

Progress and Plans at the Sweetpotato Support Platform for West Africa

Ted Carey



Project Progress Review
Bill & Melinda Gates Foundation
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- **Breeding**
- **Seed**
(germplasm/
exchange)
- **Community**

- Breeding + Seed
- BMGF or SP
- Country
- RAC

Sweetpotato Support Platform West Africa



Breeding Objectives:

- Population improvement program at a sub-regional level
- Link with participatory varietal selection at the national level



SPHI Target Countries in W. Africa:

Ghana, Nigeria, Burkina Faso, Benin

SASHA Currently Supports Breeding, Germplasm Distribution, and Platform Partnerships for R4D and impact:

Variety Development, Seed Systems, Value Chains, etc.

- AGRA, WAAPP, RAC, MOFAs, CRPs (RTB and Dryland Systems)

Sweetpotato Breeding Selection Sites and Target Zones in Ghana



Target areas where sweetpotato is currently important, or benchmark sites for CRP Dryland Systems

Breeding selection sites

Consortium Research Program (CRP) benchmark sites

CSIR - Savanna Agricultural Research Inst.

CSIR – Crops Research Inst.

Selection sites are located where sweetpotato is important



**BABA SALIFU, KOMENDA,
CENTRAL REGION**



**FARMERS
MANCHORO,
UPPER EAST REGION**



**NUTIFAFE WOMEN'S GROUP,
KPORKUVE, VOLTA REGION**

Some characteristics of selection sites in Ghana



Region	AEZ	Role of sweetpotato	Preferred type of SP (vars)
Ashanti	Forest	Insignificant	Not preferred
Central	Coastal Savanna	Commercial	Yellow skin, yellow flesh (Blue Blue)
Volta	Coastal Savanna	Commercial/Food security	Red skin, white flesh (CRI-Ogyefo)
Upper East	Guinea/Sudan Savanna	Food security/less commercial	Skin color less important, OFSP exist (not improved)

Constraints: **Drought** can be a constraint in any AEZ, but tends to be worse in savanna AEZs, **SPVD** tends to be worst in forest zone, **Soil fertility** tends to be low in most places, **Weevils** are a significant constraint.

Detailed assessments are underway with partners to identify value chain and seed system interventions

Confirmation of consumer tastes and target products is essential



**PARTICIPATORY ASSESSMENT,
KOMENDA, CENTRAL REGION**



**GLEANERS AT HARVEST,
TONO, NAVRONGO
UPPER EAST REGION**



**POSTHARVEST TEAM
ASSISTING AT 2012
HARVESTS**



Consumer Survey - Ghana



- 300 consumers (100 in each region target region): 87% liked, but most didn't eat often
 - Form: Boiled (43%); fried (35%); roasted (13%), raw (5%), mashed (4%)
 - Reason for liking: Sweetness (55%), nutrition (21%), satiation (10%), ease of cooking (7%), health benefits (3%), affordability (5%)
 - Reason for not liking: too sweet (20%), nausea (4%), stomach ache (4%), causes diabetes, malaria, cardiovascular diseases and bilharzia (40%)

Accelerated Breeding Scheme Ghana



Year 1	Crossing block (50 parents)							
Year 2	Seedling nursery (~240 families, 5000 genotypes)							
	OT - Kumasi (virus + proximity)			OT – Tono (key production area)				
	~250 clones selected with top selections going for recombination							
Year 3	PT – UE		PT – CR		PT – VR		PT - AR	
	~25 clones selected							
Year 4	AT + OFT		AT + OFT		AT + OFT		AT + OFT	
	Decentralized testing and multiplication							
Year 5	Official release							

OT – Observational Trial (3-plant plots, no reps)

PT – Preliminary Trial (>14-plant plots, 2 reps)

AT – Advanced Trial (75 plants, 2 reps); OFT – On-farm Trial

UE – Upper East, CR – Central Region, VR – Volta Region, AR – Asante Region

**Predominant
Allocation of
Responsibility**

--SASHA

– National
Program

Trials by type and location, Color-coded by institutional responsibility



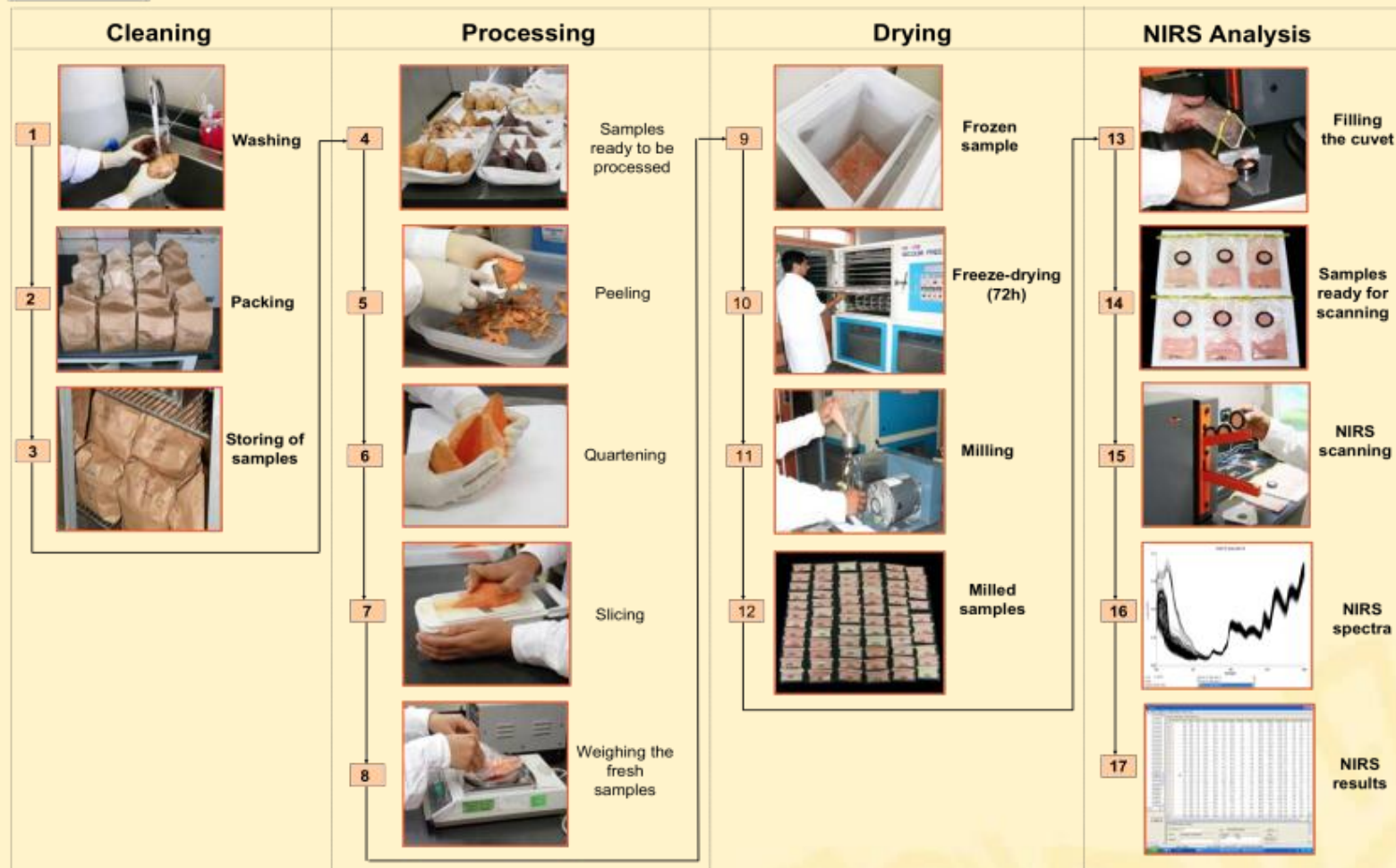
Region	Location	Hybrid	Multiply	OT	PT	AT	OFT
Asanti	Fumesua	1 1	1	1	1	1	
G. Accra	Pokuase					1	
Volta	Ohawu		1		1	1	6
Upper East	Navrongo		1	1			3
Central	Komenda				1	1	6 2
Total		2	3	2	5	6	14+5

SASHA = Orange, **WAAPP = Black**, **RIMP FFF sites =Blue**

Rapid proximate analysis for minerals, sugars and β -carotene done using NIRS



Workflow for sample preparation and NIRS analysis of sweetpotato samples at Quality and Nutrition Laboratory



Some attributes of selected clones from Preliminary Trial



Name	No sites Selected	Com yld (t/ha)	Dry Matter (%)	Foliage Yield (t/ha)	Flesh color	Sweet ness (1-5)	Taste pref (1-5)
PG11092-5	4	14.1	37.3	23.6	Yellow	3	4
PG11123-18	3	8.5	43.6	17.2	Cream	4	4
PG11191-1	4	12.9	36.4	17.5	Yellow	4	4
PG11105-6	3	13.5	36.6	18.3	Cream	4	4
PG11077-14	3	16.8	31.8	17.8	Cream	3	4
PG11040-6	3	9.8	26.1	15.3	Orange	4	2
CRI-Ogyefo		16.2	36.5	26.7	White	3	5
Mean (n=30)		11.8	32.9	13.1		3	3.5

Barcode Labels and PDAs for Use at SSP-WA



Capacity Building – Students



Ernest Baafi, WACCI



Vivian Oduro, WACCI



Victor Amankwaah,
AGRA

Not shown:

- SOME Koussao, WACCI; Solomon Afruape, WACCI
- Eric Dery, M.S. in Food Sci + Technol, KNUST
- Eric Owusu-Mensah evaluating amylase activity in relation processing potential, Ph.D, Food Sci + Technol KNUST
- Jebeh Samba, Hybridization efficiency. MS-AGRA, KNUST
- John Saaka, net tunnels, Undergrad thesis, UDS
- Additional students sought

Objective under Seed Systems Research Program



- Establish a regional platform for safe and efficient exchange and maintenance of germplasm
 - Improved indexing, virus cleaning, in vitro maintenance and genetic fingerprinting in each sub-region
 - ISO 17025-compliant germplasm indexing and distribution capacity
 - Upgrade in vitro facilities and tissue culture staff to ensure safe receipt and shipment of germplasm

Regional germplasm distribution – SSP-WA by October 2013



SCREENHOUSE FOR PRODUCTION OF CLEAN PLANTS



REFURBISHED HOUSE FOR GRAFTING/ QUARANTINE

In vitro maintenance and multiplication routine, and thermotherapy almost ready. CSIR-CRI hired TC Specialist.

Clean foundation seed is Integral to success of the breeding effort



Recurrent visits by CIP virologist to each Support Platform



VIRUS INDEXING AND ISO PROCEDURES TRAINING CSIR-CRI, KUMASI, 2012

Current Seed System Efforts in Ghana



- Demand for OFSP by RAC and FRI; Opportunities with School Feeding
- Decentralized multiplication/dissemination of OFSP (Apomuden)
 - 25,000 vines distributed to multipliers in 5 regions during dry season; anticipate 1,000,000 at start of rains in June
- Cleanup of released varieties underway (CSIR-CRI/WAAPP/SASHA)

Seed Scenes from Ghana



**FARMER, AED AND RESEARCHER (SARI) DISCUSS
MULTIPLICATION PLANS, JIRAPA, FEB 2013**

**SAMPSON NDEGO, BEWDA IN HIS GARDEN,
BAWKU, FEB 2013**

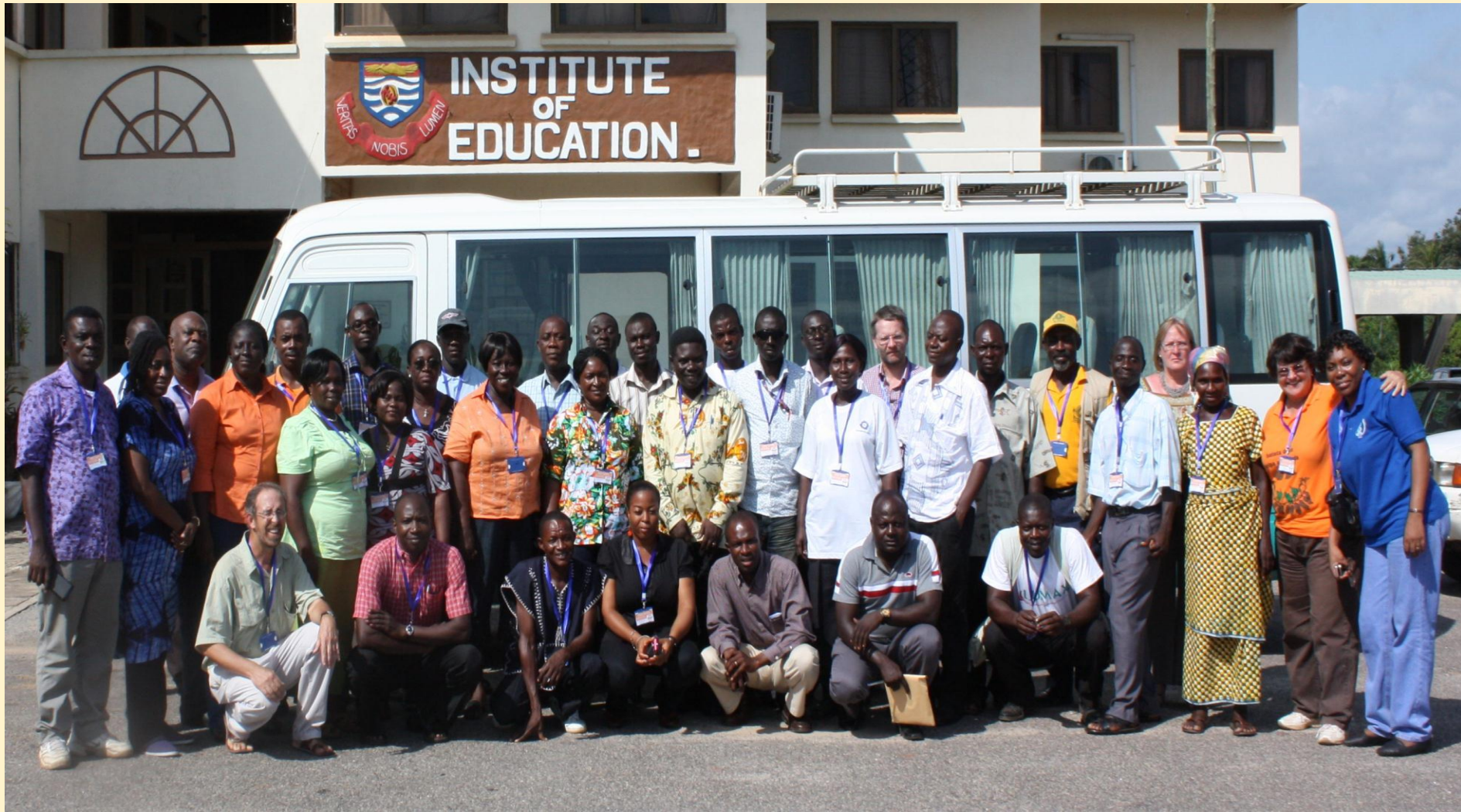
Sweetpotato Support Platforms



- Built around breeding and seed
 - Populations for breeders
 - Varieties for farmers
 - Safe international movement of germplasm
- Provide a stakeholder forum
- Help build a strong and broad Community of Practice

SSP-WA #2

Cape Coast, Ghana, October 2010



Updates on Value Chains



- BMGF-funded regional value chain assessment
 - Sweetpotato is an increasingly important cash crop in Ghana, Nigeria and Burkina Faso
 - Recommendations related strengthening
 - Fresh market linkages
 - Targeting school feeding programs
 - Animal feed potential (particularly pigs)

What's Next?



- Interest in sweetpotato improvement continues and is strengthening in SSA
- We are entering the golden age of sweetpotato breeding
- Let us prove our worth!

Thank you



H.K. Adu-Dapaah, J.N. Asafu-Agyei, Kwadwo Adofo, E. Obeng-Bio, Y. Alhassan, Isaac Owusu, E. Osei-Bonsu, V. Amankwaah, Nyarko Asamoah, Joseph Awoodzie, Marian Quain, Evelyn Adu-Kwarteng, J.N. Lamptey, Ernest Baafi, Vivian Oduro, Eric Owusu-Mensa, Ibok Oduro, Esi Amoaful, Solomon Afuape, Jude Njoku, Malachy Akoroda, Mike Afolabi, SOME Koussao, Margaret Quarm, Christopher Ayiwo, Mark Dadoza, Yussif Alhassan, Charity Wiredu, Daniel Akansake, Kofi Tiero, Dramani, Kwabena Acheremu, Leandre Dahoundo, Ruth Thompson, Ekpork Ackah, M-A. Zakariah, Akwasi Adjekum, Innocent Nwankwo



Our vision is roots and tubers improving the lives of the poor