Wheat Technologies Toolkit

This toolkit is a collection of technologies designed to optimize wheat cultivation across Africa. These technologies have been meticulously selected to address the challenges encountered in wheat production, processing, commercialization, and storage, ensuring a more resilient and profitable wheat sector. By integrating these technologies into your projects or business plans, yo...

15 TECHNOLOGIES | CREATED ON JUN 10, 2024 BY TAAT PROFILING TEAM | LAST UPDATED MAY 28, 2025

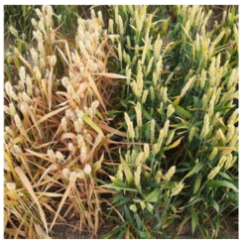
TECHNOLOGIES IN THIS TOOLKIT

- **Heat and Drought Tolerant Wheat Varieties**
- **Trace**: FairFood Traceability Solutions
- **Turbocrop**: Field crop plant establishment biostimulant
- **GrainMate**: Grain Moisture Meter
- **IPM**: Integrated Management of Insects, Diseases and Weeds in...
- **Conservation agriculture**: Minimal Tillage and Surface Mulching of Soils
- **Furrow Irrigated Raised Bed Wheat Production**
- **Wheat Cultivation in Dryland through Winter Irrigation**
- **Yellow Rust and Stem Rust Resistant wheat**
- **Hello Tractor**: Contract mechanization apps
- **Combine Harvesters for Wheat and Fleet Management tool**
- **PICS**: Hermetic Bags for Safe Storage of grain
- **Hessian Fly Resistant Wheat Varieties**
- **Flour Milling and Blending Systems for Wheat, Sorghum a...**
- **NextGen Advisory**: Digital Advisory tool for Farmers

https://taat.africa/pwq

Heat and Drought Tolerant Wheat Varieties

Wheat cultivation in high temperature regions



These wheat varieties mature in 90 days, withstand temperatures 4°C above normal, maintain 75% yield under extreme conditions, resist diseases like yellow stem rust, and have high water use efficiency. They also good for bread flour with a protein content of 14-15%. Ideal for challenging environments like Sub-Saharan Africa.

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 7

Problem

- **Heat Stress**: Yield loss due to temperatures 4°C higher than normal.
- **Drought Conditions**: Poor performance with less than 200mm of moisture.
- **Low Productivity**: Traditional varieties yield much less than 6 tons/ha.
- **Limited Cultivation Zones**: Unsuitable for high temperatures and low rainfall areas

Solution

- **Heat Tolerance**: Withstand temperatures 4°C higher than normal.
- **Drought Resistance**: Perform well with less than 200mm of moisture.
- **Higher Yields**: Achieve up to 6 tons/ha.
- **Expanded Cultivation Areas**: Suitable for high-temperature and low-rainfall regions.

Key points to design your project

To integrate this technology

- Calculate seed quantity based on planting rate and cost,
- Consider sourcing logistics,
- Provide training and communication support, and
- Collaborate with agricultural institutes and seed multiplication companies for implementation.

Additionally, it's recommended to combine this technology with other wheat production methods for optimal results.

Cost: $$$

4 - 6 tons/ha	**100** kg/ha	IP
increase in yield	Planting rate	Unknown

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

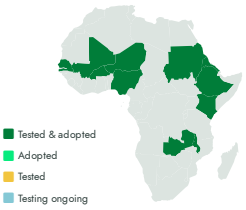
Categories

Production, Improved varieties, Drought tolerance, Heat tolerance

Best used with

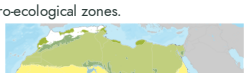
- Wheat Cultivation in Dryland through Winter Irrigation ›
- Furrow Irrigated Raised Bed Wheat Production ›
- Yellow Rust and Stem Rust Resistant wheat ›

Tested/adopted in



Where it can be used

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



Trace: FairFood Traceability Solutions

Easy-to-use solution for food traceability

Trace technology is an advanced tracking solution for agricultural and food-related companies, offering transparency and sustainability. It enhances consumer trust by providing clear and verifiable data about a product's journey and ethical production practices.

This technology is pre-validated.

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

Gender assessment 3

Climate impact 6

Problem

- Agri-food companies struggle with risk mitigation in their operations.
- Transparent traceability of agri-food products is challenging to ensure.
- The food industry lacks sufficient tools for storing and managing essential data.

Solution

- Traceability solutions enable showcasing the precise origin of products.
- Transparent sharing of evidence supporting brand values with the public.
- FairFood's traceability solutions contribute to increased income for farmers.
- Foster transparency and trust, helping create fairer compensation mechanisms within the agri-food supply chain.

Key points to design your project

"FairFood Traceability Solutions" offers a digital platform to enhance transparency and trust in the agri-food supply chain. To integrate this technology into your project,

- Accessing the platform and installing the necessary software, considering associated costs.
- Configure the platform with relevant supply chain information and provide training and ongoing support to personnel.
- Utilize the platform to track product movement and share transparent information.

11,070 USD Initial investment	**110 USD** Social Return on Investment per farmer per YEAR
22.14 USD subscription/user/year	**3,320 USD** Operating Investment /YEAR
IP Open source / open access	

FAIRFOOD

Fairfood
Marten van Gils

Commodities

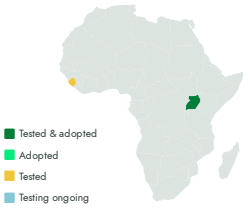
Common bean, Cassava, Cowpea, Leguminous, Maize, Sorghum/Millet, + 9 more

Sustainable Development Goals

Categories

Production, Prevention & storage, Transformation, Market, Pre-production, Digital applications, + -3 more

Tested/adopted in



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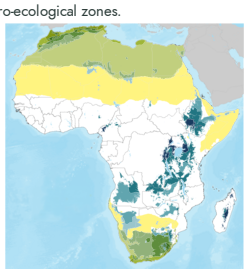
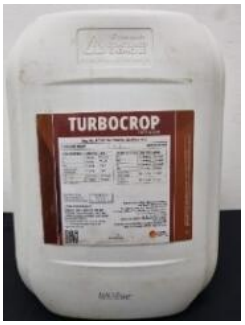


Target groups

Breeders, Farmers, Processors, Fish Farmers, Sellers

Turbocrop: Field crop plant establishment biostimulant

Specialized biostimulant for root development and vegetative growth on field crops



Turbocrop is a specialized biostimulant product designed to enhance the development of roots and promote vegetative growth in crops. It is specifically formulated to improve plants' ability to withstand and cope with abiotic stress factors, such as extreme temperatures, drought, or nutrient deficiencies.

UPL Ltd.
Florent Clair

This technology is validated.

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

Gender assessment 4

Climate impact 6 1

Problem

- Imbalances in soil nutrients hinder optimal plant growth and productivity.
- Factors constrain the potential size and structure of plants, impacting overall yield.
- Restrictions in root development impede nutrient uptake, affecting plant health and productivity.
- Inefficiencies in nutrient absorption and utilization by plants result in suboptimal growth.
- Various factors contribute to limitations in crop yields, affecting agricultural productivity and food security.

Solution

- Stimulates root hair formation for enhanced nutrient absorption.
- Promotes stem elongation and leaf growth, particularly during tillering.
- Provides a balanced blend of essential nutrients for optimal crop growth.
- Improves nutrient utilization efficiency for better plant performance.
- Offers a holistic approach to plant growth, addressing root development, stem elongation, leaf formation, and nutrient optimization.

Key points to design your project

Turbocrop technology improves food security, nutrition, and climate resilience by boosting yields, enhancing nutrient absorption, and supporting sustainable, biodiverse farming.

Integration steps:

- Align with project needs
- Estimate required quantity and costs (including training/support)
- Select reliable suppliers
- Plan for integration, staff training, and performance monitoring
- Promote the technology through communication efforts
- Collaborate with development institutes and agri-service partners for success

Cost: $$$ **10 - 20 USD**
Fertilizer cost

460 Kg/ha	**170 USD/ha**	**IP**
Yield increase	Benefit on maize in South Africa	Patent granted

Commodities

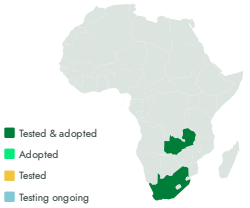
Wheat, Maize, Groundnut, Common bean, Other commodity

Sustainable Development Goals

Categories

Production, Inputs, Fertilizer

Tested/adopted in



Where it can be used

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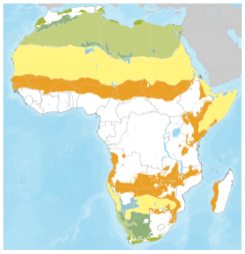


Target groups

Farmers

GrainMate: Grain Moisture Meter

Control the moisture content of grains and reduce post-harvest losses.

The Grain Moisture Meter helps African farmers prevent mold and post-harvest losses. Ministries of Agriculture, extension services, and food safety agencies use it to ensure quality control, improve storage, and enforce market standards. It supports fair trade, enhances food security, and boosts market value at both farmer and national levels.

Sesi Technologies Limited
Isaac Sesi

This technology is pre-validated.

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

Gender assessment 4

Climate impact 4

Problem

- **Grain Losses:** FAO reports 10–20% of grain is lost in Sub-Saharan Africa due to poor post-harvest handling.
- **Unreliable Methods:** Farmers use biting or tossing grains, which are inaccurate.
- **Lack of Moisture Meters:** Many farmers can't afford or find reliable grain moisture meters.
- **Mold Risk:** Grains above 13.5% moisture quickly develop mold.
- **Poultry Impact:** High-moisture grains reduce egg production and increase bird disease and deaths.

Solution

- **Eliminates Guesswork:** The meter replaces unreliable methods, enabling informed storage decisions.
- **Improves Accessibility:** Affordable and easy to use, priced at $60, it's accessible to many farmers.
- **Reduces Grain Losses:** It helps farmers measure moisture accurately, preventing post-harvest losses and ensuring food security.
- **Supports National Planning:** Reliable data aids governments in monitoring grain quality, predicting risks, and shaping food security policies.

Key points to design your project

The GrainMate Moisture Meter addresses challenges in traditional grain moisture measurement. To integrate this technology into your project, you mainly need to:

- Assess the quantity of GrainMate Moisture Meters needed,
- Account for delivery costs to your project site,
- Provide training.

Cost: $$$ **45—60 USD**
Price for resellers and users

ROI: $$$ **90 %**
Post-harvest losses reduced

Commodities

Maize, Sorghum/Millet, Soybean, Wheat, Groundnut

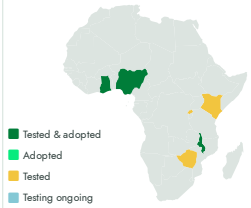
Sustainable Development Goals

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

Categories

Prevention & storage, Equipment, Post-harvest handling

Tested/adopted in



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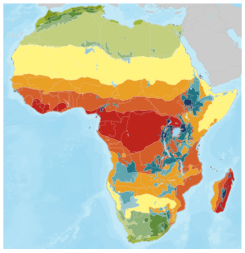


Target groups

Farmers, Processors, Warehouse Operators, Advisory and Extension Services

IPM: Integrated Management of Insects, Diseases and Weeds in Wheat

Balanced Protection for Sustainable Harvests

IPM in wheat combines biological and cultural techniques, releasing beneficial organisms through gradual or immediate methods to control pests and reduce chemical reliance. Key practices like crop rotation, adjusted planting times, increased crop density, and mass trapping target aphids, weeds, whiteflies, and thrips effectively.

ICARDA
Science for resilient livelihoods in dry areas

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

This technology is TAAT1 validated.

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

Gender assessment 5

Climate impact 6

Problem

- **Emergence of Pesticide-Resistant Pests:** Frequent pesticide use leads to resistant pest biotypes, risking crop damage and reducing yields.
- **Distorted Natural Pest Control:** Excessive pesticide application disrupts natural pest predators, leading to uncontrolled pest populations.
- **Environmental Risks with Chemicals:** Overuse of pesticides can harm soil, water, and ecosystems, posing environmental risks.

Solution

- **Preventing Pesticide Resistance:** IPM employs diverse biological and agronomic methods to reduce reliance on chemical agents, preventing the emergence of pesticide-resistant pests.
- **Restoring Natural Pest Control:** IPM balances populations of beneficial and harmful organisms using biological, mechanical/physical, and cultural techniques, restoring natural pest control mechanisms.
- **Sustainable Crop Protection:** IPM minimizes the use of chemical pesticides, promoting sustainable crop protection and safeguarding food safety and environmental health.

Key points to design your project

Integrated Pest Management (IPM) improves crop productivity and food security while minimizing health risks associated with pesticides. To effectively implement IPM, it is essential:

- To identify pests and beneficial organisms, understand the benefits and costs, access control agents, estimate their required quantities, and provide necessary training.
- To develope communication materials and collaborate with agricultural development institutes for successful integration of IPM into agricultural practices.

Cost: $$$ **515 USD**
Full IPM package

ROI: $$$ **30—70 %**
Yield increased

17—33 %
Reduction in beetle damage

<10 %
Rust infestation reduction

35 USD per hectare
Profit generated by IPM

IP
Open source / open access

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

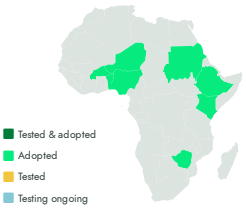
Categories

Production, Practices,
Pest control (excluding weeds),
Weed management

Best used with

- Yellow Rust and Stem Rust Resistant wheat ›
- Hessian Fly Resistant Wheat Varieties ›
- Heat and Drought Tolerant Wheat Varieties ›

Tested/adopted in



Where it can be used

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

Conservation agriculture: Minimal Tillage and Surface Mulching of Soils

Conservation Agriculture for Sustainable Farming

Later ripening and better grain filling of wheat due to water conservation in no-till system (middle)

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

Conservation agriculture (CA) includes minimal soil disturbance, surface residue retention, and crop rotation, proven effective in dryland wheat farming. It improves soil quality, water use efficiency, and yield stability, while reducing costs and energy. Additionally, CA enhances soil biodiversity, mitigates emissions, and sequesters carbon, benefiting both farmers and the environment.

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

- Excessive tillage and limited organic matter degrade soil quality.
- Droughts, intense rains, and overuse limit water availability.
- Dryland farming yields are low and vulnerable to water scarcity.
- Agriculture contributes to emissions and affects carbon storage.
- Traditional tillage leads to weed competition and yield reduction.

Solution

- Minimal soil disturbance, surface residue retention, and crop rotation.
- Enhanced soil quality, water efficiency, and yield stability.
- Mitigates drought and heat stress on crops.
- Saves water and reduces herbicide usage.
- Manages soil nutrients and pests effectively.
- Suitable for various soil types and water conditions.
- Increases resilience to environmental stresses.

Key points to design your project

The Minimal Tillage and Surface Mulching of Soils technology boosts crop productivity and ensures food security by maintaining consistent yields while conserving water and soil health. This method reduces agriculture's environmental impact, aiding in poverty alleviation and promoting sustainable livelihoods for farmers. To integrate this technology, it is essential to raise awareness of its benefits, ensure equipment accessibility, implement incentives for agroecosystem services, establish connections with food industries for market access, allocate resources for training and ongoing support, collaborate with agricultural institutions, and explore integration with complementary technologies.

Cost: $$$ **740 USD/ha**

Three-year average total production under CA

15 - 22 %	**18 - 21 %**	**20 %**	**923 USD/ha**	**IP**
Increase in yield	water use efficiency	increase in income	Increase in profit from wheat production	Open source / open access

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

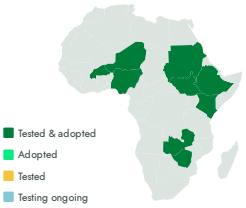
Categories

Production, Practices,
Pest control (excluding weeds),
Water management

Best used with

- Yellow Rust and Stem Rust Resistant wheat ›
- Hessian Fly Resistant Wheat Varieties ›

Tested/adopted in



Where it can be used

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Furrow Irrigated Raised Bed Wheat Production

Smart Irrigation, Bountiful Harvests

This technique involves creating raised beds with furrows for planting crops, which ensures even irrigation and optimal soil moisture while reducing soil erosion and preventing waterlogging. It is effective with specific irrigated wheat varieties. In Ethiopia, suitable varieties include Amibera, Ga'ambo, Kakaba, Fentale-2, Shorima, Dandaa, and Ogolcho. In Nigeria, the varieties are Attila,...

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International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

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

- **Flooding wastes water:** Raises production costs.
- **Scattered fertilizer:** Costs more, harms environment.
- **Uncontrolled moisture:** Lowers yields, hurts productivity.
- **Limited freshwater:** Weakens drought resistance, hurts yields.

Solution

- **Saves water:** Targets furrows for optimal soil moisture.
- **Protects crops:** Raised beds prevent waterlogging and improve drainage.
- **Reduces waste:** Precise fertilizer application minimizes cost and environmental harm.
- **Boosts harvests:** Rainwater harvesting and controlled irrigation maximize water use for resilient crops.

Key points to design your project

This technology empowers women (less irrigation labor) & promotes climate-smart agriculture (water conservation, reduced erosion) - supports SDGs 2 (Zero Hunger), 5 (Gender Equality), & 13 (Climate Action). To integrate in a project, consider:

1. **Partnerships:** Collaborate with research institutions, extension services, and cooperatives (consider IITA).
2. **Training:** Train farmers on bed construction, furrow management, and best practices (~$50-100/farmer).
3. **Land & Seed Selection:** Evaluate land slope (<3% ideal) and soil texture. Choose drought-resistant, high-yielding wheat varieties.
4. **Cost Estimation:** Seeds (~$5-10/kg), tools (~$10-20/farmer), labor & inputs (~$300/hectare).
5. **Water Management:** Choose efficient method (canals, wells) based on budget and needs.
6. **Implementation:** Construct beds & furrows, monitor water usage. Plan for recurrent bed reconstruction every 3 seasons.

Cost: $$$ **300 USD**
labor and input per ha

360 USD
sheet plastic per ha

100—250 USD
water from planting to harvest

IP
Open source / open access

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

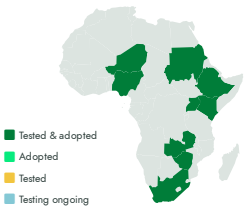
Categories

Production, Practices, Water management

Best used with

- Wheat Cultivation in Dryland through Winter Irrigation ›
- Minimal Tillage and Surface Mulching of Soils ›

Tested/adopted in



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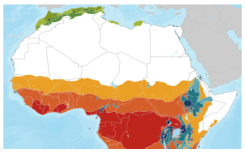

Wheat Cultivation in Dryland through Winter Irrigation

Growing Resilient Wheat, Even in the Hottest Seasons.

Expanded Production of Irrigated Wheat technology, emphases the cultivation of spring wheat varieties and the use of suitable irrigation systems, specific wheat varieties, fertilizers, and pesticides to promote a sustainable and resilient approach to wheat cultivation.

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 6 1

Problem

- Decreased wheat yields due to exposure to high diurnal temperatures
- The global climate change, leading to heightened risks of yield losses and crop failure.
- Traditional cultivation of wheat during the hot rainy seasons exposes the crop to adverse effects of heat stress.

Solution

- Promote winter production of wheat in African dryland,
- Develop and implement irrigation systems, including investments in water lifting and drip feed infrastructure,
- Encourage the use of heat-tolerant wheat varieties including fertilizers, and pesticides.

Key points to design your project

This technology improves wheat production. To implement it:

- Provide access to affordable irrigation systems
- Estimate input quantities, consider delivery costs, provide training, and develop communication materials.
- Collaborate with agricultural institutes and seed companies is recommended for successful technology integration

Cost: $$$ **373 USD**

Total cost of a winter production using surface irrigation

4 - 6 ton/ha
Grain yields increased

100,000 - 300,000 Ha
Possible area for cultivation expansion

IP
Open source / open access

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

Categories

Production, Practices, Water management

Best used with

- Furrow Irrigated Raised Bed Wheat Production ›

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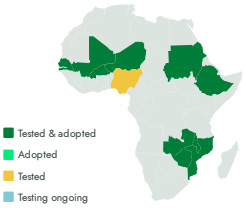

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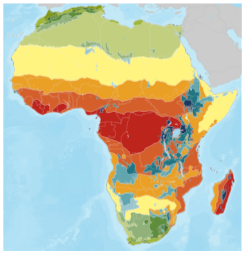

Target groups

Farmers

Yellow Rust and Stem Rust Resistant wheat

Rust-Resistant Wheat for a Flourishing Future

Rust-resistant wheat varieties use All-stage resistance (ASR) and Adult plant resistance (APR) genes to combat rust fungi. ASR provides strong protection but can be overcome by evolving fungi. APR offers partial, longer-lasting, broad-spectrum resistance. Combining ASR and APR enhances resistance.

Symptoms of yellow rust (left) and stem rust (right)

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International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

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

- **Rust Epidemics**: Yellow and stem rust cause significant yield losses and devastate wheat crops in Sub-Saharan Africa.
- **Rapid Spread**: These diseases spread rapidly through wind-borne spores, leading to massive losses.
- **New Strains & Native Infections**: Continuous emergence of new strains and infections in native grasses make control and eradication challenging.

Solution

- **ASR and APR Genes**: Provide strong and broad-spectrum protection against rust fungi at all plant stages.
- **High Yield Potential**: Maintain high yield despite rust resistance.
- **Robustness**: Exhibit resistance to other diseases and environmental stresses like drought.

Key points to design your project

Rust-resistant wheat varieties mitigate climate change effects on wheat production and contribute to SDGs 2, 5, and 13. Adoption involves:

1. **Capacity Building**: Training farmers on the benefits and management of these varieties.
2. **Participatory Variety Selection**: Involving farmers in trials to select suitable varieties.
3. **Seed Multiplication and Distribution**: Producing and distributing seeds, requiring partnerships with seed companies and local governments.
4. **Field Demonstrations**: Showcasing the performance of the varieties.
5. **Monitoring and Evaluation**: Regularly assessing the adoption and impact.
6. **Advocacy**: Promoting policies and practices that support widespread adoption.

These activities may overlap and their sequence can vary based on the project's context and resources.

4.1 Ton/ha
average grain yield

440 USD
Total farming operational costs

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

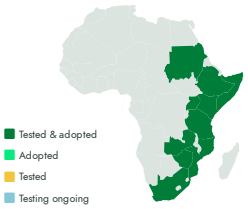
Categories

Production, Improved varieties, Disease resistance, Yield improvement

Best used with

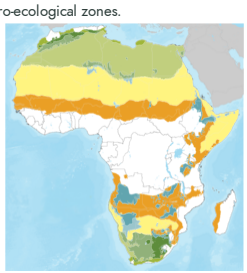
- Integrated Management of Insects, Diseases and Weeds in Wheat ›

Tested/adopted in



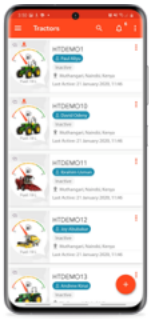
Where it can be used

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



Hello Tractor: Contract mechanization apps

Enhance crop productivity, reduce labour costs, and increase incomes with Hello Tractor - the digital platform revolutionizing agricultural mechanization in Sub-Saharan Africa.



Hello Tractor is a digital platform facilitating the sharing of agricultural power equipment, connecting owners and smallholder farmers. It incorporates monitoring devices to gather vital data about tractors, harvesters, and other equipment, allowing for efficient management and optimization.

Hello Tractor
Rispa Miliza

Technology from

ProPAS

Commodities

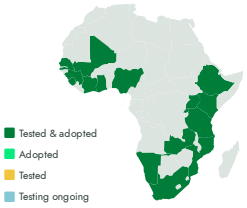
Maize, Rice, Wheat, Sorghum/Millet, Cowpea, Groundnut, + 5 more

Sustainable Development Goals

Categories

Production, Market, Digital applications, Supply chain management, Crop management

Tested/adopted in



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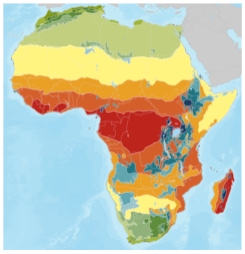


Target groups

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 7

Problem

- Limited access to modern agricultural technologies for small-scale producers.
- High costs and risks associated with operating tractors and power equipment on farms.
- Inadequate information and communication channels for farmers to access mechanization services.
- Inefficient management of agricultural equipment, leading to underutilization and suboptimal performance.
- Limited scalability of mechanization services in smallholder farming communities.

Solution

- Access to modern agricultural technologies for small-scale producers
- Cost-effective and risk-minimized operation of agricultural equipment
- Improved information and communication channels for farmers
- Efficient management of agricultural equipment
- Scalability of mechanization services in smallholder farming communities

Key points to design your project

- Hello Tractor revolutionizes agriculture by making mechanized farming affordable and efficient, thereby reducing poverty and combating hunger.
- It also promotes gender equality and stimulates rural economic growth by creating job opportunities.
- Through its digital platform, Hello Tractor innovates agriculture and enhances infrastructure efficiency.
- To integrate the technology, purchase smart devices, upload data, and monitor operations closely.
- Collaborate with relevant organizations and invest in training and communication materials for successful implementation.

Cost: $$$ **75 - 210 USD**

Cost of getting the technology

60—70 USD

Cost of renting a four-wheel tractor for 4 hours

IP

Copyright

Combine Harvesters for Wheat and Fleet Management tool

Efficient Harvesting, Smarter Fleet Management

The combine harvester is a modern agricultural machinery designed to perform multiple harvesting operations as threshing, gathering, and winnowing, all in a single process. Available in various sizes, its suitable for crops like wheat, maize, rice, soybean, barley, sunflower, and more.

Combine harvester operating in Sudan

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 6 1

Problem

- Traditional manual harvesting is time-consuming and demands significant labor.
- Conventional threshing methods are slow and risk potential grain loss.
- Manual separation of grain from chaff is inefficient, leading to impurities.
- Older methods may have limited capacity, resulting in slower operations.

Solution

- Combine harvesters automates the harvesting process, reducing the need for manual labor.
- Its offers threshing mechanisms, minimizing grain loss during harvesting.
- Its incorporate separation technologies, ensuring effective grain separation and reducing impurities.
- Help to increases harvesting capacity.

Key points to design your project

Combine harvesters and fleet management offer transformative solutions to challenges in traditional grain harvesting by minimizing yield losses. Integrating this technology involves:

- Evaluating unit sizes and costs, considering sources.
- Training, communication support, and
- Collaboration with agricultural institutes.

Cost: $$$ **12,000—500,000 USD**
Unit of combine harvesters

35 %
Reduced harvest losses

56—63 USD
harvesting unit cost per Ha

IP
Unknown

Technology from

ProPAS

Commodities

Maize, Rice, Wheat, Soybean

Sustainable Development Goals

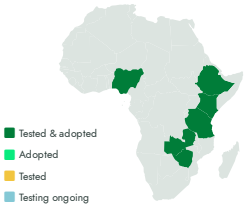
Categories

Harvest, Equipment, Land preparation

Best used with

- Contract mechanization apps ›

Tested/adopted in



Where it can be used

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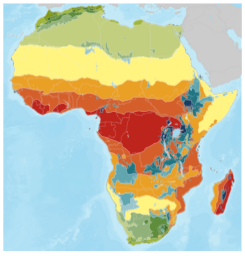


Target groups

Farmers

PICS: Hermetic Bags for Safe Storage of grain

Low cost storage technologies for grain

Hermetic bags are like super-sealed containers that stop air and moisture from reaching the grains inside. This way, farmers can store their grains for up to two years without them getting bad. This is good for farmers because it means they always have enough food and can sell their grains for better prices.

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 5

Problem

- **Post-harvest losses**: Farmers in Sub-Saharan Africa lose over 25% of beans due to inadequate storage methods.
- **Pest infestations**: Weevils, moths, and mites damage stored beans, forcing farmers to sell at low prices immediately after harvest to minimize losses.
- **Fungal contamination**: Traditional storage can lead to fungal growth, such as aflatoxin, contaminating beans and reducing their quality.
- **Food security issues**: Ineffective storage hinders farmers' ability to keep enough beans for consumption between harvests, threatening food security and livelihoods.

Solution

- **Airtight sealing**: The multi-layer design blocks air and moisture, preventing pest infestations without chemicals.
- **Moisture control**: Hermetic bags maintain stable moisture levels, inhibiting fungal growth like aflatoxin.
- **Long-term preservation**: They preserve beans for up to two years, maintaining quality and cooking time.
- **High durability**: Made from strong, reusable materials, hermetic bags ensure reliable grain storage.

Key points to design your project

To integrate PICS bags into your project:

- **Cost Analysis**: Bags cost $1 to $1.5 each (50kg or 100kg capacity). Estimate the number needed.
- **Supply Chain**: Identify suppliers, including delivery costs and any import duties.
- **Training**: Budget for training sessions and ongoing support.
- **Communication**: Create promotional materials (flyers, videos, etc.).
- **Grain Preparation**: Ensure grains are properly dried before storage, using moisture measurement devices if necessary.

These steps will help enhance food security and reduce post-harvest losses.

Cost: $$$ **2—3 USD**
Bag cost for users

ROI: $$$ **90 %**
Reduction of loss

50 or 100 Kg
Bag capacity

2 year
Life span

IP
Trademark

Alliance

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

Technology from

ProPAS

Commodities

Common bean, Rice, Wheat, Maize, Sorghum/Millet, Soybean

Sustainable Development Goals

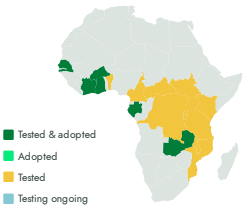
Categories

Prevention & storage, Equipment, Post-harvest handling

Best used with

- Mechanized Threshing Operations ›

Tested/adopted in



Where it can be used

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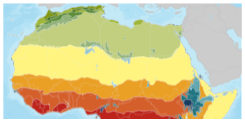


Hessian Fly Resistant Wheat Varieties

Reduce wheat losses due to Hessian fly and increase yield

The Hessian Fly Resistant Wheat Varieties are specifically bred wheat plants with a natural ability to resist the Hessian fly, a destructive insect. Created through selective breeding, these varieties are developed to withstand larvae attacks, acting as a protective shield for the wheat.

Hessian fly adult (left) and larvae and damage to wheat (right)

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

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

The wheat production faces infestations by the Hessian fly and lead to substantial losses in many major wheat-producing areas, impacting crop yields.

Solution

- Hessian Fly Resistant Wheat Varieties provides a natural barrier against infestations.
- These varieties significantly decrease damage caused by Hessian fly larvae, ensuring healthier crops.

Key points to design your project

This technology enhances gender inclusion by improving nutrition and food security. To integrate it into your project, estimate seed costs, consider delivery expenses, and collaborate with local institutes and seed companies. Training, monitoring, and communication support are essential for successful implementation.

Cost: $$$ **35—43 USD**
Seed needed per ha

ROI: $$$

79—100 %	**5.5—7.1 tons/ha**	**105 USD**	**IP**
Protection of plants from pests	yield potential	Additional production of forages per ha	Copyright

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

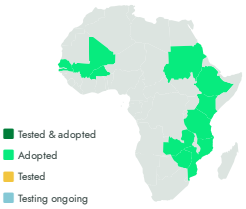
Categories

Production, Improved varieties, Insect resistance

Best used with

- Integrated Management of Insects, Diseases and Weeds in Wheat ›

Tested/adopted in



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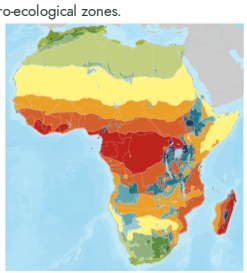


Flour Milling and Blending Systems for Wheat, Sorghum and Millet

Produce a premium wheat, sorghum and millet flour close to production areas

This technology comprises milling and blending systems that enable the production of premium flour products in both rural and urban areas. Different milling systems are available, meeting industry standards. An abrasive grain mill typically includes a feed-in hopper, roller table for grinding, rotary sieve for bran separation, and a conveyor belt.

This technology is TAAT1 validated.

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

Gender assessment 4

Climate impact 3

Problem

- The traditional grinding and cooking of millet and sorghum grains are associated with significant time, energy burden, and labor intensity.
- Transport and cost issues arise in the distribution of raw grain to rural consumers.
- A lack of value addition to raw grain for products sold in urban markets and food processing.

Solution

- The milling and blending systems automate the process, saving time, energy, and labor.
- They reduce the necessity to transport raw grain over long distances, lowering costs for rural consumers.
- The flour processing adds value to raw grain.

Key points to design your project

This technology can be integrated into nutrition projects, offering job opportunities. To implement it, focus on :

- Awareness,
- Product standards,
- Efficient production setups,
- Collaboration with food processor companies.

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

For small flour mill machine with a capacity of 300 - 500 kg flour per hour

ROI: $$$ **12—15 %**

increase in milling yield

38,000 USD

Base price for a fully automatic flour mill with a capacity of 30 ton flour per day

80—82 %

maximal recovery of flour

18—20 %

maximal recovery of bran

IP

Open source / open access

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Dougbedji Fatondji

Technology from

ProPAS

Commodities

Sorghum/Millet, Wheat

Sustainable Development Goals

2 ZERO HUNGER

8 DECENT WORK AND ECONOMIC GROWTH

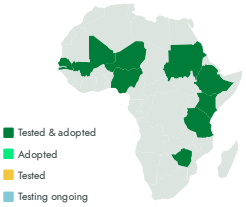
Categories

Transformation, Equipment, Agrifood processing

Best used with

- Millet and Sorghum Varieties for Better Nutrition and Stress Resistance ›

Tested/adopted in



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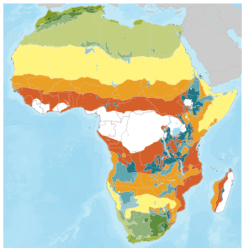


NextGen Advisory: Digital Advisory tool for Farmers

Empowering Farmers with Digital Guidance

The NextGen advisory system utilizes precise location, context, and climate data to offer tailored agricultural advisories. Using machine learning algorithms, the system analyzes diverse data points to provide accurate recommendations for fertilizer use and other farming practices.

This technology is **pre-validated**.

8·7

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

Gender assessment

Climate impact

Problem

- Traditional low fertilizer application rates, which are prevalent in many agricultural regions.
- This practice leads to underutilization of resources and limits crop growth, thereby affecting overall agricultural productivity.

Solution

- The tool provide site-specific organic and inorganic fertilizer recommendations for key crops such as maize, teff, and wheat.
- It integrates hyper-localized data and tailored approaches to address soil fertility management plus (ISFM+) framework.
- This comprehensive tool aims to increase agricultural productivity and sustainability by providing precise, actionable advisories directly to farmers.

Key points to design your project

The NextGenAgroadvisory tool aims to revolutionize wheat, maize and teff farming, boosting production, increasing profits, and minimizing wastage.

To integrate NextGenAgroadvisory Into Your Project:

- Access the app from Google Play or the web for advice on various devices.
- Farmers get advisories through videos, interactive voice responses, and digital formats for accessibility.
- Promote the tool's benefits and ease of access among farmers.
- Promote investments in fertilizer and weed management technologies.
- Create flyers, videos, and radio broadcasts to encourage adoption.

24—36 %

Wheat yield increased

IP

Unknown

EXCELLENCE IN AGRONOMY
Adapt Intensify Grow

Excellence in Agronomy
Lulseged Tamene

Technology from

CASH from EiA

Commodities

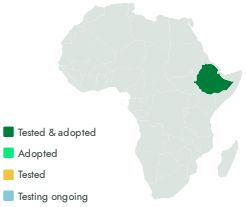
Wheat, Teff, Maize

Sustainable Development Goals

Categories

Production, Digital applications, Advisory and information service, Yield improvement

Tested/adopted in



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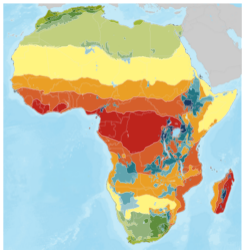

Target groups

Development institutions, Farmers,

Wheat Technologies Toolkit

https://taat.africa/pwq

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

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TAAT is funded by the African Development Bank, the TAAT Clearinghouse is co-funded by the Bill and Melinda Gates Foundation and the African Development Bank.