Ready-to-Scale Technologies from IITA

This toolkit brings together a comprehensive portfolio of technologies developed or promoted by the International Institute of Tropical Agriculture (IITA), aimed at sustainably improving the productivity, climate resilience, and economic value of agricultural systems in Africa. The technologies presented here span the entire agricultural value chain — from varietal developmen...

48 TECHNOLOGIES | CREATED ON MAY 16, 2025 BY TAAT PROFILING TEAM | LAST UPDATED MAY 21, 2025

TECHNOLOGIES IN THIS TOOLKIT

- **KABANA 6H/NARITA7 hybrid**: High yielding and disease tolerant...
- **Marketing Strategies**
- **Biological control of cassava mealybug**
- **EcoCycle Larvae System**: Black Soldier Fly Larvae (BSFL) proteins f...
- **Solar bubble drier**: Inflatable solar dryer for crop drying
- **BSFF**: Organic fertilizer for soil improvement
- **CassQual**: Cassava Seed Quality Management system
- **Cassava EGS Model**: Early Generation Seed Production of...
- **BASICS Model**: A Seed System Model for Cassava Transformation
- **Cassava virus indexing**: Molecular diagnostics for cassava seed health...
- **ME-CASS**: Cassava Seed Monitoring System
- **Capacity Building Strategies**
- **CSAM**: Organized support networks for cassava seed entrepreneurs
- **Cassava Seed System Advocacy and Scaling Model**
- **CSE Model**: Cassava Seed Entrepreneur Business Model
- **SeedTracker**: Digital Tool for Strengthening Seed Governance an...
- **Improved Cassava Varieties**: Market-driven cassava breeding an...
- **Seed Inoculation with Rhizobia**
- **Pre-plant blended fertilizers and nitrogen topdressing for maize**
- **Herbicides Calculator**
- **Six Steps to Cassava Weed Management**
- **Equipment for feed production**: Cassava Peels for Animal Feed...
- **High quality cassava flour and industrial starches**
- **Value-added Processing of Bananas and Plantain**
- **Cassava varieties with high dry matter and starch content**
- **CBC**: Cassava Business Connector
- **Biological control of the pod borer Maruca vitrata with exotic**...
- **NoduMax**: Inoculant for Soybeans
- **Cassava seed-bulking farms**
- **Banana Peels as Feed and Organic Resource**
- **Induced Ripening of Banana for Increased Marketability and**...
- **Aflasafe®**: Aflatoxin management
- **Propagation of Banana and Plantain Disease-Cleaned Suckers**
- **Improved Varieties of Plantain for Tropical Lowlands**
- **In-Vitro Banana Tissue Culture Propagation**
- **Golden cassava varieties (Vitamin A fortified)**
- **Disease resistant cassava varieties**
- **Specialty blended fertilizers for root and tuber crops**
- **Pneumatic Cassava Dryers**
- **Mechanized Cassava Planting and Harvesting**
- **Waxing of fresh cassava roots to extend the shelf-life and increas**...
- **Mobile Cassava Processing Plant**
- **Multi-Crop production system**: Intercropping Strategies for Banana...
- **Spacing and Stand Management in Banana and Plantain**
- **Specialty Fertilizers and Local Blending for Banana and Plantain**
- **SAH cassava**: Semi Autotrophic Hydroponics for Cassava...
- **SAH**: Semi-Autotrophic Hydroponics for yam multiplication
- **Beauveria Biopesticide**: Based on the entomopathogenic fungus...

https://taat.africa/xzl

KABANA 6H/NARITA7 hybrid: High yielding and disease tolerant banana

long lasting banana nicknamed 'kiwangazi' by farmers.

The KABANA 6H/NARITA7 banana hybrid is a high-yielding variety resistant to black Sigatoka, banana weevils, and nematodes. It can produce 57.7 kg per bunch with a potential yield of 60 tons/ha/year. Developed by IITA and NARO, it's a practical solution for farmers, particularly in Uganda, enhancing plantation longevity and economic return.

This technology is validated.

9·8 Scaling readiness: idea maturity 9/9; level of use 8/9

Gender assessment 4

Climate impact 4

Problem

- **Decreased Yield**: Banana plantations have been facing a decline in yield due to various factors.
- **Black Sigatoka Disease**: This leaf spot disease significantly reduces banana yield.
- **Pest Infestation**: Banana weevils and nematodes cause root damage and reduce plantation longevity.
- **Short Plantation Lifespan**: Pests and diseases have been reducing the lifespan of banana plantations, particularly in Uganda.

Solution

- **Disease Resistance**: It's tolerant to black Sigatoka, a leaf spot disease, which helps in maintaining the yield.
- **Pest Resistance**: The hybrid is resistant to banana weevils and nematodes, addressing the issue of pest infestation and root damage.
- **Longevity**: The resistance to common pests and diseases increases the lifespan of banana plantations, solving the problem of short plantation lifespan.

Key points to design your project

The high-yielding, disease-tolerant banana hybrid Kabana 6H (NARITA 7) addresses major challenges in banana production, especially in regions prone to disease and climate variability. By boosting yields and promoting climate adaptation, it enhances food security, reduces poverty, and promotes women's economic empowerment.

To integrate Kabana 6H (NARITA 7) into your project:

- **Collaboration**: Partner with breeders and research institutions to select suitable varieties.
- **Cultivar Selection**: Choose cultivars based on climate, production goals, and market needs.
- **Training**: Provide local training on macro-propagation and agronomic practices.
- **Planting Material**: Estimate planting needs (1111 plants/ha) and use clean materials.
- **Cost**: Budget USD 2,542/ha, including inputs, labor, and delivery costs.
- **Outreach**: Create communication materials to promote the technology.

Cost: $$$ **2,542 USD**
all cost per hectare per year

ROI: $$$ **47.8 %**

57.7 kg per bunch
Real-life yield

60 tons/ha/year
Potential yield

IP
Plant variety protection

IITA and NARO
Michael Batte/Alex Barekye

Commodities

Banana/Plantain

Sustainable Development Goals

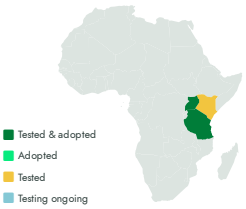
Categories

Production, Improved varieties, Disease resistance, Yield improvement

Best used with

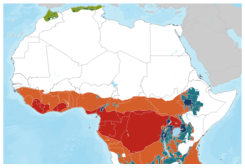
- Propagation of Banana and Plantain Disease-Cleaned Suckers ›
- Intercropping Strategies for Banana and Plantain ›
- Spacing and Stand Management in Banana and Plantain ›
- Value-added Processing of Bananas and Plantain ›
- Banana Peels as Feed and Organic Resource ›

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Marketing Strategies

Sell Smart, Grow Fast

Marketing Strategies is a practical toolkit that helps cassava seed producers improve market access and visibility. It offers guidance on customer targeting, product positioning, and demand-driven marketing. By tackling issues like low awareness, weak customer ties, and poor pricing, it supports seed entrepreneurs, especially those working with vegetatively propagated crops, in building trusted, profitable, and resilient businesses.

International Institute of Tropical Agriculture (IITA) & Sahel Consulting Agriculture and Nutrition Limited

Temi Adegoroye

This technology is pre-validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Gender assessment 4

Climate impact 7

Problem

- **Low farmer awareness** of high-quality certified cassava seeds
- **Preference for traditional planting materials**, limiting demand for certified seeds
- **Weak market linkages** between seed producers and buyers
- **High transport costs**, creating bottlenecks in seed distribution
- **Limited access to affordable certified seeds**, due to high prices and lack of financing
- **Limited reach of traditional marketing channels**, such as radio and extension services
- **Underutilization of digital marketing tools**, reducing visibility and customer engagement
- **Barriers to business growth and seed adoption** for producers of vegetatively propagated crops (VPCs) like cassava

Solution

- **Increase awareness** through campaigns and demo plots.
- **Improve affordability** with flexible pricing and financing.
- **Train seed producers** in marketing and customer engagement.
- **Strengthen distribution** via dealers, cooperatives, and direct delivery.
- **Leverage digital tools** (SMS, radio, marketplaces).
- **Build trust** with branding and certification.
- **Support local marketers** with low-cost promotion strategies.

Key points to design your project

The **Marketing Strategies toolkit** helps cassava seed producers boost visibility, build trust, and increase demand for certified seeds. It supports climate and gender goals by promoting inclusive, data-driven marketing. Key steps include stakeholder engagement, training on marketing and branding, use of digital channels, and monitoring adoption. The toolkit includes ready-to-use materials and can be tailored to local needs with support from partners like IITA.

392 USD

Cost of deploying the marketing strategy

IP

Open source / open access

Commodities

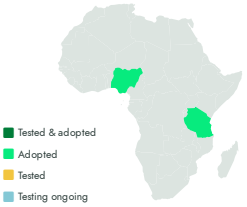
Cassava

Sustainable Development Goals

Categories

Production, Policies

Tested/adopted in



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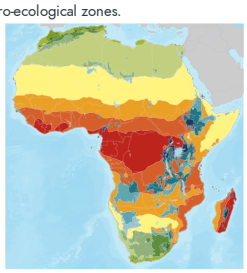


Target groups

Farmers, Processors, Seed companies, Advisory and Extension Services

Biological control of cassava mealybug

Enhancing Cassava Resilience: Targeted Biocontrol with a Beneficial Wasp

Biological control with Anagyrus lopezi uses a natural wasp to manage cassava mealybugs without chemicals. The wasps are mass-reared, released into the field, and they lay eggs on the mealybugs—where the hatching larvae consume and kill the pests. This eco-friendly method has reduced mealybug populations by about 90% in over 20 countries, safeguarding cassava crops and saving farmers...

International Institute of Tropical Agriculture (IITA)
Neuenschwander Peter

This technology is pre-validated.

9·7 Scaling readiness: idea maturity 9/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- **Severe Crop Loss:** Cassava yields were decimated in the 1970s.
- **Famine:** Loss of a staple food led to widespread shortages.
- **Economic Hardship:** Millions of farmers suffered significant financial losses.
- **Ineffective Control:** Traditional pest management methods failed to contain the outbreak.

Solution

- **Natural Pest Control:** A. lopezi targets and kills cassava mealybugs by laying eggs inside them.
- **Restored Yields:** Its action reduces pest numbers by about 90%, allowing cassava crops to recover.
- **Eco-Friendly & Sustainable:** This method replaces harmful chemicals with a long-term, self-sustaining solution.

Key points to design your project

Integrating Cassava Mealybug Biocontrol into National Projects

1. **Pest Identification** – Confirm if the outbreak is due to cassava mealybug (CM) and assess soil and crop conditions that may affect A. lopezi's efficiency. Consult entomologists for accurate identification.
2. **Technical Support & Permits** – Engage IITA for guidance and obtain a quarantine permit ensuring A. lopezi's safety per FAO regulations.
3. **Importation & Release** – Import A. lopezi, conduct quarantine checks, and release it in selected fields under national supervision.
4. **Monitoring & Evaluation** – Track A. lopezi's establishment, spread, and impact on mealybug populations, cassava yield, and farmer livelihoods.

Cost: $$$ **15 000 USD**

Starter cultures, rearing and expert guidance

9.4 billion USD

Estimation of benefits over 40 years (1974–2013) across 27 African countries

IP

Open source / open access

Commodities

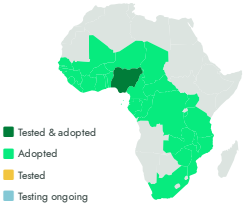
Cassava

Sustainable Development Goals

Categories

Production, Practices, Biological control

Tested/adopted in



Where it can be used

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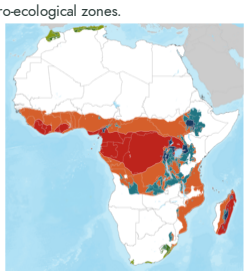


Target groups

Governments

EcoCycle Larvae System: Black Soldier Fly Larvae (BSFL) proteins for low cost Fish feeds

BSFL proteins for sustainable local fish and chicken feed production

BSFL composting is a biological method that uses Black Soldier Fly larvae to break down organic waste like food scraps and manure. The process produces nutrient-rich larvae for animal feed and a compost by-product called frass.

This technology is pre-validated.

8·9 Scaling readiness: idea maturity 8/9; level of use 9/9

Gender assessment 4

Climate impact 7

Problem

- Fish and poultry farming in sub-Saharan Africa face inconsistent and unreliable year-round feed supplies.
- The feed prices significantly increase production costs, making it difficult for fish farmers to sustain operations.
- 30-40% of food and organic is wasted, resulting in to negative environmental impacts, such as pollution and resource depletion.

Solution

- Using BSFL to decompose organic waste provides a sustainable way to waste and reduce environmental harm.
- BSFL technology produces nutrient-rich larvae that can be used as a low-cost feed for fish and poultry.
- Encouraging the adoption of BSFL technology supports a circular economy model that fosters long-term economic stability and environmental protection.

Key points to design your project

Black Soldier Fly Larvae (BSFL) Composting Technology enables sustainable waste management in sub-Saharan Africa by converting organic waste into affordable, nutrient-rich livestock feed. Implementing this technology involves setting up waste collection systems, BSFL rearing facilities, and marketing feed. with initial costs ranging from 1,000 to 2,400 USD. Key project partners may include waste management organizations and government agencies, and training is essential for effective management of BSFL systems.

1,000—2,400 USD
Small BSFL composting system

375—1,040 %
Return on investment

IP
Unknown

IITA
Rousseau Djouaka

Commodities

Fish

Sustainable Development Goals

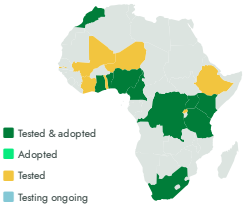
Categories

Pre-production, Inputs, Animal healthcare

Best used with

- Fast Growing and Hybrid African Catfish ›
- Cage Systems for Fish farming ›
- Tank Systems for Fish farming ›
- Flow-Through and Recirculatory Water Systems for Fish Tanks ›

Tested/adopted in



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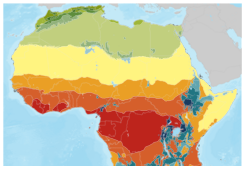


Solar bubble drier: Inflatable solar dryer for crop drying

Low-cost hygienic drying technology for high-quality products

Hohenheim University & IITA
Prof. Dr. Joachim Müller

The ISD (Solar Bubble Dryer) is a mobile system that uses solar energy to dry freshly harvested cassava roots in a protected environment. It operates by converting sunlight into heat through a solar-collecting tunnel, speeding up the drying process. A photovoltaic system powers a blower to circulate air, inflate the tunnel, and remove moisture. The system also allows mixing of the product...

This technology is pre-validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Gender assessment 4

Climate impact 6 1

Problem

- Fresh cassava roots deteriorate quickly after harvest, leading to substantial post-harvest losses.
- Traditional open-air drying methods expose cassava to weather, insects, dust, and animals, reducing product quality.
- High moisture content makes transporting fresh cassava costly, highlighting the need for drying near harvest sites.
- Delayed processing degrades the purity and functionality of cassava starch.

Solution

- Faster drying in a protected environment improves cassava quality.
- Mobile design allows drying near harvest sites, reducing transport costs and post-harvest losses.
- Solar-powered, self-sustained, and does not rely on fuel or electricity.
- Protects cassava from rain, dust, insects, and pests, ensuring cleaner, higher-quality output.
- Reduces post-harvest losses, typically between 28% and 42%, through efficient drying.

Key points to design your project

The Solar Bubble Dryer (ISD) is a sustainable, mobile technology that uses solar energy to dry crops efficiently, reducing post-harvest losses and enhancing food quality. It supports food security and climate goals by minimizing waste and avoiding fuel-based drying methods.

To implement ISD technology, consider:

- **Cost**: Initial investment is around USD1,800 per unit.
- **Supply Chain**: Identify suppliers and account for transportation and import costs.
- **Training**: Provide hands-on training on usage and maintenance.
- **Communication**: Use materials like brochures and videos to raise awareness.

This approach can enhance project outcomes and benefit farmers by promoting eco-friendly, efficient drying methods.

Cost: $$$ **1,800 USD**
Initial investment

ROI: $$$ **7 - 180 %**
Benefit for Cassava

90 - 145 kg of cassava per 3-5 day cycle
Drying Capacity

10 years
Lifespan

10,957 - 29,604 USD
Operating Costs

IP
No formal IP rights

Commodities

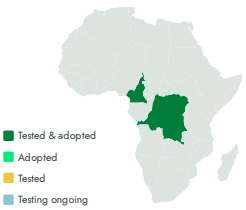
Maize, Rice, Cassava, Legume

Sustainable Development Goals

Categories

Prevention & storage, Equipment, Post-harvest handling, Agrifood processing

Tested/adopted in



Where it can be used

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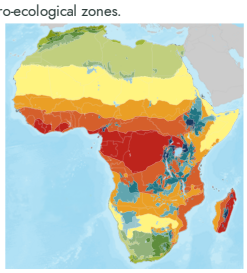


Target groups

Farmers, Sellers

BSFF: Organic fertilizer for soil improvement

Low cost fertilizer for healthy and profitable agriculture for African farmers.

Frass is a nutrient-rich compost produced from black soldier fly larvae (BSFL) treatment of biodegradable waste. Commercially, it consists of BSFL faeces, substrate residues, exoskeletons, and a microbial population aiding fermentation.

International Institute of Tropical Agriculture (IITA)
Dr Rousseau DJOUAKA

This technology is pre-validated.

8·7 Scaling readiness: idea maturity 8/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- Africa faces a lack of organic waste management solutions, leading to severe environmental threats.
- Soil fertility in smallholder farms is declining due to nutrient imbalances, where more nutrients are extracted than replenished, worsening food security.

Solution

- BSFF technology converts organic waste into nutrient-rich compost, reducing environmental contamination and improving soil fertility.
- It promotes sustainable agricultural practices by enhancing soil health.

Key points to design your project

To integrate the BSFF technology into your project:

- **Educate Farmers**: Raise awareness among farmers about the benefits of using BSFF fertilizer for improving crop yields and soil health.
- **Promote Accessibility**: Ensure equitable access to BSFF products and financial support for local suppliers and smallholder farmers.
- **Calculate Fertilizer Needs**: Determine the required quantities of BSFF fertilizer, considering a recommended application rate of 10 tons per hectare for poor soils.

Cost: $$$ **3 USD**

Per 50kg bag

Commodities

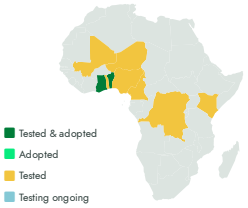
Vegetable crop

Sustainable Development Goals

Categories

Production, Inputs, Fertilizer

Tested/adopted in



Where it can be used

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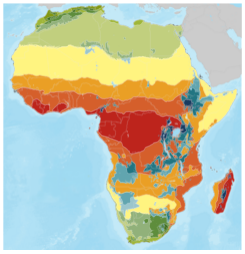


Target groups

Farmers

CassQual: Cassava Seed Quality Management system

Enhancing cassava productivity through healthy planting material

The system aligns with national seed regulations to ensure quality from breeder seed to farmer distribution. Regulators oversee certification and promote community-based Quality Declared Seed (QDS) models. Digital tools like Seed Tracker and PlantVillage Nuru streamline inspections and disease diagnostics.

IITA
James Legg

This technology is pre-validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Gender assessment 2

Climate impact 3 3

Problem

- High spread of viral diseases (CMD, CBSD) reducing national cassava yields
- Weak or non-existent cassava seed certification frameworks
- Limited capacity to trace and monitor seed distribution

Solution

- Official inspection protocols and standards to maintain seed quality
- Adoption of digital tools for real-time seed system monitoring
- Labeling systems to improve traceability and market transparency
- National strategies that integrate cassava into regulated seed systems
- Protocol for self-certification by QDS or community level seed producers

Key points to design your project

The Cassava Seed Quality Management System strengthens national seed systems by formalizing cassava certification and improving farmer access to clean, high-yield planting material.

- It aligns with national food security and climate goals, contributing to SDGs 2, 5, 13, and 15.
- Governments can adopt it by aligning policies, developing certification guidelines, training inspectors, and supporting field-level implementation with digital tools.
- Supporting CSEs at QDS or community level to self-certify using Seed Tracker will increase the coverage and cost-efficiency of seed quality management

251,400 USD
To set up the system

916 %
ROI calculated for a scenario involving 300 seed producers

60,000 USD
Annual monitoring cost

25,000 USD
Annual certification costs

135 %
Yield increased

IP
Open source / open access

Commodities

Cassava

Sustainable Development Goals

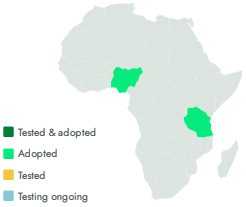
1 NO POVERTY

2 ZERO HUNGER

Categories

Pre-production, Practices,
Pest control (excluding weeds), Seed system

Tested/adopted in



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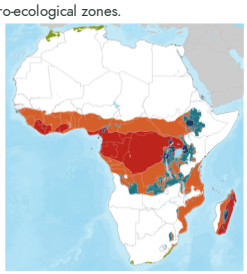


Target groups

Breeders, Seed companies,
Advisory and Extension Services,
Seed Regulators

Cassava EGS Model: Early Generation Seed Production of Cassava

Breeder & Foundation Cassava Seeds—Always Within Reach

This model helps government projects secure a steady supply of quality cassava seeds by linking research centers with certified seed producers. It ensures national standards, supports disease control, and improves farmer access to reliable planting material, making large-scale cassava production more effective.

IITA
Elohor Mercy Diebiru-Ojo

This technology is pre-validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Gender assessment 4

Climate impact 6

Problem

- **Limited Certified Seed for Scaling:** Not enough certified cassava cuttings for large-scale distribution.
- **Poor Seed Quality:** Poor quality seeds make it hard to improve national cassava yields.
- **Traceability Problems:** Difficult to control and trace where seeds come from.
- **Slow Rollout of New Varieties:** Delays in getting new improved varieties to farmers.

Solution

- **Better Seed Distribution:** Organizes and expands access to certified seeds nationwide.
- **Higher Seed Quality:** Regular checks guarantee only healthy seeds reach farmers.
- **Seed Traceability:** Seeds can be tracked for better monitoring and control.
- **Quicker Release of New Varieties:** Fast-tracks improved varieties from research to farmers.

Key points to design your project

The Cassava EGS Model helps build strong national seed systems. To implement it successfully, consider the following:

- Focus on building a lasting seed system, not just seasonal distribution.
- Budget for initial investment in training, farm setup, and inspections.
- Ensure the seed certification system is functional—or plan to strengthen it.
- Allow one full season for breeder seed multiplication and planning for scale.
- Secure access to breeder seed early through formal agreements with research centers.
- Support seed companies or cooperatives with training and resources.
- Raise farmer awareness about certified seed through demos and outreach.
- Use tools like SeedTracker for monitoring, certification, and traceability.
- Start in regions with high cassava demand or agro-industrial potential.
- Coordinate across ministries and contact **IITA GoSeed** for technical support in setting up and scaling the model.

1,753.20 USD
Production Cost/ hectare for seed companies

82 %
Return on investment / year for seed companies

3,195 USD
Revenue/hectare for seed companies

IP
No formal IP rights

Commodities

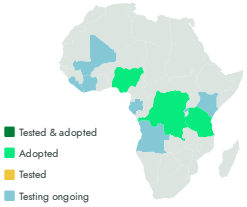
Cassava

Sustainable Development Goals

Categories

Pre-production, Practices, Seed system

Tested/adopted in



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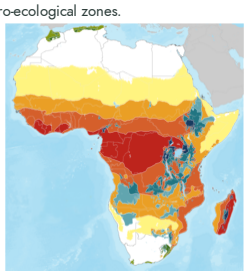


Target groups

Breeders, Development institutions, Farmers, Governments, Seed companies, Researcher center

BASICS Model: A Seed System Model for Cassava Transformation

An economically sustainable integrated cassava seed system!

The **BASICS Model** is a full-package solution to modernize cassava seed production and distribution. It moves away from giving free stems to farmers and instead supports a **commercial approach** where certified cassava seeds (stem cuttings) are produced, inspected, and sold by trained seed entrepreneurs.

IITA and Sasakawa Africa Association
Dr Godwin Atser

This technology is pre-validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 5

Climate impact 2

Problem

- Cassava yields remain low due to farmers using infected, uncertified planting material.
- This increases food insecurity and keeps rural incomes low.
- Most national seed systems lack regulation and traceability.

Solution

- **Reliable access to improved varieties**: BASICS ensures farmers get **disease-free**, **high-yielding** planting materials.
- **Disease control through virus indexing**: Early-generation seed is tested and verified to be virus-free using diagnostics tools, reducing disease incidence.
- **Sustainable business model**: Seed is **sold, not given away**, creating **local jobs** and ensuring long-term supply through seed entrepreneurs.
- **Digital monitoring**: Tools like **Seed Tracker** support regulators and seed producers in quality control, increasing transparency and traceability.
- **Boosted yields**: Adoption of the system can **double cassava yields** from less than 10 tons/ha to **20 tons/ha or more**.

Key points to design your project

Cassava demand is rising fast with new processing industries. To implement it:

- Identify market-demanded and registered cassava varieties for promotion through the seed system
- Set up a public or hybrid early-generation seed (EGS) unit.
- Install SAH labs to rapidly multiply improved varieties.
- Support youth-led Cassava Seed Entrepreneurs (CSEs) as a job creation tool.
- Strengthen regulatory agencies for quality assurance.

IP

Open source / open access

Commodities

Cassava

Sustainable Development Goals

Categories

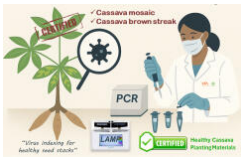
Pre-production, Practices, Yield improvement, Seed system

Best used with

- Early Generation Seed Production of Cassava ›
- Capacity Building Strategies ›
- Marketing Strategies ›
- Molecular diagnostics for cassava seed health certification ›
- Cassava Seed Entrepreneur Business Model ›
- Nuru for in-field Pest ›
- Cassava Seed Quality Management system ›
- Cassava Seed Monitoring System ›
- Digital tool for Strengthening Seed Governance and Certification Systems ›
- Organized support networks for cassava seed entrepreneurs ›
- Cassava Seed System Advocacy and Scaling

Cassava virus indexing: Molecular diagnostics for cassava seed health certification

Virus diagnostic tool for cassava seed health certification by seed producers and seed certifiers.



International Institute of Tropical Agriculture (IITA)
Lava Kumar

Cassava virus indexing is a method used to detect and remove virus-infected cassava plants early in the seed production process. It uses advanced diagnostics like **PCR** and **LAMP** to ensure only virus-free plants are used. This helps maintain seed quality, strengthens crop health, and supports seed certification efforts, making it essential for seed producers and certifiers in cassava-growing regions.

This technology is pre-validated.

9·8 Scaling readiness: idea maturity 9/9; level of use 8/9

Gender assessment 4

Climate impact 3

Problem

- Virus-infected cassava planting materials are often unknowingly used in seed production.
- Vegetative propagation (e.g., stem cuttings) increases the risk of virus transmission.
- Cassava crops are highly vulnerable to damaging viruses like CMD (Cassava Mosaic Disease) and CBSD (Cassava Brown Streak Disease).
- Lack of effective screening tools leads to poor seed quality and crop losses.

Solution

- **Accurate detection** of viruses using PCR and LAMP techniques.
- **Virus-free planting material** selection for better seed quality.
- **Improved seed certification** by enabling diagnostic-based certification.
- **Increased crop resilience** and yield by using healthy seeds.

Key points to design your project

Cassava Virus Indexing helps improve seed quality and prevent virus spread in cassava production. It supports food security and seed certification by detecting infected planting materials early.

To adopt it in your projects:

- Estimate testing needs and equipment (PCR, LAMP kits, reagents).
- Budget for lab setup (USD 3/sample).
- Train staff on sample collection, diagnostics, and analysis.
- Create awareness materials for seed stakeholders.
- Partner with research centers and seed certifiers for smooth integration.

20,000 USD
Initial setup cost for a diagnostic lab

3 USD
Cost per sample for testing

IP
No formal IP rights

Commodities

Cassava

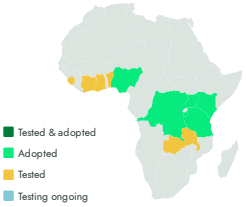
Sustainable Development Goals

2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Categories

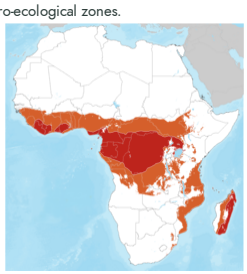
Pre-production, Practices,
Pest control (excluding weeds), Seed system

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Breeders, Seed companies,
Advisory and Extension Services,
Seed Regulators

ME-CASS: Cassava Seed Monitoring System

Making Cassava Seed Systems Work Better

ME-CASS helps governments track the release, certification, and distribution of cassava varieties to ensure farmers get quality seeds. It also supports policy planning with real-time data on seed flows and adoption, improving regulation, accountability, and investment targeting.

IITA
Richardson Okechukwu

This technology is pre-validated.

7·3 Scaling readiness: idea maturity 7/9; level of use 3/9

Gender assessment 4

Climate impact

Problem

- Difficult to track which varieties are in circulation due to renaming and poor recordkeeping.
- National certification agencies struggle to document and monitor seed distribution.
- No tools to assess whether improved seeds reach farmers or support system-wide improvements.

Solution

- ME-CASS offers full traceability of seed flows across all system levels.
- It integrates data from certification agencies to improve transparency and compliance.
- Governments can monitor adoption rates, seed quality, and producer performance to inform policy and investments.

Key points to design your project

To adopt ME-CASS, government projects need more than just software—they need coordination, trained teams, and structured data systems. Here are key tips:

- Use or connect ME-CASS to existing national databases.
- Assign a small team with digital and monitoring skills.
- Define clear indicators like variety names, seed volumes, and target zones.
- Involve breeders, seed producers, and regulators from the start.
- Pilot in 1–2 regions before scaling nationally.
- Budget for devices and internet access (with offline options where needed).
- Align ME-CASS with existing government reporting systems.
- Keep the system flexible to add other crops later (e.g., yam, sweetpotato).

IP

Open source / open access

Commodities

Cassava

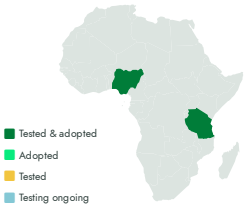
Sustainable Development Goals

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING

Categories

Production, Market, Pre-production, Digital applications, Advisory and information service, Crop management, + 0 more

Tested/adopted in



Target groups

Breeders, Governments, Seed companies, Researcher center, Seed Regulators

Capacity Building Strategies

From Knowledge to Yield — Empowering Cassava Seed Systems.

Building Capacity is a hands-on toolkit that helps cassava seed producers get better at what they do. It provides easy-to-use training materials, business tips, and ways to work better with others. The goal is to improve seed quality, increase harvests, and help seed businesses grow in a way that lasts.

International Institut of Tropical Agriculture (IITA) & Sahel Consulting Agriculture and Nutrition Limited

Temi Adegoroye

This technology is pre-validated.

9·8 Scaling readiness: idea maturity 9/9; level of use 8/9

Gender assessment 4

Climate impact 7

Problem

- **Limited Technical Skills** – Many seed producers lack the know-how for quality seed production.
- **Weak Business Knowledge** – Producers struggle to run seed ventures as profitable businesses.
- **Poor Market Access** – Limited connections to buyers reduce sales and visibility.
- **Weak Regulatory Links** – Little collaboration with seed authorities leads to certification issues.

Solution

- **Targeted Training** – Builds technical skills based on producers' real needs.
- **Business Tools** – Strengthens seed business planning and management.
- **Market Access** – Helps producers connect with more buyers.
- **Regulatory Support** – Improves compliance with seed quality standards.
- **Demo Fields** – Offers hands-on learning opportunities.
- **Needs Assessment** – Identifies gaps to guide training.
- **Impact Tracking** – Monitors progress and results.

Key points to design your project

The *Building Capacity* toolkit strengthens cassava seed systems by addressing gaps in skills, market access, and regulations. To implement, first **profile seed producers** and **assess their needs**, then **develop tailored training** and **offer hands-on learning opportunities**. **Build partnerships with institutions and regulators** to ensure alignment with industry standards. **Establish monitoring mechanisms** using key metrics to track progress and impact. Additionally, **train local trainers** to ensure ongoing support and capacity building. This approach fosters sustainable, profitable seed systems for cassava.

28,800 USD

Capacity building for 1,350 farmers

3,000 USD	3,000 USD	10,000 USD	10,800 USD	IP
Training manual development	Training Venue and other facilities	Facilitators Expense	Cost of printing the training materials	Unknown

Commodities

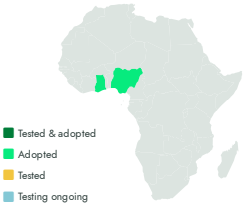
Vegetatively Propagated Crops

Sustainable Development Goals

Categories

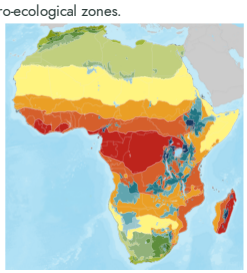
Production, Policies

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Farmers, Seed companies

CSAM: Organized support networks for cassava seed entrepreneurs

The International Institute of Tropical Agriculture (IITA)
Regina Kapinga

Building stronger cassava seed businesses for African seed entrepreneurs and farmers.

Cassava Seed Association Model (CSAM) formalizes cassava seed production by forming structured associations of seed entrepreneurs. These associations enable access to certification, finance, training, and policy advocacy, improving seed quality and market access.

This technology is pre-validated.

9·3 Scaling readiness: idea maturity 9/9; level of use 3/9

Gender assessment 3

Climate impact 6

Problem

- Fragmented seed production leads to high costs, poor quality, and limited access to certification and finance.
- Free seed distribution undermines the development of a sustainable, commercial seed market.
- Weak advocacy and policy influence due to lack of formal structures.

Solution

- Establishes formal associations, providing joint certification and collective marketing.
- Improves access to financing and market opportunities.
- Strengthens advocacy for favorable policies and long-term investment.

Key points to design your project

- **The Cassava Seed Association Model (CSAM)** transforms fragmented cassava seed production into an inclusive, sustainable, and market-driven system by legally organizing seed producers into empowered associations.
- It facilitates access to certification, finance, training, and policy platforms—advancing gender equity, youth participation, and resilience in line with SDGs.
- A complete implementation toolkit and technical support are available to scale impact through partnerships with NARS, regulators, and the TAAT network.

IP

Open source / open access

Commodities

Cassava

Sustainable Development Goals

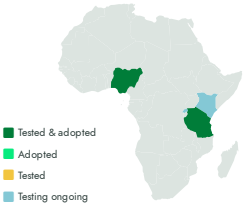
Categories

Prevention & storage, Practices, Yield improvement, Seed system

Best used with

- Digital Tool for Strengthening Seed Governance and Certification Systems ›

Tested/adopted in



Where it can be used

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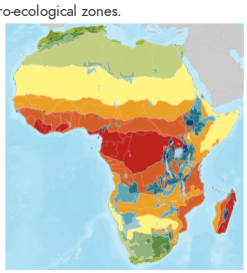


Target groups

Farmers, Seed companies, Researcher center,

Cassava Seed System Advocacy and Scaling Model

From Advocacy to Action: Replicating Success with Lasting Investment

This model helps governments and development partners build strong national cassava seed systems. It promotes long-term solutions by integrating proven technologies—like Early Generation Seed, SAH, and digital tools—into national plans and policies. Through coordinated advocacy and planning, the model strengthens local leadership, supports seed entrepreneurs, and improves farmer access to clean, improved cassava seed. It has already been used in over 10 countries, showing strong potential for scaling and sustainability.

This technology is pre-validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Gender assessment 4

Climate impact 5

Problem

- Free seed distribution creates market distortions, dependency, and blocks private seed business development.
- Innovative models remain small due to lack of advocacy, funding, and policy integration.
- Weak advocacy and coordination prevent innovations from influencing national decisions and attracting investment.
- Short-term, project-based approaches end without lasting impact or sustainability mechanisms.

Solution

- Promotes commercial seed systems to reduce dependency on free seed.
- Helps scale successful models by integrating them into national policies and budgets.
- Builds advocacy platforms to align governments, donors, and seed actors.
- Replaces short-term projects with long-term, coordinated national programs.

Key points to design your project

This model helps governments lead the reform of cassava seed systems through national policies, coordinated action, and sustainable investment.

Key Points:

- **Contact IITA early** to access tools and technical support.
- **Secure institutional buy-in** from ministries or national research systems.
- **Host stakeholder workshops** to align roles and responsibilities.
- **Use MoUs or agreements** to formalize collaboration with partners.
- **Integrate into existing platforms** like cassava task forces or seed programs.
- **Apply standardized tools** for advocacy, training, and monitoring.
- **Commit public funding** to demonstrate ownership and attract donor support.
- **Start with a seed system assessment** to identify key gaps.
- **Strengthen existing institutions** rather than creating new ones.
- **Scale progressively** based on available resources and capacity.

IP

Open source / open access

IITA
Regina Kapinga

Commodities

Cassava

Sustainable Development Goals

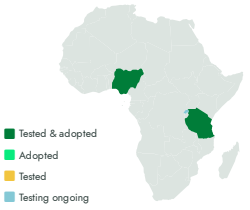
Categories

Pre-production, Policies

Best used with

- Cassava Seed Monitoring System ›
- Early Generation Seed Production of Cassava ›

Tested/adopted in



Where it can be used

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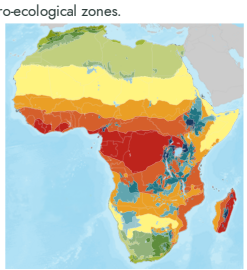


Target groups

CSE Model: Cassava Seed Entrepreneur Business Model

Transforming Cassava Farming Through Entrepreneurial Innovation!

The CSE Business Model empowers local entrepreneurs by providing training and certification in seed production and a straightforward digital quality-control platform, links them to buyers through pre-agreed contracts and cooperative financing, and has scaled to deliver over 11 million disease-free cuttings annually in Tanzania and Nigeria.

The International Institute of Tropical Agriculture (IITA)
James Legg

This technology is pre-validated.

9·3 Scaling readiness: idea maturity 9/9; level of use 3/9

Gender assessment 3

Climate impact 7

Problem

- Informal seed sharing and free handouts spread pests and diseases.
- Farmers lose over 50 % of potential yields due to poor-quality cuttings.
- Dependency on donations discourages local investment.

Solution

- Train and register CSE entrepreneurs to produce certified seed.
- Deliver 83 million clean cuttings/year in Tanzania, generating USD 1.5 M.
- Strengthen local seed systems for sustainable yield gains.

Key points to design your project

- Professionalize cassava seed systems by onboarding CSEs into formal roles, boosting food security, gender inclusion and climate resilience.
- Engage regulators, extension services and community groups with MoUs to define roles, data sharing and policy alignment.
- Deploy SeedTracker™ for digital plot registration, real-time dashboards and e-certification, supported by "train-the-trainer" workshops.
- Mobilize SACCOS/RLF finance, seed-production grants, M&E analytics and policy briefs to scale, sustain and refine the model.

79 %

ROI estimated by the technology provider

IP

Open source / open access

Commodities

Cassava

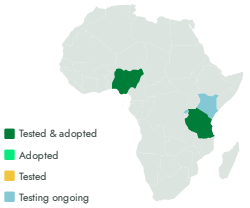
Sustainable Development Goals

1 NO POVERTY
2 ZERO HUNGER
5 GENDER EQUALITY
8 DECENT WORK AND ECONOMIC GROWTH
17 PARTNERSHIPS FOR THE GOALS

Categories

Pre-production, Practices, Yield improvement, Seed system

Tested/adopted in



Where it can be used

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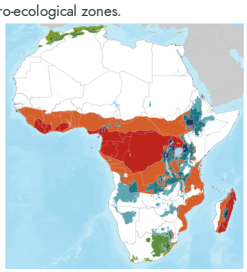


Target groups

Farmers, Processors, Seed companies, Advisory and Extension Services, Seed Regulators

SeedTracker: Digital Tool for Strengthening Seed Governance and Certification Systems

Build an efficient seed system!

SeedTracker is a web- and mobile-based application designed for national and decentralized seed system management. It enables registration of seed producers and fields, records inspection activities, provides real-time access to certification status, and generates georeferenced data for decision-making. It works offline and in multiple languages, making it suitable for rural deployment. Regulatory agencies can use it to oversee field activities remotely, support decentralized certification, and build national seed databases.

International Institute of Tropical Agriculture (IITA)
Lava Kumar

This technology is pre-validated.

9·7 Scaling readiness: idea maturity 9/9; level of use 7/9

Gender assessment 3

Climate impact 3

Problem

- **Fragmented seed certification systems:** Many countries still rely on paper-based, decentralized systems, making it difficult for regulators to ensure compliance and quality.
- **Limited oversight in rural areas:** National agencies struggle to monitor seed activities in distant communities.
- **Weak data systems:** Planning for seed demand, pest outbreaks, and variety deployment is limited due to poor data availability.

Solution

- **Centralized certification and registration system:** Allows regulators to digitally record and validate seed field inspections and certification at all levels.
- **Digital traceability:** Tracks each seed lot from registration to sale, helping prevent fraud and improving transparency.
- **Georeferenced seed data:** Provides evidence for better planning, resource allocation, and response to seed system gaps.

Key points to design your project

The **SeedTracker** technology ensures traceability and quality assurance for cassava planting materials, enhancing smallholder farmers' access to high-quality, climate-resilient varieties.

- It supports national priorities on climate resilience, gender inclusion, and SDGs, empowering governments to make data-driven decisions.
- Key activities include stakeholder mobilization, capacity building, digital certification integration, real-time monitoring, and impact tracking. A toolkit with training materials and dashboards is available to support implementation.

5,000 USD
Minimum cost

-
Not yet estimated

IP
No formal IP rights

Commodities

All Crops

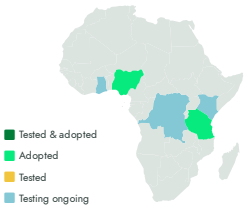
Sustainable Development Goals

2 ZERO HUNGER
5 GENDER EQUALITY
13 CLIMATE ACTION
17 PARTNERSHIPS FOR THE GOALS

Categories

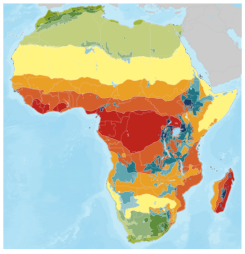
Pre-production, Digital applications, Supply chain management, Advisory and information service, + 0 more

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Seed companies,
Advisory and Extension Services

Improved Cassava Varieties: Market-driven cassava breeding and promotion system

Improved cassava varieties crucial for enhancing food security, increasing farmer incomes, and reducing poverty in Africa.

This technology is a demand-led cassava breeding system that develops and promotes improved varieties tailored to market needs. It defines product profiles (e.g., fresh market, processing, biofortified) through stakeholder input, applies standard breeding and field testing, and works with regulators to release farmer-friendly varieties. Adoption is driven through demos, launch events, and media campaigns, ensuring better market alignment and wider uptake.

International Institute of Tropical Agriculture (IITA)
Mercy Diebiru-Ojo

This technology is pre-validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Gender assessment 4

Climate impact 5 1

Problem

- Poor alignment between available cassava varieties and market demands
- Low adoption of improved varieties by farmers
- Weak stakeholder engagement in variety development
- Limited availability of breeder/pre-basic seeds
- Delays in official variety release processes
- Inadequate promotion and awareness of new varieties

Solution

- Breeding cassava varieties tailored to market demands
- Involving stakeholders in defining preferred product traits
- Using structured trials to validate variety performance
- Supporting formal variety release and registration
- Promoting new varieties through demos and media campaigns

Key points to design your project

This initiative aims to improve cassava productivity by developing market-demanded varieties.

- Includes demonstration trials, awareness campaigns, and events to boost adoption.
- Enhances yields and farmer incomes by integrating these varieties into national seed systems.
- Backed by CGIAR and national institutions in countries like Nigeria and Tanzania.

IP

Open source / open access

Commodities

Cassava

Sustainable Development Goals

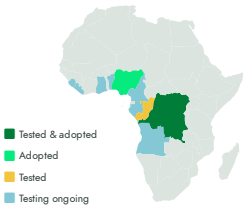
Categories

Production, Improved varieties, Disease resistance, Insect resistance, + 0 more

Best used with

- Cassava seed-bulking farms ›
- Marketing Strategies ›
- Capacity Building Strategies ›
- Cassava Seed Entrepreneur Business Model ›

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.

Seed Inoculation with Rhizobia

Boosting Crops, Nourishing Communities

The "two-step" procedure of seed inoculation that results in effective coverage with elite rhizobial (Source: the N2Africa Project)

Seed inoculation with elite rhizobium strains boosts legume yields by addressing nitrogen limitations through Biological Nitrogen Fixation (BNF). This cost-effective practice enhances crop production on small-scale farms in Africa, reducing reliance on expensive fertilizers, promoting environmental sustainability, and ensuring food, nutrition, and income security for farmers.

International Institute of Tropical Agriculture (IITA)
David Ojo

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- **Nitrogen Deficiency**: Soils often lack sufficient nitrogen for plant growth.
- **Incompatible Rhizobia**: Newly introduced legume species may not be compatible with local rhizobia, leading to low yields.
- **Soil Health**: Maintaining soil fertility and health is a constant challenge.
- **Plant Diseases**: Farmers constantly battle against diseases that can devastate crops.
- **Sustainability**: Balancing economic viability with environmental sustainability is a major concern.

Solution

- **Biological Nitrogen Fixation**: Rhizobia address nitrogen deficiency.
- **Specific Strain Introduction**: Inoculation ensures the presence of the needed rhizobia.
- **Rhizobia Population Boost**: Inoculation guarantees optimal nodulation and nitrogen fixation.
- **Sustainable Farming**: Rhizobia promote sustainable agriculture.
- **Stress-Tolerant Strains Introduction**: Inoculation mitigates effects of stress on nitrogen-fixing symbiosis.

Key points to design your project

Rhizobia inoculant technology is a win-win for Africa:

It boosts food security (SDG 2), increases legume yields mean more food and income for farmers, especially women (SDG 5). Climate-smart agriculture (SDG 13), less reliance on chemical fertilizers reduces emissions.

To integrate this tech in your project, consider:

- Partnering with experts for training and quality control.
- Selecting suitable legumes and effective, adaptable rhizobia strains.
- Ensuring cost-effectiveness and proper distribution with storage and quality checks.
- Educating farmers and monitoring project success.

Cost: $$$ **15,000 USD**

Total cost of manufacturing one ton of dry inoculant

IP

Unknown

Technology from

ProPAS

Commodities

Soybean, Common bean

Sustainable Development Goals

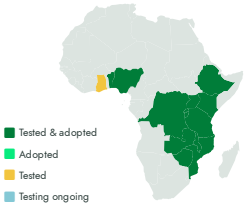
Categories

Production, Inputs, Inoculant

Best used with

- Climbing Bean with High Yield and N Fixation ›
- Biofortified Beans for Improved Nutrition ›
- Specialty Fertilizer Blends for Common Bean ›

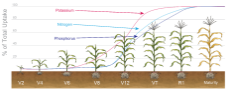
Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.

Pre-plant blended fertilizers and nitrogen topdressing for maize



Unlock Maize Potential with Balanced Fertilizer Bliss!

Pre-plant blended fertilizers for maize is a technology involved to carefully mixed solid granular fertilizers, including urea, calcium ammonium nitrate, and potassium chloride, to meet maize crop nutrient needs.

International Institute of Tropical Agriculture (IITA)
Jonga Munyaradzi

This technology is TAAT1 validated.

8·9 Scaling readiness: idea maturity 8/9; level of use 9/9

Gender assessment 4

Climate impact 5

Problem

- Traditional fertilizer application methods often lead to uneven nutrient distribution,
- Improper dosages and application schedules of mineral fertilizers are common,
- Inefficient nutrient application practices can lead to environmental losses, including nutrient runoff and leaching.

Solution

- Implementing pre-plant blended fertilizers and nitrogen topdressing for precise and efficient nutrient delivery,
- Providing specific nutrient blends to address inadequate nutrient supply for healthier and more productive maize crops.
- Promoting responsible fertilizer use through carefully formulated blends and split applications, minimizing wastage

Key points to design your project

The technology of pre-plant blended fertilizers and nitrogen topdressing for maize offers several benefits. Key steps to integrate this technology include:

- Identifying appropriate formulations, developing mixing protocols, brokering market entries,
- Conducting farmer demonstrations, providing financial support,
- Estimating required quantities, budgeting costs, allocating funds for training and support, developing communication materials, and forming partnerships with relevant stakeholders.

0.3—0.5 ton/ha	30 %	57 %	IP
Grain yield increase	N uptake increase	P uptake increase	Trademark

Technology from

ProPAS

Commodities

Maize

Sustainable Development Goals

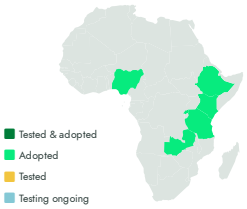
2 ZERO HUNGER

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Categories

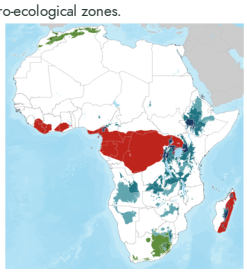
Production, Inputs, Fertilizer

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



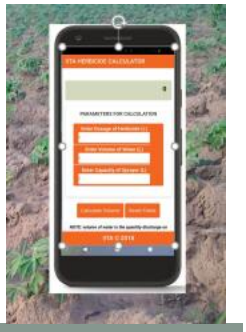
Target groups

Farmers

Herbicides Calculator

Reduce pesticide and herbicide losses with IITA's herbicide calculator

The IITA Herbicide Calculator is a digital tool that helps farmers figure out the right amount for backpack sprayers. This tool was developed using Java language, the Ionic framework, and Android Studio, ensuring its robustness and usability.



International Institute of Tropical Agriculture (IITA)
Godwin Atser

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 6

Problem

- The widespread misuse of pesticides (including herbicides) due to poor calibration of spray tanks.
- Loss of inputs (pesticides or herbicides) during applications.
- Residue of chemical products in crops due to overdosing of pesticides or herbicides.

Solution

- The"IITA Herbicides Calculator" technology ensures the precise application of pesticides, mitigating issues related to over or under-dosing.
- Its promotes the effectiveness of herbicides, facilitating their optimal application.

Key points to design your project

To integrate this technology,

- Establish training programs and connect producers to financial support and markets.
- Estimate costs for the subscription to the IITA Herbicide calculator, android phones, data, training, and communication support.
- Collaborate with agricultural development institutes and seed multiplication companies.

30,000 USD

Cover training, android phones, data

IP

Open source / open access

Technology from

ProPAS

Commodities

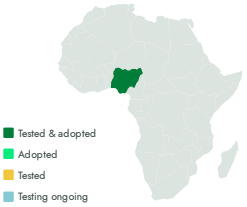
Maize, Rice, Sorghum/Millet, Cowpea, Soybean, Cassava, + 1 more

Sustainable Development Goals

Categories

Production, Digital applications, Pest control

Tested/adopted in



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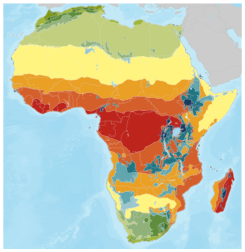


Target groups

Farmers

Six Steps to Cassava Weed Management

Weed-free Fields, Bountiful Yields!

The "Six Steps Cassava Weed Management" technology is a holistic solution to weed problems in Sub-Saharan Africa's cassava fields. It provides a decision-making framework for farmers to effectively control weeds, leading to higher cassava yields. This adaptable method caters to diverse farming conditions, enhancing cassava productivity and regional food security.

International Institute of Tropical Agriculture (IITA)
Friday Ekeleme

This technology is TAAT1 validated.

9·7 Scaling readiness: idea maturity 9/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- **Weed Encroachment**: Cassava fields in Sub-Saharan Africa are frequently overrun by weeds due to inadequate and untimely control measures.
- **Slow Canopy Development**: The growth pattern of cassava makes it vulnerable to weed encroachment in the early weeks of cultivation.
- **Nutrient and Water Competition**: Abundant weeds consume significant nutrients and water, drastically reducing cassava yield.

Solution

- **Improved Yield**: It enables farmers to significantly increase cassava yields by managing weeds effectively.
- **Comprehensive Approach**: It provides a holistic strategy for weed control, including site selection, weed identification, and herbicide application.
- **Resource-Friendly**: The technology is accessible to small-scale farmers, requiring only simple and cost-effective equipment and herbicides.

Key points to design your project

The "Six Steps Cassava Weed Management" technology boosts cassava yields, eases women's workload, and aligns with SDGs 2, 5, and 13.

To integrate it into your project:

- Educate farmers about its benefits.
- Distribute the decision support tool and recommendations.
- Ensure access to small loans.
- Plan for various farming activities.
- Use simple, cost-effective equipment.

It works well with other cassava cultivation practices and digital tools like Akilimo and the IITA Herbicide calculator.

Key partners include the International Institute of Tropical Agriculture (IITA).

30–50 %
Root yield increased

20-30 USD/ha
Cost for herbicide application

28-46 USD/ha
Cost for weed removal labor

IP
Open source / open access

Technology from

ProPAS

Commodities

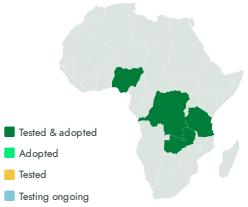
Cassava

Sustainable Development Goals

Categories

Production, Practices, Weed management

Tested/adopted in



Where it can be used

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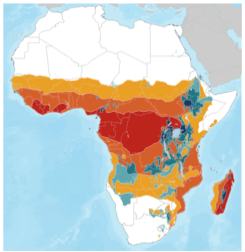


Target groups

Farmers

Equipment for feed production: Cassava Peels for Animal Feed Production

Affordable animal feed for breeders

This technology streamlines the conversion of cassava peels into animal feed, reducing labor costs and drying times while extending shelf life. It tackles environmental issues caused by excess cassava peels and provides a sustainable solution by utilizing them as valuable animal feed and fiber sources.

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- Cassava processing generates large peel quantities, leading to environmental issues through dumping and burning.
- Despite their potential as animal feed, peels remain underused due to drying constraints, aflatoxin risk, and poor storability.
- African communities face shortages of nutritious animal feeds, impacting livestock and fish rearing.

Solution

- Converts cassava peels into animal feed efficiently, reducing costs and extending shelf life.
- Ensures animal and consumer health by preventing harmful substances in the final product.
- Promotes rural job opportunities and business growth.
- Offers cost-effective and nutritious alternatives to traditional feed sources like maize and wheat.

Key points to design your project

The use of cassava peels for animal feed production empowers women in rural areas by providing income opportunities and reduces climate impact by minimizing waste and greenhouse gas emissions. This aligns with Sustainable Development Goals (SDGs) related to sustainable agriculture, gender equality, responsible consumption and production, and climate action.

To incorporate cassava peel animal feed production into a project, consider activities like raising awareness, identifying suitable equipment, developing operating protocols, and inventorying cassava peel sources. Training and support from a dedicated team are essential, along with communication materials for technology promotion. Accompanying solutions include mechanized drying of cassava using flash or pneumatic dryers.

3,400 USD

The base equipment required for small-scale processing of cassava peels into animal feeds

1,000 USD	600 USD	850 USD	400 USD	IP
Cost of a motorized grater	Cost of a press with hydraulic jack	Cost of a motorized pulverize	Cost of a mechanical sieve	Open source / open access

International Institute of Tropical Agriculture (IITA),International Livestock Research Institute (ILRI)
Tunde Amole

Technology from

ProPAS

Commodities

Cassava

Sustainable Development Goals

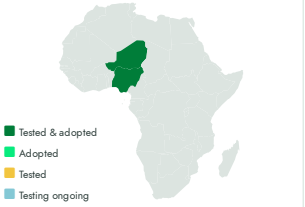
Categories

Transformation, Equipment, Animal feed production

Best used with

- Pneumatic Cassava Dryers ›

Tested/adopted in



Where it can be used

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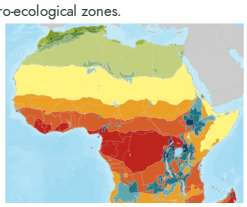


High quality cassava flour and industrial starches

Extend Freshness, Expand Opportunities with Cassava Flour!

High-Quality Cassava Flour (HQCF) is a non-fermented cassava product with an odorless, white/off-white appearance. It addresses the challenge of perishable fresh cassava roots, offering longer shelf life and reduced transport costs. HQCF, produced through specific steps, holds potential for various food.

International Institute of Tropical Agriculture (IITA)
Abass Adebayo

This technology is TAAT1 validated.

8·7 Scaling readiness: idea maturity 8/9; level of use 7/9

Gender assessment 4

Climate impact 4 1

Problem

The HQCF technology adressed several problem such as:

- Rapid perishability and molding of fresh cassava roots due to high water content.
- Toxic cyanide compounds in cassava roots, which need to be eliminated for safety.
- Traditional cassava flour production methods that do not provide significant market opportunities for smallholder cassava farmers.

Solution

- Detoxification of cassava roots through the HQCF production process, eliminating bitter taste and toxicity without fermentation.
- Utilization of HQCF for a wide range of food and industrial applications, serving as substitutes for imported wheat.
- Building capacity in remote rural communities for HQCF to enhance the competitiveness and value addition in the cassava value chain.

Key points to design your project

High-Quality Cassava Flour (HQCF) is a non-fermented solution addressing perishability in cassava roots, providing extended shelf life. It supports gender equality, reduces carbon footprint, and aligns with SDGs for poverty reduction and economic growth. Integration considerations involve estimating root quantity, logistics planning, training support, and developing communication materials.

Cost: $$$ **60 USD**

Processing of 1MT of fresh cassava

25 %

Reduction of wheat flour in bakeries

1 ton HQCF from 5.5 tons fresh cassava roots

Cassava root to HQCF conversion ratio

IP

Open source / open access

Technology from

ProPAS

Commodities

Cassava

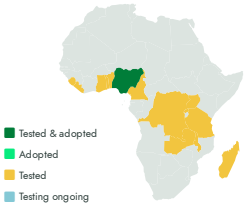
Sustainable Development Goals

2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
8 DECENT WORK AND ECONOMIC GROWTH

Categories

Transformation, Equipment, Agrifood processing

Tested/adopted in



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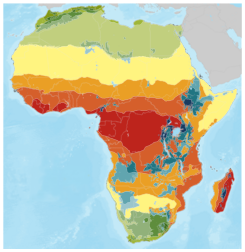


Target groups

Processors

Value-added Processing of Bananas and Plantain

Banana and Plantain Processing for a Healthier Diet

This technology involves the processing of bananas (ripe or unripe) into valuable products like flour, purees, and chips. Unripe fruits are dried and ground into flour (good for baking!), while ripe ones are pulped for drinks and snacks. The technology works for small or large-scale production.

Banana flour has a growing demand as a wheat substitute

International Institute of Tropical Agriculture (IITA)
Patchimaporn Udomkun

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- **Postharvest Losses**: Bananas and plantains are perishable crops, prone to rapid deterioration after harvest, resulting in significant losses.
- **Unattractive Appearance**: Traditional flour processing can yield a brownish color, which may not be appealing to consumers.

Solution

- **Extended Shelf Life:** Processing like flour production and pulping creates longer-lasting banana and plantain products, reducing waste.
- **Enhanced Flour Quality:** Blanching and special soaking techniques improve flour color and functionality for baking and food production.

Key points to design your project

The Value-added Processing of Bananas and Plantain technology offers numerous benefits, including job creation and waste reduction, aligning with Sustainable Development Goals such as zero hunger and decent work.

To ensure its adoption by farmers, key activities include:

- Awareness campaigns
- Technology demonstrations
- Access to inputs and markets
- Financial support
- Monitoring and evaluation
- Capacity building

Prioritizing gender-inclusive training and sustainable practices in government projects can amplify its positive impact.

1,500 USD
Banana flour production machinery that can process 100 kg per hour

10000—60000 USD
Equipment for the automatic production of fried banana chips (100-500 kg/hour)

1,500 USD
Commercial presses for producing banana pulp (0,5 ton/hour)

IP
Open source / open access

Technology from

ProPAS

Commodities

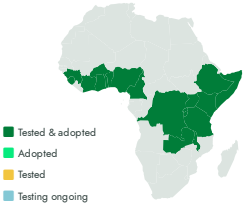
Banana/Plantain

Sustainable Development Goals

Categories

Transformation, Equipment, Post-harvest handling, Agrifood processing

Tested/adopted in



Where it can be used

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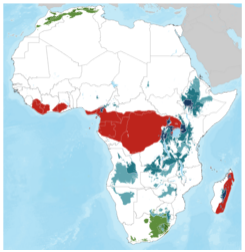


Target groups

Processors

Cassava varieties with high dry matter and starch content

Enhancing cassava yields and quality for greater food security in Africa.

This technology involves improved varieties of cassava with enhanced dry matter content. Through conventional breeding and other methods, these cassava varieties have been developed. These high-quality roots are well-suited to the needs of farmers and various industrial processes.

International Institute of Tropical Agriculture (IITA)
Elizabeth Parkes

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 5

Problem

- **Low Dry Matter and Starch Content**: Traditional cassava varieties often have low dry matter and starch content, reducing their economic value and utility in food and industrial applications.
- **Limited Variety Options**: Farmers have limited access to high-quality cassava varieties, which restricts their ability to improve crop yields and quality.

Solution

- **Higher Dry Matter & Starch:** Enhances root quality for fresh and industrial use.
- **Increased Yields:** Boosts cassava yield and economic returns.
- **Adaptability:** Resistant to pests, diseases, and harsh conditions.
- **Food Security:** Produces nutritious, high-yield crops.

Key points to design your project

The cassava varieties with high dry matter and starch content technology significantly contribute to sustainable development. To integrate this technology into your project,

- Focus on identifying or developing suitable cassava varieties,
- Estimate the quantity of cassava roots needed, including delivery costs.
- Consider a team of trainers for support and develop communication materials.

Cost: $$$ ROI: $$$

35 ton/ha	40 - 45 %	80 - 95 %	IP
potential yield	dry mater content	starch content	Plant variety protection

Technology from

ProPAS

Commodities

Cassava

Sustainable Development Goals

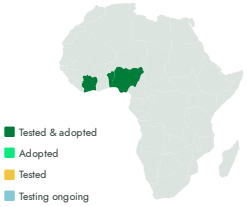
Categories

Production, Improved varieties, Yield improvement, Quality improvement

Best used with

- Digital Decision Support Tool ›

Tested/adopted in



Where it can be used

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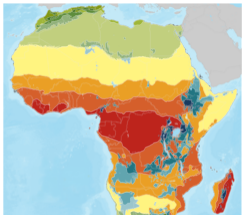


CBC: Cassava Business Connector

Revolutionize the cassava value chain with CBC, ensuring seamless communication and robust market linkages for enhanced income opportunities.

The Cassava Business Connector (CBC) is a digital platform that links cassava producers, processors, and end-users to streamline communication and coordination within the cassava value chain. Accessible at http://taat-cbc.org, it enables real-time tracking, communication.

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 7

Problem

- Communication gap between actors in the cassava value chain, leading to weak market linkage.
- Lack of awareness among producers about potential buyers and vice versa.
- Inefficient integration of value chain actors, hindering communication and coordination.
- Lack of visibility among value chain actors, including producers, input suppliers, processors, and end-users.

Solution

- CBC helps the coordination of material flow from fields to end-users,
- Allows decentralized monitoring of production,
- Real-time information exchange between the users, and offers secure accounts to each user, protected by login and password, for information safety.

Key points to design your project

To integrate the CBC into your project, consider the following steps:

- Raise awareness among cassava stakeholders about the benefits and availability of the Cassava Business Connector.
- Establish training programs for stakeholders to ensure effective utilization of the CBC platform.
- Foster collective action programs to encourage collaboration among producers, processors, and end-users.
- Facilitate access to financial support and markets for cassava stakeholders through the CBC platform.

IP

Open source / open access

International Institute of Tropical Agriculture (IITA)
Adebayo Abass

Technology from

ProPAS

Commodities

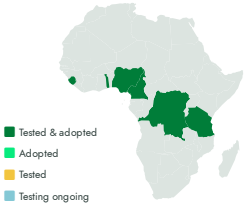
Cassava

Sustainable Development Goals

Categories

Market, Digital applications, Market linkage

Tested/adopted in



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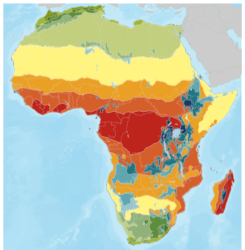


Target groups

Farmers, Sellers

Biological control of the pod borer Maruca vitrata with exotic parasitoids

Low-cost natural pest control

The "Biological control of Maruca vitrata pod borer with parasitoids" technology involves releasing lab-reared parasitic wasps to naturally control pod borer pests in cowpea fields. By establishing a self-sustaining wasp population, it reduces the need for chemical pesticides. Combined with pest-resistant cowpea varieties and eco-friendly products, this approach offers sustainable crop protection.

International Institute of Tropical Agriculture (IITA)
Manuele Tamo

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- **Damage from Maruca vitrata:** The pod borer Maruca vitrata causes substantial damage to cowpea crops, resulting in yield losses of up to 80%.
- **Reliance on Chemical Pesticides:** Farmers traditionally depend on chemical pesticides to combat Maruca vitrata and other pests like aphids and thrips in cowpea fields.
- **Environmental Impact:** Excessive use of chemical pesticides can lead to environmental consequences such as soil degradation and harm to beneficial insects.

Solution

- **Biological Control:** Parasitic wasps from Taiwan reduce Maruca vitrata population by over 85% in Benin and Burkina Faso.
- **Collaboration:** National agencies release parasitic wasps onto cowpea fields, reducing reliance on chemical pesticides.
- **Integrated Pest Management:** Parasitic wasps, resistant cowpea varieties, and biopesticides minimize environmental impact.
- **Awareness:** Educating farmers about biological control benefits and preserving host plants is crucial.

Key points to design your project

This approach enhances cowpea yields, reduces losses, and supports food security by minimizing pesticide use and targeting key pests. Key activities for implementing *Maruca vitrata* biocontrol include mapping yield losses, raising awareness, establishing import policies for biocontrol agents, and training farmers in pest management. Complementary solutions involve using pest-resistant varieties and supporting community-based biopesticide production, such as 'neem tea bags' by women's groups in Niger.

5,000 USD
To install an initial pilot colony of parasitoids

6,000 USD
Running costs

IP
Open source / open access

Technology from

ProPAS

Commodities

Cowpea

Sustainable Development Goals

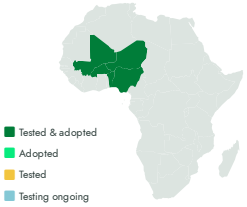
Categories

Production, Inputs, Natural Enemies

Best used with

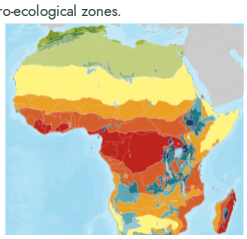
- Integrated Management of Insects, Diseases and Weeds in common bean ›

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



NoduMax: Inoculant for Soybeans

Advanced Soybean Inoculation Solution for Sustainable Agriculture

This technology is a solid inoculant, which contains the industry-standard strain USDA 110 and includes a gum Arabic adhesive and user instructions. It is packed in 100 g packets sufficient for 10 to 15 kg soybean seed.

International Institute of Tropical Agriculture (IITA)
David Ojo

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- Poor Root Nodulation and Low Biological Nitrogen Fixation (BNF) in Soybeans
- Lack of Quality Inoculant in the Market
- Limited Access to Affordable Inoculants in African Countries
- Complex Application Procedures
- Lack of Protein Sufficiency and Soil Fertility in Soybean Production
- Clumping in Alternative Inoculation Methods

Solution

- Promotes biological nitrogen fixation, reducing the need for expensive nitrogen fertilizers.
- Ensures the presence of symbiotic rhizobium bacteria, optimizing root nodulation for improved nutrient absorption.
- Enhances BNF, thereby boosting soil fertility and reducing reliance on synthetic fertilizers.
- Promotes natural nutrient cycling in the soil, contributing to sustainable agricultural practices.

Key points to design your project

- Implementation steps for the technology include assessing product quantities, considering delivery costs, and engaging trainers for installation support.
- Communication support, such as flyers, videos, and radio broadcasts, should be developed to promote the technology.
- For improved maize variety optimization, companion planting with resistant soybean varieties and proper nutrient fertilization is recommended.
- Collaboration with agricultural development institutes and agro-dealers facilitates successful technology implementation.

Cost: $$$ **3.20 USD**
For the purchase of 100g

ROI: $$$ **1 USD**
Profit per unit for retailers

150,000 USD
To build the NoduMax factory

120,000 USD
To equip the NoduMax factory

IP
Unknown

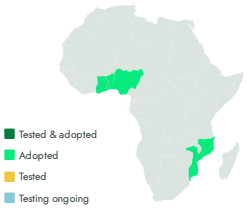
Technology from
ProPAS

Commodities
Soybean

Sustainable Development Goals

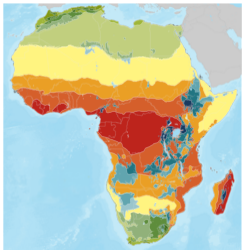
Categories
Inputs, Inoculant

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups
Farmers

Cassava seed-bulking farms

Quality cassava cuttings close to the fields

The practice of seed-bulking farms for cassava provides quality planting material directly to smallholder farmers, situated near their fields. This facilitates access to improved varieties and reduces the cost of transporting cuttings, leading to increased profitability.

This technology is TAAT1 validated.

8·7 Scaling readiness: idea maturity 8/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- The distribution of cassava stem cuttings is problematic as they rapidly lose their sprouting vigor when stored.
- Their bulk and weight drive up transport costs, limiting the supply of improved cassava planting material.
- Smallholder farmers often rely on seed companies with limited geographical coverage, restricting their access to improved cassava varieties.

Solution

- Seed-bulking farms provide high-quality, disease-free cassava stem cuttings, improving access to superior cassava varieties.
- Reduced transport times and decentralized production enhance planting material survival.
- This approach supports community-based businesses, boosting incomes for farmers and processors.

Key points to design your project

This technology promotes transformative impacts.

Integrating it in project involves:

- Identifying suitable cassava varieties.
- Training farmers on seed-bulking.
- Optimizing production and distribution.
- Providing access to loans.

20 ha of cutting harvested

per ha planted every 16 months

IP

Open source / open access

International Institute of Tropical Agriculture (IITA)
Abass Adebayo

Technology from

ProPAS

Commodities

Cassava

Sustainable Development Goals

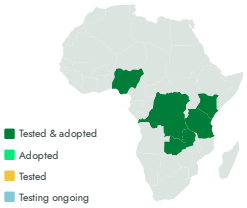
Categories

Production, Practices, Seed system

Best used with

- Disease resistant cassava varieties ›
- Golden cassava varieties (Vitamin A fortified) ›
- Cassava varieties with high dry matter and starch content ›

Tested/adopted in



Where it can be used

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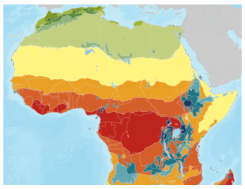


Banana Peels as Feed and Organic Resource

From Waste to Resource

Banana and plantain peels offer a sustainable solution to waste disposal, serving as valuable resources for animal feed, soil input, and cooking ingredients. Proper processing detoxifies the peels, making them suitable for consumption by animals and contributing to waste reduction in regions where plantains and cooking bananas are common.

An industrial green banana peeler able to processes 600 units per hour

International Institute of Tropical Agriculture (IITA)
John Derera

This technology is TAAT1 validated.

7·8 Scaling readiness: idea maturity 7/9; level of use 8/9

Gender assessment 3

Climate impact 7

Problem

- Waste accumulation due to the disposal of banana and plantain peels.
- Concerns regarding the chemical composition and nutrient ratios of the peels, especially when used as animal feed.
- Difficulty in removing peels from green bananas and plantains, leading to inefficiencies in processing.
- Restrictions on using raw peels in poultry feed due to the presence of anti-nutritional compounds like tannins and oxalate.
- Challenges in effectively utilizing peels, such as feed refusal due to high tannin content and the need for proper processing techniques to detoxify peels.

Solution

- Banana and plantain peels are valuable components in livestock and poultry diets.
- Dried peels contain essential nutrients like potassium, phosphorus, iron, calcium, magnesium, and sodium.
- Utilizing peels reduces waste accumulation and promotes sustainable resource management.
- Treated and composted peels serve as beneficial organic inputs for soil improvement.
- Green peels provide an energy source in animal diets due to their carbohydrate content.
- Fresh peels with high moisture content help animals stay hydrated.
- In smaller quantities, peels find use in cooking, water purification, and manufacturing beauty and health products.

Key points to design your project

- Technology utilizes banana and plantain peels for animal feed and compost.
- Enhances food security and promotes sustainable resource management.
- Improves soil health, aids carbon sequestration, and supports climate resilience.
- Steps to incorporate technology include understanding nutrient composition, sourcing machinery, and marketing products.
- Costs vary for machinery, with single belt peelers at USD 3500 and larger multi-channel machines at USD16,000.
- Consider delivery expenses and collaborate with agricultural institutions for widespread adoption.

Cost: $$$ **3,500 USD**

A single belt 0.37 kWatt peeler

16,000 USD

Larger multi-channel 2.0 kWatt machines

IP

Open source / open access

Technology from

ProPAS

Commodities

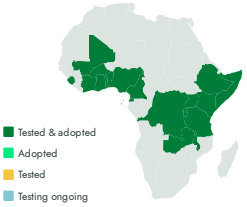
Banana/Plantain

Sustainable Development Goals

Categories

Pre-production, Equipment, Agrifood processing

Tested/adopted in



Where it can be used

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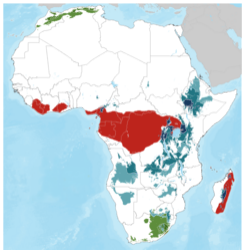


Target groups

Breeders

Induced Ripening of Banana for Increased Marketability and Storage

Ripening Solutions for Quality and Efficiency

The Induced Ripening of Banana for Increased Marketability and Storage technology is a method designed to enhance the ripening process of bananas, specifically dessert bananas, to ensure they are market-ready and have an extended shelf life. In this process, bananas are artificially ripened using various chemical agents, most notably ethylene gas.

Industrial ripening chamber with refrigeration and gas control (Credit: Nilkamal)

International Institute of Tropical Agriculture (IITA)
Patchimaporn Udomkun

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 4 1

Problem

- Bananas, especially plantains, suffer significant post-harvest losses due to transportation damage and spoilage.
- Traditional ripening methods, such as wrapping banana bunches with green leaves, are time-consuming and result in non-uniform ripening.
- Consumers prefer ready-to-eat bananas, and fruit sellers need a consistent supply of ripe fruit to meet this demand.

Solution

- Artificial ripening with ethylene gas ensures that bananas are ready for the market, reducing the risk of post-harvest losses.
- The technology allows for the acceleration or slowing down of the ripening process based on market demand, optimizing the supply chain.
- The technology meets consumer demand for ready-to-eat bananas, benefiting both fruit growers and sellers.

Key points to design your project

The technology of induced ripening offers cost-effective solutions for enhancing the marketability and storage of bananas, empowering farmers and aiding in poverty alleviation. Steps to integrate this technology include:

- Conducting market assessments, developing a business plan,
- Allocating resources for training and support,
- Collaborating with agricultural institutions.

Cost: $$$ **3,500 USD**

Constructing artisanal chambers

17,000 USD

Industrial semi-automated ripening chambers of 5 tones of banana

IP

Trademark

Technology from

ProPAS

Commodities

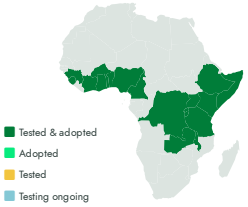
Banana/Plantain

Sustainable Development Goals

Categories

Prevention & storage, Practices, Post-harvest management

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.

Target groups

Farmers, Sellers

Aflasafe®: Aflatoxin management

Aflatoxin-safe fields and crops for safer food in Africa

Aflasafe® is a biocontrol technology for aflatoxins management that uses harmless types of the fungus Aspergilus flavus which do not and cannot produce the toxins. The atoxigenic fungi are coated onto ordinary sorghum grain for transferring these innovative biocontrol agents to farmers' fields.

International Institute of Tropical Agriculture (IITA)
Ortega-Beltran, Alejandro

This technology is TAAT1 validated.

8·9 Scaling readiness: idea maturity 8/9; level of use 9/9

Gender assessment 4

Climate impact 5

Problem

- Widespread aflatoxin contamination in staple crops, animal feeds, and processed foods across Africa.
- Consumption of contaminated food leads to severe health issues such as liver cancer, weakened immunity, and organ damage.
- Aflatoxin contamination renders food unfit for consumption and trade, resulting in significant economic losses.

Solution

- Prevents aflatoxin production using harmless strains of Aspergillus flavus.
- Affordable solution to reduce aflatoxin levels in food safely.
- Tailored to African conditions, utilizing native atoxigenic fungal strains.
- Selected through rigorous field testing.
- Halts aflatoxin contamination during transportation, storage, and processing.

Key points to design your project

To use this technology in your project, plan these activities:

- Calculate the product quantity based on the cost (12 to 20 USD per Ha) and the requirement (10 kg per ha).
- Factor in the delivery, import, and duty costs from the supplier to the site.
- Budget for training and support from a team of trainers during installation.
- Develop communication materials (flyers, videos, radio, etc.) for the technology.
- Follow post-harvest practices (drying and storage) for the improved maize variety.
- Work with agricultural institutes and agro-dealers in your country.

Cost: $$$ **12 - 20 USD** per Ha

ROI: $$$ **16 %** Increase in income

10 kg/ha Recommended dosage application

4 kg/acre Recommended dosage application

IP Trademark

Technology from

ProPAS

Commodities

Maize, Sorghum/Millet, Groundnut, Chili peppers, Sesame, Sunflower

Sustainable Development Goals

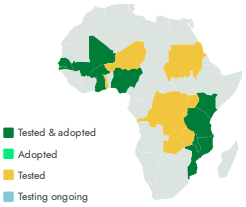
Categories

Production, Prevention & storage, Inputs, Pesticide

Best used with

- Drought Tolerant Maize Varieties and Water Efficient Maize Varieties ›

Tested/adopted in



Where it can be used

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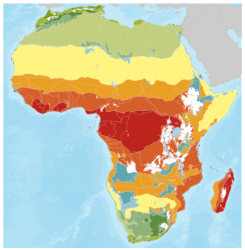


Propagation of Banana and Plantain Disease-Cleaned Suckers

Propagate Success with Clean Suckers

Macro-propagation involves two techniques: field-based (decapitation) and detached corm (beds). It ensures disease-free seedlings, promoting uniform growth and stress resistance. Clean knives and hardened sprouts are vital for success.

Complete decapitation with excised meristem (top) and sprouting suckers (bottom)

International Institute of Tropical Agriculture (IITA)
Amah Delphine

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 7

Problem

- Natural regeneration often results in contaminated banana and plantain planting materials, harming productivity and lifespan.
- Traditional methods result in non-uniform growth, affecting the overall efficiency of banana and plantain cultivation.
- Conventional methods may lead to stress-prone plantlets, negatively impacting their adaptation and performance in the field.

Solution

- Macro-propagation ensures the production of banana and plantain seedlings free from pests and diseases, promoting healthier and more resilient crops.
- Macro-propagation contributes to increased productivity and prolonged lifespan of banana and plantain plants .
- This technique reduces financial barriers by offering a low-cost method of obtaining disease-free seedlings
- Macro-propagation ensures more uniform growth of banana and plantain seedlings.

Key points to design your project

The adoption of Propagation of Disease-Cleaned Suckers technology presents an opportunity to enhance banana and plantain production. To integrate this technology into your project, consider the following steps:

- Ensure access to disease-free suckers for banana and plantain farmers at affordable prices.
- Educate farmers about the benefits of using disease-cleaned suckers and encourage their adoption of this technology.
- Provide training and certification to farmers on proper sucker selection and planting techniques to maximize yield.
- Collaborate with agricultural extension services to disseminate information and support the implementation of disease-cleaned sucker propagation.

Cost: $$$ **1500 USD per 8000 plantlets**

Nusery four months maintenance

ROI: $$$ **725—1050 USD**

Net profit per cycle

340 USD

2,500 plantlets shade house

2,300 USD

Cost of chamber of 8,000 plantlets

IP

Open source / open access

Technology from

ProPAS

Commodities

Banana/Plantain

Sustainable Development Goals

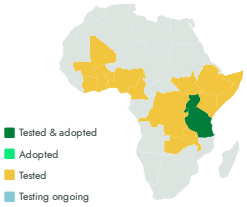
Categories

Production, Practices, Seed system

Best used with

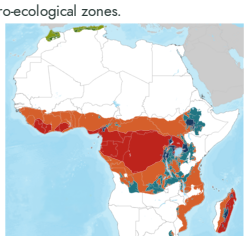
- Improved Varieties of Plantain for Tropical Lowlands ›
- Improved Varieties of Banana for the African Highlands ›

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Improved Varieties of Plantain for Tropical Lowlands

Better Plantain Varieties for Thriving Farmers

The "Improved Varieties of Plantain for Tropical Lowlands" makes stronger and healthier plantains that can resist diseases and pests. It does this by mixing different kinds of plantains to create new varieties. These special plantains grow well in different climates and have more leaves and fruits.

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 3

Climate impact 7

Problem

- Black leaf streak disease causing significant yield losses ranging from 33% to 50%.
- Weevils and nematodes undermining corm and root systems.
- Declining soil fertility due to poor management practices.

Solution

- This technology aims to combat black leaf streak disease, weevils, and nematodes.
- Focus on high productivity and drought resilience to mitigate yield losses.
- Emphasis on preferred cooking traits to meet consumer preferences.
- Adaptation to diverse climatic and production conditions.

Key points to design your project

The adoption of improved plantain varieties offers significant benefits for food security and income in disease-prone areas with fluctuating climates. Here's a concise summary:

Key Activities:

- **Selecting suitable cultivars** based on climate, management, production goals, and market needs.
- **Educating stakeholders**—multipliers, farmers, processors—about the advantages like disease resistance and higher yields.
- **Creating training hubs** for seed multipliers and farmers on propagation techniques and best farming practices.

A dedicated team of trainers should be engaged to provide comprehensive training and support during the project implementation. The budget should cover the costs for training sessions and post-training assistance.

290—1000 USD
Planting material/ha

ROI: $$$ **500 %**
Benefit to cost advantages starts from the second cycle harvest onwards

1400 USD
Production inputs and labor per ha

IP
Open source / open access

International Institute of Tropical Agriculture (IITA)
Moses Nyine

Technology from

ProPAS

Commodities

Banana/Plantain

Sustainable Development Goals

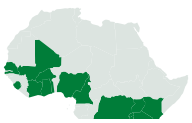
Categories

Production, Improved varieties, Disease resistance, Insect resistance, + 0 more

Best used with

- In-Vitro Banana Tissue Culture Propagation ›
- Propagation of Banana and Plantain Disease-Cleaned Suckers ›
- Intercropping Strategies for Banana and Plantain ›
- Spacing and Stand Management in Banana and Plantain ›
- Banana Peels as Feed and Organic Resource ›
- Value-added Processing of Bananas and Plantain ›

Tested/adopted in



In-Vitro Banana Tissue Culture Propagation

A rapid quality plantlets delivery technology for banana

In-Vitro Tissue Culture Propagation involves a series of steps including initiation, multiplication, shooting and rooting, and hardening, all performed in controlled, sterile laboratory conditions to produce disease-free banana and plantain plantlets.

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 7

Problem

- Traditional crops were more susceptible to extreme weather conditions, leading to significant crop damage and reduced yields.
- Traditional propagation methods were more susceptible to diseases, resulting in widespread outbreaks
- Natural disasters and disease outbreaks often led to slow recovery in agricultural systems

Solution

- In vitro micro-propagation eliminates all pests and diseases except for viruses.
- TC plants have the benefits of uniformity and fast propagation of large numbers of plantlets.
- These advantages enable marketing and more rapid recovery from broad-scale damage such as disease outbreak and extreme weather.

Key points to design your project

The adoption of in-vitro propagation technology offers a significant opportunity to enhance banana and plantain production while reducing losses from pests and diseases. To integrate this technology into your project, consider steps such as

- Business planning and market analysis, securing financing for equipment acquisition,
- Staff training on handling and quality control,
- Farmer awareness campaigns on planting and propagation of tissue culture (TC) plantlets,
- Additionally, explore partnerships with agricultural research institutes and government agencies to promote widespread adoption and improvement of banana and plantain production nationwide.

Cost: $$$ **1,3 USD**

Per plantlets

ROI: $$$ **40 %**

Profit

3000 Tissue Culture plantlets

A nursery business can produce 3,000 TC plantlets per cycle

IP

No formal IP rights

International Institute of Tropical Agriculture (IITA)
Amah Delphine

Technology from

ProPAS

Commodities

Banana/Plantain

Sustainable Development Goals

2 ZERO HUNGER

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

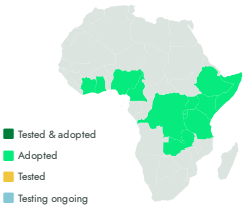
Categories

Production, Practices,
Pest control (excluding weeds),
Yield improvement

Best used with

- Improved Varieties of Plantain for Tropical Lowlands ›
- Improved Varieties of Banana for the African Highlands ›
- Propagation of Banana and Plantain Disease-Cleaned Suckers ›

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.

Golden cassava varieties (Vitamin A fortified)

Yellow-fleshed cassava rich in vitamin A

Yellow-fleshed cassava is a vitamin A-enriched variety. The variety is the result of the cross-breeding of natural lines containing high levels of provitamin A and hybrid lines with higher yield potential disease resistance and drought tolerance.

International Institute of Tropical Agriculture (IITA)
Elizabeth Parkes

This technology is TAAT1 validated.

7·6 Scaling readiness: idea maturity 7/9; level of use 6/9

Gender assessment 4

Climate impact 5

Problem

- Lack of essential nutrients in conventional cassava varieties, notably vitamin A deficiency affecting 50% of children.
- Insufficient vitamin A leading to preventable blindness and weakened immune systems in children.
- Limited nutritional value and agronomic challenges, such as disease susceptibility and low yield potential.

Solution

- Golden cassava varieties are enriched with provitamin A, addressing vitamin A deficiency and hidden hunger.
- Through breeding, golden cassava exhibits enhanced traits like disease resistance and drought tolerance.
- These varieties contain 2 to 3 times more provitamin A, meeting nutritional needs in cassava-dependent communities.
- Golden cassava suits various agro-ecosystems, enhancing its reach.

Key points to design your project

To integrate it into your project:

1. Establish quality parameters with stakeholders.
2. Engage seed companies for high-quality seeds.
3. Stimulate demand among consumers.
4. Provide financial assistance to farmers.

Consider seed quantity, delivery costs, training, communication support, and collaboration with local agricultural institutes and companies for successful implementation.

IP

Open source / open access

Technology from

ProPAS

Commodities

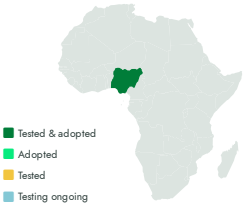
Cassava

Sustainable Development Goals

Categories

Production, Improved varieties, Yield improvement, Quality improvement

Tested/adopted in



Where it can be used

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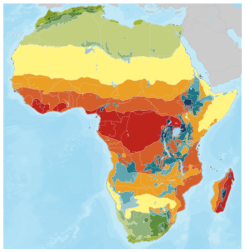


Target groups

Farmers, Seed companies

Disease resistant cassava varieties

Disease-Resistant Cassava Cuttings for Higher Yields

"Disease Resistant Cassava Varieties" are specially bred to withstand common viral diseases like cassava mosaic and cassava brown streak in sub-Saharan Africa. Those varieties help farmers protect their crops, increase yields, and improve food security. Ongoing breeding programs aim to find more varieties for sustainable cassava production.

International Institute of Tropical Agriculture (IITA)
Edward Kanju

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- Viral diseases damage cassava leaves, reducing photosynthesis and causing significant yield losses.
- Current disease control methods for cassava are ineffective against viral pathogens.
- Farmers in African countries experience yield losses ranging from 20% to 95%, valued at approximately US$1,200 – 2,300 million.

Solution

- Disease-resistant cassava varieties significantly reduce infection rates and yield losses.
- Genes from wild types are transferred into improved cassava varieties through conventional crossing techniques, offering a cost-effective approach.
- Many resistant cassava varieties also exhibit comprehensive resistance to other major cassava pathogens, benefiting integrated crop health management by farmers.

Key points to design your project

- Disease-resistant cassava varieties technology empowers women, enhances food security, and mitigates climate change impacts.
- Integration involves raising awareness, acquiring adapted cassava lines, and building stakeholder capacity.
- Costs include delivery, training, and planting materials, estimated at USD 30 to 35 per hectare.
- Collaboration with agricultural institutes and seed companies is key for effective implementation.
- Availability spans various countries, requiring consideration of import clearance and duties.

Cost: $$$ **30—35 USD**

1 ha of planting materials of elite cassava varieties

15—20 %

Incidences of cassava mosaic disease with resistant varieties

Technology from

ProPAS

Commodities

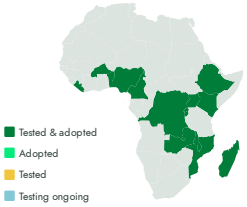
Cassava

Sustainable Development Goals

Categories

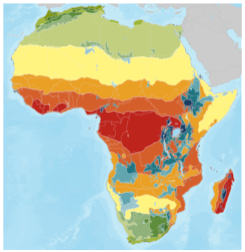
Production, Improved varieties, Disease resistance

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Farmers, Seed companies

Specialty blended fertilizers for root and tuber crops

Special fertilizer for root and tuber crops

Specialty Blended Fertilizers for Root and Tuber Crops" are custom fertilizers that provide essential nutrients to address soil deficiencies in Sub-Saharan Africa. They are designed for sweet potato and cassava farming, promoting efficient nutrient use, root growth, and overall crop health.

International Institute of Tropical Agriculture (IITA)
Paul Woomer

This technology is TAAT1 validated.

6·6 Scaling readiness: idea maturity 6/9; level of use 6/9

Gender assessment 3

Climate impact 7

Problem

- **Soil Issues**: Many soils in Sub-Saharan Africa lack essential nutrients and suffer from low fertility, limiting the production of crops like sweet potato and cassava.
- **Insufficient Crop Resilience**: Crops like sweet potato and cassava are vulnerable to drought, pests, diseases, and stress, impacting their quality and yield.

Solution

- **Balanced Nutrient Supply and Crop-Specific Formulas**: These fertilizers provide essential nutrients to address soil deficiencies in Sub-Saharan Africa and are tailored to meet the specific needs of crops like sweet potato and cassava.
- **Enhanced Crop Health and Yield**: The right nutrient formula enhances crop productivity, quality, and resilience, helping them resist drought, pests, diseases, and stress.

Key points to design your project

This fertilizer technology aids several Sustainable Development Goals (SDGs) and aligns with key government project priorities like food security and climate action. It can potentially empower women in farming and has a positive climate impact.

To implement this technology:

- Identify potential partners among fertilizer manufacturers,
- Launch an awareness campaign, and organize training programs,
- Collaborate with the manufacturer for product development and distribution,
- Set up demonstration plots, establish a feedback mechanism,
- Regularly monitor and evaluate the impact.

16 to 26 ton per hectare
sweetpotato yield increase

IP
Open source / open access

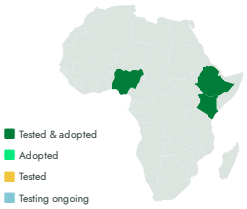
Technology from
ProPAS

Commodities
Sweet Potato, Cassava

Sustainable Development Goals

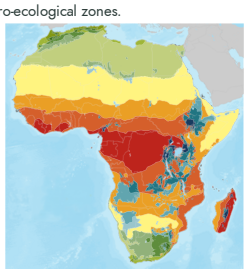
Categories
Production, Inputs, Fertilizer

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups
Farmers

Pneumatic Cassava Dryers

Low-cost mechanized drying of cassava using Flash Dryers

This technology promote the flash dryers which has the shortest residence time of drying, the most economical and widely used drying system for solids that have been dewatered or inherently have low moisture content. Thus, it's suitability for the production of starch, high-quality cassava flour (HQCF) and powdered fufu.

International Institute of Tropical Agriculture (IITA)
Adebayo Abass

This technology is TAAT1 validated.

8·8 Scaling readiness: idea maturity 8/9; level of use 8/9

Gender assessment 4

Climate impact 5

Problem

- The challenge of efficient and cost-effective of dryers.
- Heat-sensitive materials
- High residence times of dryers.

Solution

- The Flash dryers have proven to be the most economical.
- They enable the production of starch, high-quality cassava flour (HQCF), and powdered fufu efficiently.
- This technology successfully addresses the challenges by providing a system that ensures a shorter residence time for drying and high drying rates.

Key points to design your project

Mechanized drying of cassava using flash fryers offers an efficient solution for processing cassava, improving productivity. To integrate this technology into your project:

- Promote the mechanized drying technology through community-level demonstration sessions.
- Engage trainers for comprehensive training and support.
- Collaborate with agricultural institutes and food industry stakeholders for implementation.

IP

Open source / open access

Technology from

ProPAS

Commodities

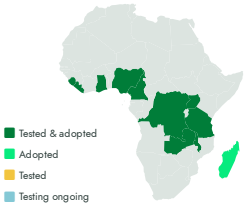
Cassava

Sustainable Development Goals

Categories

Transformation, Equipment, Agrifood processing

Tested/adopted in



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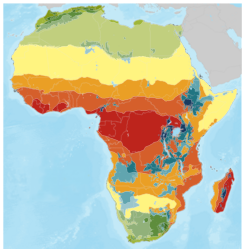


Target groups

Processors

Mechanized Cassava Planting and Harvesting

Empowering Cassava Farmers: More Yield, Less Labor, Better Quality

Mechanized cassava planting and harvesting technology is a specialized equipment of two-row planters and harvesters, typically operated by tractors. This technology improves the efficiency of cassava farming by reducing labor requirements.

This technology is TAAT1 validated.

8·7 Scaling readiness: idea maturity 8/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- Low cassava yields (10 t/ha) compared to global competitiveness (minimum expected yield of 25 t/ha).
- Labour-intensive and time-consuming planting and harvesting operations.
- Lack of mechanization and use of modern agricultural technologies in cassava production.

Solution

- Increase productivity and efficiency in cassava farming. The yield from mechanically managed farm could increase by 38% over the yield in the manually managed farm.
- Reduce production costs associated with manual labor.
- Improve competitiveness of the cassava sub-sector by enhancing productivity and reducing costs through mechanized operations.

Key points to design your project

The Mechanized Cassava Planting and Harvesting technology offers an efficient solution for planting and harvesting cassava. To integrate this technology, into your project,

- Promote it through demonstration sessions, provide training to operators, and ensure access to suitable farmland.
- Components of mechanized cassava production include land preparation, planting, herbicide application, fertilization, weeding, harvesting, and transportation.
- Evaluate the size and number of units needed, considering lower costs compared to manual operations.

Cost: $$$ **367 USD**
Mechanical cassava production

50 %
Reduced of manual cost operation

13 USD/ha
Cost of mechanized planting

25 USD/ha
Cost of mechanized harvesting

IP
Open source / open access

International Institute of Tropical Agriculture (IITA)
Adebayo Abass

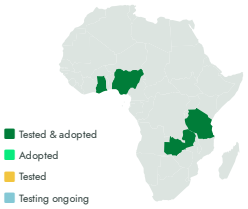
Technology from
ProPAS

Commodities
Cassava

Sustainable Development Goals

Categories
Production, Equipment, Land preparation

Tested/adopted in



Where it can be used

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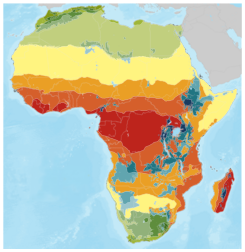


Target groups
Farmers

Waxing of fresh cassava roots to extend the shelf-life and increase marketability

Extend shelf-life of fresh cassava

The waxing technology for cassava roots starts from careful cultivation to produce commercially acceptable roots. Before harvest, leaves are pruned to prevent damage. After harvest, roots are sorted, washed, weighed, disinfected, and dried at a pack-house. Finally, a food-grade wax is applied to extend their shelf-life.

International Institute of Tropical Agriculture (IITA)
Adebayo Abass

This technology is TAAT1 validated.

7·7 Scaling readiness: idea maturity 7/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- **Deterioration**: Cassava roots deteriorate rapidly post-harvest.
- **Marketability**: Their size, shape, and harvest damage affect marketability.
- **Food Security**: Short shelf-life limits availability, affecting food security.

Solution

- **Preservation**: Waxing extends freshness and protects cassava roots.
- **Shelf-life**: It significantly extends the roots' shelf-life.
- **Food Security**: The technology enhances food security by ensuring longer availability of cassava roots.

Key points to design your project

The waxing technology for cassava roots boosts climate resilience and aligns with SDGs 2, 8, and 13 by extending shelf-life, enhancing marketability, and promoting a climate-resilient crop.

For its adoption, the following steps are essential:

1. **Training and Cultivation**: Conduct educational programs on the waxing technology and guide farmers on producing commercially viable cassava roots.
2. **Harvesting and Post-Harvest Handling**: Train farmers on pruning and harvesting to avoid damage, and instruct on post-harvest procedures including transporting, sorting, washing, weighing, and disinfecting the roots.
3. **Waxing and Pack-house Operations**: Demonstrate the process of drying and waxing the roots, and assist in setting up a pack-house if necessary.
4. **Market Linkages and Evaluation**: Establish market linkages for selling waxed cassava roots, and monitor the technology's adoption and evaluate its impact.

126 USD/ton
total cost for waxing

32 %
Marginal rate compared to unwaxed roots

3,000—5,000 USD
Estimated investment cost for an "all-inclusive" packhouse or processing centre, including water supply

IP
Open source / open access

Technology from

ProPAS

Commodities

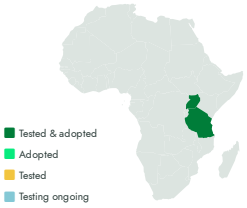
Cassava

Sustainable Development Goals

Categories

Prevention & storage, Practices, Post-harvest management

Tested/adopted in



Where it can be used

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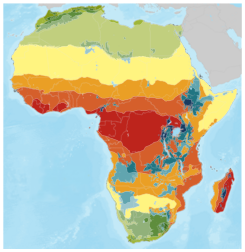


Target groups

Farmers

Mobile Cassava Processing Plant

Transforming Cassava, Mobile Processing for Sustainable Agriculture

The MCPP is a mobile unit equipped with machinery for processing cassava into products like high-quality cassava cake, wet fufu, and gari. It features a flatbed workspace formed by opening the back sides and tailgate, with standard operating procedures for specific products.

International Institute of Tropical Agriculture (IITA)
Adebayo Abass

This technology is TAAT1 validated.

6·6 Scaling readiness: idea maturity 6/9; level of use 6/9

Gender assessment 4

Climate impact 4 1

Problem

- Limited market access for cassava farmers in rural areas due to inaccessible rural roads
- High risk of postharvest losses and transportation costs due to cassava's perishability and bulkiness
- Lack of necessary infrastructure (electricity, water, etc.) and labor in rural areas to attract investments in processing factories
- Inconsistent and inadequate supply of cassava roots for processors

Solution

- The MCPP is most useful for processing factory owners to process cassava at farm-gate into non-perishable semi-processed products that are 20-50% of the weight of fresh roots.
- The less bulky semi-processed products are transported from the farms at lower transportation cost to city-based factories for final drying and packaging at a competitive price and higher profitability.

Key points to design your project

The Mobile Cassava Processing Plant (MCPP) offers an innovative solution for cassava processing. To integrate the MCPP into your project, follow these steps:

- Promote the technology through community demonstrations to raise awareness.
- Assess project requirements to determine MCPP size and configuration.
- Consider logistical factors like delivery costs and import duties.
- Engage trainers for comprehensive equipment operation and maintenance training.
- Develop communication materials to educate stakeholders on MCPP benefits.

Cost: $$$ **40000—48500** **USD**
Cost of a mobile processing factory

ROI: $$$ **156 %**
Gari production

52900 USD	**49386 USD**	**155 %**	**IP**
Startup Capital (gari production)	Startup capital (high-quality cassava cake)	ROI (high-quality cassava cake)	Open source / open access

Technology from

ProPAS

Commodities

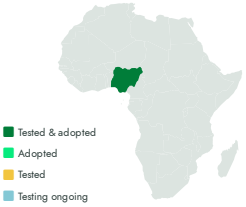
Cassava

Sustainable Development Goals

Categories

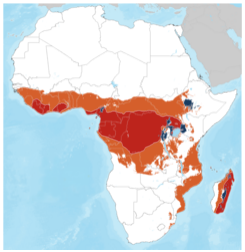
Transformation, Equipment, Agrifood processing

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Processors

Multi-Crop production system: Intercropping Strategies for Banana and Plantain

Improved system production for better yield

Banana with common bean understory (Credit: B. Dhed'a)

Intercropping, growing bananas or plantains alongside other plants, offers farmers numerous benefits but also poses challenges like nutrient competition, disease spread, and careful handling during planting and harvesting to avoid root damage.

This technology is TAAT1 validated.

5·7 Scaling readiness: idea maturity 5/9; level of use 7/9

Gender assessment 4

Climate impact 7

Problem

- Competition for nutrients and water
- Weed proliferation
- Soil degradation and erosion
- Vulnerability to pests and diseases
- Dependency on external inputs
- Susceptibility to extreme weather
- Loss of biodiversity

Solution

- Allows for early yields before banana crops, while suppressing weeds.
- Canopies and roots protect against soil erosion.
- Legume intercrops provide nitrogen through biological fixation.
- Biomass from intercrops serves as mulch and organic nutrients.
- Intercropping diversifies farmers' income sources.
- Reduces disease spread, Enhances soil health.
- Strengthens food systems' resilience....

Key points to design your project

To integrate Intercropping Strategies for Banana and Plantain into your project, follow these steps:

1. Educate farmers about the benefits, emphasizing increased productivity and reduced chemical use.
2. Provide tailored extension support for variety selection and best practices.
3. Facilitate seed production and ensure accessibility of inputs.
4. Allocate funds for training and ongoing support.
5. Develop communication materials to promote adoption.
6. Establish partnerships with farmers.
7. Consider integrating with other complementary technologies for optimal results.

IP

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International Institute of Tropical Agriculture (IITA)
Godfrey Taulya

Technology from

ProPAS

Commodities

Banana/Plantain

Sustainable Development Goals

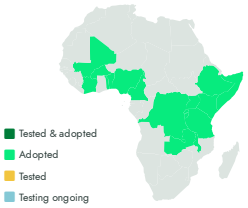
Categories

Production, Practices, Weed management, Soil fertility

Best used with

- Biofortified Beans for Improved Nutrition ›
- Orange-Fleshed Sweet Potato (High provitamin A) ›
- Disease resistant cassava varieties ›
- High yield rice varieties for Africa ›

Tested/adopted in



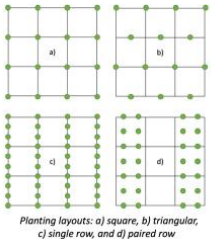
Where it can be used

This technology can be used in the colored agro-ecological zones.

Spacing and Stand Management in Banana and Plantain

Optimized Spacing, Maximum Yield

This technology optimizes banana and plantain plant spacing to boost yield, considering factors like plant variety, climate, and soil fertility. It uses various planting systems and may require herbicide use and stem base "earthing-up" in windy areas.



Planting layouts: a) square, b) triangular, c) single row, and d) paired row

International Institute of Tropical Agriculture (IITA)
Godfrey Taulya

This technology is TAAT1 validated.

8·9 Scaling readiness: idea maturity 8/9; level of use 9/9

Gender assessment 3

Climate impact 7

Problem

- High plant densities cause uneven growth, delayed maturity, and increased labor.
- Low densities lead to weed competition and yield variability.
- Unmanaged stands accumulate pests and diseases.
- Insufficient wind protection damages plants.

Solution

- Proper spacing promotes uniform growth, reduces labor, and optimizes yield.
- Adequate spacing minimizes resource competition and maximizes sunlight exposure.
- Square block planting provides wind protection.
- Spacing aids in weed management and pest/disease control.

Key points to design your project

The Spacing and Stand Management technology in Banana and Plantain farming boosts yield and mitigates climate impact, aiding both small-scale and large-scale producers. It contributes to SDGs 2 (Zero Hunger) and 13 (Climate Action) by maximizing yield and improving resource efficiency.

For successful implementation in Africa, the following steps are crucial:

- Engaging stakeholders
- Training farmers
- Setting up demonstration plots
- Providing support services
- Conducting regular monitoring and evaluation

The cost of training varies based on several factors. It's advisable to reach out to the technology provider or a local agricultural extension service for detailed information.

100 t/ha/year
Dwarf Cavendish planted at 2500 to 4400 plants per ha

IP
Open source / open access

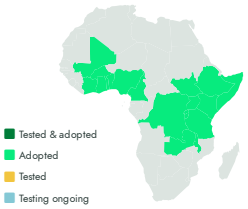
Technology from
ProPAS

Commodities
Banana/Plantain

Sustainable Development Goals

Categories
Production, Practices, Yield improvement

Tested/adopted in



Where it can be used

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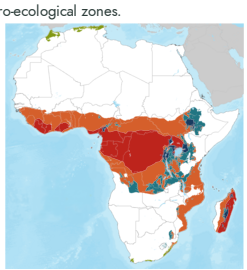


Target groups
Farmers

Specialty Fertilizers and Local Blending for Banana and Plantain

Fertilize for Success: Banana & Plantain Boost

The technology of Specialty Fertilizers and Local Blending for Banana and Plantain involves creating tailored fertilizer blends to enhance banana and plantain yield in Sub-Saharan Africa. It adapts to soil characteristics, improves crop resilience, and increases productivity and nutritional value. It's a cost-effective solution for farmers.

International Institute of Tropical Agriculture (IITA)
Godfrey Taulya

This technology is TAAT1 validated.

8·9 Scaling readiness: idea maturity 8/9; level of use 9/9

Gender assessment 4

Climate impact 7

Problem

- **Nutrient Deficiency**: Poor soil nutrients lead to low crop yields.
- **Environmental Stresses**: Crops are vulnerable to drought, pests, and diseases.
- **Climate Change**: Drought due to climate change affects crop health and productivity.

Solution

- **Nutrient Supply**: Provides balanced nutrients, improving crop growth and yield.
- **Crop Resilience**: Strengthens crop resilience to environmental stresses.
- **Climate Adaptability**: Helps crops withstand impacts of climate change.

Key points to design your project

The Specialty Fertilizers and Local Blending for Banana and Plantain technology contributes to several Sustainable Development Goals (SDGs) by improving crop yields, promoting gender equality, and having a positive impact on the climate. It enhances productivity and resilience of crops, contributing to zero hunger and economic growth.

To implement this technology:

- Identify potential partners
- Launch an awareness campaign and training programs,
- Develop the right blends of fertilizer and leverage the manufacturer's distribution network,
- Set up demonstration plots,
- Establish a feedback mechanism, and regularly monitor and evaluate the impact of the technology.

6 ton/ha
yield increase

IP
Open source / open access

Technology from

ProPAS

Commodities

Banana/Plantain

Sustainable Development Goals

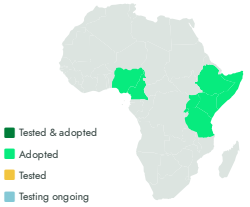
Categories

Production, Inputs, Fertilizer

Best used with

- Improved Varieties of Plantain for Tropical Lowlands ›
- Improved Varieties of Banana for the African Highlands ›

Tested/adopted in



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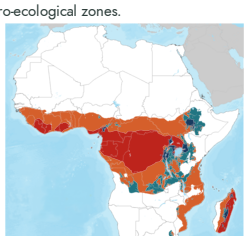


SAH cassava: Semi Autotrophic Hydroponics for Cassava Multiplication

A rapid quality seed delivery technology for cassava

SAH for Cassava Multiplication is an innovative technology using controlled environments for cost-effective and adaptable cassava propagation. It fosters robust root growth, reduces diseases, and yields high-quality plantlets, expediting access to new cassava varieties and boosting overall productivity in farming.

International Institute of Tropical Agriculture (IITA)
Mercy Elohor Diebiru-Ojo

This technology is TAAT1 validated.

9·9 Scaling readiness: idea maturity 9/9; level of use 9/9

Gender assessment 4

Climate impact 7

Problem

- Traditional methods are time-consuming.
- Conventional propagation prone to pests and diseases.
- Seed and tissue culture methods have low multiplication ratios.
- Stem cuttings may be more susceptible to pests and diseases when planted in open fields.

Solution

- SAH enables rapid access to new cassava varieties.
- Creates a controlled environment for healthy root growth.
- SAH significantly improves ratios compared to seed and tissue culture.
- Planting materials from SAH are more resilient and less susceptible to pests and diseases in open fields.

Key points to design your project

To integrate the technology, estimate plantlet quantities, consider delivery costs, and account for training and communication support.

Additionally, optimize by combining the technology with disease-resistant and golden cassava varieties.

Collaboration with agricultural institutes and seed multiplication companies is recommended for implementation in your country.

Cost: $$$ **10,000 USD**
Setup up for a 40 sq. meter facility

ROI: $$$ **80 %**
over one year

0.05 USD	**0.05 - 1 USD**	**116 %**	**IP**
operating cost per plant	Production cost	ROI over 3 year	Unknown

Technology from

ProPAS

Commodities

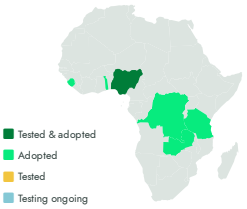
Cassava

Sustainable Development Goals

Categories

Production, Practices, Seed system

Tested/adopted in



Where it can be used

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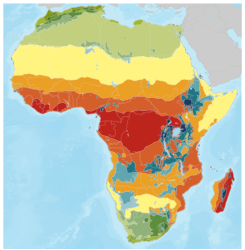


Target groups

Farmers

SAH: Semi-Autotrophic Hydroponics for yam multiplication

Multiplying Seeds, Securing Harvests, Ensuring Food Security!

International Institute of Tropical Agriculture (IITA)
Pelemo Olugboyega Success

SAH is a low-cost licensed technology designed for mass multiplication of yam through leaf nodal cuttings, which are grown in a sterile planting medium such as peat moss, decomposed sawdust, rice husk, or cocopeat. These cuttings are placed in transparent plastic containers under controlled conditions, where they develop roots, shoots, and eventually tubers.

⚠ This technology is **not yet validated**.

9·3 Scaling readiness: idea maturity 9/9; level of use 3/9

Gender assessment 2

Climate impact 5

Problem

- **Insufficient Seed Supply**: The production of seed yam is inadequate to meet national food security needs.
- **High Seed Costs**: Seed yam accounts for up to **50% of total production costs**, making it unaffordable for many farmers.
- **High Seed Consumption from Previous Harvests**: Farmers typically **use up to 33% of their previous year's harvest** as seed, reducing food availability for consumption and sale.

Solution

- **High Multiplication Rate**: A **single box of 25 seedlings** can yield up to **500 plants in 90 days**, and over **1,000 plants** when transplanted into pots for further multiplication.
- **Space Efficiency**: **1 million planting materials** can be produced within **60 square meters**, ensuring year-round supply.
- **Scalability**: The technology is adaptable for **formal seed systems and commercial seed enterprises**, supporting the growth of the yam seed sector.

Key points to design your project

Semi-Autotrophic Hydroponics (SAH) enables year-round, cost-effective yam seed multiplication, addressing seed shortages and high production costs. To integrate this technology,

- Estimate plantlet needs (50,000 for 16 hectares), factor in delivery and import costs, and include training for successful implementation.
- Collaborate with agricultural institutes and seed companies to ensure sustainable integration and increased food security.

2250 USD
Cost of producing 50,000 SAH seedling

33 %
Return on investment on seedling sales

60,000 USD
Construction or acquisition of the fixed assets

10,000—25,000 USD
Labor cost in West Africa per year

20,000 USD
Laboratory setup including shelving

15,000 USD
Consumables (Substrates, plastic box, nutrients and non-consumables and maintenance)

IP
Open source / open access

Commodities

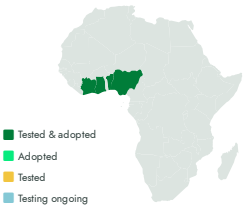
Yam

Sustainable Development Goals

Categories

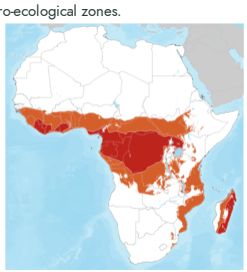
Production, Practices, Yield improvement, Seed system

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Beauveria Biopesticide: Based on the entomopathogenic fungus Beauveria bassiana

A Sustainable, Profitable Solution for Diamondback Moth and Beyond!

This biopesticide utilizes *Beauveria bassiana*, an entomopathogenic fungus, specifically isolate Bb11, to control pests like the cabbage moth (*Plutella xylostella*). The fungus produces conidia spores that attach to the insect's cuticle, germinate, and penetrate internal tissues, leading to the insect's death. It is a natural, eco-friendly alternative to chemical pesticides, safe for humans, animals, and beneficial insects, and is effective in Integrated Pest Management (IPM) systems for sustainable crop protection.

This technology is **not yet validated**.

Scaling readiness: idea maturity unknown; level of use unknown

Gender assessment

Climate impact

Problem

- Smallholder farmers face major crop losses due to pests like fall armyworm, aphids, and whiteflies.
- Overuse of chemical pesticides has led to pest resistance, reducing effectiveness.
- Synthetic pesticides pose risks to human health, pollinators, and ecosystems.
- Affordable and eco-friendly alternatives are limited or inaccessible to farmers.
- Climate change is worsening pest outbreaks and expanding their range.

Solution

- Uses the natural fungus *Beauveria bassiana* to biologically control harmful insect pests.
- Effectively targets pests like fall armyworm, aphids, whiteflies, and borers without harming beneficial insects.
- Reduces dependence on chemical pesticides, lowering environmental and health risks.
- Can be integrated into climate-smart and organic farming practices.
- Supports sustainable pest management and preserves biodiversity.
- Suitable for smallholder use—safe, affordable, and easy to apply.

Key points to design your project

Beauveria bassiana (Bb11) is a locally validated, eco-friendly biopesticide that effectively controls pests like diamondback moths, fall armyworms, and aphids. It reduces reliance on chemical pesticides, supports food security, and preserves biodiversity.

To integrate Bb11 into government programs:

1. **Estimate needs** by crop and pest pressure.
2. **Verify local availability** or plan for import.
3. **Train farmers and extension agents** on application.
4. **Raise awareness** through educational materials.
5. **Promote IPM strategies** for long-term effectiveness.
6. **Collaborate with partners** for broad adoption.

International Institute of Tropical Agriculture (IITA)
Manuele Tamo

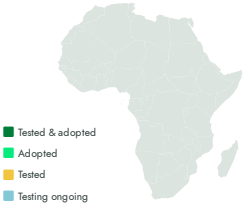
Commodities

Sustainable Development Goals

Categories

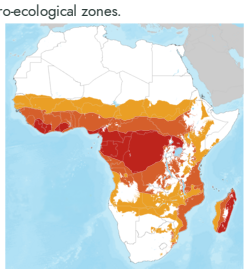
Production, Inputs, Pesticide, Biocontrol

Tested/adopted in



Where it can be used

This technology can be used in the colored agro-ecological zones.



Target groups

Farmers, Researcher center

Ready-to-Scale Technologies from IITA

https://taat.africa/xzl

ABOUT US

TAAT

TAAT, Technologies for African Agricultural Transformation, is an African Development Bank initiative to boost agricultural productivity by rapidly rolling out proven technologies to more than 40 million smallholder farmers.

TAAT aims to double crop, livestock, and fish productivity by 2025 by engaging both public and private sectors to expand access to productivity-increasing technologies across the continent.TAAT advises African government who receive funding from international financial institutions such as the African Development Bank to help them integrate the best agricultural technologies in their development projects. TAAT also offers technical assistance for the integration of these technologies, when needed.

TAAT Technologies

TAAT definition of agricultural technologies is very broad: they include improved varieties, inputs, equipment, agricultural infrastructure, practices and agricultural policies. In short, any solution to an agricultural constraint. TAAT technologies have been developed by a wide variety of organizations: the CGIAR, other international research institutions, national research organizations, or the private sector.

TAAT Clearinghouse

Within TAAT, the Clearinghouse has the remit to select, profile and validate agricultural technologies, and showcase them in online catalogs to support the advisory role that the Clearinghouse offers to governments and the private sector. The Clearinghouse strives to be an 'honest broker' of technologies through its selection, profiling, validation and advice.

TAAT e-catalogs

The e-catalogs are designed to be used by decision-makers within governments, private sector companies or development organizations. They facilitate the search for appropriate solutions that are adapted to local conditions and requirements, and provide all necessary information, presented in jargon-free and easy to analyze technology profiles. Once a decision-maker has selected a technology of interest, the e-catalogs facilitate their direct contact with those who can help them implement the technology, whether they are a research group or a private company.

TAAT Technology Toolkits

Technology toolkits are hand-picked selections of technologies from the TAAT e-catalogs. We offer some curated toolkits for specific cases, and registered users can create their own toolkits, showcasing their selection of technologies. Toolkits can be used online and shared as links, as mini e-catalogs, they can also be downloaded, saved, shared or printed as collections of technology pitches in PDF format (pitches are one-page summaries of technology profiles, available for all technologies on the e-catalogs).

CONTACT

Chrys Akem – TAAT Program Coordinator: +234 8169020531
Dr Solomon Gizaw – Head, TAAT Clearinghouse: +251 900461992
taat-africa@cgiar.org | https://e-catalogs.taat-africa.org

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