

TOOLS4SEEDSYSTEMS:

WORKING TOWARDS RESILIENCE THROUGH ROOT, TUBER AND BANANA CROPS IN HUMANITARIAN SETTINGS



OMONDI BONAVENTURE AMAN • TOOLBOX FOR SEED SYSTEMS VIRTUAL TRAINING • MAY 25, 2023

BANANA & PLANTAIN SEED PRODUCTION PRACTICES







Musa spp : Banana and Plantain







Banana and Plantain: diversity

- Differences: economical and historical
- Banana and plantain one crop multiple uses
- Variations in starchiness
- Growth habit dominance of the main stem
- Fruit characteristics
- Plantains more lowland forms, (not clear cut)
- Shared cropping methods
- Shared pests and diseases
- Seed systems are mainly informal between farmers
- Formal seed of high multiplication rates; often safer.



Banana propagation



Banana suckers





Corm fragments





Tissue culture propagation and rooting



Hardening nursery



Site selection for seed multiplication

- Sucker mother gardens
 - Soil fertility
 - Pests and disease risk (Soil, vector borne)
 - Access (and security)
 - Security significant consideration

Hardening Nursery:

- Security
- Accessibility
- Water availability
- Pest and disease risk
- Rooting medium
- Facilities e.g. sterilisation and potting







Selection of varieties and sourcing of seed

• Variety selection:

- Who will plant? Why? Price
- Production systems, adaptability
- Consumption and market price

• Seed sourcing:

- Availability, trusted source, seed
- Quality of seed (seed, mother plant)
- Adaptability (sucker, plantlets?)
- Quantity and timing





Planning seed production



Banana suckers



Corm fragment techniques



Tissue culture propagation and rooting

Delay	Week - months	Weeks	2 – 3 months	4 – 6 months
Proliferation	< 3 – 10 a year	ca 10	10 - 25	>> 1000
Adaptability	Medium to high	need rooting	need hardening	Low @planting
Disease risk	High if informal			Low if indexed
Transport	Low	Medium	medium	Stage dependent



Pest and disease management

• Main pests

- Banana weevils: tunnel in the corm limiting nutrient and water flow
- Nematodes: destroy roots
- Control:
 - Paring to minimise carry over
 - Hot water treatment
 - Trapping
- Main diseases
 - Banana bunchy top disease virus, seed borne, aphid transmitted
 - Bacterial wilt (mostly in East Africa) limited vector borne
 - Fusarium wilt (multiple races)
 - Black/ yellow leaf streak (Sigatoka)



Bunchy top disease



Banana bacterial wilt



Fusarium wilt (TR4!!)



Support tools

Training manuals on Macropropagation: Link

Tumaini App: <u>Google Play Store</u>

BBTD training course: https://classes.afrique-learning.com/

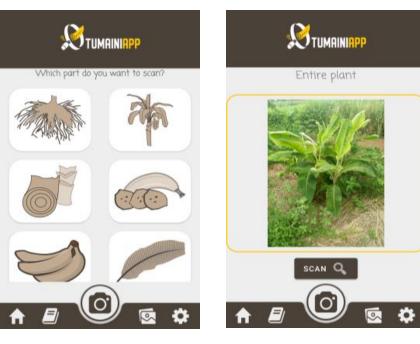
Bacterial Wilt training course: crop health courses

TUMAINI App – Free in Google Playstore

• Online Course on BBTD management (FREE!)

https://classes.afrique-learning.com/

Email: <u>b.a.omondi@cgiar.org</u> (to register)







VPC seed systems concerns

Challenge	Effect	Tweaks and options
Low multiplication rates	Poor timing with the planting season	Mother garden – decapitation, false decapitation
		Low tech micropropagation: corm splits/ bucket system
Bulkiness, transportation	Bulkiness, perishability, loss of vigour	Localized acclimatization nurseries (for TC plantlets)
		Sucker local splitting and macropropagation
Packaging and handling	Space and spoilage during	Trimming roots and leaves
	transportation	Wet gunny bag packaging (fast rooting necessary)
Storage: short shelf life	Rapid perishability in storage,	Suckers, high ability to regenerate, cut off leaves
	loss of vigour during storage	Plantlets: possibility of 2 nd bud/ trim leaves, roots
		Planning – late or early delivery common issue
Disease and pest	Risk of rapid spread of diseases	Match disease risk with distribution rates
transmission	Do no harm engagements!	Disease hazard management steps
		Paring suckers/ sterilize soil and use rich organic matter.
Varietal fidelity	Seed provided not cultivars desired	Local mother garden tweaks to enable association
	Diversity of cultivar desires	Explore labelling details



NTTS

Multiplication rates



Sterilisation



Paring – minimize pest carry over



Sterilisation – corms and media



Protection – keeping off vectors



Logistics – planning and delocalization







Thank you





