


Nutrient-rich variety

Varieties of grains, roots, tubers, enriched with essential nutrients such as: vitamin A, iron, zinc, etc.

7 TECHNOLOGIES | CREATED ON APR 15, 2024 BY TAAT PROFILING TEAM | LAST UPDATED JUL 24, 2025



TECHNOLOGIES IN THIS TOOLKIT

- **Cassava varieties with high dry matter and starch content**
- **HIB varieties**: Biofortified Beans for Improved Nutrition
- **OFSP**: Orange-Fleshed Sweet Potato (High provitamin A)
- **Purple Antioxidant Potatoes**: Purple-fleshed sweet potato (high i...
- **Golden maize varieties (High provitamin A)**
- **Golden cassava varieties (Vitamin A fortified)**
- **Climbing Bean with High Yield and N Fixation**

https://taat.africa/rrj

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

Cost: $$$ ROI: $$$

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

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 business plan

This technology, focusing on cassava varieties with high dry matter and starch content, benefits both seed multipliers and users, such as aggregators and farmers.

- Seed multipliers should be aware that most of these cassava varieties are royalty-free but require certification for seed systems compliance.
- Potential customers include farmers, development projects, government agencies, and NGOs.
- To assess profitability, estimating the realized profit considering the overall cost structure and potential yields is crucial.

Gender assessment 4

Climate impact 5

Technology from

ProPAS

Commodities

Cassava

Sustainable Development Goals

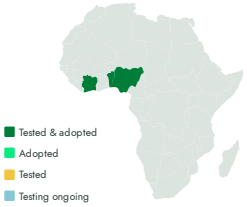
Categories

Production, Improved varieties, Yield improvement, Quality improvement

Best used with

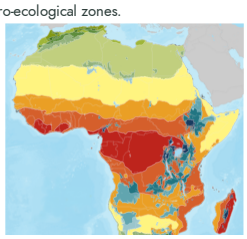
- Digital Decision Support Tool ›

Tested/adopted in



Where it can be used

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



HIB varieties: Biofortified Beans for Improved Nutrition

Fueling Health with Iron-Rich Beans

"Biofortified Beans for Improved Nutrition" technology develops high-iron bean varieties via biofortification to combat deficiencies in Sub-Saharan Africa. With 31 released varieties, it enhances regional food security and nutrition.

This technology is TAAT1 validated.

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

IP

Open source / open access

Problem

- Iron and zinc deficiencies leading to: Anemia, Impaired motor and cognitive development, Increased risk of maternal death and premature births, Low birth weight
- Weakened immune systems
- Increased susceptibility to infections
- Stunted growth

Solution

- Development of high-iron bean varieties through biofortification.
- Crossbreeding local elite lines with American bean varieties naturally rich in iron.
- Resulting in High-Iron Beans (HIB) with traits including: High productivity, Drought and disease tolerance, Preferred culinary characteristics, Quick cooking.
- Release of 31 HIB varieties in key production areas across Sub-Saharan Africa.
- Enhanced food security and nutrition in the region.

Key points to design your business plan

For Manufacturer:

- Stock up on Foundation or Registered Seed, no license needed.
- Target customers include wholesale distributors, government agencies, NGOs.
- Strong partnerships with distributors are vital.

For Users:

- Available in various countries, consider import duties.
- Partner with HIB sellers, estimate cost structure and potential profits.

Gender assessment 4

Climate impact 7

Alliance

The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT)

Justin Mabeya Machini

Technology from

ProPAS

Commodities

Common bean

Sustainable Development Goals

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

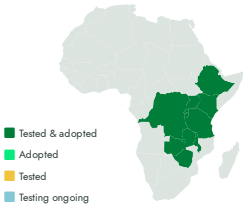
Categories

Production, Improved varieties, Quality improvement

Best used with

- Seed dressing of Seed with Fungicide and Insecticide ›
- Seed Inoculation with Rhizobia ›
- 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.

OFSP: Orange-Fleshed Sweet Potato (High provitamin A)

Orange Sweetness, Nutrient Richness, and Farmer's Success - Embrace OFSP!

Orange Fleshed Sweet Potato (OFSP) is a biofortified crop rich in beta-carotene, particularly in comparison to light-colored flesh cultivars. Upon consumption, the beta-carotene converts into vitamin A, enhancing nutrition and supplementing diets. OFSP holds significant potential for improving food and nutritional security throughout Africa.

International Potato Center (CIP)
Kwikiriza Norman

This technology is TAAT1 validated.

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

Cost: $$$ **20 USD**
10kg vines

200 kg	**25 tons**	IP
vines for 1 acre (0.3 hectare)	per hectare	Open source / open access

Problem

- Widespread vitamin A deficiency contributes to malnourishment,
- Traditional sweet potato varieties yield only 3-7 tons per hectare, resulting in limited food availability and income for farmers.
- The lack of diverse and nutrient-rich crops hampers overall nutrition, posing a challenge to addressing dietary deficiencies and promoting sustainable agriculture.

Solution

- It addresses vitamin A deficiency by providing a rich source of this essential nutrient, promoting better health and nutrition.
- OFSP's improved varieties yield 25 tons per hectare, significantly surpassing traditional varieties, thereby enhancing food security and increasing farmers' income.
- OFSP offers a versatile and nutrient-rich crop, diversifying nutrient sources and contributing to overall nutrition, promoting a sustainable and healthier agricultural ecosystem.

Key points to design your business plan

This technology is beneficial for two main groups: manufacturers, and end users (farmers):

To efficiently multiply varieties, acquire enhanced OFSP varieties and participate in training sessions.

Potential customers include wholesale distributors, government agencies, and NGOs. Building partnerships with distributors is crucial.

Gender assessment 5

Climate impact 6 1

Technology from

ProPAS

Commodities

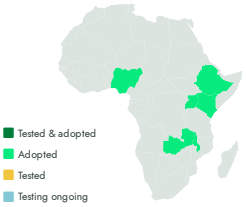
Sweet Potato

Sustainable Development Goals

Categories

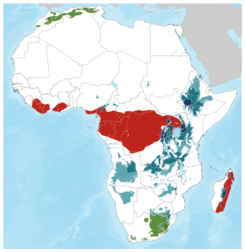
Production, Improved varieties, Yield improvement, Quality improvement

Tested/adopted in



Where it can be used

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



Target groups

Farmers, Seed companies

Purple Antioxidant Potatoes: Purple-fleshed sweet potato (high in antioxidants)

Sustain Your Health with Purple Potato

The Purple-fleshed sweet potatoes (PFSP) is a sweet potato variety with purple-colored flesh. These PFSP varieties are characterized by their high levels of anthocyanins, a type of flavonoid that imparts the purple color and contributes to their antioxidant properties.

International Potato Center (CIP)
Kwikiriza Norman

This technology is TAAT1 validated.

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

Cost: $$$ **20 USD**
A bag of 10 Kg of sweet potato vines

ROI: $$$ **30 %**
Increase in better health

IP
Open source / open access

Problem

- Vitamin deficiencies are widespread in subsistence farming and poor communities
- People in these communities face health risks related to heart disease and cancer
- There is a need to address dietary imbalances in these communities.

Solution

- PFSP varieties have two to three times more antioxidant activity compared to white or yellow sweet potatoes.
- The high levels of antioxidants in PFSP contribute to the body's growth, immune system, and brain activity.
- Residues from PFSP, such as vines, peels, and deformed tubers, can be repurposed into silage, providing nutritious fodder for ruminants and pigs.
- PFSP varieties are rich in potassium, fiber, vitamin C, and vitamin B6

Key points to design your business plan

This technology appeals to seed multipliers and farmers.

- Seed multipliers can efficiently propagate Purple-fleshed sweet potato (PFSP) vines without needing a license, targeting wholesale distributors and various organizations as potential customers.
- Farmers benefit from using PFSP, needing reliable sellers of PFSP vines to access the technology. They should estimate the profit potential of incorporating PFSP into their farming practices.

Gender assessment 4

Climate impact 7

Technology from

ProPAS

Commodities

Sweet Potato

Sustainable Development Goals

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

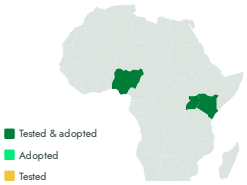
Categories

Production, Improved varieties, Quality improvement

Best used with

- Community-based multiplication of sweet potato vines and cuttings ›
- Tent-style greenhouse for multiplication of sweet potato vines and cuttings ›
- Raised beds for sweet potato production and weed management ›
- Specialty blended fertilizers for root and tuber crops ›
- Relay intercropping of sweet potato with legumes ›
- Silage production from sweet potato vines and tubers ›

Tested/adopted in



Golden maize varieties (High provitamin A)

Nutrition-boosting, income-enhancing maize.

These maize varieties have distinctive orange kernels, a result of high beta-carotene content. They are developed through advanced breeding techniques, combining naturally provitamin A enriched lines from Central and South America with elite land races and hybrid lines with improved agronomic traits.

African Agricultural Technology Foundation (AATF)
Jonga Munyaradzi

This technology is TAAT1 validated.

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

Cost: $$$ **0.8—1.2 USD** per kg

10—20 % Revenue increased

IP
Open source / open access

Problem

- Significant population, including children and adults, faces preventable blindness and weakened immune systems due to insufficient vitamin A levels.
- Increased susceptibility to diseases such as measles, diarrhea, and respiratory infections.
- Common maize varieties lack vital vitamins and minerals, contributing to widespread malnutrition.
- 50% of children aged 0.5 to 5 years are at risk of vitamin A deficiency, leading to severe health complications and diminished quality of life

Solution

- Provitamin A enriched maize varieties provide a stable source of essential nutrients, combating deficiencies.
- Preservation of beta-carotene ensures a consistent supply of vitamin A.
- Genomic modification maintains nutrient content without compromising yield.
- Cost-effective approach for regions heavily reliant on maize.
- Tailored to meet nutritional needs, providing a significant portion of daily vitamin A requirement.
- Accessible and adaptable for diverse farming systems.

Key points to design your business plan

This technology is beneficial for three main groups: manufacturers, resellers, and end users (farmers).

Golden Maize technology provides a cost-effective solution, addressing vitamin A deficiency and empowering diverse farming communities globally. Selling the product enhances user engagement, contributing to overall health and wellbeing. Utilizing Provitamin A enriched maize ensures a sustainable solution, combating vitamin A deficiency and empowering farming communities for enhanced health and wellbeing.

Inclusion assessment 4

Climate impact 4

Technology from

ProPAS

Commodities

Maize

Sustainable Development Goals

2 ZERO HUNGER · 3 GOOD HEALTH AND WELL-BEING · 13 CLIMATE ACTION

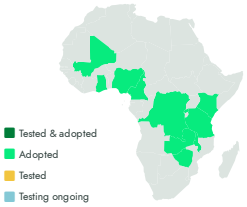
Categories

Production, Improved varieties, Yield improvement, Quality improvement

Best used with

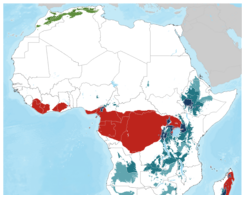
Drought Tolerant Maize Varieties and Water Efficient Maize Varieties, Pre-plant blended fertilizers and nitrogen topdressing for maize, Maize-legume rotation and...
See all 3 technologies online

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

IP

Open source / open access

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 business plan

This technology is beneficial for three main groups: seed multipliers, resellers and farmers

For seed multipliers, effective seed multiplication involves stocking Foundation or Registered Seed, with open-pollinating varieties requiring certification.

Resellers target customers include small retailers, development projects, producers, and producer cooperatives.

Users benefit from cost-effective solutions and partnerships with sellers.

Gender assessment 4

Climate impact 5

Technology from

ProPAS

Commodities

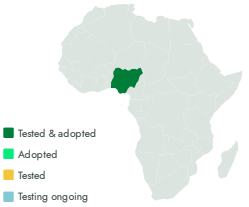
Cassava

Sustainable Development Goals

Categories

Production, Improved varieties, Yield improvement, Quality improvement

Tested/adopted in



Where it can be used

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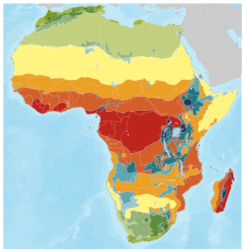


Target groups

Farmers, Seed companies

Climbing Bean with High Yield and N Fixation

Growing Prosperity: Climbing Beans for Food Security & Income Growth

Climbing beans, with their long vines and high growth, are a valuable crop for small-scale farmers in Sub-Saharan Africa. Improved varieties, bred for productivity, resilience, and superior nitrogen-fixing abilities, contribute significantly to food security and income in the region. These beans are also processed into various products for local and international markets.

This technology is TAAT1 validated.

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

4.6 t/ha	92 kg	28 %	IP
Potential yield	N fixed per ha	Increase in bean consumption	Trademark

Problem

- **Agricultural Challenges**: Limited yields and susceptibility to pests and diseases affect small-scale farmers.
- **Environmental Stresses**: Drought, poor soil quality, and nitrogen-depleted soils hinder bean cultivation.
- **Food Insecurity**: These challenges contribute to food insecurity and malnutrition in small-scale farming communities.

Solution

- **Higher Yields**: Climbing beans yield more than bush beans.
- **Pest/Disease Resistance**: These varieties resist common pests and diseases.
- **Stress Tolerance**: They thrive in adverse conditions.
- **Nitrogen Fixation**: The technology reduces fertilizer costs.
- **Food Security**: They provide a reliable food source for small-scale farmers.

Key points to design your business plan

Seed Multiplier: Producing climbing bean varieties is a sustainable solution that empowers farming communities and contributes to global wellbeing. Seed multipliers need to acquire Foundation or Registered Seed and adhere to licensing requirements for producing and selling certified seeds. Their potential customers include wholesale distributors, development projects, government agencies, and NGOs.

Resellers: Reselling climbing bean varieties enhances health and wellbeing globally. Resellers need to source climbing bean varieties in bulk, identify efficient transportation methods, and find suitable storage facilities. Their potential customers include local retailers, development projects, producers, and producer cooperatives.

User: Using climbing bean varieties fosters economic empowerment and enhances the wellbeing of farming communities. Users need sellers of climbing bean varieties and must consider costs of seeds, labor, and fertilizer inputs to estimate potential profit.

Gender assessment 4

Climate impact 7

Alliance

The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT)

Josey Kamanda

Technology from

ProPAS

Commodities

Common bean

Sustainable Development Goals

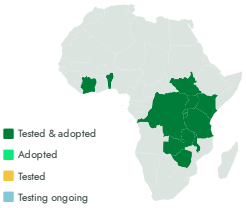
Categories

Production, Improved varieties, Disease resistance, Insect resistance

Best used with

- Low-Cost Staking for Climbing Beans ›
- Seed Inoculation with Rhizobia ›
- Seed dressing of Seed with Fungicide and Insecticide ›

Tested/adopted in



Where it can be used

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

Nutrient-rich variety

https://taat.africa/rrj

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).

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