

Cassava Seed Tracker

Concept and Key Features

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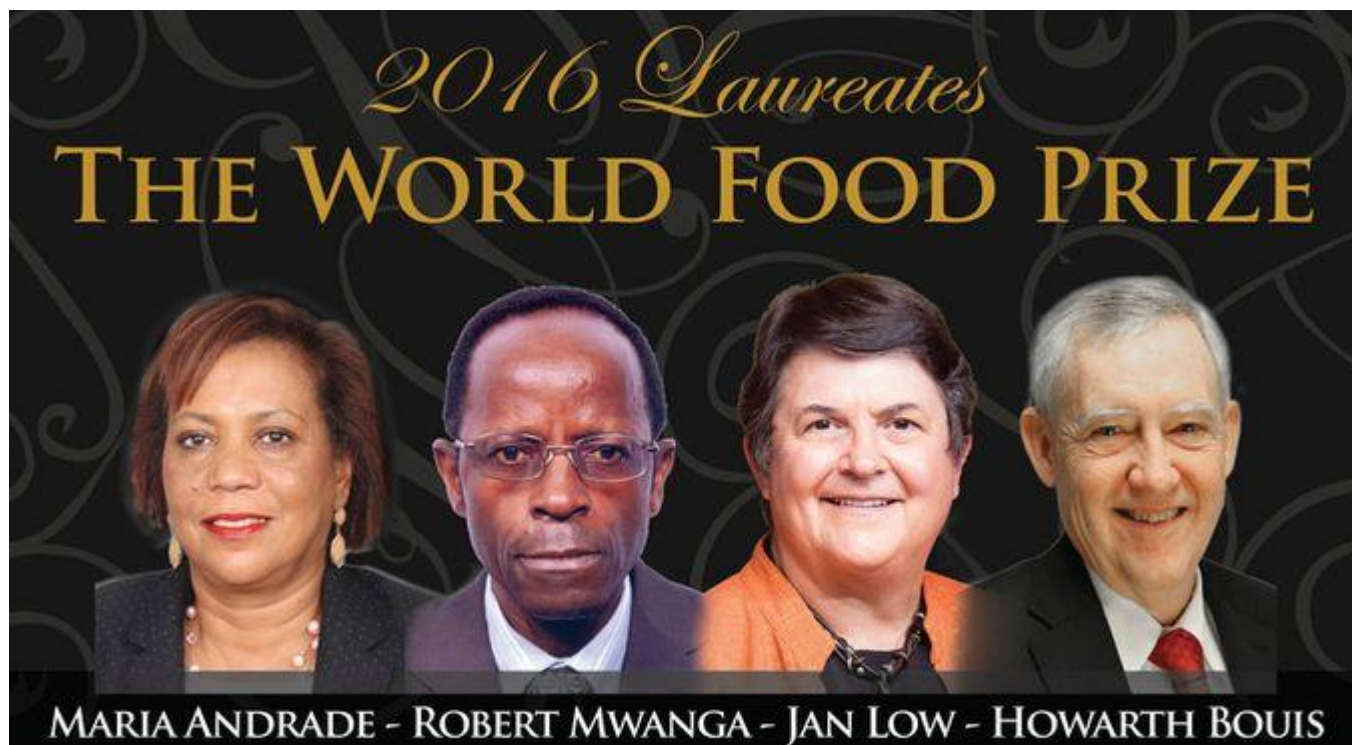
BASICS

BUILDING AN ECONOMICALLY
SUSTAINABLE, INTEGRATED
CASSAVA SEED SYSTEM



**Research
Program on**
Roots, Tubers
and Bananas

Congratulations to CIP Team



First Working Group Meeting of the CGIAR Germplasm Health Units

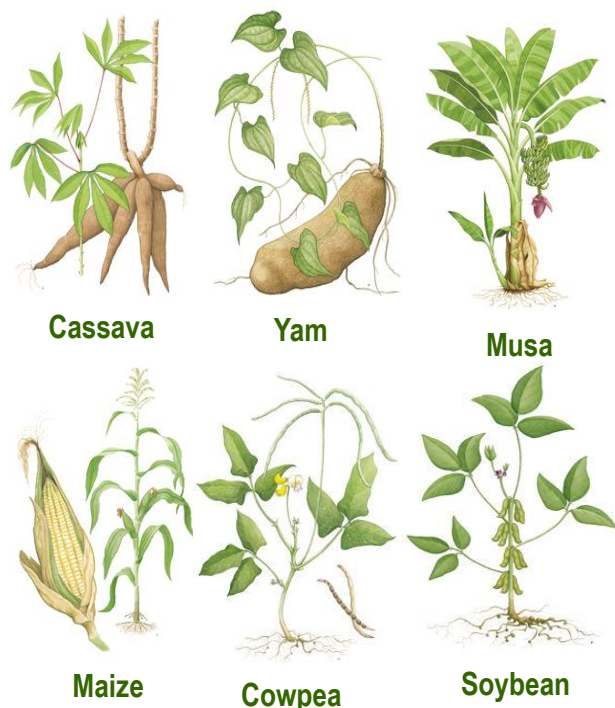






IITA: An international non-profit R4D organization for the development of agriculture established in 1967

- **Headquarters & West Africa hub in Ibadan, Nigeria; regional hubs in Lusaka, Dar, Kinshasa**



IITA R4D stations serve our scientists and partners across sub-Saharan Africa. (Map by IITA)

About me 😊

- **PhD in Virology**
- **Special Project Scientist (ICRISAT)**
- **Scientist (ICRISAT)**
- **Virologist - West and Central Africa (IITA)**
- **Head, Germplasm Health and Virologist (IITA)**



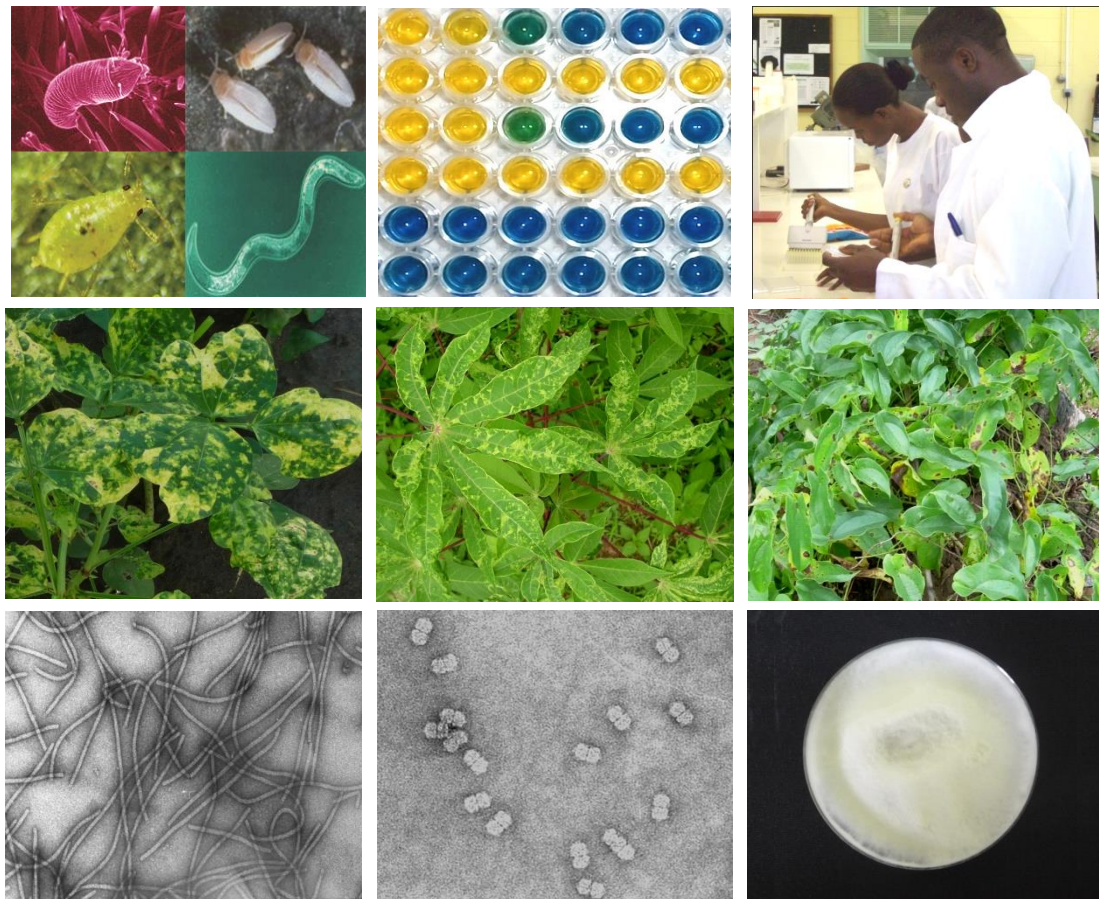
- 1. Understand the foe**
- 2. Develop tools to monitor them**
- 3. Establish technologies to prevent, control and manage viruses**
- 4. Disseminate knowledge technologies**

Ensuring germplasm health safety

- Facilitate exchange of 'pest-free' germplasm
- Ensuring compliance with phytosanitary regulations
- Facilitates
 - Inspection import and export material
 - Production of healthy planting material
 - Import and export permits



Diagnostics



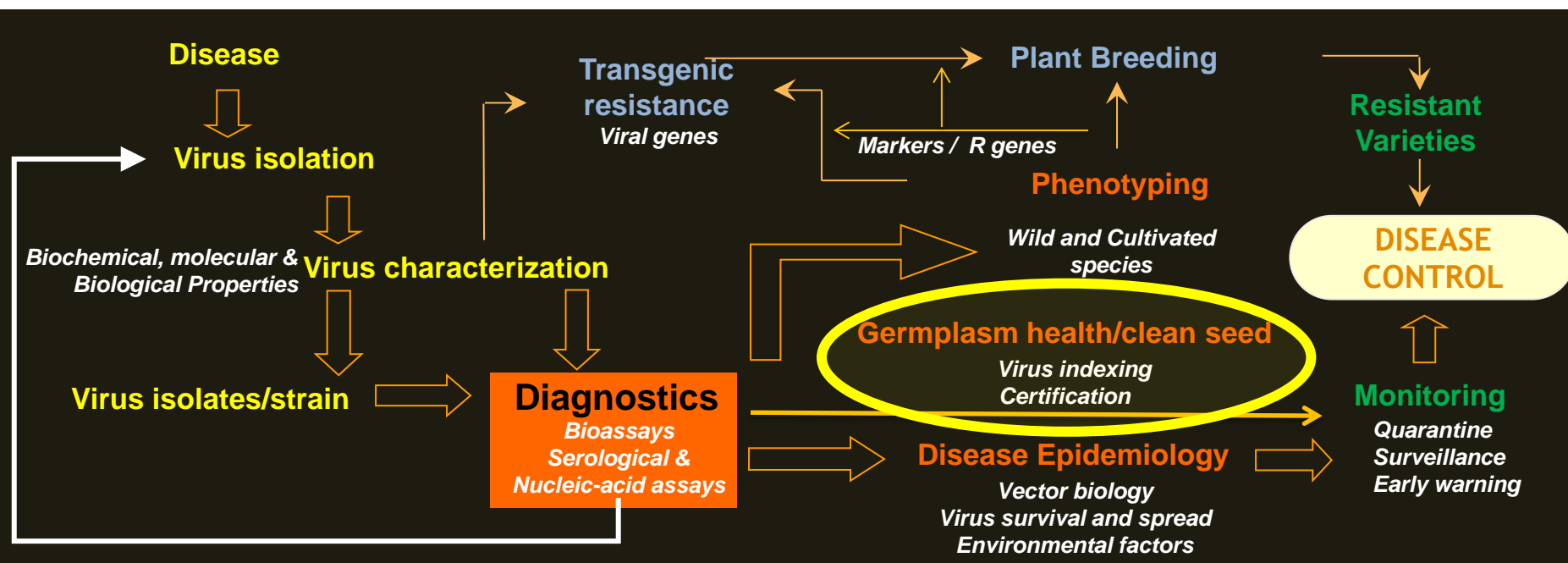
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GGTTGCAGAGAACTACATC

GTTACTACGCAAAGGAGG

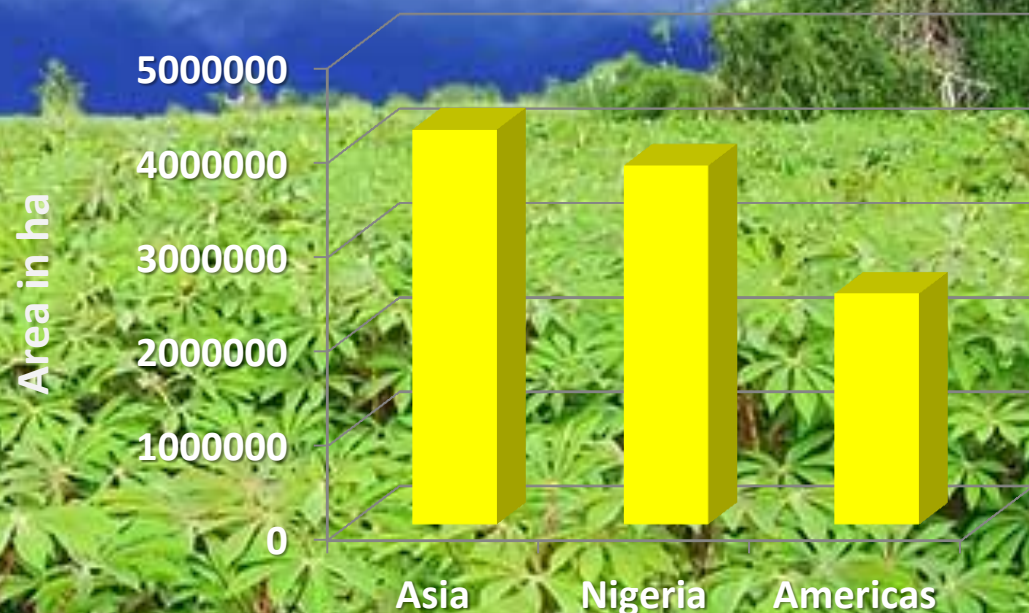
- Knowledge generation on pests and pathogens
- Develop tools and technologies for better understanding and monitoring of pests and pathogens.
- Capacity development and technology transfer.

Virus disease control through quality seed





- **Nigeria is no. 1 in area & production**



Cassava propagation

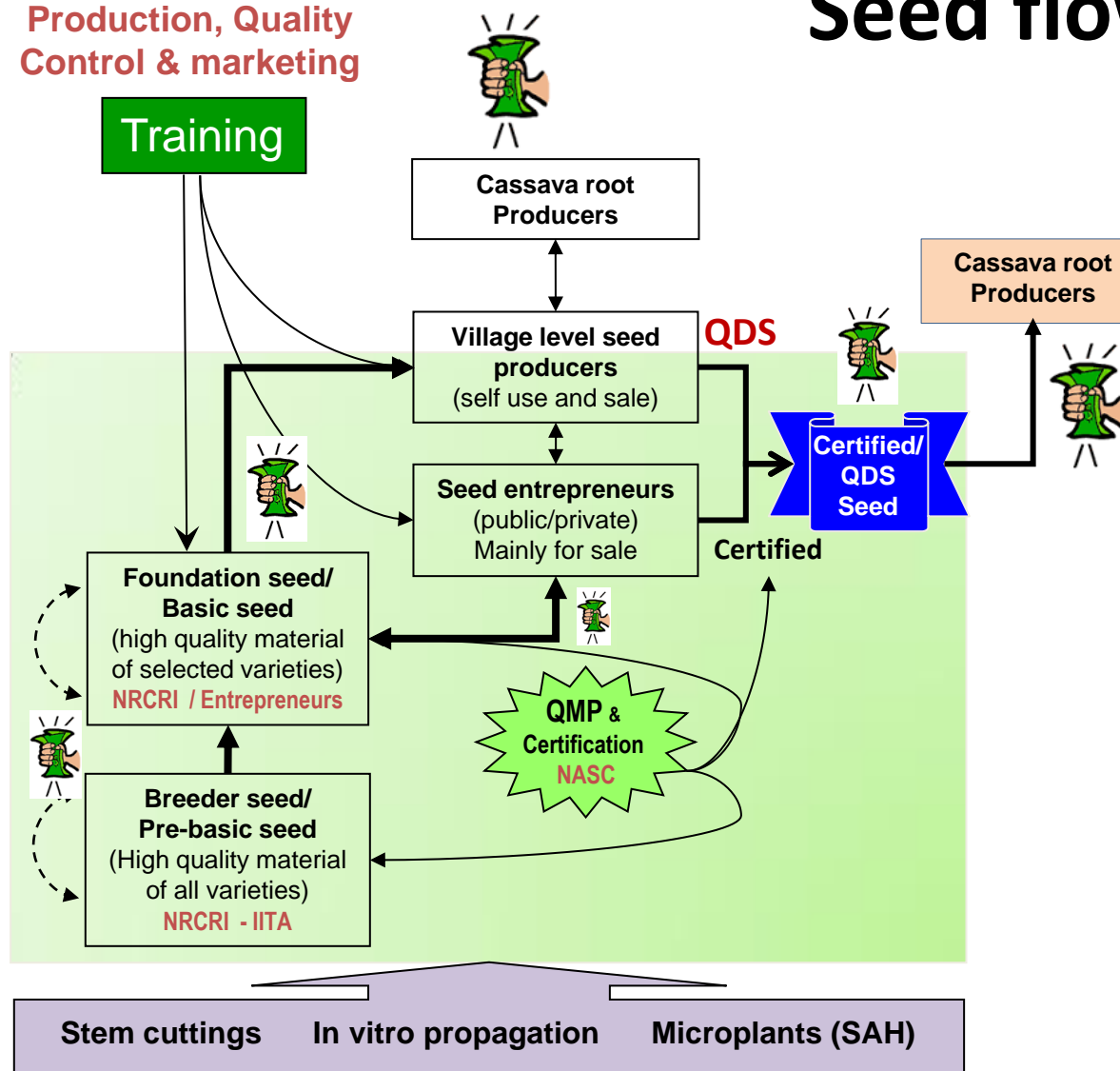


Pathogen	Stems	Sterile, virus tested tissue culture plants	Virus tested SAH plants	seed
<i>Insects</i>	+++	-	-	-
<i>Bacterial blight</i>	+	-	-	-
<i>Fungi (Cassava anthracnose)</i>	+	-	-	-
Virus (cassava mosaic)	+++	-	-	-



Seed flow

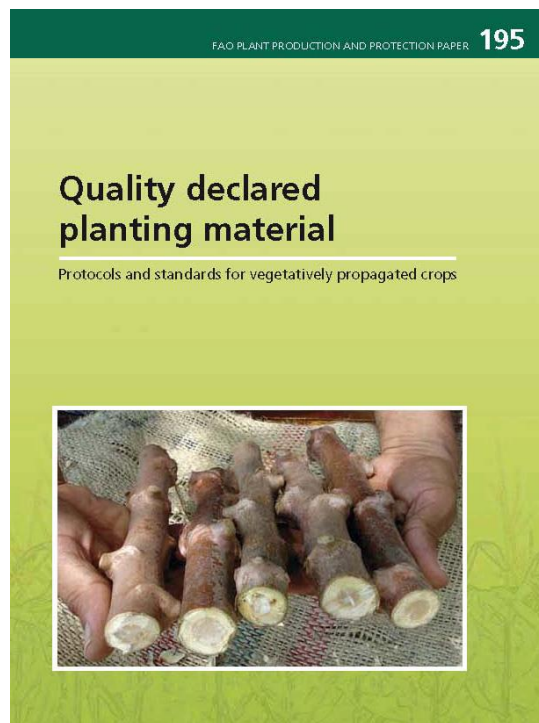
Production, Quality Control & marketing



Seed quality

- Healthy (free from pests and pathogens)
- True-to-type (genetic uniformity)
- Quality (physical attributes)

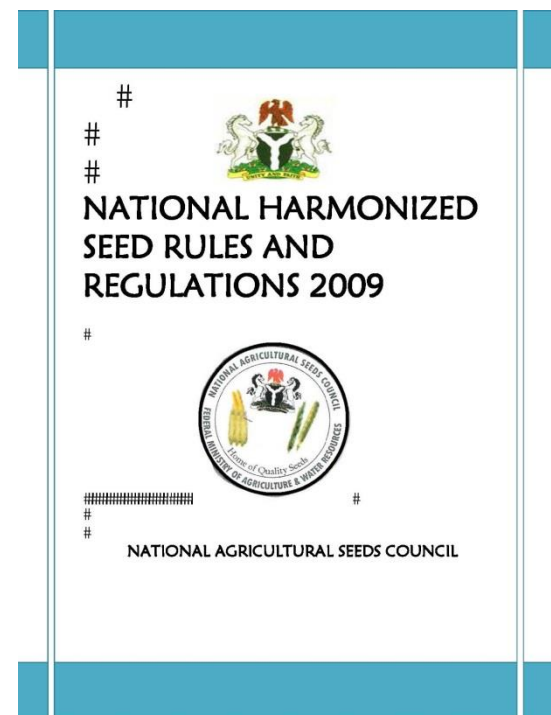
Quality management protocol



ECOWAS Standards

ECOWAS Certification Standards for Root and Tuber Plant Seed

C/REG.4/05/2008



- Pre-basic (Breeder seed)
- Basic (Foundation seed) $G0 \rightarrow G1 \rightarrow G2$
- Certified seed (Commercial seed) $C0 \rightarrow C1 \rightarrow C2 \rightarrow C3 \rightarrow C4$

Quality parameters



Parameter	Foundation (Basic seed)	Certified (Pre-basic seed)
Off type	10%	20%
*CMD (mosaic)	10%	20%
*CAD (Anthracnose)	10%	20%
*CBB (bacterial blight)	10%	20%
Scale insects	0%	20%
CM (mealybug)	10%	20%
CGM (green mite)	10%	20%
*Note: CBB, CMD, CGM only plants with severity ≥ 3 are scored		

- Seed farms are **qualified** / **rejected** based on the compliance to the minimum certification standards

Quality management protocol

Cassava Seed Tracker

Camera, GPS, skills in verification of site and stem stocks

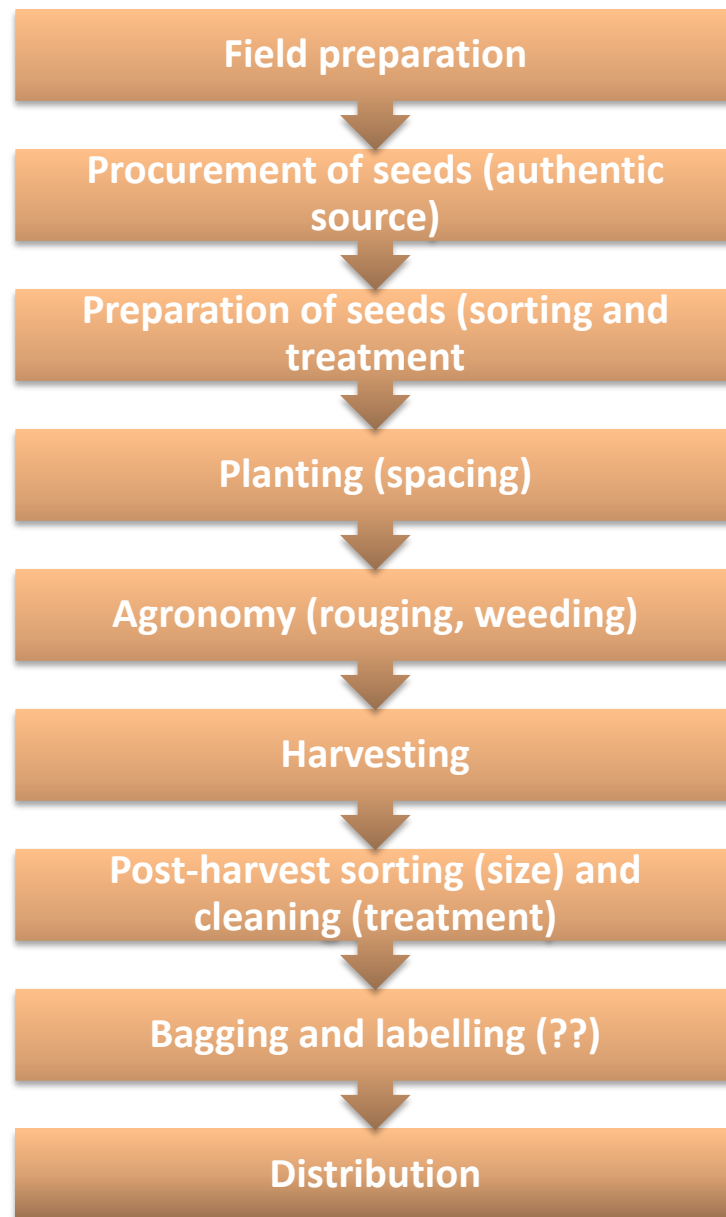
Camera, GPS, pocket guides (smart tool in future); skills in assessing pests and diseases (incidence and severity), variety identification

Camera, GPS, pocket guides (smart tool in future); skills in assessing stem quality, stem size and stock assessment, labelling

•Pre-planting
(1st inspection)
Verification of site,
planting material
source

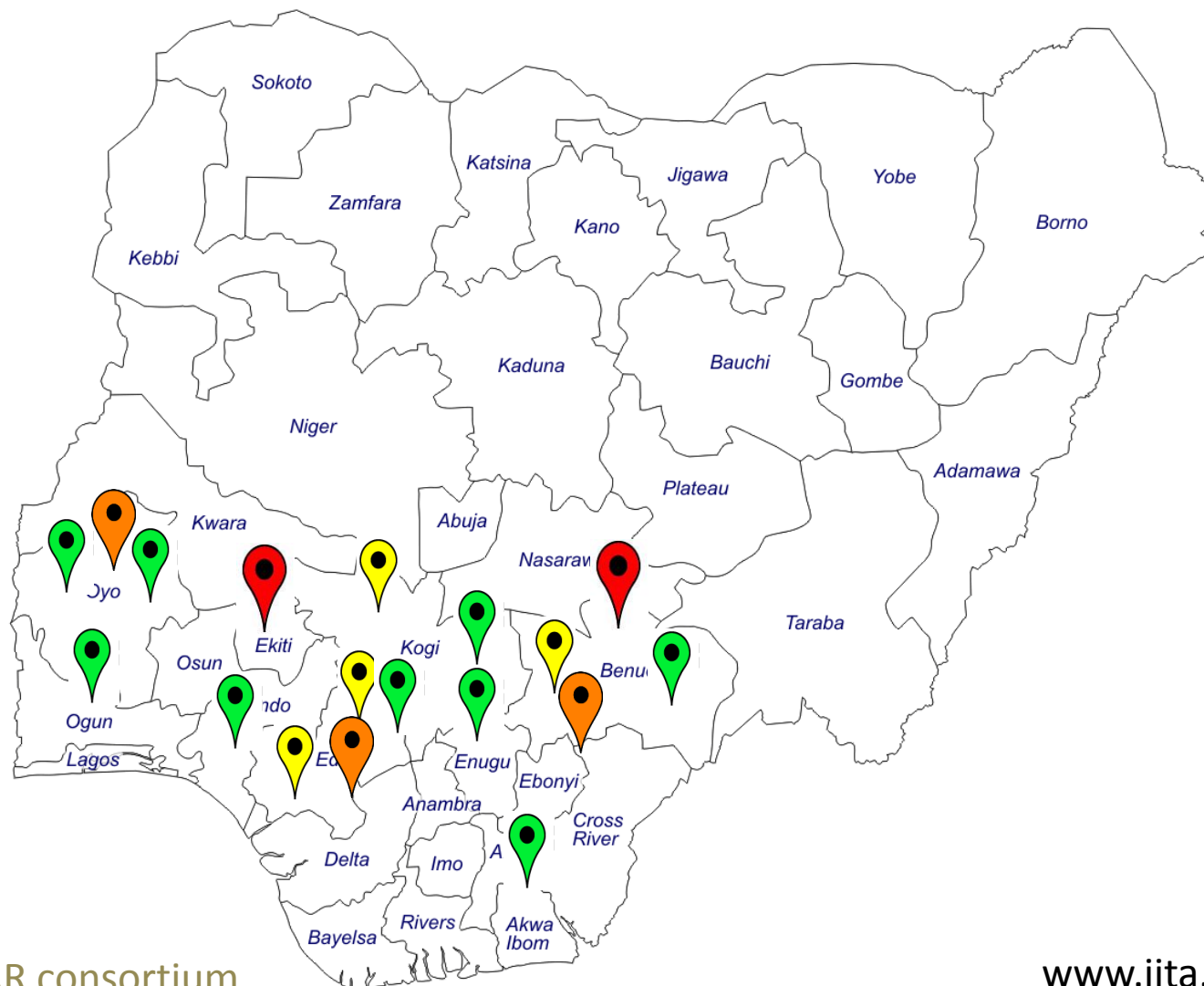
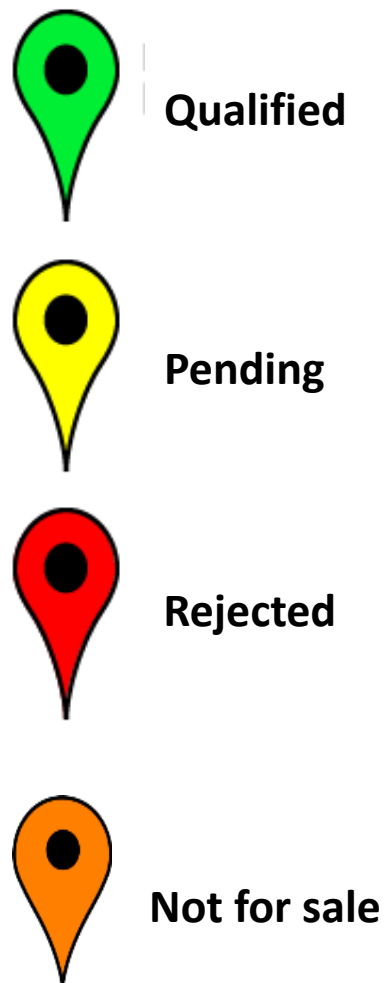
•Post-planting
(2nd inspection
16 to 20 weeks post
planting)
Pest thresholds,
spacing, varietal
purity, weeding,
empty spaces

•Harvesting
(3rd and final
inspection)
Stem quality,
stock assessment and
labelling



What are the challenges being addressed?

- Common communication platform for the seed value chain
- Traceability
- Ready access to information (real time)
- Regulatory control
- Communication and networking
- Consistency and accuracy of input data and data analysis
- Simplified verification (barcoding)
- Inventory management



Seed tracker

The screenshot shows a web browser window with the URL seedtracker.org/cassava/. The website features a navigation bar with links: Home, About, Resources, Partners, Search User, Contact Us, Sign up, and Login. The main content area has a background image of a cassava field. On the left, a smartphone displays a map titled "Production by Location" showing various regions in Nigeria. On the right, the text "Cassava Seed Tracker" is prominently displayed, followed by a description: "Cassava Seed Tracker is a full featured database program that allows users to electronically track seed production throughout planting, weeding and harvest times. With this online tool, information on seed classifications, growth history, product suppliers, item locations and much more are easily generated for the good use by the user." Below this text is a blue "Get started" button. The Windows taskbar at the bottom shows the time as 10:44 AM on 9/15/2016.

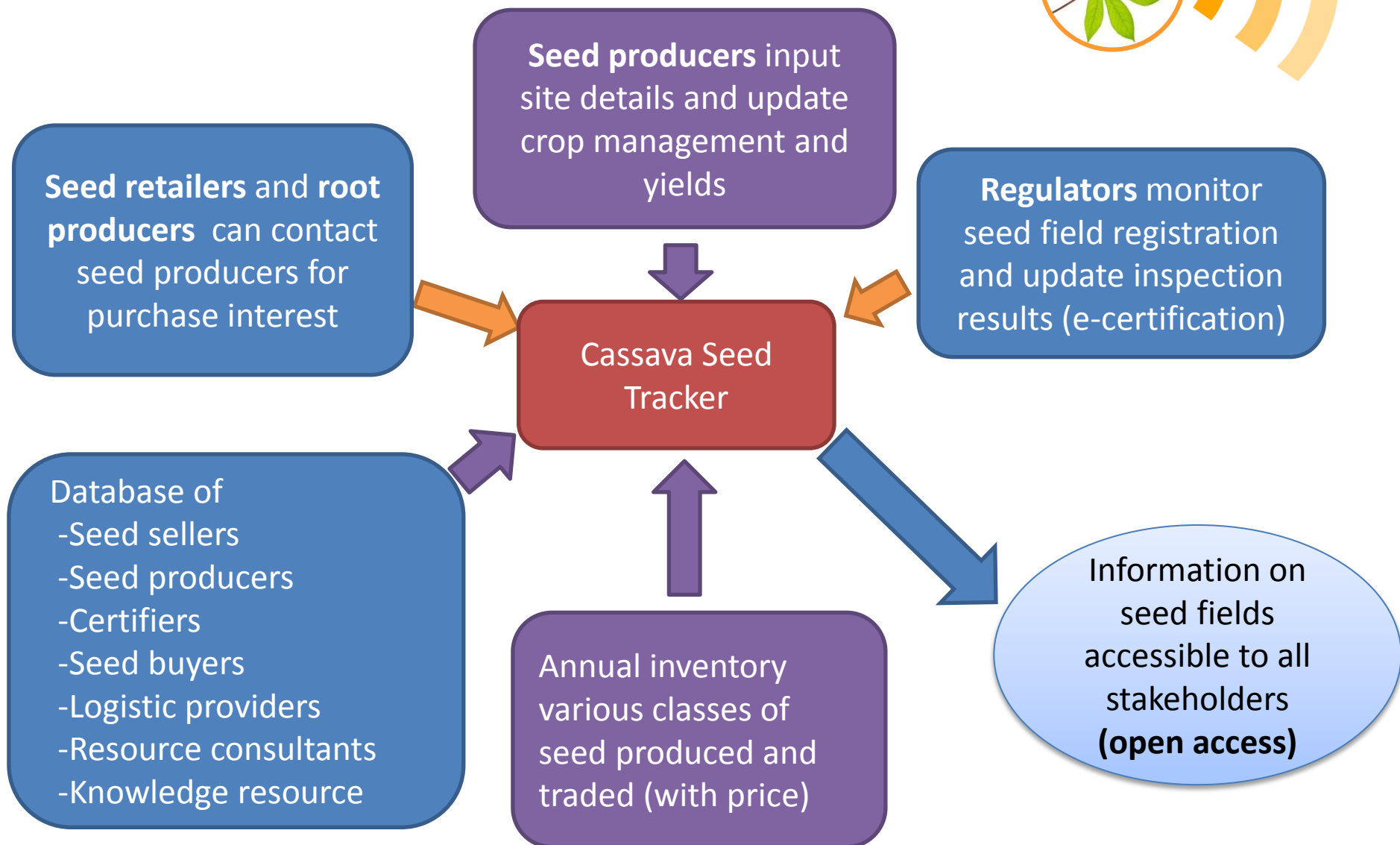
Features



Site ID#

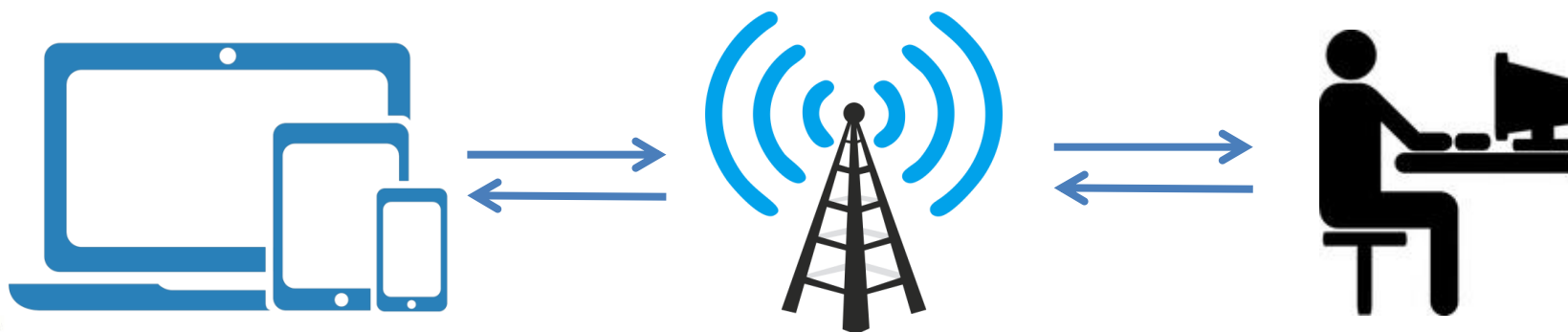
- Pre-basic seed
- TME419
- 1 ha
- C Egesi
- Certification status: Pass
- Seed availability: Yes or No
- Contact

Features

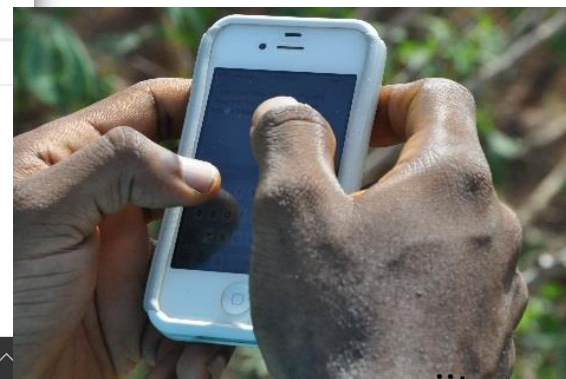
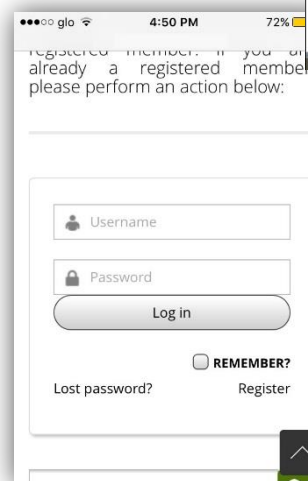
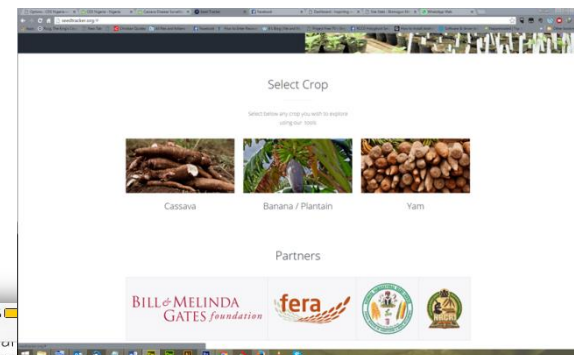


Backend

1. Input using ODKCollect on Open Data Kit or XForms on Ona for Android and OS; on Enketo for website
2. MySQL database for data collection, sorting and display
3. Integration on a website for easy access and use
(www.seedtrackere.org/cassava)
4. Accessible through Android or OS (mobile phones and touchpads), and html (computers and laptops) programs



- Off-line & on-line access
- Forms for entering seed field information (planting, management and harvest)
- Inspection status (certification and qualification of fields)
- Input for seed stock, production cost, market price and other
- Trade (expression of interest)
- Automatic GPS extraction and data sorting
- Includes controlled access area (for input by authorized members only; password control)
- Open access areas
- Ownership to NASC, with mirror servers in NASC and IITA (as backup)



Main users

Seed producer

Registration

Source of seed

Planting information

Management information

Harvest details

Seed stock

Inventory of operations
(input cost)

Selling price

Certifier

Verification of registration

Pre-planting inspection
& qualification

Active growth stage
inspection & qualification

At harvest inspection &
qualification

Confirmation of stocks

Provision of labels

E-certification

Trader

Verification of seed sites

Expression of interest for
purchase

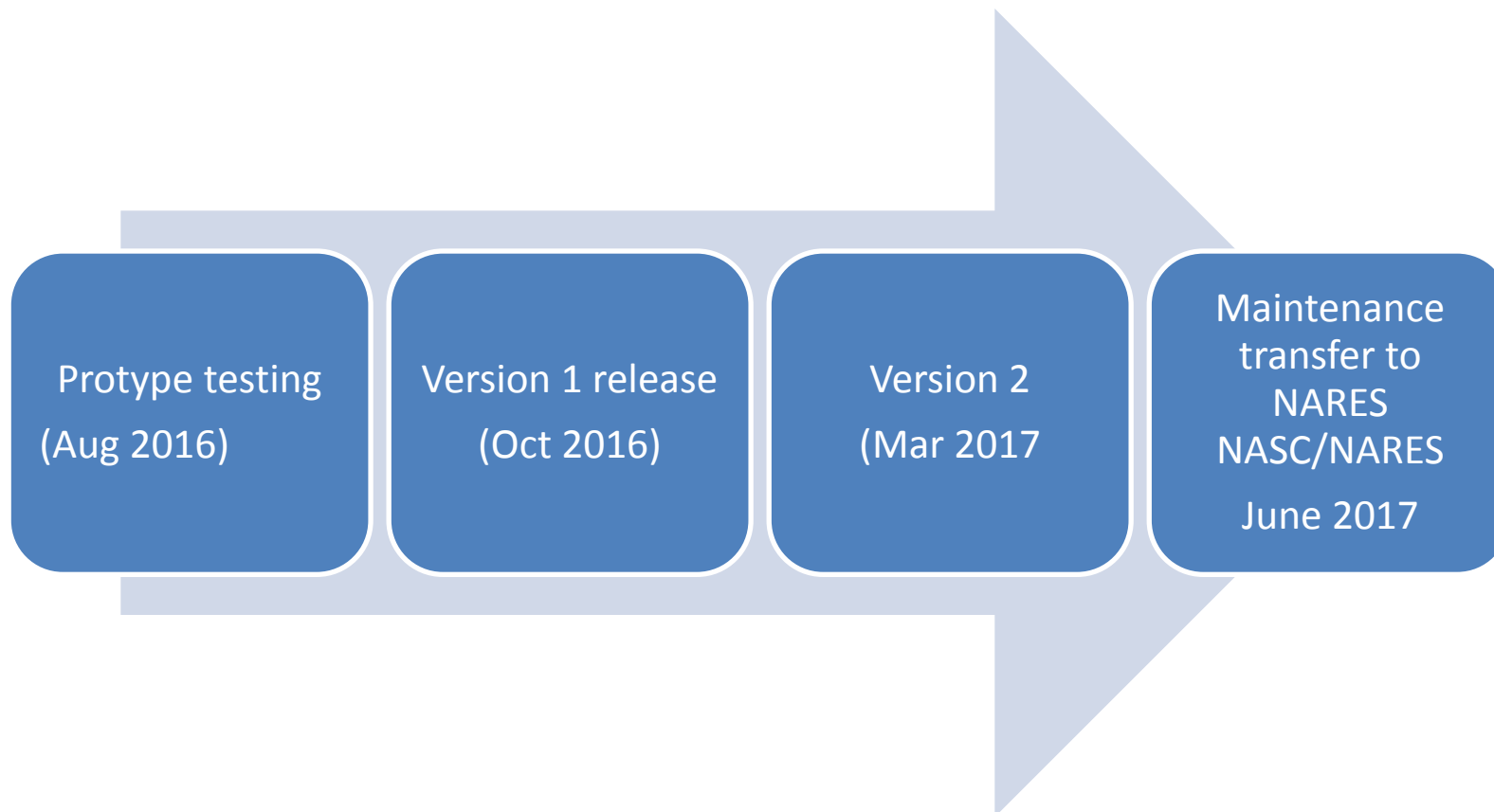
Trade negotiation and
purchase

Sale price

Sale information

Links to BASICS ME&L team

Timeline



Monitoring, Learning and Update (throughout the project life)

Acknowledgments



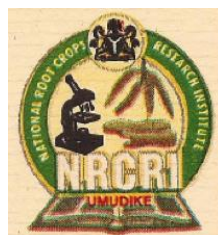
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**BILL & MELINDA
GATES foundation**



**Research
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FROM THE AMERICAN PEOPLE

Thanks for your attention