Transforming for Impact
Keynote Talk
EiB Virtual Meeting

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Main focus of Talk

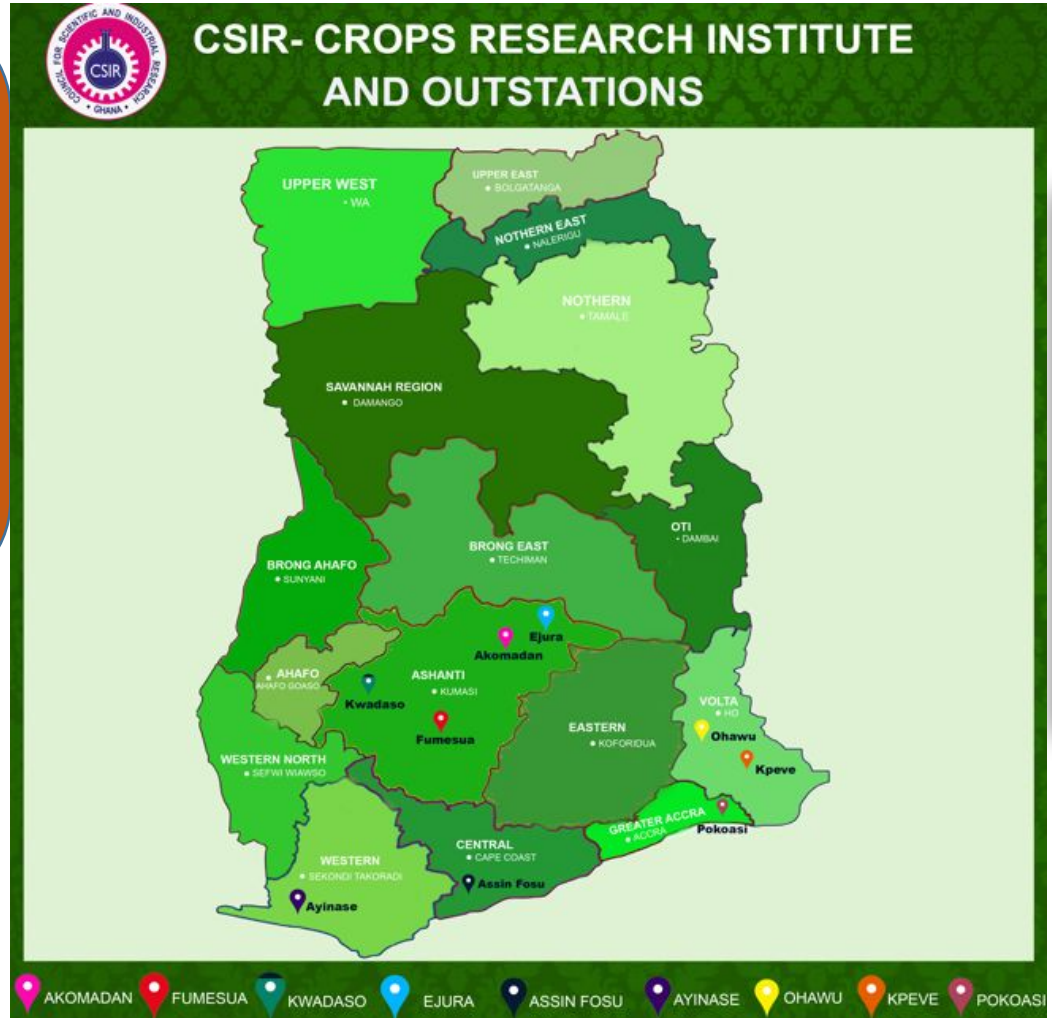
- CSIR-CRI Ghana Quick Overview
- Challenges CSIR – CRI is addressing
- What does the EiB/CGIAR transformation agenda means
- Transformation expectations

CSIR-CROPS RESEARCH INSTITUTE

- CSIR-CRI est. in 1964
- The largest of the 13 Institutes under CSIR
- Located in Ashanti region with 7 out stations spread across Ghana

Total Work force:536

PhD:40
MPhil/MSc/M.A: 70
BSc: 65
Diploma: 26
Others: 335



Our Vision

To become a Centre of Excellence for agricultural research, innovation and capacity building for development

Our Mission

Develop and disseminate demand-driven technologies and build capacity for sustainable food and industrial crops productivity to enhance livelihoods

Graduated from NCoS to RCoE for Root and Tuber Crops in 2018

MANDATE CROPS

Cereals: Maize and Rice

Legumes/Oil seeds: Cowpea, Soybean, Groundnut, Bambara groundnut, Canning beans

Horticultural Crops: Plantain, Banana, Tropical fruits (Citrus, Mango, Pineapple, Avocado, Pawpaw), Vegetables (Pepper, Garden egg, Tomato, Onion, Garlic, Leafy vegetables)

Roots and Tubers: Cassava, Yam, Cocoyam, Sweetpotato, Taro

Industrial Crops: Rubber, Sugar cane

Crop Variety Development approach

As an institute, we are:

- The Leading agriculture research organization in Ghana and the sub-region
- Regional center of excellence in breeding for RTB
- Multi – Discipline breeding program
- Bottom up breeding approach with the end-users and all relevant stakeholders
- Released more than **150** crop varieties

ADDRESSING THE GLOBAL PROBLEM OF CLIMATE CHANGE

- Climate change has rendered food production systems vulnerable globally but with the greatest extent of damage in sub-Saharan Africa.
- Ghanaian agriculture is largely rainfed (only 2% is irrigated)
- In a few years time much of our most productive agricultural lands cannot support crop production because of lack of rainfall.
- Unreliable rainfall patterns affecting cropping systems
- The need to develop extremely drought tolerant crops that can grow for long periods even without rain.

OUR APPROACH

To develop climate-resilient crops (extremely drought tolerant crops e.g., cereals (maize, rice,), legumes (Cowpea, Soybean, RTBs etc.) that can grow in the absence of rainfall for weeks or months.

WHAT WE NEED TO ACHIEVE THIS

Modernization of breeding to make it more responsive to the needs of clients

A systems approach comprising the combination of different approaches

EXPECTATION FROM EiB

- Help in modernization and continuous improvement of breeding programs
- Improvement in station infrastructure and equipment
- Training in management of breeding programs and infrastructure

WHAT DO WE HAVE?

Human Resource (staff trained at the highest level)

Some of the facilities needed to achieve this

EXPECTED BENEFITS TO THE COUNTRY

Improvement in genetic gains of major crops will:
Improve livelihoods of farmers

Improve the food security situation in Ghana

Generate income for the nation through exports

CSIR – CRI EiB Collaboration Current Progress

- MoU between EiB and CRI to modernize breeding
- Station Assessments completed
- Gap assessments completed for Rice and Improvement Plan being implemented
- Gap assessments ongoing for maize & RTP Crops
- Digitization of breeding programs (equipment and BMS adoption) ongoing
- Infrastructural investment cases developed

What we need to be modernized - EiB

- Digitization of breeding programs (equipment and BMS adoption)
- Platforms for our research data
- Irrigation and weather station
- Solar Electricity Back up to support national Grid
- Seed storage upgrade for efficient seed system
- Station equipment upgrade (field machinery and equipment)
- Training on maintenance of equipment and infrastructure

Looking forward to Transformation

Business models developed

Effective seed delivery system to meet demands

Self sustaining system to ensure facilities and investments are well maintained and improved

Resilient cropping systems to support all food crops

State- of -the-art research facility in place

Part of the Global network of delivery system

Thank you for your attention

Acknowledgment

Hi-Rice CtEH

EBCA - IFAD

OTHER CONTRIBUTIONS TO NATIONAL DEVELOPMENT

- ✔ Production of planting materials for the Government of Ghana's **Planting for Food and Jobs Programme***(Maize, Rice, Soybean, Pepper, Cassava).*

- ✔ Contribution awareness creation for Parliamentary select committee towards the Biosafety Act (Act 831) leading to the establishment of the **National Biosafety Authority (NBA)** in 2011.

- ✔ Contribution towards the passing of the **Plant Variety Protection Bill, 2020** which seeks to establish a legal framework to protect the rights of breeders of new varieties of plants or plant groupings and to promote the breeding of new varieties of plants in Ghana.

CROP VARIETAL RELEASES

Over one hundred and fifty (150) improved crop varieties developed and released

Pepper (2)
Cowpea (14)
Groundnut (15)
Soybean (9)
Canning Bean (4)
Maize (33)

Sweetpotato (17)
Yam(7)
Cocoyam/Taro (7)
Banana (2)
Rice (14)
Cassava (19)

"Poundable" ***CRI Bankye*** **variety**

Potential Yield: **55 t/ha**

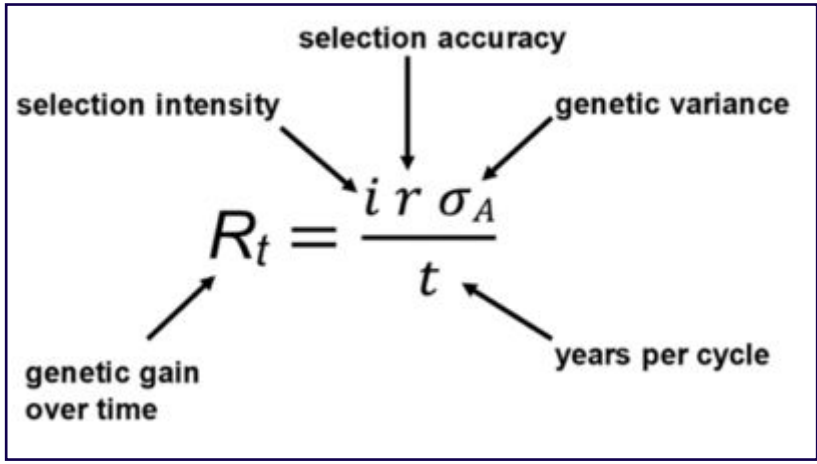
Resistant to the African Cassava Mosaic Virus

Example of EIB Support

Modernization Activities of Rice Breeding program since 2020

- **EIB baseline assessment of Breeding Program and Station Infrastructure**
- **A Customized Improvement Plan was developed focusing on the ff:**
  1. Market Segments and Product profiles Definition
  2. Core-Elite Lines Defined to Close Elite Germplasm Pool
  3. Genotypic QA/QC and QTL profiling of Core Elite parents
  4. Digitization of Operations
  5. RGA expansion and Restructuring of Pipelines

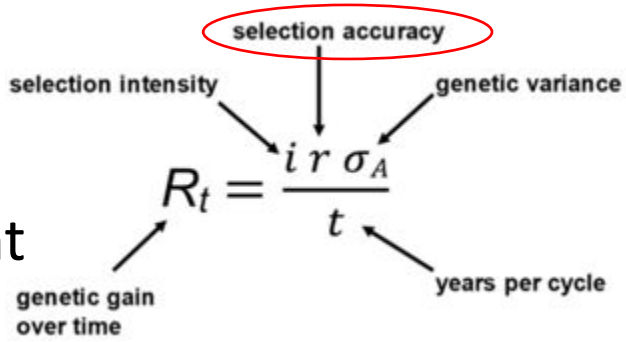
Tier 1	Mature Program
Tier 2	Mid Stage
Tier 3	Early Stage
Tier 4	Trait Introgression
Tier 5	Testing



Manipulating the levers of the GG Equation for Quick Wins


RICE BREEDING
ACTIVITIES
CSIR-CROPS RESEARCH INSTITUTE
Development of Superior Varieties
Evaluation of Elite Lines
Production of Breeder Seed

Digitization of Breeding Operations



- Station Assessment led to the purchase of equipment through the CtEH Digitization Project
- Packet printers, tag printers, handhelds and seed counters are now used

Zebra ZT 400

Previously, tags are hand written; data collected on paper and transcribed on laptop

RGA Screenhouse Expansion, Centralized line dev facility @ CRI, Kumasi

- RGA screenhouse can accommodate 2.5 cycles/year but current capacity can only handle 5 crosses per year (SSD)
- RGA screenhouse expansion underway to manage at least 20 crosses annually
- CRI will offer centralized line dev facility for both CRI and SARI rice programs
- Seed Inventory and Processing will be upgraded through HiRice-CtEH support.