



**COMPENDIUM OF TECHNOLOGIES
DEVELOPED BY THE NATIONAL AGRICULTURAL
RESEARCH ORGANISATION 2012-2025**

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OVER VIEW

NARO conducts research guided by a research agenda aimed at solving food and nutrition insecurity; unlocking employment opportunities and wealth creation; increasing production and productivity; value addition, market access and institutional capacity development for improved livelihoods and sustainable agricultural transformation.

This is achieved through generating and promoting of Technologies, Innovations and Management Practices (TIMPS) in crops, livestock, forestry and fisheries as well as integration of Indigenous Knowledge with modern scientific methods in the research agenda such as biodiversity conservation, characterisation and bio-prospecting.

Guided by her mission and goals, NARO implements a client and impact oriented, market responsive research agenda through its 16 Public Agricultural Research Institutes (PARIs) (7 National Agricultural Research Institutes, 9 Zonal Agricultural Research Institutes).



MANDATE

“Coordinating, overseeing and guiding agricultural research in Uganda”.

VISION

“A competitive society supported by a dynamic agricultural research innovation system”.

Mission

“To innovate for sustainable agricultural transformation”.

GOAL

“To increase total factor productivity and access to agricultural research products and services for inclusive growth.”

CORE VALUES

Inclusivity, Transparency, Subsidiarity, Accountability and Excellence.



*Location of the
Public Agricultural
Reserch Institutes
(PARIs)*





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TECHNOLOGY COMPENDIUM 2025 EDITION

Introduction

The National Agricultural Research Organization (NARO) was established by the NAR Act 2005 to oversee and coordinate Agricultural Research in Uganda. NARO's goal is to enhance the contribution of agricultural research for sustainable agricultural productivity, economic growth, food security and poverty eradication through generation and dissemination of appropriate technologies, knowledge and information.

The core business is grounded on generation and promotion of Technologies Innovations and Management Practices (TIMPS) in crops, livestock, fisheries and integration of Indigenous Knowledge (IK) with modern scientific methods in some of the research agenda such as biodiversity conservation, characterization and bio-prospecting.

The term "technologies" as used in NARO includes strategies, approaches, prototypes, breeds, varieties, provenances, management practices; value added products, recipes and new agricultural knowledge in the domain of crops, forestry, livestock, fisheries and natural resource management. This compendium is a documentation of key technologies developed and/or recommended between 2012-2025.

Purpose

The prime purpose of this compendium is to communicate and inform intended users about the presence of NARO technologies for increased uptake.



Target audience for the Compendium

This compendium is intended to provide information about NARO technologies to farmers, policy makers, processors, marketiers, extension service providers and consumers. Other beneficiaries include academia, scientists and development partners.



ACRONYMS

ALS	Angular Leaf Spot
ANTH	Anthraxnose
BCMV	Bean Common Mosaic Virus
BCTB	Black Coffee Twig Borer
BR	Black Root
CBB	Cassava Bacterial Blight
CGM	Cassava Green Mite
CMD	Cassava Mosaic Disease
GLS	Grey Leaf Spot
MSV	Maize Streak Virus
MuZARDI	Mukono Zonal Agricultural Research & Development Institute
NARO	National Agricultural Research Organization
NARL	National Agricultural Research Laboratories
NaCRRRI	National Crops Resources Research Institute
NaFORRI	National Forestry Resources Research Institute
NaCORI	National Coffee Research Institute
NaFIRRI	National Fisheries Resources Research Institute
NaLRRRI	National Livestock Resources Research Institute
NaSARRI	National Semi-Arid Resources Research Institute



NLB Northern Leaf Blight

PARI Public Agricultural Research Institute

PPBs Permanent Planting Basins

RR Root Rot

ZARDI Zonal Agricultural Research and Development Institute



CROP TECHNOLOGIES

BANANA





NAROBan 1 (NARL, 2017)

Attributes and Adaptation



- ❖ Potential yield of up to 54.9t/ha/yr
- ❖ Resistant to black Sigatoka
- ❖ Tolerant to pests (weevils, nematodes)
- ❖ Highly acceptable to consumers, 83%
- ❖ Plant maturity: 13.7 months
- ❖ Bunch maturity: 3-5 months
- ❖ Suitable production ecosystem: Well drained loam soils

Source of Seed:

NARL, Kawanda;

+256 414-567156/414-699242/753-605621

NAROBan 2 (NARL, 2017)

Attributes and Adaptation



- ❖ Plant maturity: 13.3 months
- ❖ Bunch maturity: 3-5 months
- ❖ Yielding potential: 60.4 t/ha/yr
- ❖ Resistant to black Sigatoka
- ❖ Tolerant to weevils and nematodes
- ❖ Days to bunch maturity = 130
- ❖ Acceptability = 4.9 (Max 6)
- ❖ Suitable production ecosystem: Well drained loam soils

Source of Seed:

NARL, Kawanda;

+256 414-567156/414-699242/753-605621



NAROBan 3 (NARL 2017)

Attributes and Adaptation



- ❖ Plant maturity: 13.8 months
- ❖ Yielding potential: 64.7t/ha/yr
- ❖ Resistant to black Sigatoka
- ❖ Tolerant to weevils and nematodes
- ❖ Days to bunch maturity = 142
- ❖ Acceptability = 4.1 (Max 6)
- ❖ Suitable production ecosystem: Well drained loam soils

Source of Seed:

NARL, Kawanda;

+256 414-567156/414-699242/753-605621



- ❖ Plant maturity: 13.2 months
- ❖ Yielding potential: 68.8t/ha/yr
- ❖ Resistant to black Sigatoka
- ❖ Tolerant to weevils
- ❖ Tolerant to nematodes
- ❖ Days to bunch maturity =126
- ❖ Acceptability = 5.1 (Max 6)
- ❖ Suitable production ecosystem: Well drained loam soils

Source of Seed:

NARL, Kawanda;

+256 414-567156/414-699242/753-605621



NAROBan 5 (NARL 2019)

Attributes and Adaptation



- ❖ Resistant to weevils, nematodes and black sigatoka
- ❖ Has big size fruits
- ❖ Maximum bunch weight of 45kg
- ❖ Average bunch weight of 28kg
- ❖ Yield: 54.5 t/ha/yr
- ❖ Tastes as good as the local varieties (yellow pulp, soft pulp and aromatic)
- ❖ Pro-vitamin A (pVA) content: 12.3µg/g dry weight
- ❖ Acceptability=5.8 (Max 6)
- ❖ Mid-altitude areas (1200-1700 masl)
- ❖ Does best in most districts of Western, South Western and Central Uganda

Source of Seed:

NARL, Kawanda;

+256 414-567156/414-699242/753-605621

NAROBAN6 (NARL 2025)

Attributes and Adaptation



- ❖ Bunch weight: 26 Kgs – 32.5 Kgs
- ❖ Average yield: 40.5 tons per hectare
- ❖ Flowering: 10 months from planting
- ❖ Maturity: 14 months
- ❖ Improved for: Tolerance to nematodes, tolerance to weevils, resistance to Fusarium wilt and black sigatoka.
- ❖ Lifespan: 10 years and more
- ❖ Blends well with landraces

Seed Source:

NARL, Kawanda;

+256 414 567 649 wcg

SWEET POTATO



NAROSPOT 1 (NaCRRI, 2017)



Attributes and Adaptation

- ❖ Maturity Period: 4 Months
- ❖ Plant type: spreading
- ❖ Yielding potential: 29 t/ha
- ❖ Long irregular root shape and purple-red in skin color
- ❖ Tolerant to both SPVD and SPW
- ❖ Resistant to Alternaria blight diseases
- ❖ High dry mater (DM), 33%
- ❖ Flesh colour cream
- ❖ Suitable production system: mid-altitude
- ❖ Root size: large

Source of Seed:

NaCRRI, Namulonge;
+256 414-573016/773-131247



NAROSPOT 2 (NaCRRI, 2017)



Attributes and Adaptation

- ❖ Maturity Period: 4 Months
- ❖ Plant type: spreading
- ❖ Early flowering and profuse
- ❖ Early maturing variety with maturity Average root yield 34.2 t/ha
- ❖ Tolerant to both SPVD and SPW
- ❖ Highly resistant to Alternaria blight
- ❖ Long irregular root shape
- ❖ High dry mater (DM), 34.2%
- ❖ Skin colour: purple-red
- ❖ Flesh colour: white
- ❖ Suitable production system: mid-altitude
- ❖ Average root size: medium

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NAROSPOT 3 (NaCRRI, 2017)

Attributes and Adaptation



- ❖ Maturity Period: 4 Months
- ❖ Plant stature: semi-erect
- ❖ Flowering: rare
- ❖ Average root yield: 18 t/ha
- ❖ Highly resistant to SPVD
- ❖ Moderately resistant to SPW
- ❖ Highly resistant to Alternaria blight
- ❖ Elliptic root shape and cream in skin color
- ❖ High dry mater (DM), 33%
- ❖ Flesh colour: white-cream
- ❖ Suitable production eco-system: mid-altitude

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247



NAROSPOT 4 (NaCRRI, 2017)

Attributes and Adaptation



- ❖ Maturity Period: 4 Months
- ❖ Plant stature: semi-erect
- ❖ Average root yield: 22 t/ha
- ❖ Highly resistant to SPVD
- ❖ Moderately resistant to SPW
- ❖ Highly resistant to Alternaria blight
- ❖ Elliptic irregular root shape and purple-red in skin color
- ❖ High dry mater (DM), 35%
- ❖ Flesh color: cream

Source of Seed:

NaCRRI, Namulonge;
+256 414-573016/773-131247

NAROSPOT 5 (NaCRRI, 2017)

Attributes and Adaptation



- ❖ Plant type is spreading
- ❖ Average root yield 19 t/ha
- ❖ Moderately resistant to SPVD
- ❖ Moderately resistant to SPW
- ❖ Moderately resistant to Alternaria blight
- ❖ Long irregular root shape
- ❖ Skin color: purple-red
- ❖ Flesh color: cream
- ❖ High dry mater (DM), 36%
- ❖ Maturity Period: 4 Months

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247



NAROSPOT 6 (NaCRRI, 2023)



Attributes and Adaptation

- ❖ Maturity: 120 days
- ❖ Potential Yield: 32.49 t/ha
- ❖ Improved for: Moderate resistance to sweet potato virus disease & Alternaria blight disease
- ❖ Best suited for: can be broadly produced in all parts of Uganda
- ❖ Dry matter content: 2

Source of Seed:

NaCRRI, Namulonge;
+256 414-573016

NAROSPOT 7 (NaCRRI, 2023)



Attributes and Adaptation

- ❖ Maturity: 120 days
- ❖ Potential Yield: 36.20 t/ha
- ❖ Improved for: Moderate resistance to sweet potato virus disease & Alternaria blight disease, moderate resistance to sweet potato weevils
- ❖ Best suited for: can be broadly produced in all parts of Uganda

Source of Seed:

NaCRRI, Namulonge;
+256 414-573016



NASPOT 12 O (NaCRRI, 2013)



Attributes and Adaptation

- ❖ Maturity period: 3.5-4 months
- ❖ Yielding potential 26.5 t/ha
- ❖ Plant stature: Semi-erect
- ❖ Moderately resistant to SPW
- ❖ Round elliptic root shape
- ❖ skin color: purple-red
- ❖ Flesh color(boiled flesh): dark orange
- ❖ High Vitamin A content
- ❖ High dry mater (DM), 32%
- ❖ Suitable production eco-system
- ❖ Altitude: mid Altitude
- ❖ Soil type: All types

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NASPOT 13 O (NaCRRI, 2013)



Attributes and Adaptation

- ❖ Plant stature is Semi-erect
- ❖ Sparse flowers
- ❖ Potential yield: 17.2 t/ha
- ❖ Moderately resistant to SPW
- ❖ Elliptic root shape
- ❖ Skin color: cream
- ❖ Flesh color: Dark orange
- ❖ High dry mater (DM), 32%
- ❖ High vitamin A content
- ❖ Maturity Period: 4 Months
- ❖ Provides high levels of vitamin A for rural households
- ❖ Tolerant to sweet potato virus (SPVD) and Alternaria blight diseases

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

CASSAVA



NAROCASS 1 (NaCRRI, 2015)



Attributes and Adaptation

- ❖ Long tubers, highest yielder so far & DM, sweet taste, resistant to CBSD
- ❖ Deep green leaves
- ❖ Root surface color: Cream
- ❖ Spacing 1m x 1m
- ❖ Average: 8-28 tubers (underground)
- ❖ Maturity period: 12 months
- ❖ Yield potential: 25-45 tons/ha
- ❖ DM: 34-37%, Grown in 80% of arable land
- ❖ Cassava Mosaic Disease (CMD) resistant and Cassava Brown Streak Disease (CBSD) tolerant variety with excellent culinary root traits
- ❖ Combines CMD resistance and CBSD tolerance making it the best choice for cultivation in CMD and CBSD hot spot areas
- ❖ Good culinary root traits makes the variety popular amongst cassava farmers
- ❖ High dry matter content (DMC) makes this variety excellent for fried and steamed products

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247



Attributes and Adaptation

- ❖ Many short tubers, high yield & DM, very aromatic, resistant to CMD and tolerant to CBSD
- ❖ Light green leaves
- ❖ Root surface color: Cream
- ❖ Spacing 1mx1m
- ❖ Average: 8-28 tubers(underground)
- ❖ Maturity period: 12 months
- ❖ Yield potential: 25-35 tons/ha
- ❖ DM:34-37%, Grown in 80% of arable land
- ❖ Cassava Mosaic Disease (CMD) resistant and Cassava Brown Streak Disease (CBSD) tolerant variety with excellent culinary root traits
- ❖ Good culinary root traits makes the variety popular amongst cassava farmers
- ❖ High dry matter content (DMC) makes this variety excellent for fried and steamed products

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

BEAN





NAROBEAN 1 (NaCRRI, 2016)

Attributes and Adaptation



- ❖ Bush-indeterminate
- ❖ Large seeded
- ❖ Yield potential:1500-2000 kg/ha
- ❖ Maturity: 60-68 days
- ❖ Best suited for low-mid altitude area
- ❖ Biofortified with Iron (65.8-72ppm (parts per million) and Zinc (31.4-34.2ppm)
- ❖ Yield potential 1500-2000kg/ha
- ❖ Best suited for low to mid-altitude areas
- ❖ Reduces malnutrition and improves health especially among children and pregnant mothers
- ❖ Drought tolerant
- ❖ Good for food security and incomes

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NAROBEAN 2 (NaCRRI, 2016)

Attributes and Adaptation



- ❖ Biofortified with Iron (66.1-72ppm) and Zinc (32.5-36.2ppm)
- ❖ Yield potential 1600-2200kg/ha
- ❖ Early maturing (58-68 days)
- ❖ Best suited for low to mid-altitude areas
- ❖ Medium seeded
- ❖ Maturity Period: 58-68 days
- ❖ Reduces malnutrition and improves health especially among children and pregnant mothers
- ❖ Drought tolerant
- ❖ Good for food security and incomes

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

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Licensed seed companies (Ref to www.naro.go.ug)



NAROBEAN 3 (NaCRRI, 2016)

Attributes and Adaptation



- ❖ Biofortified with Iron (65.4-69ppm) and Zinc (35-38ppm)
- ❖ Yield potential 1500-2000kg/ha
- ❖ Best suited for low to mid-altitude areas
- ❖ Bush-determinate
- ❖ Medium seeded
- ❖ Maturity Period: 58-68 days
- ❖ Reduces malnutrition and improves health especially among children and pregnant mothers
- ❖ Drought tolerant
- ❖ Good for food security and incomes

Source of Seed:

NaCRRI, Namulonge;

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Licensed seed companies (Ref to www.naro.go.ug)

NAROBEAN 4C (NaCRRI, 2016)**Attributes and Adaptation**

- ❖ Growth habit: Climber
- ❖ Seed size: medium seeded with oval shape
- ❖ Color: Red mottled
- ❖ Maturity Period: 82 - 88 days
- ❖ Yield potential: 2500-3700kg/ha
- ❖ Iron level: 77.4 - 83ppm
- ❖ Zinc level: 32.1-34.5ppm
- ❖ Best suited for Mid-high altitude area
- ❖ Drought tolerant
- ❖ Good for food security and incomes
- ❖ Reduces malnutrition and improves health especially among children and pregnant mothers

Source of Seed:

NaCRRI, Namulonge;

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Licensed seed companies (Ref to www.naro.go.ug)



NAROBEAN 5C (NaCRRI, 2016)

Attributes and Adaptation



- ❖ Growth habit: Climber
- ❖ Seed size: large seeded with kidney shape
- ❖ Color: Orange
- ❖ Maturity Period: 88 – 96 days
- ❖ Yield potential: 2500-3300kg/ha
- ❖ Iron level: 72.2 – 80ppm
- ❖ Zinc level: 34.7ppm
- ❖ Best suited for Mid-high altitude area
- ❖ Drought tolerant
- ❖ Good for food security and incomes

Source of Seed:

NaCRRI, Namulonge;

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Licensed seed companies (Ref to www.naro.go.ug)

NAROBEAN 6 (NACRRI, 2019)

Attributes and Adaptation



- ❖ Small seeded
- ❖ Yield potential: 2100-3800 kg/ha
- ❖ Maturity: 68-72 days
- ❖ Iron >72 ppm
- ❖ Zinc > 34 ppm
- ❖ Market class quality
- ❖ Highly Palatable
- ❖ Bush type (determinate bush)
- ❖ Drought tolerant
- ❖ Tolerant to Anthracnose, Bean common mosaic virus (BCMV), Angular leaf spot (ALS), Rust and most of other diseases
- ❖ Best suited for low-mid altitude areas (1000-1500 Masl) such as Lake Victoria Crescent agro ecological

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



NAROBEAN 7 (NACRRI, 2019)

Attributes and Adaptation



- ❖ Drought tolerant
- ❖ Small seeded
- ❖ Yield potential: 1900-3500 kg/ha
- ❖ Maturity: 68-73 days
- ❖ Iron >75 ppm Zinc >35 ppm
- ❖ Highly Palatable
- ❖ Bush type (indeterminate bush)
- ❖ Drought tolerant
- ❖ Tolerant to Anthracnose, BCMV, Rust, ALS and most of other diseases
- ❖ Best suited for low-mid altitude areas (1200-1700 Masl)
- ❖ Best preferred in northern Uganda (West-Nile and Mid-Northern agro ecological zone)

Source of Seed:

NaCRRI, Namulonge;

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Licensed seed companies (Ref to www.naro.go.ug)

NABE 17 (NaCRRI, 2012)



Attributes and Adaptation

- ❖ Bush type
- ❖ Yield potential: (2000-2500kg/ha)
- ❖ Tolerant to anthracnose, BCMV, ALS and other diseases
- ❖ Size: Medium seeded and oval shaped
- ❖ Color: Red and dirty white mottle
- ❖ Market class quality
- ❖ Maturity Period: 58-75 days
- ❖ Drought tolerant
- ❖ Good for food security and incomes

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



NABE 18 (NaCRRI, 2012)



Attributes and Adaptation

- ❖ Bush type
- ❖ Maturity Period: 63 – 78 days
- ❖ Yield potential: (2000-2500kg/ha)
- ❖ Resistant to anthracnose, BCMV, ALS & tolerant to Root rot diseases
- ❖ Seed size: Large seeded(49.3g/100 seeds)
- ❖ Drought tolerant
- ❖ Dark seed color preferred in northern Uganda(purple mottled)
- ❖ Best suited for low to mid altitude northern Uganda regions

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



- ❖ Yield potential: (2000-2500kg/ha)
- ❖ Resistant to anthracnose, BCMV, ALS, and tolerant most of other diseases
- ❖ Red mottled in colour
- ❖ Medium seeded and kidney shaped
- ❖ Maturity Period: 60 -70 days
- ❖ Market class quality
- ❖ Best suited for low to mid-altitude areas
- ❖ Drought tolerant
- ❖ 5-10% yield increase above local varieties such as Nambale varieties due to disease resistance

Source of Seed:

NaCRRI, Namulonge;

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+256-778737611/704118988

Licenced seed companies (Ref to www.naro.go.ug)



NABE 20 (NaCRRI, 2012)



Attributes and Adaptation

- ❖ Yield potential: (1600-2200kg/ha)
- ❖ Tolerant to anthracnose, BCMV, ALS, and most other diseases
- ❖ Medium seeded: 41g/100seds
- ❖ Market class quality (Kanyebwa type)
- ❖ Maturity Period: 58 – 70 days
- ❖ Bush type(indeterminate bush)
- ❖ Color & shape
- ❖ Drought tolerant
- ❖ Increased bean yields 10-15% above local varieties over local Kanyebwa varieties
- ❖ Good for food security and incomes
- ❖ Best suited for low to mid-altitude areas

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NABE 21 (NaCRRI, 2012)



Attributes and Adaptation

- ❖ Bush type
- ❖ Yield potential: (1500-2000kg/ha)
- ❖ Tolerant to anthracnose, BCMV, ALS, and most of other diseases
- ❖ Color: Dirty yellow with red tan mottles
- ❖ Size: Medium oval shaped seed
- ❖ Maturity Period: 58 - 70 day
- ❖ Drought tolerant
- ❖ Best suited for low to mid-altitude areas especially for eastern Uganda
- ❖ Market class quality

Source of Seed:

NaCRRI, Namulonge;

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Licensed seed companies (Ref to www.naro.go.ug)



NABE 22 (NaCRRI, 2012)



Attributes and Adaptation

- ❖ Yield potential: (1500-2000 kg/ha)
- ❖ Bush type (determinate)
- ❖ Resistant to anthracnose, BCMV, ALS, and tolerant to root rots and most of other diseases
- ❖ Best suited for low to mid-altitude in northern Uganda Market
- ❖ Medium seeded (42g/100 seeds)
- ❖ Maturity Period: 58 – 70 days
- ❖ Color and shape: dark purple speckled kidney beans
- ❖ Drought tolerant
- ❖ Yields (5-10%) due to high level of disease resistance
- ❖ Highly marketable in Northern Uganda
- ❖ Good for food security and incomes

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NABE 23 (NaCRRI, 2012)

Attributes and Adaptation



- ❖ Yield potential (2000-2500kg/ha)
- ❖ Bush type (determinate blue)
- ❖ Maturity (64-75 days)
- ❖ Tolerant to anthracnose, BCMV, ALS, root rots and most of other diseases
- ❖ Shape: Large seeded and Kidney shaped Kanyebwa
- ❖ Dark tan and dirty red stripes
- ❖ Best suited for low to mid-altitude
- ❖ Drought tolerant
- ❖ Good for food security and incomes

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



NABE 26C (NaCRRI, 2012)



Attributes and Adaptation

- ❖ Yield potential (2800-3500kg/ha)
- ❖ Growth habit: Climber
- ❖ Resistant to anthracnose, ALS and root rot diseases
- ❖ Maturity Period: 77 - 113 days
- ❖ Improved bean productivity for low-mid-high altitude regions
- ❖ Suitability: A high yielding variety in mid and high altitude areas

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

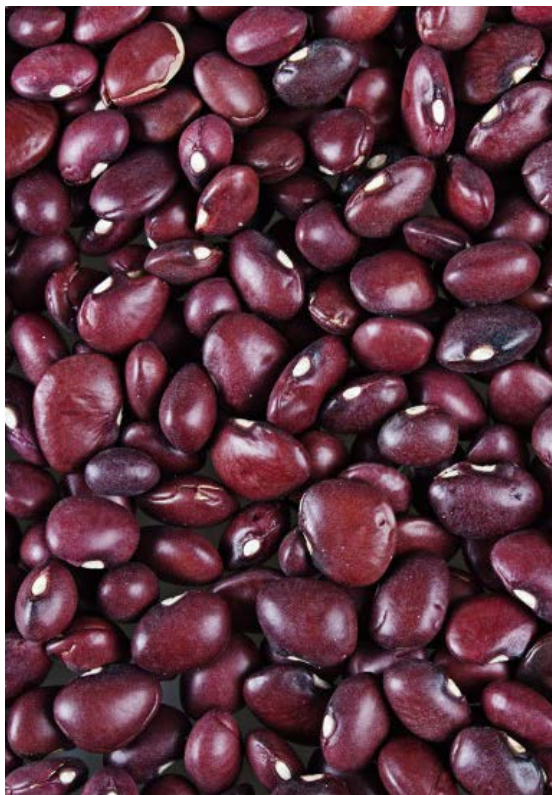
NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NABE 29 (NaCRRI, 2012)

Attributes and Adaptation



- ❖ Yield (2200-3500kg/ha)
- ❖ Shape: kidney shaped
- ❖ Color: red-maroon
- ❖ Tolerant to anthracnose, BCMV, ALS, root rots
- ❖ Best suited for mid-high altitude areas
- ❖ Maturity Period: 78 - 120 days
- ❖ Suitability: A high yielding variety in low- mid and high altitude areas

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



NABE 14R (NaCRRI, 2024)



Attributes and Adaptation

- ❖ Bush type: (Determinate Bush)
- ❖ Seed size: Medium/Kidney
- ❖ Maturity: 76-94 Days
- ❖ Potential Yield: 2700 Kg/Ha
- ❖ Improved for: Anthracnose Resistance, Bean Rot Resistance
- ❖ Best suited for: low and Mid-Highland Altitude Areas
- ❖ Highly Palatable

Seed Source:

NaCRRI, Namulonge;

+256 414-573016

NABE 12CR (NaCRRI, 2024)

Attributes and Adaptation



- ❖ Climber type: (indeterminate climber)
- ❖ Seed size: Medium
- ❖ Maturity: 94 - 105 days
- ❖ Potential Yield: 3800 Kg/Ha
- ❖ Cooking time: Short
- ❖ Improved for: Root Rot Resistance
- ❖ Market class quality: (Target is Fresh pods market)
- ❖ Best suited for: low and Mid-Highland Altitude Areas
- ❖ Highly Palatable

Seed Source:

NaCRRI, Namulonge;

+256 414-573016

FINGER MILLET



NAROMIL 1 (NaSARRI, 2017)

Attributes and Adaptation



- ❖ Yield Potential: 3-4.1 t/ha
- ❖ Duration: 100 days
- ❖ Medium tall, erect and nonlodging plant type
- ❖ Resistant to leaf blast & moderately resistant to neck and finger blast
- ❖ 8 - 9 top curved fingers per panicle
- ❖ 5 - 9 productive tillers
- ❖ Synchronized maturity
- ❖ Easy thresh ability
- ❖ Rich in protein (9.8%) and calcium (0.66%)
- ❖ Highly suitable for value addition
- ❖ High Iron content (5134 mg/kg), high zinc content (25.11 g/kg)
- ❖ Improves borne health and good brain development

Source of Seed:

NaSARRI, Serere; +256 392-250553/779-035814

NARO holdings Ltd; +256-778737611/704118988

Licenced seed companies (Ref to www.naro.go.ug)



NAROMIL 2 (NaSARRI, 2017)



Attributes and Adaptation

- ❖ Yield Potential: 2.93-4.07 t/ha
- ❖ Duration: 102 days
- ❖ Medium tall, erect and non-lodging plant type
- ❖ Resistant to leaf blast & moderately resistant to neck and finger blast
- ❖ Nutritionally rich grain (12.2% protein)
- ❖ Highly suitable for value addition
- ❖ High Iron content (4912 mg/kg)
- ❖ Drought tolerant
- ❖ Improves borne health

Source of Seed:

NaSARRI, Serere;

+256 392-250553/779-035814

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NAROMIL 3 (NaSARRI, 2017)

Attributes and Adaptation



- ❖ Yield Potential: 2.7 – 4.4 t/ha
- ❖ Duration: 110 days
- ❖ Medium tall, erect and nonlodging plant type
- ❖ Resistant to blast
- ❖ Nutritionally rich grain (10.5% protein)
- ❖ Rich in Iron (88.44 mg/kg)
- ❖ Diastatic Unit 40.0
- ❖ Highly suitable for value addition
- ❖ High iron content (88.44 mg/kg)
- ❖ High amylase activity (40)
- ❖ Drought tolerant
- ❖ Good for controlling anaemia
- ❖ Good digestibility

Source of Seed:

NaSARRI, Serere;

+256 392-250553/779-035814

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



NAROMIL 4 (NaSARRI, 2017)



Attributes and Adaptation

- ❖ Yield Potential: 2.8 -3.7 t/ha
- ❖ Duration: 85 days
- ❖ Resistant to blast
- ❖ Nutritionally rich grain (7.9% protein)
- ❖ Diastatic Unit 44.0
- ❖ Excellent malting quality
- ❖ Highly suitable for value addition
- ❖ Good for malting
- ❖ Resistance striga
- ❖ Drought tolerant
- ❖ Good for production of good local brew

Source of Seed:

NaSARRI, Serere;

+256 392-250553/779-035814

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NAROMIL 5 (NaSARRI, 2017)

Attributes and Adaptation



- ❖ Yield Potential: 2.6-3.5 t/ha
- ❖ Duration: 100 days
- ❖ Medium tall, erect and nonlodging plant type
- ❖ Drought tolerant
- ❖ Stay green
- ❖ Good brewing
- ❖ Resistant to leaf blast & moderately resistant to neck and finger blast
- ❖ Nutritionally rich grain (12.2% protein)
- ❖ Diastatic Unit 50.3
- ❖ Highly suitable for value addition
- ❖ Good for making baby food blends for better growth

Source of Seed:

NaSARRI, Serere;

+256 392-250553/779-035814

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

SORGHUM





- ❖ Maturity period: 110-120 days
- ❖ Grain color: creamy white
- ❖ Yield potential: 2.8-3.0t/ha
- ❖ Suitable production eco-system: sub humid altitude
- ❖ Plant color: Tan
- ❖ Variety use: suitable for breweries
- ❖ Tolerant to: striga, drought
- ❖ Sugar level: High
- ❖ Tannin level: Zero
- ❖ Excellent for making lager beer

Source of Seed:

NaSARRI, Serere;

+256 392-250553/779-035814

NARO holdings Ltd,

+256-778737611/704118988

Licenced seed companies (Ref to www.naro.go.ug)



NAROSORGHUM 2 (NaSARRI, 2017)

Attributes and Adaptation



- ❖ Maturity period: 100-110 days
- ❖ Grain color: Red
- ❖ Yield potential: 2.5-2.7 t/ha
- ❖ Suitable production eco-system: sub humid altitude
- ❖ Plant color: Pigment
- ❖ Variety use: food fermented breweries
- ❖ Sugar level: High
- ❖ Tannin level: Zero
- ❖ Tolerant to striga
- ❖ Tolerant to drought
- ❖ Excellent for making lager beer

Source of Seed:

NaSARRI, Serere;

+256 392-250553/779-035814

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NAROSORGHUM 3 (NaSARRI, 2017) **Attributes and Adaptation**



- ❖ Maturity period: 110-120 days
- ❖ Grain color: Chalky white
- ❖ Yield potential: 3 t/ha
- ❖ Suitable production eco-system: sub humid altitude
- ❖ Plant color: Pigment
- ❖ Variety use: food, Larger beer production
- ❖ Tolerant to drought
- ❖ Resistant to sorghum midge
- ❖ Good for brewing, for making lager beer

Source of Seed:

NaSARRI, Serere;

+256 392-250553/779-035814

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



NAROSORGHUM 4 (NaSARRI, 2017)

Attributes and Adaptation



- ❖ Maturity period: 90-100 days
- ❖ Grain color: Red
- ❖ Yield potential: 2.3-2.5 t/ha
- ❖ Suitable production eco-system: sub humid altitude
- ❖ Plant color: Pigment
- ❖ Variety use: food, fermented breweries
- ❖ Tolerant to birds and drought
- ❖ Used for food when blended with cassava flour

Source of Seed:

NaSARRI, Serere;

+256 392-250553/779-035814

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

COFFEE





NARO Coffee 10 (NaCORI, 2017)

Attributes and Adaptation



- ❖ Yield potential (4.87tons of cc/ ha/yr) for shelled coffee
- ❖ Tolerant to coffee wilt diseases and leaf rust
- ❖ Retention by screen (16/64)-55%
- ❖ Good cup quality-80%
- ❖ Suitable production eco-system: Low-mid altitudes (Lake Victoria and Lake Albert Crescent) eg districts of Masaka, Mukono, Ibanda, Mityana
- ❖ 63% higher yields than first lot of the 7 CWD-resistant varieties

Source of Seed:

NaCORI, Kituza;

+256 414-697659/755 576446



- ❖ Yield potential: (3.9tons of cc/ ha/yr) for shelled coffee
- ❖ Tolerant to coffee wilt disease
- ❖ Resistant to leaf rust
- ❖ Resistant to red blister
- ❖ Retention by screen (16/64)-12%
- ❖ Good cup quality-79%
- ❖ Suitable production eco-system: Low-mid altitudes (Lake Victoria and Lake Albert Crescent) eg districts of Masaka, Mukono, Ibanda, Mityana
- ❖ 28% higher yields than first lot of the 7 CWD-resistant varieties

Source of Seed:

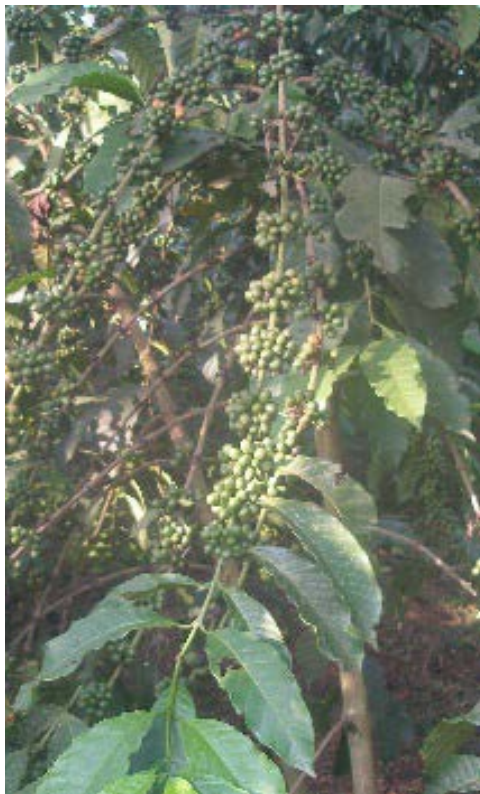
NaCORI, Kizuza;

+256 414-697659/755 576446



NARO Coffee 8 (NaCORI, 2017)

Attributes and Adaptation



- ❖ High yielding (3.1tons of cc/ ha/yr) for shelled coffee
- ❖ Resistant to coffee wilt disease
- ❖ Resistant to leaf rust
- ❖ Resistant to red blister
- ❖ Retention by screen (16/64)-53%
- ❖ Good cup quality-73%
- ❖ Suitable production eco-system: Low-mid altitudes (Lake Victoria and Lake Albert Crescent) eg districts of Masaka, Mukono, Ibanda, Mityana
- ❖ 2% higher yields than first lot of the 7 CWD-resistant varieties

Source of Seed:

NaCORI, Kituza;

+256 414-697659/755 576446

RICE





NamChe 1 (NaCRRI, 2013)



Attributes and Adaptation

- ❖ Highly drought tolerant
- ❖ High Milling percentage 66%
- ❖ Panicle: long and compact
- ❖ Maturity period: 105 days after germination
- ❖ Yield Potential: 3,800kg/ha
- ❖ Resistant to rice blast, BLB and Sheath blight
- ❖ Type: Upland rice
- ❖ Aroma: Slight
- ❖ Colour of grain husk: Straw colour
- ❖ Milled grain: very white
- ❖ Suitable production eco-system: All areas except highland areas above 1300masl

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NamChe 2 (NaCRRI, 2013)



Attributes and Adaptation

- ❖ Maturity period: 128-132 days
- ❖ Yield potential: 4,300kg/ha
- ❖ Type: Upland rice
- ❖ Aroma: Good
- ❖ Colour of grain husk: Straw colour
- ❖ Milled grain: Glossy white
- ❖ Suitable production eco-system: All areas except highland areas above 1300masl
- ❖ Resistant to rice blast, BLB and Sheath blight
- ❖ Tolerant to drought
- ❖ High Milling percentage 67%

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



NamChe 3 (NaCRRI, 2013)



Attributes and Adaptation

- ❖ Maturity period: 125 days after generation
- ❖ Yield potential: 4,550kg/ha
- ❖ Type: Upland rice
- ❖ Aroma: Non
- ❖ Colour of grain husk: Straw colour
- ❖ Milled grain: white
- ❖ Suitable production eco-system: All areas except highland areas above 1300masl
- ❖ Resistant to rice blast, BLB and Sheath blight
- ❖ Tolerant to drought
- ❖ Panicle: long and compact
- ❖ High Milling percentage 72%

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

NamChe 4 (NaCRRI, 2013)

Attributes and Adaptation



- ❖ Maturity period: 125 days after generation
- ❖ Yield potential: 4,500kg/ha
- ❖ Type: Upland rice
- ❖ Aroma: Good
- ❖ Colour of grain husk: Straw colour
- ❖ Milled grain: white
- ❖ Suitable production eco-system: All areas except highland areas above 1300masl
- ❖ Resistant to rice blast, BLB and Sheath blight
- ❖ Tolerant to drought
- ❖ High Milling percentage 72%

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



Okile (NaCRRI, 2014)



Attributes and Adaptation

- ❖ Maturity Period: 140days after generation
- ❖ Yield Potential: 6,760kg/ha
- ❖ Type: Lowland rice
- ❖ Aroma: Non aromatic, non-sticky when cooked
- ❖ Colour of grain husk: Straw colour
- ❖ Milled grain: white
- ❖ Leaf blade colour: Light green
- ❖ Suitable production eco-system
- ❖ Highly tolerant to drought
- ❖ High Milling percentage 67%
- ❖ Tolerant to RYMV blight
- ❖ Fluffy when cooked

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)

KOMBOKA (NaCRRI, 2014)

Attributes and Adaptation



- ❖ Maturity Period: 118 days after generation
- ❖ Yield Potential: 6,850kg/ha
- ❖ Type: Lowland rice
- ❖ Aromatic, non-sticky when cooked
- ❖ Colour of grain husk: Straw colour
- ❖ Milled grain: Very white
- ❖ Leaf blade colour: Light green
- ❖ Suitable production eco-system
- ❖ Highly tolerant to drought
- ❖ Tolerant to RYMV
- ❖ High Milling percentage 68%
- ❖ Fluffy when cooked
- ❖ Early maturity

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



Arize-1 (NaCRRI, 2019)

Attributes and Adaptation



- ❖ High yield potential (7.9 tons/ha)
- ❖ Quick maturing within 95-135 days
- ❖ Good aromatic taste
- ❖ Texture that extends and soft on cooking
- ❖ Non-pasty preferred by majority of women
- ❖ Tolerant to Rice Yellow Mottle Virus, Rice Blast and Bacterial Leaf Streak
- ❖ Fluffy when cooked
- ❖ Milling Percentage (63%)
- ❖ Whole grain (80%)
- ❖ Amylose content (23%)
- ❖ Alkali spreading value (6.1)
- ❖ Gel constancy (73 mm)
- ❖ Low-mid altitude areas(1200-1700 Masl)
- ❖ Rain fed Lowland and irrigated areas Hybrid Rice

Source of Seed:

NaCRRI, Namulonge;

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NARO holdings Ltd,

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Licensed seed companies (Ref to www.naro.go.ug)

Chinuga-1 (NaCRRI, 2019)

Attributes and Adaptation



- ❖ Has straw colored grains
- ❖ Medium grain type
- ❖ High yield potential ranging from 9.6 tons/ha
- ❖ Maturing within 95-135 days
- ❖ with a good aromatic taste
- ❖ Texture that extends and soft on cooking
- ❖ Non-pasty preferred by majority of women
- ❖ Resistant to Rice Yellow Mottle Virus, Rice Blast and Bacterial Leaf Streak
- ❖ Bold and big grains similar to SUPA
- ❖ Strong stem
- ❖ Milling percentage (64%)
- ❖ Whole grain (70%)
- ❖ Amylose content (21.6%)
- ❖ Alkali spreading value (5.9)
- ❖ Gel Consistency (63 mm)
- ❖ More production per unit area compared to Arize
- ❖ Rain fed Lowland (below 1200 Masl) and irrigated areas Hybrid Rice

Source of Seed: NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd,

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Licensed seed companies (Ref to www.naro.go.ug)



PR 107(NARORICE 1), (NaCRRI, 2021)

Attributes and Adaptation



- ❖ Early maturing (95 days to maturity)
- ❖ Moderate aroma
- ❖ Has straw colored grains
- ❖ Heavy grains 34grams/1000grains similar to SUPA V88
- ❖ Has distinctive erect flag leaf
- ❖ Tolerant to RYMV, Rice blast, BLB, Narrow Leaf spot and BLS
- ❖ Yield average 5780 Kgs/ha

Source of Seed: NaCRRI, Namulonge; +256 414-573016/773-131247
NARO holdings Ltd; +256-778737611/704118988,
Licenced seed companies (Ref to www.naro.go.ug)

MET 12(NARORICE 2), (NaCRRI, 2021)

Attributes and Adaptation



- ❖ Early maturing (102 days to maturity)
- ❖ Aromatic
- ❖ Has straw colored grains with weak purple tip
- ❖ Slender grains line Basmati
- ❖ Medium grains 25grams/1000grains similar to Basmati 370
- ❖ Long culm (76 cm)
- ❖ Tolerant to RYMV, Rice blast, BLB, Narrow Leaf spot and BLS
- ❖ Yield average 5980 Kgs/ha

Source of Seed: NaCRRI, Namulonge; +256 414-573016/773-131247
NARO holdings Ltd; +256-778737611/704118988,
Licenced seed companies (Ref to www.naro.go.ug)

MET 20(NARORICE 3), (NaCRRI, 2021)

Attributes and Adaptation



- ❖ Early maturing (115 days to maturity)
- ❖ Moderate aroma
- ❖ Has straw colored grains with strong purple tip
- ❖ Heavy grains 36grams/1000grains slightly bigger than the preferred SUPA V88
- ❖ Long culm (80 cm)
- ❖ Tolerant to RYMV, Rice blast, BLB, Narrow Leaf spot and BLS
- ❖ Yield average 4760 Kgs/ha

Source of Seed: NaCRRI, Namulonge; +256 414-573016/773-131247

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Licenced seed companies (Ref to www.naro.go.ug)

ARU 1189 (NARORICE 4), (NaCRRI, 2021)

Attributes and Adaptation



- ❖ Medium maturing (130 days to maturity)
- ❖ Moderate aroma
- ❖ Has straw colored grains with weak purple tip
- ❖ Heavy grains 31grams/1000grains
- ❖ Basal leaf sheath color: green with purple lines
- ❖ Tolerant to RYMV, Rice blast, BLB, Narrow Leaf spot and BLS
- ❖ Yield average 6520 Kgs/ha

Source of Seed: NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licenced seed companies (Ref to www.naro.go.ug)



WDR-73, (NaCRRI, 2022)



Attributes and Adaptation

- ❖ Yield: 9.2t/ha
- ❖ Matures within 120 days
- ❖ Grain size: Slender
- ❖ Drought tolerance: Moderately tolerant
- ❖ Grain discoloration: Highly tolerant to grain discoloration
- ❖ Tolerant to RYMV, Rice Blast and AfrGM
- ❖ resistant to Bacterial Leaf Blight

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd;

+256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

KF20039-Ukafaci-39, (NaCRRI, 2023)

Attributes and Adaptation



- ❖ Time of heading – 63 days
- ❖ Maturity period – 99 days
- ❖ Yield: 6t/ha
- ❖ Heavy grains 27 grams/1000 grains
- ❖ Plant height – 96 cm
- ❖ Moderately resistant to Rice Yellow Mottle Virus disease
- ❖ Moderately resistant to Rice blast and Narrow leaf spot fungal diseases
- ❖ Moderately resistant to Bacterial Leaf Blight and Bacterial Leaf Streak

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016

MAIZE



NAROMAIZE 60 IR (NaCRRI, 2017)

Attributes and Adaptation



- ❖ Maturity period: 130 days
- ❖ Yield potential: 6.7 t/ha
- ❖ Special for Striga infested areas
- ❖ Yield advantage of up to 70% compared to popular non Imazapyr resistant (IR) varieties

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

NAROMAIZE 59 IR (NaCRRI, 2017)

Attributes and Adaptation



- ❖ Maturity period: 120-130 days
- ❖ Yield potential: 6.3 t/ha
- ❖ Special for Striga infested areas
- ❖ Yield advantage of up to 70% compared to popular non Imazapyr resistant (IR) varieties

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)



UH5557 (NARO Maize 57) (NaCRRI, 2015) **Attributes and Adaptation**



- ❖ Yield potential 7.5 t/ha
- ❖ Maturity period: 115-120 days
- ❖ Highly adaptable variety which combines tolerance to drought and low nitrogen

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

WE2101 (NaCRRI, 2014)

Attributes and Adaptation



- ❖ Drought Tolerant
- ❖ Yield potential 8.0 t/ha
- ❖ Maturity period: 120 days

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

WE2106 (NaCRRI, 2014)**Attributes and Adaptation**

- ❖ Drought Tolerant
- ❖ Yield potential 8.0 t/ha
- ❖ Maturity period: 120 days

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

WE2114 (NaCRRI, 2013)**Attributes and Adaptation**

- ❖ Drought Tolerant
- ❖ Yield potential 8.0 t/ha
- ❖ Maturity period: 120-125 days

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)



WE2115 (NaCRRI, 2013)



Attributes and Adaptation

- ❖ Drought Tolerant
- ❖ Yield potential 8.0 t/ha
- ❖ Maturity period: 120-125 days

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

WE3103 (NaCRRI, 2016)



Attributes and Adaptation

- ❖ Drought tolerant
- ❖ Intermediate maturing
- ❖ Yield potential 7.5 t/ha
- ❖ Maturity period: 120 days

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

WE3106 (NaCRRI, 2016)

Attributes and Adaptation



- ❖ Drought tolerant
- ❖ Yield potential 8 t/ha
- ❖ Maturity period: 120 days

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

WE3109 (NaCRRI, 2016)

Attributes and Adaptation



- ❖ Drought tolerant
- ❖ Yield potential 7.8 t/ha
- ❖ Maturity period: 120 days
- ❖ Resistant to Aflatoxin
- ❖ Stable under drought stress (yield of >3.6t/ha) and optimum conditions, Very high response to fertilization (>9.6t/ha), hence suitable for both small scale and commercial farmers

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)



UH5401 (NaCRRI, 2014) **Attributes and Adaptation**



- ❖ Drought Tolerant
- ❖ Yield potential 8.0 t/ha
- ❖ Maturity period: 120-125 days
- ❖ Weevil resistant hybrid
- ❖ Tolerant to common foliar diseases such as maize streak Virus, Turcicum leaf blight and Gray leaf spot

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

UH5556 (NARO Maize 56) (NaCRRI, 2016)



Attributes and Adaptation

- ❖ Tolerant to maize lethal necrosis (MLN)
- ❖ Yield potential 7.8 t/ha
- ❖ Maturity period: 130-136 days
- ❖ Resistance to other prevalent foliar diseases

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

UH5053 (NaCRRI, 2012)**Attributes and Adaptation**

- ❖ Very stable under unreliable rains
- ❖ Yield potential 7.0 t/ha
- ❖ Maturity period: 120-125 days
- ❖ Drought tolerant varietal cross hybrid created by combining two open pollinated parents

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

UH5052 (NaCRRI, 2012)**Attributes and Adaptation**

- ❖ Very stable under unreliable rains
- ❖ Yield potential 7.0 t/ha
- ❖ Maturity period: 120-125 days
- ❖ Drought tolerant varietal cross hybrid created by combining two open pollinated parents

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)



UH5051 (NaCRRI, 2012) Attributes and Adaptation



- ❖ Very stable under unreliable rains
- ❖ Yield potential 7.0 t/ha
- ❖ Maturity period: 120-125 days
- ❖ Drought tolerant varietal cross hybrid (OPV by OPV cross) created by combining two open-pollinated parents
- ❖ Yield potential of 2t/ha higher than popular open pollinated maize varieties

Source of Seed: NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

UH5354 (NaCRRI, 2013) Attributes and Adaptation



- ❖ Tolerant to maize lethal necrosis (MLN)
- ❖ Drought Tolerant
- ❖ Yield potential 9.0 t/ha
- ❖ Maturity period: 130-135 days

Source of Seed:

NaCRRI, Namulonge; +256 414-573016/773-131247

NARO holdings Ltd; +256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)

UH5961 (NAROMAIZE 61) (NACRRI, 2019)



Attributes and Adaptation

- ❖ Medium maturity (120-130 days)
- ❖ Yield potential: 7 – 9 tons/ha
- ❖ Tolerant to foliar diseases – GLS, Turcicum, common rust, Maize Streak Virus (MSV)
- ❖ Mid altitude Drought Tolerant (1200-1700Masl)

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd;

+256-778737611/704118988,

Licensed seed companies (Ref to www.naro.go.ug)



UH5962 (NAROMAIZE 62) (NACRRI, 2019)



Attributes and Adaptation

- ❖ Medium maturity (120-130 days)
- ❖ Yield potential: 7 - 9 tons/ha
- ❖ Tolerant to foliar diseases - GLS, Turcicum, common rust, Maize Streak Virus(MSV)
- ❖ Mid altitude((1200-1700Masl)
- ❖ Drought Tolerant

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/773-131247

NARO holdings Ltd;

+256-778737611/704118988,

Licenced seed companies (Ref to www.naro.go.ug)

NARO-maize-63-VitA (NACRRI, 2023)**Attributes and Adaptation**

- ❖ Maturity period - 120 days
- ❖ High Vitamin - A content
- ❖ High milling percentage - (61% flour)
- ❖ High yielding - 7.7t/ha
- ❖ Drought tolerant
- ❖ Tolerant to common foliar diseases
- ❖ Suitable for mid-altitude regions

Source of Seed:
NaCRRI, Namulonge;
+256 414-573016

NARO-maize-64-Str (NaCRRI, 2023)**Attributes and Adaptation**

- ❖ Maturity period - 110 days
- ❖ Resistant to Striga weed
- ❖ High milling percentage (60% flour)
- ❖ High yielding: 7.3t/ha
- ❖ Tolerant to common foliar diseases
- ❖ Suitable for Striga endemic areas

Source of Seed:
NaCRRI, Namulonge;
+256 414-573016

POTATO



NAROPOT 1 (KaZARDI, 2015) Attributes and Adaptation



- ❖ High yielding 28t/ha
- ❖ Red skin colour
- ❖ Short dormancy of 90 days
- ❖ Maturity period of 90 days
- ❖ Highly resistant to late blight disease
- ❖ Cream flesh colour
- ❖ Good for crisping and table qualities

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

NAROPOT 2 (KaZARDI, 2015) Attributes and Adaptation



- ❖ High yield of 24t/ha
- ❖ Resistant to late blight
- ❖ Tolerant to bacterial wilt
- ❖ short dormancy period of 90 days
- ❖ Maturity period of 100 days
- ❖ Good crisping and table qualities
- ❖ Cream flesh colour
- ❖ Red skin

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597



NAROPOT 3 (KaZARDI, 2015) Attributes and Adaptation



- ❖ Produces high yields (19.6T/HA)
- ❖ Resistant to late blight, has high dry matter content (20.8%)
- ❖ Has short round tubers with short size of the chip
- ❖ Highly liked by the majority of the farmers and generally accepted by end-users for table and crisps production

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

Arizona (KaZARDI, 2016)

Attributes and Adaptation



- ❖ Produces high yields (20.3T/HA)
- ❖ Tubers that have good appearance of the chip
- ❖ Tubers have few and shallow eyes
- ❖ Oblong shaped
- ❖ Produces relatively average size chips that generally accepted for by industry for French fry production

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

Elmundo (KaZARDI, 2016)



Attributes and Adaptation

- ❖ Produces high yields (20.2T/HA)
- ❖ Produces Light cream medium size chips
- ❖ Tubers are long with Shallow eyes
- ❖ Generally accepted for by industry for French fry processing

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

Markies (KaZARDI, 2016)



Attributes and Adaptation

- ❖ High yields (19.5T/HA)
- ❖ Tubers have few and shallow eyes
- ❖ Tubers are big in size, oblong shaped with length of the chip above 8cm
- ❖ Tubers are generally accepted by end-users for table, French fry and crisps processing

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597



Sagitta (KaZARDI, 2016) **Attributes and Adaptation**



- ❖ Produces high yields (19.9T/HA)
- ❖ Produces very long, regular shaped tubers with regular surface
- ❖ Has shallow eyes, generally accepted by end users for both table and French fry processing

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

Connect (KaZARDI, 2016) **Attributes and Adaptation**



- ❖ Higher yields (20.5 T/Ha)
- ❖ Resistant to late blight white
- ❖ Round shaped with high acceptability as table potato
- ❖ Has Few eyes, that are shallow
- ❖ Produces short chip size

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

Voyager (KaZARDI, 2016)



Attributes and Adaptation

- ❖ Producers high stable yields (20T/HA) across regions in Uganda
- ❖ Short chip size of average diameter
- ❖ Few shallow eyes
- ❖ Generally accepted by industry for crisp production

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

Sarpomira (KaZARDI, 2016)



Attributes and Adaptation

- ❖ High tolerance to Late Blight disease
- ❖ Gives high yields (22 T/Ha)
- ❖ Suitable for a range of soil types
- ❖ Have good short term and long term storage
- ❖ High tolerance to late blight disease
- ❖ Have multiple uses but good for making chips
- ❖ High resistance to internal bruising
- ❖ Tubers are mostly uniform in shape

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597



NAROPOT 4 (Rwangume) (KaZARDI, 2016)



Attributes and Adaptation

- ❖ Resistant to late blight disease
- ❖ High yielding 21 t/ha
- ❖ Red skin colour
- ❖ Good crisping and table qualities
- ❖ Short dormancy period of 90 days
- ❖ Early maturing at 90 days
- ❖ Resistant to late blight
- ❖ High dry matter content (20.8%)

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

NAROPOT5 (KaZARDI 2022)



Attributes and Adaptation

- ❖ Yield =36.9 t/ha
- ❖ Maturity= 90 days
- ❖ Good for crisping
- ❖ Dormancy period=45-60 days
- ❖ Dry matter=24%
- ❖ Tolerant to late blight

Source of Seed

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

NAROPOT6 (KaZARDI 2022)



Attributes and Adaptation

- ❖ Yield =24.9 t/ha
- ❖ Maturity=120 days
- ❖ Good for crisping
- ❖ Dormancy (45-60 days)
- ❖ Dry matter=20.6%
- ❖ Tolerant to blight

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597



NAROPOT7 (KaZARDI, 2025)



Attributes and Adaptation

- ❖ Maturity Period: 90-100 Days
- ❖ Dormancy period: 45-60 days
- ❖ Yield potential: 30.2 t/ha
- ❖ Disease tolerance: Highly resistant to late blight
- ❖ Use/utilization: Processing (Crisping and Chipping)
- ❖ Dry Matter Content (%):21.6
- ❖ Agro-ecological adaptability: Well adaptable to mid-high altitude areas (1200-2500 m.a.s.l)

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

NAROPOT8 (KaZARDI 2025)



Attributes and Adaptation

- ❖ Maturity Period: 90-100 Days
- ❖ Dormancy period: 45-60 Days
- ❖ Yield potential: 30 t/ha
- ❖ Disease tolerance: Highly resistant to late blight
- ❖ Use/utilization: Processing (Crisping and Chipping)
- ❖ Dry Matter Content (%):22.1%
- ❖ Agro-ecological adaptability: Well adaptable to mid - high altitude areas (1200-2500 m.a.s.l)

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597



NAROPOT9 (KaZARDI, 2025)



Attributes and Adaptation

- ❖ Maturity Period: 90-100 Days
- ❖ Dormancy period: 45-60 Days
- ❖ Yield potential: 31.4 t/ha
- ❖ Disease tolerance: Highly resistant to late blight
- ❖ Use/utilization: Processing (Crisping and Chipping)
- ❖ Dry Matter Content (%):20.5%
- ❖ Agro-ecological adaptability: Well adaptable to mid - high altitude areas (1200-2500 m.a.s.l)

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

NAROPOT10 (KaZARDI 2025)



Attributes and Adaptation

- ❖ Maturity Period: 100 - 120 Days
- ❖ Dormancy period: 60-90 Days
- ❖ Yield potential: 24.3 t/ha
- ❖ Disease tolerance: Highly resistant to late blight
- ❖ Use/utilization: Processing (Crisping and Chipping)
- ❖ Dry Matter Content (%):28.1%
- ❖ Agro-ecological adaptability: Well adaptable to mid - high altitude areas (1200-2500 m.a.s.l)

Source of Seed:

Kachwekano ZARDI, Kabale
+256 486 426495/782 361597

GROUNDNUTS



NARONUT 1R (NaSARRI, 2019)



Attributes and Adaptation

- ❖ Red colour
- ❖ Easy to shell
- ❖ 18% protein and 36% fat content
- ❖ Drought tolerant
- ❖ Earliness (75 – 80 DAP)
- ❖ Resistant to groundnut rosette virus
- ❖ High yielding (up to 2 tons /ha)
- ❖ Grows best in the semi-arid areas and cattle corridors of Uganda

Source of Seed:

NaSARRI, Serere;

+256 392-250553/753-858768

NARO holdings Ltd,

+256-778737611/704118988

Licenced seed companies (Ref to www.naro.go.ug)





NARONUT 2T (NaSARRI, 2019)

Attributes and Adaptation



- ❖ Tan in colour
- ❖ Best for butter making (39.6% fat content)
- ❖ More nutritious than other varieties (25.7% Protein)
- ❖ Drought tolerant
- ❖ Resistant to groundnut rosette virus
- ❖ Earliness (80-85 days after planting)
- ❖ High yielding (up to 2 tons/ha)
- ❖ Grows best in West-Nile and Mid-Northern AEC

Source of Seed:

NaSARRI, Serere;

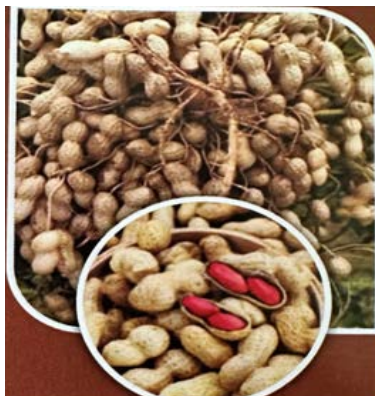
+256 392-250553/753-858768

NARO holdings Ltd,

+256-778737611/704118988

Licensed seed companies (Ref to www.naro.go.ug)



NARONUT 3R (NaSARRI, 2024)**Attributes and Adaptation**

- ❖ Seed color: Red
- ❖ Seeds per pod: 2
- ❖ Seed size: small – medium
- ❖ Maturity: 90 days
- ❖ Potential yield: 2000-2500 kg/ha
- ❖ Taste: sweet
- ❖ Nutrition Content: High Protein, Oil, Zinc

Source of Seed:

NaSARRI, Serere;
+256-454465665

NARONUT 4R (NaSARRI, 2024)**Attributes and Adaptation**

- ❖ Seed color: Red
- ❖ Seeds per pod: 2
- ❖ Maturity: 110 days
- ❖ Potential yield: 3000-3500 kg/ha
- ❖ Shelling: Soft shell
- ❖ Nutrition Content: High Protein, Oil, Zinc

Source of Seed:

NaSARRI, Serere;
+256-454465665



NARONUT 5R (NaSARRI, 2024)

Attributes and Adaptation



- ❖ Seed color: Red
- ❖ Seeds per pod: 3-4
- ❖ Seed size: small - medium
- ❖ Maturity: 90 days
- ❖ Potential yield: 2000-2500 kg/ha
- ❖ Taste: Sweet
- ❖ Nutrition Content: High Protein, Oil, Zinc

Source of Seed:

NaSARRI, Serere;
+256-454465665

VEGETABLES





TOMATO VARIETIES (NaCRRI 2021)

Tenten



Attributes and Adaptation

- ❖ Cherry variety – fruit weight -20 gms
- ❖ High yielding (23.2 t/ha)
- ❖ Early maturing (92 days)
- ❖ Long shelf life (36 days)
- ❖ High resistance to tomato mosaic virus, fusarium wilt and root knot nematodes

Source of Seed: NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licensed seed companies (Ref to www.naro.go.ug)

Pinktop



Attributes and Adaptation

- ❖ A heavy fruit : 172gms/ fruit
- ❖ High yielding (29.5 t/ha)
- ❖ Early maturing (93 days)
- ❖ Long shelf life (18 days)
- ❖ Resistant to Nematodes , leaf mold, Tomato mosaic virus, Fusarium crown and root rot

Source of Seed: NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licensed seed companies (Ref to www.naro.go.ug)

EGG PLANT VARIETIES (NaCRRI 2021)

Miggeuni



Attributes and Adaptation

- ❖ High yielding (8 t/ha)
- ❖ Tolerant to bacterial wilt and Fusarium wilt
- ❖ Long fruit in length (20-35cm)
- ❖ Tolerant to fusarium crown rot and bacterial wilt

Source of Seed: NaCRRI, Namulonge;

+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,

Licenced seed companies (Ref to www.naro.go.ug)

Heukmi



Attributes and Adaptation

- ❖ High yielding (9 t/ha)
- ❖ Resistant to bacterial wilt and Fusarium wilt
- ❖ Big fruit size and long (18-20 cm)
- ❖ Harvesting for a long time 9-12 months

Source of Seed:

NaCRRI, Namulonge;

+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,

Licenced seed companies (Ref to www.naro.go.ug)



KALE VARIETIES (NaCRRI 2021)

Matjang



Attributes and Adaptation

- ❖ High yielding (22t/ acre)
- ❖ The leaves have a deep green colour Has short internodes leaves
- ❖ Short/ dwarf variety -36cm at 6month of age
- ❖ Doesn't suffer from bolting (premature flowering)

Source of Seed: NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licenced seed companies (Ref to www.naro.go.ug)

Jeil Guijok



Attributes and Adaptation

- ❖ High yielding (18t/ acre)
- ❖ The leaves are pale green in colour Had border and tender leaves
- ❖ Short variety : 40cm tall at 8 months of age
- ❖ Doesn't survive from bolting (pre-mature flowering under hot / dry weather)

Source of Seed: NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licenced seed companies (Ref to www.naro.go.ug)

CUCUMBER VARIETIES (NaCRRI 2021)

Gangryuk-samcheok

Attributes and Adaptation



- ❖ High yielding (21.4 t/ha)
- ❖ Fruit weight (525 gm/fruit)
- ❖ Resistant to Cucumber Mosaic virus and powdery mildew

Source of Seed: NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licensed seed companies (Ref to www.naro.go.ug)

Sinbi-nakhap

Attributes and Adaptation



- ❖ Low yielding (9.6 t/ha)
- ❖ Fruit size (384 gm/fruit)
- ❖ Susceptible to Cucumber Mosaic virus
- ❖ Resistant to powdery mildew

Source of Seed:

NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licensed seed companies (Ref to www.naro.go.ug)



CABBAGE VARIETIES (NaCRRI 2021)

Onnuri



Attributes and Adaptation

- ❖ High yielding (46.7 t/ha)
- ❖ Early maturing- 70 days after transplanting
- ❖ Average fruit weight of 1.5 to 2.5 kgs
- ❖ Tolerant to soft rot and down mildew

Source of Seed: NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licenced seed companies (Ref to www.naro.go.ug)

Hogirl



Attributes and Adaptation

- ❖ High yielding (38.4 t/ha)
- ❖ Early maturing : 750-80 days after transplanting
- ❖ Average fruit weight of 1.6kg , very tasty
- ❖ Tolerant to soft rot and down mildew

Source of Seed:
NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licenced seed companies (Ref to www.naro.go.ug)

CHINESE CABBAGE VARIETIES (NaCRRI 2021)

Noranja

Attributes and Adaptation



- ❖ High yielding (96.9 t/ha)
- ❖ Big fruit size (2.4kg)
- ❖ Doesn't flower during hot weather
- ❖ Maintains structure at different growth stages

Source of Seed: NaCRRI, Namulonge;
+256 414-573016/774-229749

NARO holdings Ltd; +256-778737611/704118988,
Licensed seed companies (Ref to www.naro.go.ug)

Bulam3hol

Attributes and Adaptation

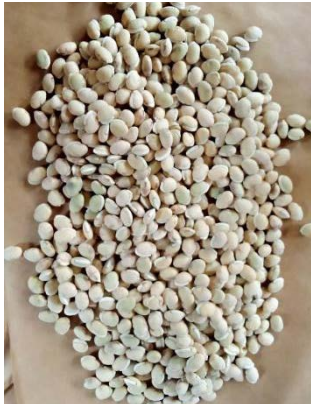


- ❖ High yielding (114.5 t/ha)
- ❖ Big fruit size (2.9 kg)
- ❖ Doesn't flower during hot weather
- ❖ Maintains structure at different growth stages

Source of Seed:
NaCRRI, Namulonge;
+256 414-573016/774-229749

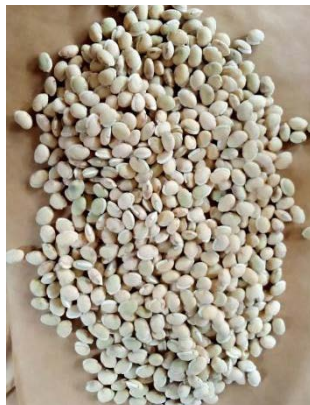
NARO holdings Ltd; +256-778737611/704118988,
Licensed seed companies (Ref to www.naro.go.ug)

PASTURES



NAROLABLAB-1 (NaLIRRI, 2023)

Attributes and Adaptation



- ❖ Germination percentage >70%
- ❖ On average, it takes 83 days for early flowering plant, 89 days for 50%, and 96 days for 100% of the plants
- ❖ It has green pods of average 5.8 length and 1.7cm wide with 4 locules
- ❖ Ripe pods contain an average 3 mature seeds
- ❖ When supported can climb up to 2 metres



Source:

NaLIRRI

+256-454-448360



Napier (NaLIRRI)



Attributes and Adaptation

- ❖ This is a tropical perennial grass, also known as elephant grass
- ❖ Livestock fodder – because it's fast-growing, high-yielding, and nutritious.
- ❖ Soil conservation – controls erosion when planted as contour strips.
- ❖ Trap crop in push-pull systems – attracts pests like stemborers away from maize and other crops.

Source:

NaLIRRI

+256-454-448360

Bracharia (NaLIRRI)

Attributes and Adaptation



- ❖ This is a tropical forage grass mainly grown for livestock feed.
- ❖ Mainly cultivated as high-quality animal fodder because it's highly nutritious, drought-tolerant, and fast-growing.
- ❖ Helps reduce soil erosion, improves soil fertility, and sequesters carbon.
- ❖ Used as a trap crop in push-pull systems for controlling pests like stemborers and fall armyworm in maize fields

Source:

NaLIRRI

+256-454-448360



LIVESTOCK TECHNOLOGIES

BREEDS





GOATS

NARO-Mubende Elite (NaLIRRI, 2017)



POULTRY

NARO Chicken (NaSARRI 2017)



Attributes and Adaptation

- ❖ Faster growth
- ❖ 90% twinning ability
- ❖ Tolerant to diseases
- ❖ Faster growth rate of kids, larger body size of goats with improved twinning ability
- ❖ Improves household nutrition and income

Source:

NaLIRRI, Nakyesasa & Maruzi
+256 414-691047/704-523391

Attributes and Adaptation

- ❖ Tolerant to diseases
- ❖ Higher growth rate (Cocks attain 2 Kg in 4 months)
- ❖ Hen attain 1.5 kg in 4 months
- ❖ Improves household nutrition and income

Source:

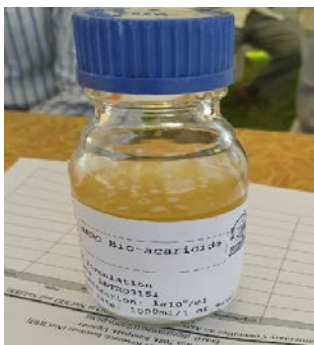
NaSARRI, Serere;
+256 392-250553/779-035814

LIVESTOCK DRUGS





BIOACARICIDE (NaLIRRI 2018)



Attributes and Adaptation

- ❖ Cost effective
- ❖ Environmentally friendly
- ❖ Controls chemical acaricide resistant ticks
- ❖ Reduce the cost of importation of acaricide by 60%

Source:

NaLIRRI, +256 414-691047/704-523391

ANTI TICK VACCINE (NARO -AV VACCINE) (NaLIRRI, 2019)



Attributes and Adaptation

- ❖ Controls the Brown ear tick which transmits East coast fever
- ❖ Kills 100% of the Brown ear tick (*R. appendiculatus*)
- ❖ Kills 100% mortality of the Bont legged tick (*A. variegatum*)
- ❖ Reduces blood sucking by 800%
- ❖ Reduces cattle deaths and cost of dairy/beef production

Source:

NaLIRRI, +256 414-691047/704-523391

NARO-Anti Helminth (Dewormer) (NaLIRRI, 2017)



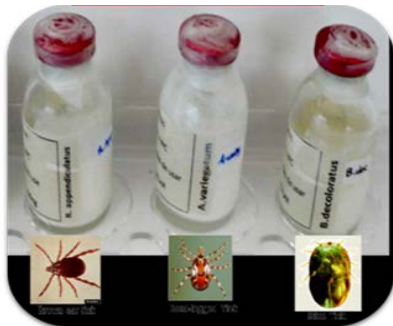
Attributes and Adaptation

- ❖ Controls helminthes
- ❖ Causes 94% mortality of nematode larvae (Haemonchus Contortus) in 24 hours
- ❖ Concentration level: 30mg/m
- ❖ Ensures normal growth of goats

Source:

NaLIRRI, +256 414-691047/704-523391

ANTI TICK VACCINE (NARO -RA VACCINE) (NaLIRRI, 2019)



Attributes and Adaptation

- ❖ Controls the Bont legged tick which transmits Anaplasmosis, Babasiosis and Cowdriosis
- ❖ Kills 100% mortality of the Bont legged tick (*A. variegatum*)
- ❖ Kills 80% of the Brown ear tick (*R. appendiculatus*)
- ❖ Reduces blood sucking by 100%
- ❖ Reduces cattle deaths and cost of dairy/beef production

Source: NaLIRRI, +256 414-691047/704-523391



NAROVAC Vaccine (NaLIRRI 2012-2025)

Attributes and Adaptation



- ❖ Controls the 3 types of notorious ticks (Bont legged tick, Brown ear tick and blue tick)
- ❖ It has 100% efficacy against ECF causing ticks
- ❖ Kills up to 90% of the Brown ear tick (*R. appendiculatus*)
- ❖ Reduces deaths in cattle and calves
- ❖ Saves a farmer UGX 188,000 per cow/year
- ❖ It is a cheaper vaccine given only 3 times (at Day 0, Day 30 and after 6 months) followed by once a year compared to acaricides which are given to the animal every week
- ❖ Reduces labour costs during treatment



Source:

NaLIRRI,

+256 414-691047/0776212292/0772593261

APICULTURE





NARO Honey



Benefits

- ❖ Honey contains healthy nutrients per tbsp. eg carbohydrates: Sucrose, glucose, maltose, galactose minerals: potassium, Calcium, Phosphorus, Iron, Zinc, Manganese etc
- ❖ Vitamins, C and B, Vit B-6
- ❖ Source of food: eaten on bread, sweetens tea, making beer and wine, mixed with sim-sim paste
- ❖ Confectionery as an ingredient in baking cakes, bread
- ❖ Pharmaceuticals in making cough syrups
- ❖ Raw material: cosmetic industry; hair oils and body lotions

NOTE: Not good for children under one year of age because of the danger of infant botulism. Children over 1 year of age develop bacteria in their intestines that can act as a defense against infant botulism. Honey is safe for older children

Source:

Honeybee pests



Attributes and benefit

- ❖ 2 Large hive beetle spp:
Oplostomus fulgineus, *O.haroldi*
- ❖ Small hive beetles spp: *Aethina tumida*
- ❖ Moths: *Galeria mellonella*, *Acherontia atropos*
- ❖ Ant spp

- ❖ Educates beekeepers and other stakeholders on early detection of pests in honeybee colonies for their control and to limit their further spread and impact on honey production

Source:

Bee forage



Combretum spp

Combretum spp



Stereosperma kunthianum

Erythrina abyssinica



Piliostigma thonningii

Attributes and benefits

- ❖ Different types of bee forage plants which are fast growing and bloom in all seasons:
Eucalyptus citrodora, *Citrus* spp, *Ocimum* spp, *Calliandra* spp
- ❖ Production of high quality honey with appreciable medicinal values.
- ❖ Multipurpose: Eucalyptus (poles, timbers & production of eucalyptus oil). Citrus_food source rich in vitamin C. Calliandra_fodder for dairy cows and goats. Ocimum_herbs.
- ❖ Used by Bee farmers, institutions (tertiary and Universities)and researchers

Source:

Domesticated stingless bee species:



Meliponula bocandei



M. feruginea




Pleibena hilderbrandtii

Attributes and benefits

- ❖ Nutritional and medicinal values
- ❖ Used by beekeepers, pharmaceuticals, cosmetics, and nutritionists and general public

Source:

NARO LIVESTOCK AND FISH FEEDS



NARO Aflatoxin Binder

Aflatoxin Adsorption capacity	75%
Increases Feed Intake	10%
Increases Weight Gain	17%
Increases Newcastle Disease titers	68.2%
Feed inclusion Rate	1%

For Poultry



NARO Aflatoxin Binder (NaLIRRI 2018)



Attributes and Adaptation

- ❖ 10% increase in feed intake
- ❖ 17% weight gain increase
- ❖ 68.2% increase in titres for Newcastle disease antigen
- ❖ 70% aflatoxin adsorption capacity

Source:

NaLIRRI, Nakyesasa & Maruzi

+256 414-691047/704-523391

Insfeed Protein Meal (NaLIRRI 2018)



Attributes and Adaptation

- ❖ Replaces up to 50% of fish in poultry diets
- ❖ With an 18% reduction in cost of production
- ❖ High value protein source supplement for poultry

Source:

NaLIRRI, Nakyesasa & Maruzi

+256 414-691047/704-523391



Dairy cow pellets (NaLIRRI, 2016)

Attributes and Adaptation



- ❖ High nutrient feed, Formulated from locally available feed resources
- ❖ Low cost and easily accessible
- ❖ 16% Crude protein content with an estimated production cost of: 1,200 Ushs per Kg
- ❖ 1 kg/cow/day for every litre increase above 8 litres of milk
- ❖ Minimizes feed wastage
- ❖ Increases milk yield/per cow (1kg of feed produces extra 2litres of milk)
- ❖ Faster calf growth
- ❖ Reduces weaning age (from 8 to 5months) and increased weaning weight (from 90kg to 115kg)

Source:

NaLIRRI, Nakyesasa & Maruzi

+256 414-691047/704-523391

Green Protein (NaLIRRI 2018)

Attributes and Adaptation



- ❖ A new organic protein source with 22% crude protein, 27% NDF, 13% ADF and 7.4% crude fat.
- ❖ Replaces fish meal by 20%
- ❖ High value protein source supplement for both poultry and fish

Source:

NaLIRRI, Nakyesasa & Maruzi
+256 414-691047/704-523391

Aflasafe UG01 (NaLIRRI 2025)

Attributes and Adaptation



- ❖ The product prevents dangerous levels of aflatoxin contamination, ensuring that food is healthy to eat and also meets public safety standards.
- ❖ It is completely safe and environmentally friendly
- ❖ It only needs to be applied by farmers once each growing season, and is cheap and cost - effective

Source:

NaLIRRI, Nakyesasa & Maruzi
+256 414 674023



- ❖ A series of supper starter diet with recipes for feeding young fish after hatching until they of the size of a finger, juvenile boosters with recipes for fast growth of juvenile fish, super grower series for feeding near to table/market size fish and brood stock feed with recipes that boost welfare of fish intended for breeding purposes
- ❖ Formulations of pre-digested and aflatoxin safe fish feed/diets
- ❖ Reduces feed waste, phosphorus water pollution and susceptibility to liver cancer for both fish and its consumers
- ❖ Enhances fish growth (2.8g/day) compared to the average of 1g/day and efficiency (0.8-1.2 FCR) compared to FCR of 2 common with most commercial diets

Source:

MBARARAZARDI,

+256 712-767995/774-709858

Fish feed aflatoxin binder (MBAZARDI, 2016)



Attributes and Adaptation

- ❖ Clay based aflatoxin binders
- ❖ Improves fish growth and health due to adsorption of carcinogenic mould toxins that cause liver cancers

Source:

MBARARAZARDI,

+256 712-767995/774-709858

Production of local live feed (Moina) for larval African catfish (NaFIRRI, 2015)



Attributes and Adaptation

- ❖ Low production costs
- ❖ Improved survival and growth rates of catfish larvae
- ❖ High nutrient content of Moina
- ❖ Mass production and availability of cheap African catfish seed on the market
- ❖ Potential employment creation

Source:

NaFIRRI ARDC, Kajjansi

+256 414-375668/755795355



Algae fish feed ingredient, and algae oil for algae based biodiesel production from *Spirulina* sp, a microalgae (NaFIRRI 2021)



Spirulina powder



Spirulina enriched fish feed



Algae oil: a precursor for biodiesel production

Attributes and Adaptation

- ❖ With a high protein content (~7.7x) in algae enriched feeds compared to that in a commercial feed, algae can be used as a supplement for fish meal feeds. This has the potential to result into reduced competition for fish as an ingredient in fish feeds, thus leaving fish for other uses especially for human consumption
- ❖ With a high calorific value of 11,722.68 kCal/kg (conventional range: 8,850 to 10,000 kCal/kg), algae oil provides a great opportunity to utilize the abundant and untapped algae for algae oil production, a precursor for algae based biodiesel production

Source:

NaFIRRI ARDC, Kajjansi

+256 414-375668/755795355

(NaFIRRI 2022)

Description



Unextruded floating feed



Black soldier fly eggs in the bottle



Black Soldier fly adults in one of the cages at ARDC insectary unit

Development of un-extruded floating insect meal-based fish feed

Optimized technology for mass production of Black soldier fly larvae and adults

Attributes and Adaptation

- ❖ Cost effective and growth enhancing feed
- ❖ Promoting conservation of wild fish stocks
- ❖ High protein content with a balanced amino acid profile for enhancing fish growth
- ❖ Highly viable foundation seed (eggs and pupae) for multiplying black soldier fly

Source:

NaFIRRI ARDC, Kajjansi

+256 414-375668/755795355



Nutrient feed mineral block



Attributes and Adaptation

- ❖ This is a compressed solid block of essential minerals and nutrients provided as a dietary supplement for livestock such as cattle, goats, and sheep.
- ❖ Supplies key minerals and vitamins often missing in natural grazing (e.g., calcium, phosphorus, salt, magnesium, copper, zinc, selenium).
- ❖ Boosts animal productivity - improves weight gain, milk yield, fertility, and overall health.
- ❖ Prevents mineral deficiency disorders, like weak bones or poor reproduction.
- ❖ Encourages regular licking, ensuring animals consume minerals slowly and consistently.

Source:
NaLIRRI

FISH BREEDING TECHNOLOGIES





Fast growing Nile Tilapia strains/seed (NaFIRRI, 2016)



Attributes and Adaptation

- ❖ Crosses of different tilapia strains from Lakes, Victoria, Kyoga and faster growth rate at an average of 2.47g per day
- ❖ High returns due to short production cycle

Source:

NaFIRRI ARDC, Kajjansi

+256 414-375668/755795355

Induced spawning technique for Kisinja (*Barbus altianalis*) (NaFIRRI, 2016)



Attributes and Adaptation

- ❖ Application of fish hormones to produce Kisinja (*Barbus altianalis*) seed
- ❖ Management tool to raise Kisinja broodstock
- ❖ Reduces pressure on wild fisheries
- ❖ Biodiversity conservation
- ❖ Diversification of aquaculture species

Source:

NaFIRRI ARDC, Kajjansi

+256 414-375668/755795355

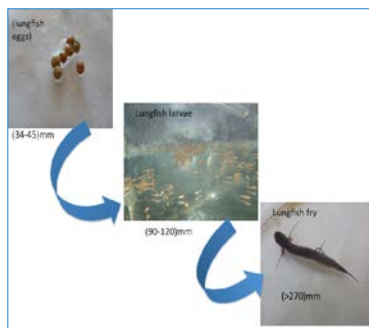
Use of the *Salvinia* weevil (NaFIRRI, NaCRRI, NARL, NISCU 2017)



Attributes and Adaptation

- ❖ Kariba weed weevil rearing unit at Namasale Landing Site, Lake Kyoga
- ❖ Is cheap and effective in controlling the weed
- ❖ No negative environmental impacts
- ❖ Improves navigation, fishing, recreation and water abstraction
- ❖ Recovery of fish breeding sites
- ❖ Once established, the weevils can sustainably clear large areas of the weed in a record time

African Lung Fish seed production (NaFIRRI, 2017)



Attributes and Adaptation

- ❖ Air breather
- ❖ Can survive in prolonged droughts
- ❖ Very nutritious
- ❖ It is now one of the most expensive fishes on the market
- ❖ Wild stocks have reduced significantly
- ❖ Reduces pressure on wild fisheries
- ❖ Biodiversity conservation
- ❖ Diversification of aquaculture species

Source: NaFIRRI ARDC, Kajjansi;

+256 414-375668/755795355

Fishes of the Lake Edward Basin, Uganda, (NaFIRRI 2024)



Special attributes

- ❖ Provides information to guide in the management of the fisheries
- ❖ Promoting conservation of wild fish stocks

Source/contact for access

**Dr. Laban Musinguzi,
Senior Research Officer,**

Fishes of the Lake Kyoga Basin, Uganda, (NaFIRRI 2024)



Special attributes

- ❖ Provides information to guide in the management of the fisheries
- ❖ Promoting conservation of wild fish stocks

Source/contact for access

Dr. Laban Musinguzi,
Senior Research Officer,

Fishes of the Lake Albert Basin, Uganda (NaFIRRI 2024)

FISHES OF THE LAKE ALBERT SYSTEM, UGANDA

<i>Protopterus aethiopicus</i> Marbled lung fish 200.0	<i>Lates niloticus</i> Nile perch 200.0
<i>Clarias gariepinus</i> African catfish 170.0	<i>Mastacembelus frenatus</i> Longtall spiny eel 40.0 Presence uncertain
<i>Hagrus docmak</i> Semutundu 127.0	<i>Polypterus senegalus</i> VU/LC 70.0
<i>Malapterurus electricus</i> Electric catfish VU/LC 122.0	<i>Mormyrus anguilloides</i> VU/LC 150.0 *
<i>Bagrus bajad</i> VU/LC 112.0 *	<i>Mormyrus macrocephalus</i> 42.0
<i>Synodontis nigrita</i> VU/LC 33.5 *	<i>Mormyrus niloticus</i> VU/NT 46.0 *
<i>Schilbe intermedius</i> Silver catfish 36.0	<i>Mormyrus caschive</i> VU/LC 100.0
<i>Schilbe mystus</i> 33.0 *	<i>Cyphomyrus grahami</i> Graham's stonebasher Presence uncertain 25.0
<i>Synodontis afrofischeri</i> Presence uncertain 17.7	<i>Marcusenius victoriarie</i> Victoria stonebasher Presence uncertain 26.0
<i>Marcusenius cyprinoides</i> Presence uncertain 33.0 *	<i>Petrophelus catostoma</i> Presence uncertain 15.0
<i>Synodontis schall</i> VU/LC 37.0 *	<i>Mormyrus kannume</i> Elephant-nout fish 100.0
<i>Synodontis serratus</i> 39.5 Possibly extant DD/VLC	<i>Pollimyrus petherici</i> VU/LC 20.0 *
<i>Synodontis frontatus</i> VU/LC 34.2	<i>Pollimyrus nigricans</i> 10.0
<i>Garra dembenisi</i> Presence uncertain 11.0	<i>Mormyrus caschive</i> VU/LC 100.0
<i>Lates macropthalbus</i> VU/VU 29.0 *	<i>Pseudocrenebus multicolor</i> 8.0
<i>Mormyrus caschive</i> VU/LC 100.0	<i>Oreochromis niloticus</i> Nile tilapia 60.0
<i>Distichodus rostratus</i> Possibly extant DD/VLC 76.0	<i>Thornochromis virgatus</i> VU/DD 5.3 *
<i>Distichodus nfaeh</i> VU/VU 83.0 *	<i>Cephalon zilli</i> Red belly tilapia VU/LC 40.0
<i>Nanochorax niloticus</i> Endemic EN/DD 4.7 *	<i>Haplochromis bullatus</i> Endemic Possibly extant DD 6.5 *
<i>Sarotherodon galilaeus</i> VU/LC 39.5 *	<i>Haplochromis albertianus</i> Endemic Possibly extant DD 1.0 *
<i>Oreochromis niloticus</i> Nile tilapia 60.0	<i>Astatochromis allaudi</i> 19.0
<i>Thornochromis virgatus</i> VU/DD 5.3 *	<i>Haplochromis loati</i> Endemic VU/DD 5.2 *
<i>Cephalon zilli</i> Red belly tilapia VU/LC 40.0	<i>Haplochromis loati</i> Endemic VU/DD 5.2 *
<i>Haplochromis bullatus</i> Endemic Possibly extant DD 6.5 *	<i>Notobranchius robustus</i> 5.5
<i>Haplochromis acium</i> Endemic VU/VU 5.2 *	<i>Leptocypris niloticus</i> VU/LC 9.5 *
<i>Micropogonias loati</i> 4.0 Possibly extant	
<i>Poecilia reticulata</i> 5.0 Introduced	
<i>Notobranchius albertinensis</i> Endemic VU/VU 5.0 *	
<i>Enteromius apteroگرامма</i> East African red finned barb Presence uncertain 5.4	
<i>Enteromius kerstenii</i> Presence uncertain 9.0	
<i>Enteromius alberti</i> Presence uncertain LC/NE 7.4	
<i>Enteromius prince</i> 8.5 Presence uncertain DD	
<i>Enteromius neumayeri</i> 11.8 Possibly extant	
<i>Alestes baremoze</i> VU/LC 43.0 *	
<i>Alestes dentex</i> VU/VU 4.5 *	
<i>Hydrocynus forskahlii</i> Ngasia VU/LC 78.0 *	
<i>Brycinus nurse</i> VU/LC 25.0 *	
<i>Rastina senegalensis</i> Presence uncertain DD LC 24.0	
<i>Micrasteropus damasi</i> 7.0 Possibly extant	
<i>Lacustricola kosenjensis</i> Possibly extant DD/DD 3.5	
<i>Lacustricola busobanus</i> 5.0	
<i>Ctenopoma muriei</i> Ocellated labriform fish 6.0	

The Lake Albert system is a watershed encompassing Lake Albert, all the rivers, streams, and wetlands associated with the lake. The images used are from the Freshwater Biodiversity Portal for Uganda (<https://freshwaterbiodiversityportal.org/uganda>). Database (fishbase.org), NaFIRRI, and publications by many scientists. Dummy pictures are used for lack of actual images for some species. The text in italics refers to scientific names. Common names, below. Possibly extant means absence of a record of the species in the last 20 years. Possibly extant means that evidence of existence is difficult to verify. **Presence uncertain** means that the presence of species is doubted. **EN**, **VU**, **DD**, **LC**, and **NT** are extinction risk categories on the national red list for the fishes of Uganda vs the global red list of the IUCN. A star (*) shows local Endemism in the Albert system. Developed by Laban Musinguzi, Nicholas Musabane, Irad Nsumeki, Momi Nsoke, Winkley Nwagwu, and Nakyehe Ilerher.

CC BY © 2024 National Fisheries Resources Research Institute (NaFIRRI), P.O Box 343 Inyanga, Telephone: +256 434 121369/+256 434 120484; Email: dlrc@naffirri.gov.ug; Website/URI : www.nffirri.gov.ug

Special attributes

- ❖ Provides information to guide in the management of the fisheries
- ❖ Promoting conservation of wild fish stocks

Source/contact for access

Dr. Laban Musinguzi,
Senior Research Officer,



TREE TECHNOLOGIES



- ❖ NARO-CARIS herbal lotion formulated and produced by NARO, contains *Carissa edulis* plant extracts antimicrobial agents that reduce and prevent pathogenic microorganisms on skin surface and prevent excessive microbial re-colonization of the skin after disinfection
- ❖ The antimicrobial compositions of the lotion contain natural plant extract materials which have the ability to sanitize and disinfect the skin without causing any skin irritation
- ❖ It inhibits growth of spoilage organisms in the product during storage, making it self-preserving
- ❖ Minimizes spread of contagious infectious bacteria, fungi and viruses that cause skin diseases

Source:

NaFORRI, Mukono
+256 414-383028/782-250112



Shea tree top-cleft grafting protocol (NaFORRI, 2016)



Attributes and Adaptation

- ❖ Protocol for successful vegetative regeneration of shea tree. Grafting is performed on seedlings or wildlings ranging up to 150 cm in height and a collar diameter of up to 3 cm
- ❖ The protocol of grafting reduced maturity period to first fruiting from >15 to 5 years

Source:

NaFORRI, Mukono

+256 414-383028/782-250112

NARO-BIOLEAF Method of *Warburgia* agronomy (NaFORRI, 2014)



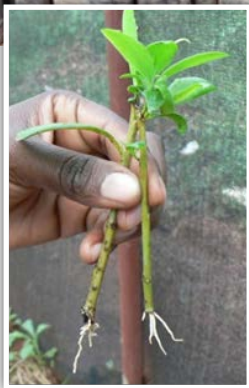
Summary description

A technique for enhancing leaf biomass production in *Warburgia ugandensis* (Mukuzannume - Luganda). It involves repeated apical cutback of *Warburgia* of 3, 6 and 9 month-old plants at 2-3 ft of height

Attributes and Adaptation

- ❖ General distribution: Grows in colonizing forest, forest edges and thickets, over dry sites
- ❖ Medicinal uses: Treatment of malaria, measles, African trypanosomiasis, leishmaniasis, candidiasis
- ❖ Propagation goal: Improvement for leaf biomass production, medicinal plant cultivation
- ❖ Propagation method: Clonal (stem cuttings)
- ❖ Time to planting out: 3 months (90 days)
- ❖ Cutting specification: Collect softwood cuttings, leaving two or more lateral buds and leaves on the cutting. Trim the cuttings to approx 7.5 cm long
- ❖ *Warburgia ugandensis* has got very good anti-microbial properties

Propagation protocol for *Warburgia ugandensis*



Propagation Procedure

- ❖ Collect only in the morning hours to reduce on desiccation and keep cuttings moist/ cool at all times by placing them in cool boxes
- ❖ Square the bases of all cuttings by use of a sharp pair of scissor to avoid one-sided rooting. Dip the cuttings in water (treated with a slight tinge of OMO soap detergent) and treat each cutting with 0.8% IBA hormone to a length of 1 cm from the base. Spray Dithane M45® at 2000 ppm on all cuttings to control fungal infections
- ❖ Construct tunnels using white 0.5 mm polythene sheets, 4 cm wide wooden frames. Fumigate milled pine bark with Dithane M-45® anti-fungal powder at 2000 ppm
- ❖ Stick each cutting into milled pine bark rooting media at a depth of between 2.5 cm and 5 cm. Compact the milled pine bark around the bases of the cuttings, water and cover with a thick polythene sheet in a non-misting chamber. Monitor every two days in a week to remove dead leaves and cuttings
- ❖ Water twice a week in order to keep the rooting media moist until the cuttings have rooted

NARO-Carboniser Stove (NaFORRI, 2017)

Attributes and Adaptation



- ❖ Fuel used: Dry biomass, agro-wastes, uncarbonized briquettes
- ❖ Design: Consists of a heat chamber with two parts that is: the solid biomass heat chamber and the producer gas heat chamber
- ❖ Capacity: up to 10 people
- ❖ Simultaneously produces charcoal and combustible gas (producer gas) used for cooking in process of burning. 2.5 times more fuel/energy and money saving; safe and convenient to use; doesn't dissipate much heat to the surrounding; fast and clean cooking and, reduced smoke/carbon emission
- ❖ Durability: over 5 years
- ❖ Carboniser stove reduces carbon monoxide emissions and produces high-quality charcoal.
- ❖ The stove simultaneously produces charcoal and gas, which may be used in briquette making and direct cooking respectively
- ❖ Cooking time: Twice faster than 3-stone stove
- ❖ Wood fuel saving: 66% compared to 3-stone stove

Source:

NaFORRI, Mukono
+256 414-383028/782-250112



NARO-KUMA Firelighters (NaFORRI, 2017)

Attributes and Adaptation



- ❖ For lighting fuel (wood, Charcoal, briquettes and any other fuel that require burning). Saw dust based firelighters for igniting cooking stoves
- ❖ Easy and fast to light fuel with minimum smoke;environmentally friendly
- ❖ Size:50gm (24 pcs) per packet
- ❖ Usage: Break a small piece (a half of a single tablet) and light from the top of the stove (sigiri), cover with charcoal and leave it for about 5 minutes to catch fire
- ❖ Durability: 1 packet can take you for about 15 days if lighting a sigiri is done at least 3 times a day
- ❖ The firelighters emit minimal smoke, are light (3.5 g), only 1.5-2.5 g are adequate to light a cooking stove
- ❖ The lighters are also safer as they do not flare up
- ❖ Reduces use of polythene bags, papers, grass or even pine sticks as firelighters thereby reducing environmental pollution

Source:

NaFORRI, Mukono

+256 414-383028/782-250112

NARO-BRIQUETTE Machine (NaFORRI, 2017)



Attributes and Adaptation

- ❖ Powerinput: Single phase, 220/240V electricity
- ❖ Floor mounted hydraulic machine for making briquettes from saw dust
- ❖ Operated by a 2-gear system at pressures of over 40 bars to produce over 100kg of hard and well compressed briquettes per hour
- ❖ Increases utilization of wood waste as source of energy
- ❖ Reduces pressure on forests for fuel wood

Source:

NaFORRI, Mukono

+256 414-383028/782-250112



Hydrogel AppRate (NaFORRI, 2017)



Attributes and Adaptation

- ❖ Water absorption capacity: 400 times their weight and swell
- ❖ Cation binding: e.g. monovalent cations more >humic substances
- ❖ When applied to the soil, as the soil dries out, the polymer releases up to 95% of the absorbed water
- ❖ Increase the water holding capacity of soils for at least 3 years
- ❖ Limit losses of water and nutrients from leaching
- ❖ Reduce evaporation from the soil
- ❖ Improve the physical properties of compact soils through good aeration
- ❖ Enhance plant growth, reduce mortality

Source:

NaFORRI, Mukono

+256 414-383028/782-250112



CSS-1



CSS-2



CSS-3



CSS-4



CSS-5

- ❖ Utilisation of these stoves will lead to less woody fuel consumption and eventually less woody biomass extraction from forests, hence curbing forest degradation

	Thermal efficiency	Fuel use reduction
CSS-1	24.8%	76.1%
CSS-2	35.7%	83.8%
CSS-3	25.2%	75.8%
CSS-4	29.4%	79.7%
CSS-5	36.2%	86.5%

Source:

NaFORRI, Mukono
+256 414-383028/782-250112

Dendrocalmus strictus charcoal (NaFORRI 2020)

Attributes and Adaptation



- ❖ NaFORRI has generated charcoal from one of the bamboo species, *Dendrocalmus strictus* a fast growing bamboo specie which is versatile and easily adapts to different environments. *D. strictus* is one of the solid bamboo varieties whose culms are unusually strong and resistant to cracking
- ❖ Its calorific/heat value is 26.7 ± 5 MJ/kg which is in the range of most woody fuels i.e. 25 MJ/kg to 30 MJ/kg
- ❖ Ash content 28.6 ± 6 g

Source:

NaFORRI, Mukono

+256 414-383028/782-250112

Wood Waste Technologies (NaFORRI,2020)



Timber offcuts glued together using resin glue

- ❖ In order to improve on wood recovery and curb deforestation, NaFORRI has generated various products from wood waste
- ❖ Using the glulam technology, timber offcuts were sectioned and glued together to make panels and eventually produce furniture

Attributes and Adaptation

- ❖ Compressive strength: 41 MPa
- ❖ Tensile strength: 26.6 MPa
- ❖ Bending strength: 30.5 MPa
- ❖ Efficient utilization of wood waste will enhance the wood product value chain as well as contribute to curbing deforestation in Uganda

Source:

NaFORRI, Mukono

+256 414-383028/782-250112

Commercial avocado varieties (NaFORRI 2020)



- ❖ Hass
- ❖ Nabal
- ❖ Esther
- ❖ Sheppard
- ❖ Fuerte
- ❖ Wilson
- ❖ Rincon
- ❖ Reed
- ❖ Ettinger
- ❖ Semile34
- ❖ Semile43

Source:

NaFORRI, Mukono

+256 414-383028/782-250112

Bambusa vulgaris (NaFORRI 2020)



This bamboo is a good energy crop and provides raw materials for furniture and construction industry

Attributes and Adaptation

- ❖ Fast growing, ready for harvest at 3 years
- ❖ Generates 6-10 bamboo culms
- ❖ Good structural and mechanical properties

Source:

NaFORRI, Mukono

+256 414-383028/782-250112

Melia volkensii (NaFORRI, 2020)



Attributes and Adaptation

Melia volkensii is a good plantation species with the following attributes;

- ❖ Fast maturing 8 10 years cf. 30 years in other mahoganies
- ❖ Drought tolerant
- ❖ Termite resistant
- ❖ Produces high quality timber
- ❖ Compatible with most crops

Source:

NaFORRI, Mukono

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SOIL & LAND MANAGEMENT TECHNOLOGIES

Permanent Planting Basins (PPBs) NARL, 2016



Description

PPBs are pits dug in the ground at regular intervals for the capture and storage of rainwater, precision nutrient management, and breaking hard soil surfaces. PPBs are recommended for small scale farmers

Unique Features

- ❖ Breaking soil hardpan
- ❖ Conserves soil moisture
- ❖ Ensures nutrient management precision
- ❖ Gives high yields(up to 5-6 tons per ha)
- ❖ Ensures risk reduction to drought

Source: NARL, Kawanda; +256 414-567156/414-699242/753-605621

Rip Lines (NARL (2016) Description



Rip lines are planting lines dug in the ground using a ripper pulled by either oxen or a tractor for the capture and storage of rainwater, precision nutrient management, and breaking hard soil surfaces. Rip lines are recommended for medium to large scale farmers with access to either oxen or tractor

Importance

Rip lines have helped farmers increase their production areas and have improved bean grain yield from an average of 300kg/ha to 1,500kg/ha and maize grain yield from an average of 3,000kg/ha to 6,000kg/ha

Source: NARL, Kawanda; +256 414-567156/414-699242/753-605621



2-Maize 1-Bean row Intercropping pattern (NARL, 2015)



Description

The “2-maize, 1-bean row intercropping pattern” is established by digging maize rows at a spacing of 75cm and one bean row between the maize rows. The intra-row spacing for maize is 60 cm, while that for beans is 10cm

Unique Features

- ❖ Standard method of maize planting
- ❖ Achieves optimum maize yield with beans as a bonus
- ❖ Enhanced labour and land use efficiency

Importance

Intercropping maize with beans is more productive than sole maize cropping as it maximizes land utilization, and increases labour utilization efficiency, food security and farm profits

Source: NARL, Kawanda;

+256 414-567156/414-699242/753-605621



AGRO-MACHINERY TECHNOLOGIES



NARO Hydraulic ram pump-RAMP1 (AEATREC, 2013)



Description

A pump that uses energy of flowing water fall to pump water to a tank placed at a height ranging from 5 - 55m. Hence there are no fuel or electricity costs.

Pumps 1,800 - 3,600 liters per second and can thus irrigate 0.5-1 acre per day

Importance

Enables smallholder commercial farmers along rivers/ streams with water falls to produce crops especially vegetables all year round for different markets

Source:

Agricultural Engineering and Appropriate Technology Research Centre(AEATREC-Namalere)

Tel: +256(0)- 414566161/772 328 519,

aeatri@starcom.co.ug

NARO Lightweight Rice Thresher -LWR1 (AEATREC, 2013)



Description

A mobile light weightthresher 138 - 150kg on two resting motorcycle tires for ease of hand pushed or pulled by a bicycle along village paths and roads from one rice farm to another by anyone including women and youth

Has threshing output 550-700Kg/liter fuel with threshing efficiency of 99.9%

Importance

Rice farmers are able to reduce grain loss from 4.78% to 0.1% translating to more income and food. This saves the country USD 5.92 million (17,760 tons of paddy) annually

Creates rice threshing jobs for anyone. Those who are doing it earn a net profit of USD 540 - 1,505 annually

Source:

Agricultural Engineering and Appropriate Technology Research Centre(AEATREC-Namalere)

Tel: +256(0)- 414566161/772 328 519,
aeatri@starcom.co.ug



Biomass Stove (AEATREC 2013)

Unique Features/description



- ❖ It efficiently combusts low porosity biomass including agro-wastes
- ❖ Saves 2.7 – 3kg of fire wood per hour
- ❖ Contributes to reducing deforestations and reduces cooking fuel costs for households

Source: Agricultural Engineering and Appropriate Technology Research Centre(AEATREC-Namalere)

Tel: +256(0)- 414566161/772 328 519, aeatri@starcom.co.ug

Fireless Cooker (AEATREC 2013)

Unique Features/description



- ❖ Has special insulation system that uses the available agro-wastes resources that prevents heat loss
- ❖ Saves 40% of firewood used in cooking at households
- ❖ Contributes to reducing deforestations
- ❖ Reduces cooking fuel costs for households

Source: Agricultural Engineering and Appropriate Technology Research Centre(AEATREC-Namalere)

Tel: +256(0)- 414566161/772 328 519, aeatri@starcom.co.ug

Ram Pump, NARORAMP-2 (AEATREC, 2020)



Specification: Can raise water to a delivery head of 4.5 to 5 m at a fall of 1 to 7 m.; pumps 1,440 litres/hour.; Can irrigate 0.5 to 1 acre per day; easy to maintain.

Attributes

- ❖ The pump is powered by energy of flowing water fall therefore has low operational cost
- ❖ Enables smallholder farmers along rivers / streams with waterfalls to produce crops especially vegetables all year round
- ❖ As it uses energy of flowing water fall, it is environmentally friendly

Source:

Agricultural Engineering and Appropriate Technology Research Centre(AEATREC-Namalere)

Tel: +256(0)- 414566161/772 328 519, aeatri@starcom.co.ug



PAH-Safe Fish Smoking kiln, NAROFIK-3 with two models: NAROFIK-3-D4 and NAROFIK-3-D6 (AEATREC, 2020)

Model - NAROFIK-3-D4



Specification: Model - NAROFIK-3-D4 - Has 4 doors and a capacity of 500 kg of fresh fish per day; Model - NAROFIK-3-D6 - Has 6 doors and a capacity of 700 kg of fresh fish per day.

Model - NAROFIK-3-D6

Attributes



- ❖ Reduces the carcinogenic elements of Polycyclic Aromatic Hydrocarbons in our smoked fish from 40,000 ppb to 0.88 ppb well below the maximum limit of 2 ppb set by EU markets
- ❖ Processed smoked fish is of very high quality: safe from cancer causing compounds, clean, golden color and uniformly smoked
- ❖ Improves the quality and increases market value of smoked fish by 75 - 85%
- ❖ Reduces amount of firewood and charcoal required for smoking fresh fish by 50%
- ❖ Significantly reduces smoking time to just 10 - 14 hours from 48 - 72 hours taken by the traditional methods of Chokori kilns
- ❖ Increases shelf-life of smoked fish
- ❖ No inhaling of smoke hence minimizing adverse effects of smoke
- ❖ Filtered smoke does not irritate the eye and throat
- ❖ Suitable for both women and men
- ❖ Not labor intensive



Contribution to Economy/Employment/ SDG

Ugandan smoked fish processed using the kiln is very competitive in both domestic and export markets. Hence has qualified smoked fish from Uganda for export. Five smoked fish processors are setting up smoked fish processing cottage factories that will use smoked fish using the kiln creating employment opportunities

Source:

Agricultural Engineering and Appropriate Technology Research Centre(AEATREC-Namalere)

Tel: +256(0)- 414566161/772 328 519, aeatri@starcom.co.ug

Calf Pen(NaLIRRI 2018)



Attributes and Adaptation

- ❖ Possession of a nipple nurse bucket that animals receive milk based on individual performance of the calf pen
- ❖ The pens have an exercise area which is approx. 2 m² to provide adequate space for the calves to exercise
- ❖ The pen has a back door which is used to access the calf but also facilitates easy changing of the calf bedding straw regularly

Source:

NaLIRRI, Nakyesasa & Maruzi

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NARO-Ngu-B Trap (NaLIRRI, 2017)

Attributes and Adaptation



- ❖ Enhanced tsetse fly capture efficiency
- ❖ Reduces incidences of Trips and Nagana

Source:

NaLIRRI, Nakyesasa & Maruzi

+256 414-691047/704-523391

Forage Chopper (NaLIRRI 2018)

Attributes and Adaptation



- ❖ Output per hour - 1 ton/ hour
- ❖ Output per liter fuel - 1.2 tons/ liter
- ❖ Produces 5 cm chop size Affordable
- ❖ Total load reduced from 52 to 13kg
- ❖ Reduced vibrations
- ❖ Working height improved from 52cm to 120cm
- ❖ Improved machine efficiency: 1.4 tons per liter compared to 1.2 tons liter
- ❖ Reduces cost of production by 220,000

Source: Agricultural Engineering and Appropriate Technology Research Centre(AEATREC-Namalere)

Tel: +256(0)- 414566161/772 328 519, aeatri@starcom.co.ug

Solar Heat pump (NaFIRRI 2021)



- ❖ The technology uses solar-generated electricity to drive a heat pump to harvest heat energy from the water source (e.g. lake).
- ❖ The heated air is blown over mukene on a rack in a tent-like enclosure (the temperature inside the enclosure is raised to c. 50 °C as compared to c. 35 °C ambient outside).
- ❖ Mukene in the enclosure dries in about 4 hours as opposed to about 7 hours outside.
- ❖ 4. Fish in the enclosure are free from insects, and not at risk of theft by or defecation from birds.

Source

Mangeni

University of St Andrews, LVFO and NaFIRRI



NARO power tiller plough

Attributes and Adaptation



- ❖ Specially designed plough for use by single axle tractors.
- ❖ The plough is ideal for smallholder farmers and machinery hire service enterprise.
- ❖ It takes 7 hours to plough 1 hector in light and worked upon soils and 14 hours in heavy and virgin soils

Source:

NARO FORA-CHOP

Attributes and Adaptation



- ❖ Chops fodder for feeding livestock
- ❖ The machine has two models: light duty and heavy duty
- ❖ Light duty has an output of 500-600 kg of fresh chopped forage in one hour
- ❖ Heavy duty has 1,500-1,600 kg of fresh chopped forage in one hour.
- ❖ Chopped fodder length varies between 25-50mm

Source:

NARO CAS-CHIP

Attributes and Adaptation






- ❖ A food grade fresh cassava chipping machine
- ❖ Cuts thin uniform chips that dry faster to produce better quality cassava chips and flour for human consumption and industry.
- ❖ Eliminates the need for removing fibers.
- ❖ Has a chipping output of 450-600kg of chipped fresh cassava per hour with a chipping efficiency of 98.5%




Source:








VALUE ADDED PRODUCTS AND PROTOTYPES FOR INDUSTRY

Prototype	Image	In charge	Write-up
Mputta oil, NaFIRRI 2022		Dr. Victoria Namulawa	Extracted from the Nile perch fish, the oil is a rich source of essential fatty acids, particularly omega-3s like DHA and EPA, and vitamin A, and contains natural antioxidants
Propolis, Bulindi ZARDI 2023		Dr William Guma	It is a resinous material that bees collect from various plant sources and is rich in flavonoids, which are known for their antioxidant properties. propolis may support the immune system and act as a natural antibiotic
Coffee aftershave, NaCORI 2022		Evans Atwijukire	An aftershave being developed by scientists at the National Coffee Research Institute(NaCORI) with a rich coffee scent and anti-inflammatory properties to maintain a healthy skin after shaving.



Prototype	Image	In charge	Write-up
Coffee scrub, Na-CORI 2022		Joseph Mulindwa And Evans Atwijukire	A coffee infused body scrub developed by scientists at National Coffee Research Institute(NaCORI) with a rich coffee scent, antioxidants and anti-inflammatory properties to maintain a healthy skin.
Cocoa wine, NaCORI 2023		Evans Atwijukire	A sweet red wine from cocoa developed by scientists at National Coffee Research Institute(NaCORI).
Cocoa Fermentation box, Na-CORRI 2023		Joseph Mulindwa	A traditional box made of hardwood used to ferment cocoa beans for 5-7 days. It allows proper drainage, airflow, and heat retention, which are essential for flavor development during fermentation.

Prototype	Image	In charge	Write-up
Coffee powder, NaCORI 2019		Evans Atwijukire	Coffee beverage developed by scientists at National Coffee Research Institute(NaCORI).
Coffee & turmeric body creme, NaCORI 2022		Evans Atwijukire	A coffee and turmeric infused body crème developed by scientists at National Coffee Research Institute(NaCORI) with a rich coffee scent, antioxidants and anti-inflammatory properties to maintain a healthy skin.
Coffee yoghurt, NaCORI 2022		Joseph Mulindwa	A coffee infused yoghurt developed by scientists at National Coffee Research Institute(NaCORI) with a rich coffee aroma.




Prototype	Image	In charge	Write-up
Cocoa butter creme, Na-CORI 2022		Evans Atwijukire	A crème containing cocoa butter developed by scientists at National Coffee Research Institute(NaCORI) rich phytochemicals that protect the skin from harmful UV rays.
Coffee body lotion, Na-CORI 2022		Evans Atwijukire	A lotion containing coffee developed by scientists at National Coffee Research Institute(NaCORI) with a rich coffee scent, anti-oxidants.




Prototype	Image	In charge	Write-up
Banana fibre hair extensions, NARL 2023		<p>Dr Jerome Kubiriba</p> <p>Dr Priver Namanya Bwesigye</p>	<p>An environmentally friendly organic hair extensions developed from fibre extracted from fresh banana stems. It is being developed by the banana program at the National Agricultural Research Laboratories (NARL-Kawanda).</p>
Fish Powder, Mbarara ZARDI 2021		<p>Chloe Kemigabo</p>	<p>A food supplement from tilapia fish that is rich in proteins and multi-vitamins. The product is being developed by scientists from the Mbarara Zonal Agriculture Research and Development Institute.</p>
Rwebitaba green tea, 2021		<p>Kawooya Ronald</p>	<p>It is a green tea developed by the Rwebitaba Zonal Agriculture Research and Development Institute with weight reducing properties and reduces risks of cardiovascular diseases.</p>









Prototype	Image	In charge	Write-up
Rwebitaba black tea, 2019		Kawooya Ronald	It is a green tea developed by the Rwebitaba Zonal Agriculture Research and Development Institute rich in antioxidants.
Tea extract lotion, Rwebitaba 2021		Kawooya Ronald	A tea infused lotion developed by scientists at Rwebitaba Zonal Agriculture Research and Development Institute with rich antioxidant properties.
Shea butter creme, Ngetta ZARDI 2022		Dr Banabas Mudde	A skin product developed from the shea nut by the Ngetta Zonal Agriculture Research and Development Institute. It is rich in antioxidants and also acts as emollient that helps to soften or smoothen dry skin in addition to anti-ageing properties.

Prototype	Image	In charge	Write-up
Shea butter jerry, Ngetta ZARDI 2022		Dr Banabas Mudde	A skin product developed from the shea-nut by the Ngetta Zonal Agriculture Research and Development Institute. It is rich in antioxidants and also acts as emollient that helps to soften or smoothen dry skin.
Shea jam, Ngetta ZARDI 2022		Dr Banabas Mudde	A fruit Jam developed from the shea-fruit pulp by the Ngetta Zonal Agriculture Research and Development Institute.
Shea Wine, Ngetta ZARDI 2023		Dr Banabas Mudde	A locally made fruit wine from the sweet, tangy shear fruit. It has a light body, fruity flavor, and floral notes. Traditionally brewed for cultural events, it's best served chilled and pairs well with spicy or grilled foods.

Prototype	Image	In charge	Write-up
Avocado soap, MuZARDI 2023		Balikoowa Brian	It is a body soap being developed by scientists at the Mukono Zonal Agriculture Research and Development Institute. It has anti-inflammatory properties and keeps the skin hydrated.
Avocado oil, MuZARDI 2023		Balikoowa Brian	An oil developed by the Mukono Zonal Agriculture Research and Development Institute rich in antimicrobial, antioxidant and anti-inflammatory properties.
Avocado seed powder, MuZARDI 2023		Balikoowa Brian	Powder developed by the Mukono Zonal Agriculture Research and Development Institute rich in antioxidants and potassium.

Prototype	Image	In charge	Write-up
Banana wine, Mba-zardi 2022			A sweet red wine developed from the East African Highland bananas
Rice pops, NaCRRRI 2023		Evans Atwijukire	A quick snack from rice developed by scientists from the National Crops Resources Research Institute.
Honey wine, AbiZARDI 2021			A sweet wine developed by scientists from the National Agricultural research Organization.

Prototype	Image	In charge	Write-up
Cassava starch, Na-CRRI 2020		Dr Benard Yada	A starch developed by the National Crops Resources Research Institute that can be used as a thickener for many products.
Purple and crème fleshed sweet potato flour, Na-CRRI 2020		Dr Benard Yada	A Flour product from sweet potatoes developed by the National Crops Resources Research Institute that can be used as an ingredient in the confectionary industry.
Cassava starch glue, NaCRRI 2021		Dr Benard Yada	A glue from cassava developed by the National Crops Resources Research Institute (NaCRRI).

Prototype	Image	In charge	Write-up
Cassava bioethanol, NaCRRRI 2020		Dr Benard Yada	It is an industrial grade ethanol developed by NaCRRRI and can be used as a solvent, in the manufacture of other organic compounds, and as an additive to automobile fuel.
Purple sweet potato wine, Na-CRRRI 2024		Dr Benard Yada	Purple sweet potato wine is a unique, naturally vibrant alcoholic beverage made from the fermentation of purple-fleshed sweet potatoes. Rich in anthocyanins (natural antioxidants), this wine boasts a striking purple hue and a mildly sweet, earthy flavor with floral and fruity notes. It is crafted by cooking, mashing, and fermenting the tubers with yeast and sugar.
Tilapia and Angara sausage products (NaFIRRI, AbiZARDI & Private Sector 2016)			<ul style="list-style-type: none"> • Is a new product on the market • Improves income due to value addition

MARKETING TOOLS

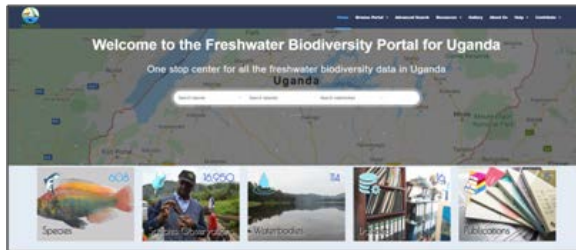
Cell phone App for fish farmers (NaFIRRI, 2017)



Attributes and Adaptation

- ❖ It is a robust technology that is easily accessible to many communities
- ❖ Marketing of fish products is fast and therefore minimizes post-harvest losses

Freshwater Biodiversity Portal for Uganda (FWPU) NaFIRRI, 2020



<https://freshwaterbiodiversity.go.ug>

Other online information sources;

- ❖ <https://naroinforhub.naro.go.ug>
- ❖ naroseedinformation app
- ❖ www.naro.go.ug

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