CGIAR Research Program (CRP) on Roots, Tubers, and Bananas
Rationale, strategy and impact

Graham Thiele – Program Director
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1. RTB program: rationale
A collaboration of:

+ a wide spectrum research-for-development stakeholders & partners
Our crops

Banana
Plantain
Cassava
Potato
Sweetpotato
Yam
Other R&T
Why Roots, Tubers, and Bananas?

• Major staples (among top 10)

• Cheap sources of energy & nutrients (14-60% daily calories)

• Locally produced/traded (less subject to global grain price fluctuations)

• Backbone of food & income security for 180 million—especially poorest of poor & women
Why Roots, Tubers and Bananas?

RTBs share

- Genetic complexity (> grains), marked consumer preferences for particular varieties
- Vegetative propagation, similar seed systems
- Perishability, bulkiness and post harvest/value chain options

• High potential: > yields & impacts
• Low profile: “women’s crops”

• Under-investment (!)
Cross center collaboration

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<th>PRIMARY CROP EXPERTISE</th>
<th>OTHER ROOTS AND TUBERS</th>
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Program “value added”

To do together what we cannot do separately

- Increased scale
- Greater capacity
- Exploit synergies: genuine “win-wins”
2. Strategy

• Program structure
• Research products
• Partnership
• Gender mainstreaming
Program structure: Integrates 7 Themes

1. Improved access to genetic resources
2. Better varieties
3. Better management of pests & diseases
4. Improved seed systems
5. Better cropping systems
6. Better market access & post-harvest
7. Partnerships Comms/Capacity + Gender
Program structure: Integrates 7 Themes

• Theme 1: Conserving and accessing genetic resources
• Theme 2: Accelerating the development and selection of varieties with higher, more stable yield and added value
• Theme 3: Managing priority pests and diseases
• Theme 4: Making available low-cost, high-quality planting material for farmers
• Theme 5: Developing tools for more productive, ecologically robust cropping systems
• Theme 6: Promoting postharvest technologies, value chains, and market opportunities
• Theme 7: Enhancing impact through partnerships
RTB: shared research products

- Common processing traits
- Heterozygote hybrids
- Models to predict degeneration and pathogen virulence
- Lower cost, more effective mass propagation methods
- Expanding utilization, reduced perishability
Impact pathways: what probability of impact?

![Graph showing impact pathways from research activity to outcome and impact over time.]
3. Impact
Impact pathways: which product?

**PL 1. Breeding tools, strategies, and approaches**
- Novel gene constructs
- New breeding methods with improved trait capture
- More efficient screening methods for drought, micronutrients

**PL 2. Trait capture and gene discovery**
- Global phenotyping network for key quality and root traits and responses to major stresses, including climate change

**PL 3. Population development and pre-breeding**
- Advanced populations with market quality and disease resistance include traits for micronutrients
- Base populations with drought and heat tolerance
- Support populations with new sources of disease resistance

**PL 4. Cultivar development**
- High-yielding cultivars through the identification and exploitation of heterosis
- Cultivars with resistance to abiotic stresses (drought)

**Research outcomes**
- Novel (transgenic) traits used for crop improvement
- Varieties with more rapid yield gains and improved traits available sooner
- Reduced timeframe and expenses for quantification of relevant traits

**Development outcomes**
- Farmers grow varieties with novel durable resistance and added-value traits
- Farmers adopt new varieties in reduced timeframe
- Cultivars with better micronutrient composition grown and consumed

**Impacts**
- Improved health due to increased macro- and micronutrient composition of new varieties
- Increased food security from use of RTB varieties
- Biodiversity conserved through on-farm use
- Increased incomes from marketing varieties with higher value in markets

**Next-users**
- Efficient use of research facilities worldwide and improved selection criteria for RTB improvement
- Agro-ecologically adapted breeding populations for each major RTB in use by NARS for breeding and selection
- NARS use germplasm with higher performance stability in the face of drought and heat
- Breeders use wide genetic resources in crop improvement programs

**End-users**
- Farmers have more stable yields under extreme weather conditions and in marginal environments
- Farmers better able to cope with new disease challenges
- Farmers experience yield jumps due to genetic potentials of RTB crops
- Higher yielding varieties with increased market value
Impact pathways: what probability of impact?

Impact pathway:

- Research activity
- Output target
- Output
- Outcome
- Impact

Level of influence of Project:

High

C
O
N
T
R
O
L

Low

Research Output

Impact

3 years

10 - 30 years
CGIAR-Comprehensive Africa Agricultural Development Programme alignment (CAADP)

Upstream and downstream complementarities along the impact pathway covered?

- Basic research
- Applied research
- Testing and release
- Technology dissemination

CGIAR + ARIs
NARIs, NGOs, firms
Extension, NGOs, farmers
CAADP: burning questions

• What priorities have been established for technology and innovation investments in African countries?
• What is the aggregate landscape of planned investments across sub-regions or across Africa?
• What are CGIAR (& SROs/NAROs) investment plans? On what themes, where? (by CRP/all CRPs).
• How well do National and CGIAR investment plans align? Can we identify R&D areas that are over- or under-represented relative to national needs?
“Best bets” for impact on poverty and food security from cassava research

• Many possible research options (products)
• Lengthy impact pathway
• Geographic diversity
• Impact on poverty, food security and gender equity
• Resources limited
• Evidence + expert opinion + economic analysis = best bets
• Priority setting guide to decision making
• Alignment with regional, sub regional and national priorities
Key points

1. CGIAR reform created 15 CRPs
2. RTB collaboration of 4 CG centers + other partners
3. Commonalities across root, tuber and banana crops
4. Seven themes
5. Impact pathways and alignment with partners
6. Best bests for research
Thank you