# Excellence in Breeding and RTB Breeding CoP

#### Sweetpotato Breeders Meeting 2018, Nairobi, Kenya

#### **Ted Carey, CIP**

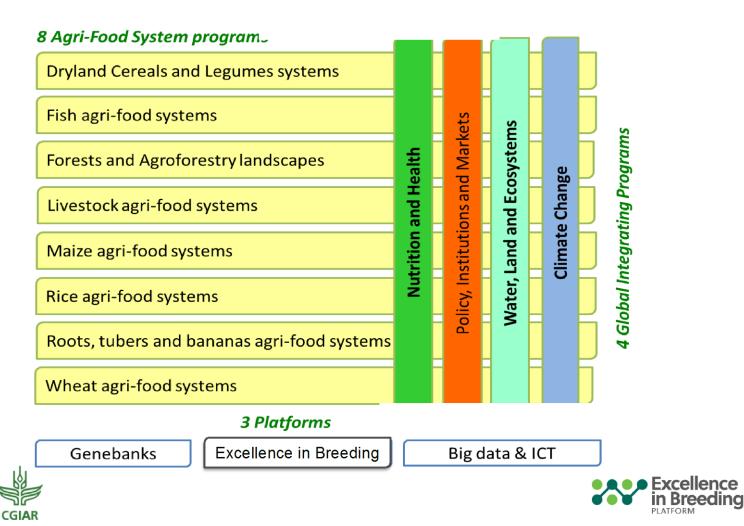
SWEETPOTATO ACTION FOR SECURITY AND HEALTH IN AFRICA

# What is EiB and RTB Breeding CoP



- Excellence in Breeding platform managed by CIMMYT
  - All CGIAR breeding and some NARS "obliged" to participate. All may participate.
  - Provide services (as we heard from from presentation on IGSS BecA)
- RTB Breeding CoP
  - Quite a bit about trait harmonization
  - Searching for a logic (which must be there)

# The CGIAR Portfolio 2017+



#### **Five focal areas = Modules**

Module 1	Breeding Excellence	
		Creating
Module 2	Trait discovery and breeding	synergies to
	tools and services	accelerate
	Constrains / conversion	genetic gains of
Module 3	Genotyping / sequencing tools and services	breeding
		programs
Module 4	Phenotyping tools and services	targeting the
	Frienolyping loois and services	developing
		world
Module 5	Bioinformatics and data management tools and services	
CGIAR		Excellence in Breeding

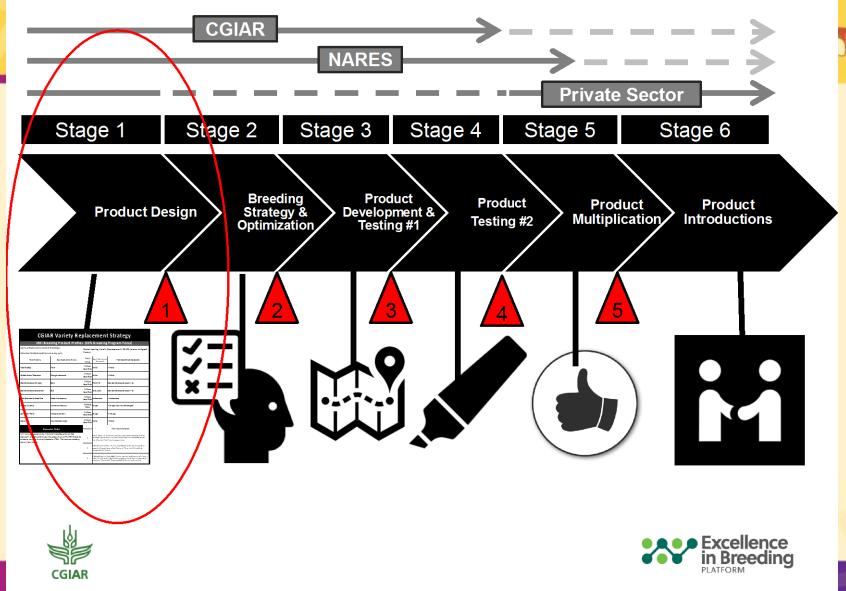
# Priority Traits for Breeding Products

for Demand Led Breeding Program



George Kotch May, 2018

Module #1 – Product Advancement (Stage Descriptions)



# The Problem We Are Trying to Solve

- Increased emphasis on developing a demand based product design (Stage #1) using cross functional teams
- Increase breeding efforts focused on demand led product design
- Increased need to measure breeding program success against a defined target by using a defined product advancement process
- Well designed product profiles increase our chances for success versus not doing them..
  - + 4.6 X improvement when we better understanding the client's needs
  - + 1.6 X improvement when we "upfront plan"
  - + 2.0 X improvement when products are designed by cross functional teams
  - + 4.6 X improvement if you measure output against the product design

Lean, Rapid and Profitable New Product Development, 2005, Robert Cooper and Scott Edgett





#### What is a Product (Variety) Replacement Strategy

- The Strategy of Product Replacement is a targeted process of replacing the Market Leading Variety.
  - If breeders don't know the varieties they are replacing than their chance of impact is severely diminished and their ROI is low
- There are "NO PERFECT" Varieties
  - Releasing client-led varieties should be driven by improvements on the current varieties being used by client as the foundation
- Product Profiles are the product design blueprints that support the Variety Replacement Strategy
- If breeding teams are not trying to replace varieties used by the value chain, product profiles should be based on market trends. These could be referred to as market-led varieties.





### **Definitions**

- Product Profiles: Are Product Design that are designed in Stage #1 of the Variety Advancement system. They are designed by a cross functional team to remove the bias of any single shareholder in the advancement system. The design if targeted so the breeding team could focus on a limited amount of economically important traits or trait combinations.
  - Product Profiles are used to support a variety replacement strategy OR
  - Product Profiles are used as a template for market creation but based on market knowledge and trends. This is kicking the ball to where the player (market trends) will be.
  - Product profiles are not a Laundry List of what the perfect variety would look like. Using the *trait dictionary as your focus to build a product profile is not effective* if you wish to have client driven impact. Product profiles should be created from client or market intellegence.





#### Example of a Variety Replacement Strategy (Rice)

	IDDI Prooding Bredu	ot Drof	ilos /a	n% Prood		
Country or Region: Central and North Mozambique		Program Selection Emphasis	iles (20% Breeding Program Focus) Market Leading Variety (Replacement): CHUPA (aroma and good flavour) Trait Sendi Mark Variety RNB reeding Program			
Trait Family Key Economic Traits		(%)				IR RI Breeding Program
i rait Family	Key Economic Traits		Value	Assessment	Trait Benchmarking Details	Assessment
'ield (Paddy)	Yield	NA	2-Must Have Trait	Mziva	= Mziva	Program is actively working with trait
Abiotic Stress Tolerance	Drought tolerance	40	2-Must Have Trait	Mziva	= Mziva	Program is actively working with trait
Biotic Resistance (Fungal)	Blast	25	2-Must Have Trait	PI2 & PI9	Standard Evaluation Scale =< 3	Program is actively working with trait
Biotic Resistance (Bacterial)	BLB	10	2-Must Have Trait	Xa 5, Xa21	Standard Evaluation Scale =< 3	Program is actively working with trait
'ield (Economic)-Head Rice	Head rice recovery	10	2-Must Have Trait	Makassane	= Makassane	Program is actively working with trait
(uality (Aroma)	Aroma and flavour	5	1-Nice to Have	Chupa	= Chupa; Nene is ultimate goal	Program has trait available
onsumer Traits	Am ylose content	5	2-Must Have Trait	Chupa	<= Chupa	Program is actively working with trait
Aaturity	Intermediate range	5	2-Must	Mziva	= Mziva	Program is actively
			Have Trait	1112104	= Mzwa	working with trait
			Have Trait	1912194	= mziva	
	Discussion Notes		Have Trait Trait Value	mziva	Trait Value Descriptors	working with trait
l) M'ziva is a released variety in Co	en tral Mozambique for rainfed ecosyster he HRR should be at least at the same lev			Nice to Man		working with trait Gene Frequency In Program
) M'tiva is a released variety in C Ind flavour should be a must. 3) T Alakassane (~75%). The traits are i	In trail Mozambique for rainfed ecosyster he HRR should be at least at the same lev anked by priority from the top.	velas	Trait Value		Trait Value Descriptors Trait Value Descriptors is not are ionations approiated a limited agreent of the according with the second according to broader markst according with the second according to our do not second according to the second according to our do not second according to the second according to our do not second according to the second according to our do not second according to the second according to our do not second according to the second according to our do not second according to the second according to our do not second according to the second according to the second according to the second second according to the second according to the	working with trait Gene Frequency in Program Program is actively working with trait
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M'Xiva is a released variety in Cr nd flavour shou'd be a must. 3) T fakassane (*75%). The traits are i Trait Imp Blast Drought tolerance Cold tolerance	In trail Mozambique for rainfed ecosystem he HRR should be at least at the same least anked by priority from the top. <b>DOOTTANCE (ESA POTTfc</b> 16 16 16 16 2 2	olio)	Trait Value	Lice to have	Trait Value Descriptors Trait Value Descriptors to that are something supportional of initial segments of the source of the accounting input across the property manage accounting value. The source of the source o	working with trait Gene Frequency k Program Program is actively working with trait Program has trait available Trait Lim ked or NO
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- In the current environment, breeder can't hope to create impact if their program is not targeted.
- Product Profiles are well researcher guides of attributed needed to replace key market varieties.
- A Variety Replacement Strategy is created so the majority of the breeding program resources are dedicated to replace a "Mega Variety".
- The Variety Replacement Strategy Drives Trait Priority Investments from the client through breeding into basic research
- Success is determined on how introductions compare to the varieties in which the breeder seeks to replace.





#### Breeding Program Assessment Tool is associated with EiB

# Thank you for your interest!

But then George wrote and said:

- Product advancement rather than stage gates
- Rather than product profiles, talk about variety replacement or market changing strategy



# **RTB Breeding CoP**

- In the Discovery cluster to link with NextGen
- Has a key task of coming mapping out trait priorities (variety replacement strategies?)
- Opportunities for RTB Breeding training data management, statistical tools (BTI bases / HIDAP and CIP tools)
- Can be a very convenient In many cases, NARS breeders
- RTBFoods brings all the RTB Breeders together



# Stay tuned Stay engaged Strive for excellence The squeaky wheel gets the grease! Thank you