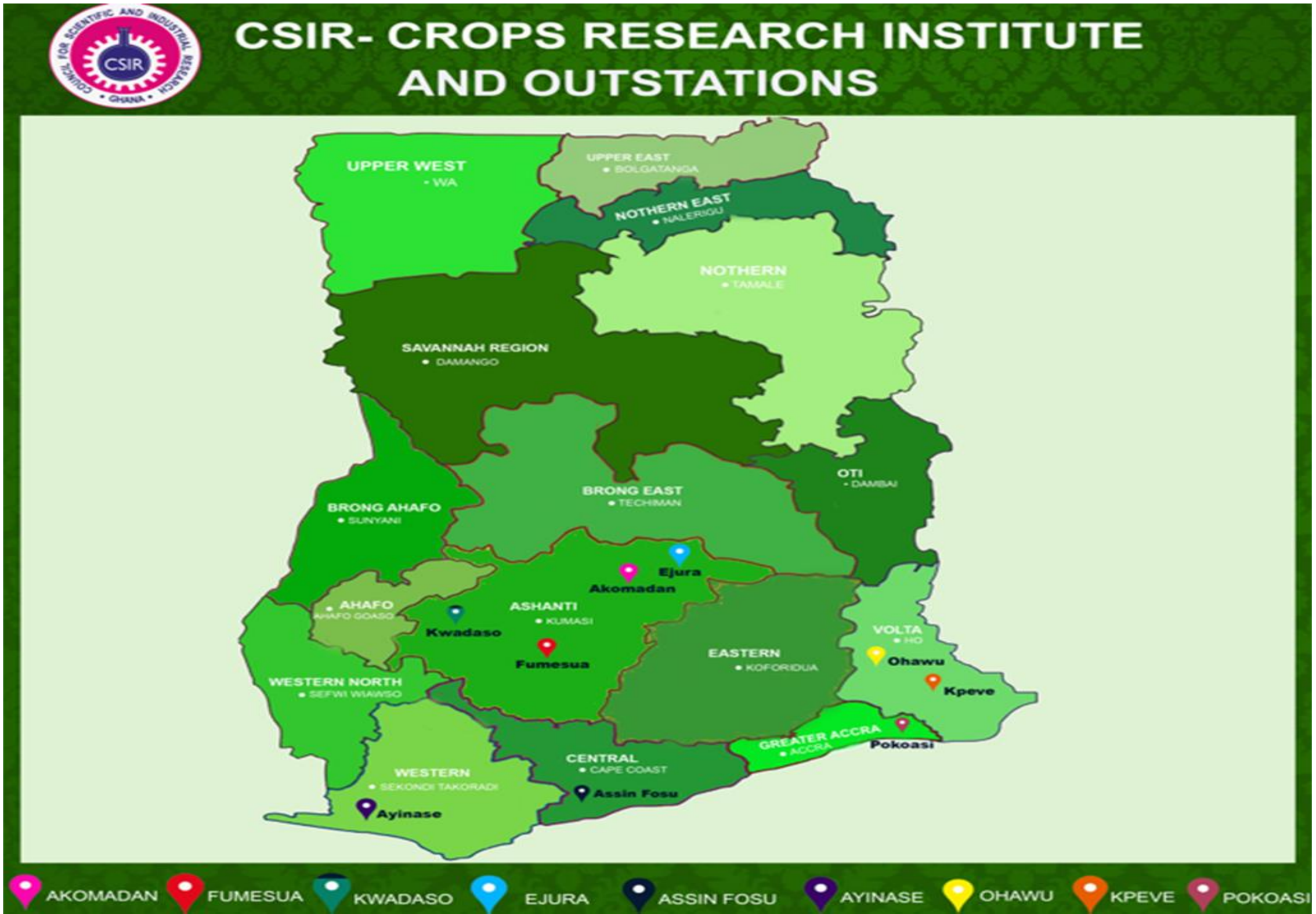
# Regional Centre of Excellence: Root and Tubers



# CSIR-CROPS RESEARCH INSTITUTE

CSIR-CRI established in 1964

The largest of the 13 Institutes under the CSIR

Transformed into its current form in 1996 by CSIR Act 521

Located at Fumesua and Kwadaso in the Ashanti region with seven (7) outstations spread across the country.

Total Work force:
PhD
MSc
BSc
Diploma
Others
Female
Male details Please provide

## 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

# RAPID MULTIPLICATION OF PLANTING MATERIALS



# SOME MAJOR RESEARCH PROJECTS

Modernizing Agriculture in Ghana

AGRA Growing Africa's Agriculture

WAAPP / PPAAC

YIIFSWA Yams for Livelihoods

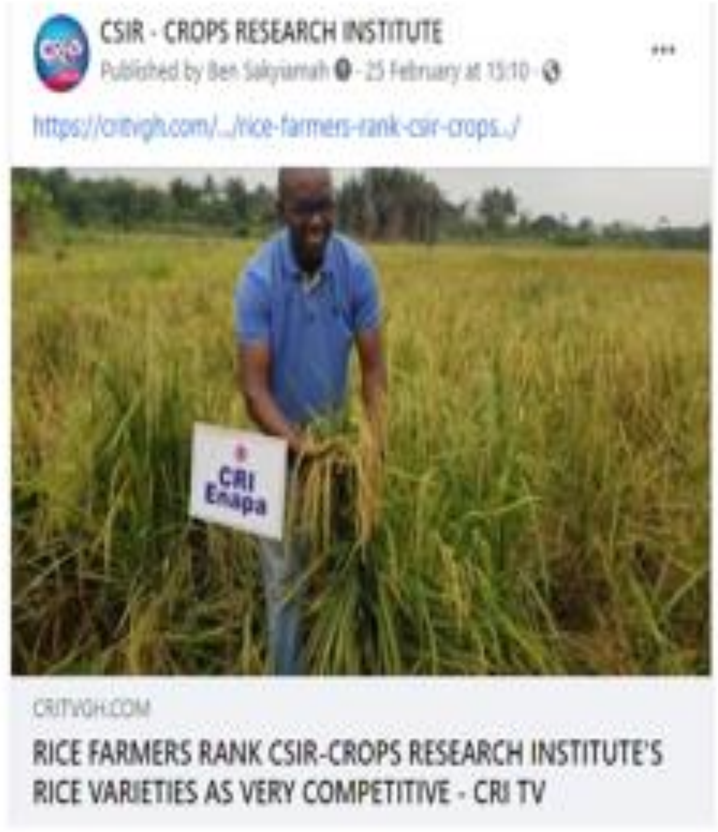

KAFACI Korea-Africa Food & Agriculture Cooperation Initiative

NATIONAL RESEARCH DEVELOPMENT CORPORATION
नेशनल रिसर्च डिवेलपमेंट कारपोरेशन
(An Enterprise of DSIR)
Ministry of Science and Technology, Govt. Of India
Facilitating Technology Transfer Since 1953

Central And West African Virus Epidemiology W A V E For Food Security

# ONLINE AND SOCIAL MEDIA PRESENCE





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# Achievements

## CROP VARIETAL RELEASES

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

| | |
|---|---|
| Pepper (2) | Sweetpotato (17) |
| Cowpea (14) | Yam(7) |
| Groundnut (15) | Cocoyam/Taro (7) |
| Soybean (9) | Banana (2) |
| Canning Bean (4) | Rice (14) |
| Maize (33) | Cassava (19) |



## OTHER AWARDS WON

- ✓ Gold Award for Excellence in Research during 'Ghana @ 50' independence celebrations
- ✓ Premier Presidential Gold Award as the National Best Scientist in 2011
- ✓ Best Maize Breeding Team in 2008, 2009, 2010 & 2016 in West Africa NARI (CRI & SARI)
- ✓ Highest winner of National Best Agricultural Researcher Awards :11 occasions, latest 2017
- ✓ Woman of Excellence AWARD in 2012
- ✓ Scientific Excellence Awards, 2017
- ✓ ASPB Excellence in Education Award 2018
- ✓ Best Candidate Award, Engineering Professional Examination, 2018
- ✓ Most Published Author in Engineering Award, 2018

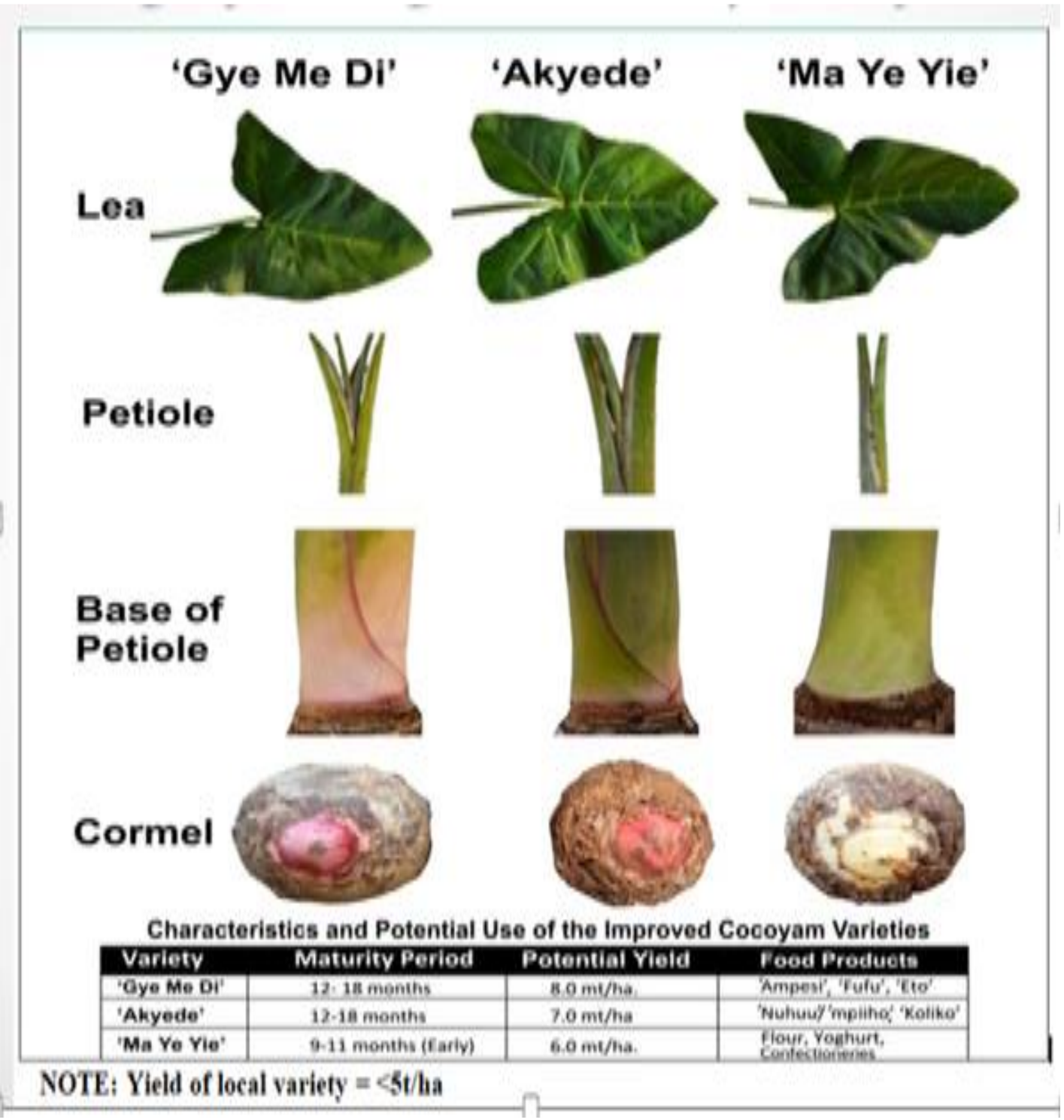
# ISO 17025:2005 ACCREDITATION FOR TESTING AND CALIBRATING LABORATORIES

The Institute's Molecular Biotechnology Laboratory has been accredited for the detection of the African Cassava Mosaic Virus (ACMV) in accordance with international standard ISO/IEC 17025:2005

# PROCESSED FOOD FROM CRI RELEASED VARIETIES




# Cocoyams

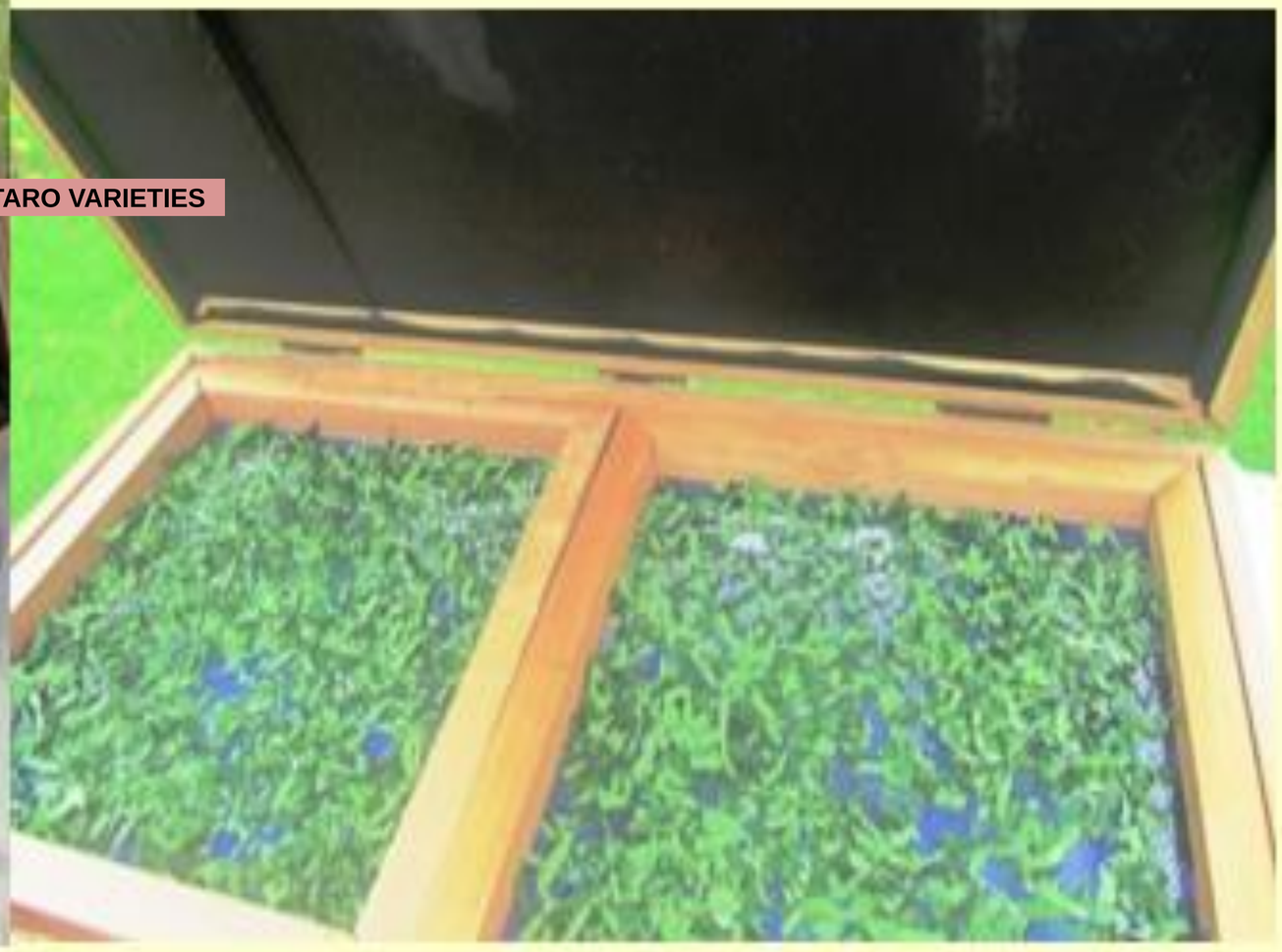



Characteristics and Potential Use of the Improved Cocoyam Varieties

| Variety | Maturity Period | Potential Yield | Food Products |
|---|---|---|---|
| 'Gye Me Di' | 12- 18 months | 8.0 mt/ha. | 'Ampesi', 'Fufu', 'Eto' |
| 'Akyede' | 12-18 months | 7.0 mt/ha | 'Nuhuu' 'mpiiho' 'Koliko' |
| 'Ma Ye Yie' | 9-11 months (Early) | 6.0 mt/ha. | Flour, Yoghurt, Confectioneries |

NOTE: Yield of local variety = <5t/ha

# Ready-to-go Technologies: Cocoyam



IMPROVED TARO VARIETIES

CSIR-CRI Solar drying technology for preserving cocoyam greens

# YAM TECHNOLOGIES

SEED SYSTEMS

1. Yam Vine Multiplication- planting with vines in pest-free soil media

Gives 240 yam stands out of 1 plant

2. Aeroponics-planting in the air- growing yams in soil-free nutrient mist; 540 new plants from 1 tuber in 1 year.

Return to investment is 130% in a year

3. Hydroponics- planting in nutrient solution

4. Bio-reactor-In vitro bioreactor systems

Enhanced mass propagation of quality declared seeds

# New Varieties

| Variety Name | Potential Yield t/ha | Prefered Agroecology | VCU |
|---|---|---|---|
| Dioscorea rotundata | | | |
| CRI Mankrong Pona | 45-70 | CS, FST & GS | Sweet, poundabe, high yielding and good storability |
| CRIKukrupa | 42-50 | CS, FST & GS | Sweet, poundable, multiple tubering |
| CRI Pona | 26-42 | CS, FST & GS | Sweet, poundable, high yielding |
| Dioscorea alata | | | |
| CRI Afase Sonyiato | 27-30 | CS, FST & GS | BCR=22; Good for ampesi and fufu |
| CRI Afase Hoodenfoo | 35-44 | CS, FST & GS | BCR=25; Good for ampesi and fufu |
| CRI Afase Adepa | 28-32 | CS, FST & GS | BCR=23;Good for ampesi and fufu |
| CRI Afase Biri | 34-44 | CS, FST & GS | BCR=32;Good for ampesi and fufu; purple-flesh |

# GOOD AGRICULTURAL PRACTICES

- **Mechanized ridging as alternative to mounding in yam production**

- **Live/trellis staking options for sustainable yam production**

- **Integrated soil fertility management (ISFM) with legumes for sustainable yam production**

- **Climate Smart Yam Production Technologies-Staking Options for Sustainable Yam Production-Use of Pigeon Pea**

# SWEETPOTATO TECHNOLOGIES

1. Rapid Vine Multiplication- planting with 2-3 node vine cuttings

Gives 6 - 10 cuttings per plant

2. Triple S (Sand, store and sprout ) for seed conservation

Saves seeds under harsh conditions

3. Tissue culture mass multiplication using Bio-reactor -In vitro systems

Enhanced mass propagation of first generation seed (Pre-basic)

# New Varieties

| Variety Name | Potential Yield t/ha | Preferred Agro-ecology | VCU |
|---|---|---|---|
| ***Orange Fleshed types*** | | | |
| CRI Apomuden | 35 | CS, FST & GS | high beta-carotene content & high yielding, excellent for baby foods |
| CRI Gavana | 28.4 | CS, FST & GS | High starch and dry matter content, excellent for fried chunks and ampesi |
| CRI Bohye | 22 | CS, FST & GS | High yielding, high starch and dry matter content, good for ampesi |
| ***White flesh types*** | | | |
| CRI Dadanyuie | 18 | CS, FST & GS | Good for ampesi , fufu, flour, chips & fries |
| CRI Hi starch | 18 | CS, FST & GS | High starch content, good for flour, ampesi and fufu |
| CRI Ogyefo | 20 | CS, FST & GS | Good for ampesi, chips, fries, flour |
| CRI Okumkom | 20 | CS, FST & GS | Good for ampesi, chips, fries |

TARO

- Mechanized / manual ridging for root production offers a better yield advantage over mounding

- High Quality planting material selection for sweetpotato production

- Timely harvest of matured fields offer high root quality and yield

## VALUE FOR CULTIVATION & USE

### CRI-Huogbelor

*Yield potential: 13.14 t/ha*
*Tolerant to Taro Leaf Blight Disease*
*Maturity: 6-7 months*

Corm dry matter content: 33%
Starch granule size: 1- 3.5 µ
Benefit-cost ratio: 2.95 – 5.91
**Varied uses:** 'ampesi', chunk-fried

### CRI-Asempa

*Yield potential: 25 t/ha, Tolerant to Taro Leaf Blight Disease*
*Maturity: 8-12 months*

Corm dry matter content: 37%
Starch granule size: 3 - 10 µ
Benefit-cost ratio: 5.69 – 11.39
**Varied uses:** 'ampesi', chunk-fried, fufu, crispy chips, flour, starch, and varied bakery products

### CRI-Agyenkwa

*Yield potential: 12 t/ha, Tolerant to Taro Leaf Blight Disease*
*Maturity: 8-12 months*

Corm dry matter content: 42%
Starch granule size: 2 - 5 µ
Benefit-cost ratio: 2.74 – 5.49
**Varied uses:** 'ampesi', chunk-fried, fufu, crispy chips, flour, starch, and varied bakery products

### CRI-Yen anya woa

*Yield potential: 35 t/ha, Tolerant to Taro Leaf Blight Disease*
*Maturity: 8-12 months*

Corm dry matter content: 41%
Starch granule size: 1 – 2.5 µ
Benefit-cost ratio: 3.54 – 7.09
**Varied uses:** 'ampesi', chunk-fried, fufu, crispy chips, flour, starch, and varied bakery products

**PREFERRED ECOLOGIES:** Low lands (muddy areas) of Forest, Transition, Coastal Savannah, Guinea Savannah and Sudan Savannah


PLANTING
for FOOD and JOBS
NP300
AX
GV 21 0 288-18 GH


100% Taro pizza made from grated taro base (no wheat flour)


CASSAVA

CASSAVA




PRA studies




# Evaluation with stakeholders


CSIR-CRI/BMGF/PEA

## Sensory test




## Product development




AGF
LAUNCHING! LAUNCHING!! LAUN


CRI-Lameses
(ANKA/10/00

# *Summary of characteristics of the six cultivars*

| Variety | Maturity period (Months) | Mean root yield (T/ha) | Total dry matter (%) | Uses† | CMD resistance | Suitable ecologies |
|---|---|---|---|---|---|---|
| ***CRI-Duade Kpakpa*** | 12 | 60 | 37 | Poundable Flour, textile industry | Resistant | Forest, Transition and Savannah |
| ***CRI-Amansan bankye*** | 12 | 57 | 38 | Flour and bakery products | Resistant | Forest, Transition and Savannah |
| ***CRI-AGRA bankye*** | 12 | 63 | 32 | Hi-starch and flour | Resistant | Forest, Transition and Savannah |
| ***CRI-Dudzie*** | 12 | 49 | 38 | Starch and flour | Resistant | Forest, Transition and Savannah |
| ***CRI-Abrabopa*** | 12 | 46 | 40 | Hi- starch | Resistant | Forest, Transition and Savannah |
| ***CRI-Lamesese*** | 12 | 50 | 39 | Poundable Flour, Hi-starch | Tolerant | Forest, Transition and Savannah |

† All cultivars can be processed into wet cake as an intermediary product for processing into gari and cassava dough for local foods such as banku and agbelima. The cultivars fit into the existing cropping systems of the different ecological zones of Ghana

# conclusion

- Good management
- Infrastructure
- Willing and Able to collaborate