of affected plants and all suckers issued from them
- Removed plants are chopped and buried
- The used tools must be sterilized before leaving affected plots
Control of Sigatoka leaf spot diseases
Control of Sigatoka leaf spot diseases

- Leaves are removed and placed on the soil

- The leaves serve then as mulch & fertilizers
Rapid impact of ICM on banana plot

Non rehabilitated plot

Improved look 1 month after rehabilitation
Better tolerance to drought
ICM methods: significant increase of productivity
Different production parameters

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Increase of productivity: weight per bunch
ICM methods implementation for banana rehabilitation

- Operates whatever the varieties
- Rapid results
  - Variety maintainance
  - Increase of productivity
  - Ecological role of banana
Impact generation

Å Target
  » Majority of banana growers adopting the banana ICM package

Å Extension approach
  » FFS approach
  » CMC

Å Qualified operational resources
  » 600 FFS facilitators and co-facilitators

Å Mobilization of farmers
Å Deployment of qualified FFS facilitators
Å Practical field implementation
Operational process and achievements
ICM package through FFS and CMC

- Organize FFS training and related field activities: 14,213 farmers & 1,122 ha
  » Different farmers groups formed
  » Trained by FFS facilitators/co-facilitators
  » Implementation in FFS plots and in farmers’ plots

- Promote CMC actions: 58,740 farmers & 2,069 ha
  » Sensitization of local leaders & Mobilization of farmers
  » Deployment of FFS facilitators/co-facilitators
  » Implementation by the communities

- Total achievements: 72,953 farmers & 3200 ha
Conclusions and recommendations

- By the ICM package: easy to conserve the genetic diversity
  - Through increasing variety productivity
  - Farmers interested to keep the different varieties

- Banana rehabilitation through ICM
  - Efficient system
  - Rapid increase of productivity

- Different banana varieties
  - Actively maintained in safe conditions

- Recommendation: expanding ICM use
  - Identifying the sites to be rehabilitated with ICM
  - Deployment of FFS facilitators & farmers’ mobilization
Thanks for your attention