



October  
2015



## RTB-ENDURE: Expanding Utilization through Research

Expanding utilization of roots, tubers and bananas and reducing their postharvest losses

### Waxing and packaging: a cost-effective solution to curb rapid postharvest deterioration of fresh cassava roots?

Cassava farmers and traders in Uganda have to contend with the vagaries of rapid postharvest deterioration of fresh cassava roots in their quest to make money from this crop. This project aims to address this challenge by investigating options for extending the shelf-life of cassava roots and developing business models to process and market the treated roots.

#### What is the problem?

Uganda is the sixth largest producer of cassava in Africa, with an estimated 5.2 million tonnes in 2013. A large amount of cassava is commercialized in the highly perishable fresh form. It is widely recognized that the production, consumption and marketing of cassava are largely affected by the rapid Postharvest Physiological Deterioration (PPD) of fresh roots that starts immediately after harvesting and leads to complete spoilage within a few days. This problem is further compounded by the limited knowledge of and access to shelf-life extension technologies, resulting in high physical and economic losses affecting several actors along the value chain. In fact, farmers and traders find themselves under pressure to sell cassava immediately after harvesting and substantial amount of cassava go to waste when delays occur. As a coping strategy, farmers and traders are forced to lower their selling prices if they are unable to sell the roots within one or two days after harvest. Furthermore, the high perishability of cassava makes challenging for farmers located in remote areas to access more lucrative urban markets

or supply distant processing industries, thus limiting incentives for investment in increased productivity and the emergence of a more commercially oriented sector.

#### What do we want to achieve?

This project aims at testing, validating and promoting the adoption of shelf-life extension technologies so as to reduce postharvest losses and increase market opportunities. The selected technologies will slow down PPD and thereby reduce spoilage of fresh cassava roots. This will enable farmers and traders to obtain higher and more stable incomes while ensuring steady supply of fresh roots to the market.

#### How are we going to make it happen?

The project will strengthen the capacities of farmers, traders, researchers and extension workers to adopt two technologies capable of slowing down PPD and



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*Expanding utilization of roots, tubers and bananas and reducing their postharvest losses (RTB-ENDURE) is a 3 year project (2014-2016) implemented by the CGIAR Research Program on Roots, Tubers and Bananas (RTB) with funding by the European Union and technical support of IFAD.*  
[www.rtb.cgiar.org/endure](http://www.rtb.cgiar.org/endure)

The CGIAR Research Program on Roots, Tubers and Bananas (RTB) is a broad alliance led by the International Potato Center (CIP) jointly with Bioversity International, the International Center for Tropical Agriculture (CIAT), the International Institute for Tropical Agriculture (IITA), and CIRAD in collaboration with research and development partners. Our shared purpose is to tap the underutilized potential of root, tuber and banana crops for improving nutrition and food security, increasing incomes and fostering greater gender equity, especially among the world's poorest and most vulnerable populations.

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The research team with traders harvesting cassava in Kiryandongo district (credit A. Lyagoba)



Fresh cassava roots being prepared for waxing during the training in Colombia (credit R. Kaliisa)

reducing the associated food losses: cassava waxing and high relative humidity storage.

**Waxing:** this method has been proven to extend the shelf-life of fresh cassava roots to about 30 days, allowing for shipping and marketing between continents. Waxing is safe and is widely practiced in Latin America and Caribbean countries for exported fresh cassava.

**Relative Humidity:** research has also proved that storage of carefully harvested, cleaned and treated fresh roots in air tight polythene bags reduces PPD.

The project is piloting two approaches: (i) farmer-led model where farmers will be trained to set up a pack house to trial the two technologies and (ii) trader-led model where a group of traders will set up a pack house, trial the two technologies and also market the products.

**Where are we working and who are we working with?**

We are working along the Kampala-Kabarole axis, with farmers and traders in the districts of Kyenjojo and Fort Portal, and wholesalers in Kampala. The project is led by the International Institute of Tropical Agriculture (IITA) and implemented in collaboration with the National Agriculture Research Organization (NARO), the International Center for Tropical Agriculture (CIAT), the International Institute of Rural Reconstruction (IIRR), Makerere University and private sector players.

**What have we achieved so far?**

A training program was organized by CIAT in Colombia to strengthen the capacities of selected members of the research team in PPD evaluation of cassava roots and expose them to the shelf-life extension technologies. PPD evaluation of a number of Ugandan varieties is underway to identify the most suitable for shelf-life extension. A market and value chain study has been conducted to identify challenges and opportunities along

the fresh cassava value chain, assess the level of postharvest losses and select the sites where to establish the pilot pack houses. Three Master's students have been enrolled for conducting post-graduate research under this project.

**What's next?**

Results from the market survey will be used for the final selection of the market opportunities for treated fresh cassava to focus on as well as to identify the private sector partners to work with. The project also plans to identify more varieties from the Kabarole axis in the near future. Two pilot pack houses will be established where fresh cassava roots will be treated and subjected to waxing and relative humidity storage. Sensory evaluation of the treated roots will be carried out, while socio-economic studies on consumers' acceptability and willingness-to-pay will be conducted. A gender baseline study will also be conducted in the near future to inform the project gender strategy.



Retailers selling piles of fresh cassava roots in Kalerwe market, Kampala (credit S. P. Waigumba)