

Accelerated Breeding 2025 Goals #2 + #3 Deep dive

Accelerated Breeding 18th June 2025

Meeting design

CGIAR

Purpose

 An information sharing meeting on goals #2 and #3 of Accelerated Breeding (AB) high-level goals for 2025

Outcomes

• Breeding teams across programs understand AB goals #2 and #3, what is expected to achieve the goals, levels of engagement and where to seek support

Agenda

- Opening remarks: Peter; 5 mins
- Presentation: Michael; 40 mins
- Discussion: All; 45 mins



AB Goals #2 and #3

CGIAR

AB Goal #2

 In interaction with partners, Crop Leads aggregate crop-specific investments around the most important, non-redundant breeding pipelines and market segments, i.e., bring focus based on all available information. It means that CGIAR focuses on the most important market segments and deprioritizes investments in smaller market segments. In some instances, smaller market segments could be the target of national efforts.

<u>AB Goal #3</u>

 Building on the updated breeding strategy (as reflected in Goals 1&2), Crop Leads contribute to designing a much stronger joint fund-raising strategy by aggregating highly relevant TPPs into product concepts. A product concept describes how the new product will appeal to its target market and investors, where and why we are investing and with what partners (from Goals 1&2).



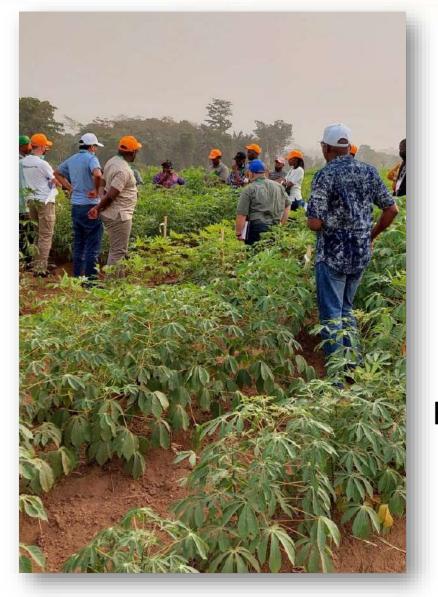
Goal #2: Breeding strategy – priority setting

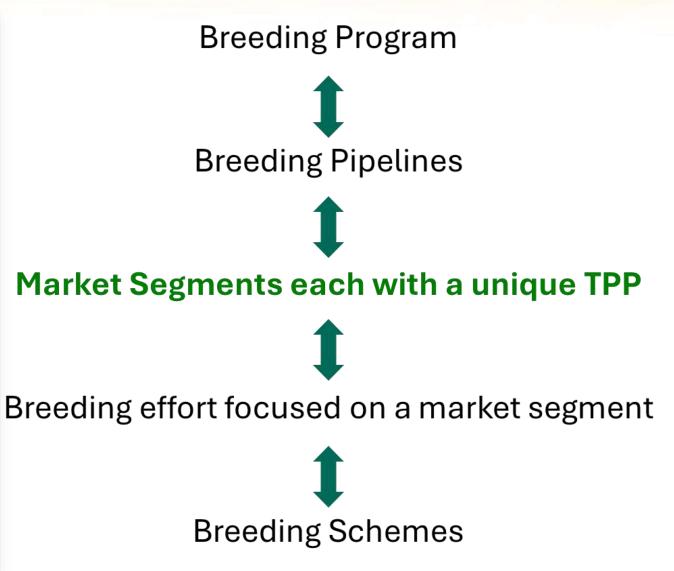
- Doing a little bit everywhere will not result in success.
- Decisions must be made about what to prioritize.
- > Even before declining budgets:
 - > Too many pipelines
 - Too many market segments
 - > Too many traits
 - > Too many countries





Breeding strategy – priority setting





Breeding strategy



Breeding Pipeline

MS 1	MS 2	MS 3
TPP 1	TPP 2	TPP 3
Cat 1	Cat 2	Cat 4

Categories of breeding effort





Category 1: Full Breeding Pipeline.

Category 2: Leverages candidates from a Category 1 pipeline testing performance in Early and Late Testing.

Category 3: differs from Category 1 by one or two simply inherited Essential Improve Trait(s) that can be delivered via backcrossing, done by CGIAR or by partners.

Category 4: Leverages candidates from a Category 1 pipeline testing performance only in Late Testing.

C	Program	Pipeline	MS	ТРР	Breeding Effort		Breeding Scheme								
			What Where How	Trait 1 Trait 2 Trait 3 Trait X	Product Design	Crossing Screening	Early Stage Testing	Late Stage Testing	On farm Verifi cation	None	Product Design	Crossing Screening	Early Stage Testing	Late Stage Testing	On farm Verifi cation
_											# cr # sc Trai scre Sele	reened ts eened ection ensity	# entries # locations # rep Traits s screened Selection intensity	# entries # locations # reps Traits screened Selection intensity	# entries # locations # reps Traits screened Selection intensity
		Pipeline 1	MS1	TPP1			Cat 1 M	S]		Bre	eeding sche	me 1	
[Breeding Program	Pipeline 2	MS2 MS3	TPP2 TPP3			Cat 1 M	S Cat 2 I	MS]		Bre	eeding sche Bree	me 2 eding scher	ne 3
		Pipeline 3	MS4 MS5 MS6	TPP4 TPP5 TPP6			Cat 1 M	Cat 2 I	MS 3 MS]]]		Br	<u> </u>	eme 4 eding schen Breeding s	
		Pipeline 4	MS7	TPP7				С	at 4 MS]					Breeding cheme 7
			MS8	TPP8		No CGI/	AR bree	eding e	ffort	Tier 5 MS		No CGI	AR bree	ding sche	eme

Use linked data reports to view breeding strategy



Queried Record(s)	BP00125					
Breeding Pipelines						
Breeding Team Name	Eastern Africa Early					
Breeding Team Lead	Yoseph Beyene					
BP ID	BP00125					
BP Short Name	Maize CIMMYT BP00125					
BP (Internal Name)	EA-PP1 Early (white)					
BP Description Early white maize hybrids, adapted to the Eastern African rainfed mid-altitude dry/wet agro-ecologies, and sui use.						
Pipeline Size						
Annual Investment (USD)	577364					
Investment Reference Year	2021					
Current Cycle Time (months)	36					
Market Segments						
Region	East and Southern Africa					
Сгор	Maize					
Germplasm Type						
MS ID	MS00375					
MS Short Name	Maize EAF MS00375					
MS Long Name	Maize Hybrid EAF Food White Mid Altitude; Dry Rainfed Early					
MS (Internal Name)	Early maturing white hybrid maize for East Africa					
Area (Ha)	963,683					
Organisation	CIMMYT					
Target Product Profiles						
TPP Lead	Yoseph Beyene					
TPP ID	ТРРООО7О					
TPP Short Name	Maize EAF TPP0070					
TPP (Internal Name)	EAPP1 Early White					
TPP Description	Early white maize hybrids, adapted to the Eastern African rainfed mid-altitude dry/wet agro-ecologies, and suitable for food use. Rainfed, Eastern Africa tropical rainfed, mid-altitude (1000-1800 masl); dry (600-800 mm annual rainfall)/wet (900-1500 mm/year) ; Kenya, Uganda (April-September); Ethiopia: May-October Tanzania (North): April-September Tanzania (South): November-March					
Category of Breeding Effort	Category 1: Full					
Costs (added, USD)						
Months to develop	-					
Essential: Traits to Improve	3					
Essential: Traits to Maintain	21					
Traits Nice to have	4					

Breeding Pipeline

MS 1

TPP 1

Use linked data reports to view breeding strategy



Target Product Profiles	
TPP Lead	Yoseph Beyene
TPP ID	TPP00070
Essential: Traits to Improve	3
Essential: Traits to Maintain	21
Traits Nice to have	4
TPP Traits	
Abiotic - ASI (days)	Essential: Maintain - Lower than 5
Abiotic - Stay-Green (1 to 9)	Nice to Have - Lower than or equal to 6
Abiotic - Yield Under Drought (tons/ha)	Essential: Improve - Percentage above check 5
Abiotic - Yield Under Low N (tons/ha)	Essential: Improve - Percentage above check 5
Agronomic - Female Inbred Seed Yield (tons/ha)	Essential: Maintain - Higher than or equal to 1
Agronomic - Female Single Cross Seed Yield (tons/ha)	Essential: Maintain - Higher than or equal to 4.5
Agronomic - Yield Under Optimum Conditions (tons/ha)	Essential: Improve - Percentage above check 5
Biotic - Disease - Common Rust (Ps) Resistance (1 to 9)	Nice to Have - Lower than 4
Biotic - Disease - Fusarium Ear Rot (FER) Percentage (%)	Essential: Maintain - Lower than 10
Biotic - Disease - Gray Leaf Spot (GLS) Resistance (1 to 9)	Essential: Maintain - Lower than or equal to 4
Biotic - Disease - Maize Lethal Necrosis (MLN) Resistance (1 to	Essential: Maintain - Lower than or equal to 4
Biotic - Disease - Maize Streak Virus (MSV) Resistance (1 to 9)	Essential: Maintain - Lower than 3
Biotic - Disease - Maize Streak Virus (MSV) Resistance	Essential: Maintain - Equal to Presence of haplotype linked to
Biotic - Disease - Turcicum Leaf Blight (TLB) Resistance (1 to 9)	Essential: Maintain - Lower than 4
Biotic - Disease - Yield Under Artificial MLN (tons/ha)	Essential: Maintain - Higher than or equal to 4
Biotic - Pests - Fall Armyworm (FAW) Resistance Cob (1 to 9)	Nice to Have - Lower than or equal to 3
Biotic - Pests - Fall Armyworm (FAW) Resistance Leaf (1 to 9)	Nice to Have - Higher than or equal to 5
Morphological - Ear Position (=Ear height/plant height) (%)	Essential: Maintain - Lower than 50
Morphological - Husk Cover (%)	Essential: Maintain - Higher than or equal to 90
Morphological - Male plant height : female ear height ratio (%)	Essential: Maintain - Higher than or equal to 100
Morphological - Plant Height (cm)	Essential: Maintain - Equal to +/- 10 cm of check
Morphological - Root Lodging (%)	Essential: Maintain - Lower than 10
Morphological - Stem Lodging (%)	Essential: Maintain - Lower than 10
Phenological - Grain Moisture (%)	Essential: Maintain - Similar to check
Phenological - Maturity (FAO Scale) (GDD)	Essential: Maintain - Within range (to) 300 to 400
Phenological - Parental Nicking (days)	Essential: Maintain - Within range (to) -5 days to plus 5 days
Quality - Visual - Grain Color (yellow, white, blue)	Essential: Maintain - Equal to white
Quality - Visual - Grain Texture (flint, semi-flint, semi-dent,	Essential: Maintain - Within range (to) semi flint, semi den

TPP traits

Need to understand full set of requirements for each pipeline



- Moving away from "your team's budget", think about the total set of requirements for each pipeline to be successful, and estimate the total investment required per breeding pipeline.
- Understand the number of new products required by a market segment over a period of years and size each breeding pipeline appropriately.
- Understand and use the cross-cutting services provided by Accelerated Breeding and Breeding Resources.
- Include the cost of marker data points, compositional assays, QG support, support to establish NARES-CG breeding networks, etc. in each pipeline budget.
- Leverage representative locations to test potential new products for different market segments in the region e.g., white, yellow and orange corn, early, mid and late maturities and OPV's and hybrids.

Prioritization criteria

- Alternative suppliers
 - Focus on low-income and lower-middle income countries as per World Bank classification
 - > Where do strong alternative suppliers exist?
- Relevance = Size of (future) Market Segment
 - > Document assumptions made re: future market segments
 - Breeding pipeline: >1 million ha
 - > Market Segment: >250,000 ha
 - Or, target smaller market segments over larger, but not both. You must decide.
- > Opportunity
 - Goal #1 (TPPs that are **in-demand**, impactful, feasible)
 - > Who will produce and distribute seed at scale? >> partner & country choices
 - Who are your effective partners NARES, local universities, local seed companies that share the joint vision of making a difference >> partner & country choice





Using criteria for decision-making

There is no strict formula to make these decisions – but decisions must be made.

➤ Mapping of pipelines and market segments (MS) revealed small MS are currently targeted. → Drop or move to category 4 breeding effort.

Ranking pipelines within crop and market segments within pipelines and category of breeding effort per market segment can be helpful.







Data now available for assessing against criteria

- Use the Excel sheet I shared in invite
- Presents the same data aggregated / disaggregated according to:
 - > Breeding Pipeline
 - Market Segment
 - > Country
- This is the Breeding Portal data matched with GloMIP data (in future to become automatized through the Harmonized Crop Report)
- To update the data, we need you to update Breeding Portal data.



Prioritizing pipelines

Organization	Cron	Internal Name for Breeding Pipeline	Annual investment	Sum of MS Area	Value adjusted MS Area	Value of
organization	crop	internal Name for Dreeding Pipeline	as estimated by	(ha)	(ha) - calculates the area	Production
			teams in the past	(na)	taking the production	(USD)
		· · · · · · · · · · · · · · · · · · ·		Ţ	- · ·	(050)
CIMMYT	Millet	HPM ESA-HYB Pearl Millet	36,413	7	2	3,074
CIAT	Cassava	Low amylose cassava for industry (LAC)	653,752	1,000	2,156	5,817,733
ICARDA	Chickpea	Irrigated	115,000	5,000	3,121	5,326,897
ICARDA	Chickpea	Rainfed Spring	30,000	30,000	15,389	28,495,208
AfricaRice	Rice	TELS-I	246,852	36,289	29,256	42,833,316
ICRISAT	Sorghum	BP4	50,000	44,604	11,152	15,674,755
СІММҮТ	Millet	LWFM	121,861	45,600	21,116	34,525,809
CIAT	Rice	DMeLF_I_Hyb	250,000	51,000	68,253	111,234,932
СІММҮТ	Sorghum	HWS	36,973	52,641	19,905	36,463,232
CIAT	Rice	DELF_ITemp_Hyb	250,000	64,000	85,651	108,250,218
ICARDA	Faba bean	Medium Seeded, Irrigated	100,000	65,000	104,107	407,074,121
СІММҮТ	Sorghum	HRS	36,973	67,877	21,447	40,613,969
IITA	Soybean	Medium/Late Soybean Mid-Altitudes	210,000	79,864	44,406	59,902,823
ICARDA	Lentil	Small Seeded, Rainfed Highlands	100,000	80,000	74,672	103,739,883
CIAT	Cassava	Biofortified cassava for fresh and processing (Dual Purpose)	87,500	92,814	200,133	277,892,378
ICARDA	Grasspea	High Biomass Grasspea	50,000	96,447	73,648	102,317,692
ICARDA	Wheat	West/Central Asia Drylands	250,000	100,000	43,111	60,949,853
ICARDA	Faba bean	Small Seeded, High Rainfed	140,000	100,621	222,241	94,023,007
ICARDA	Wheat	West Africa Savannas	150,000	115,000	53,774	98,675,730
AfricaRice	Rice	TMeLS-I	246,852	135,688	109,392	166,888,161
ICRISAT	Pigeonpea	TPP2-Early-Asia	250,000	150,000	63,200	87,801,720
СІММҮТ	Millet	EWFM	53,344	153,600	71,128	95,134,149
IITA	Cowpea	Medium To Late Duration Cowpea	322,189	178,210	38,292	56,667,437
ICRISAT	Sorghum	BP3	100,000	178,440	44,615	62,707,454
ICARDA	Faba bean	Large Seeded, Low Rainfed Cool	130,000	193,000	208,914	246,612,036
AfricaRice	Rice	DELF-U	329,137	193,286	128,574	187,033,431
CIP	Sweetpotato	Southern Africa Drought Heat OFSP	925,000	196,928	619,662	1,001,302,588
ICARDA	Wheat	East Africa Drylands	150,000	220,000	169,739	228,544,590
IITA	Soybean	Early Maturing Soybean Mid-Altitudes	140,000	230,874	127,531	179,760,299
IITA	Cowpea	Short Duration Cowpea	966,568	261,604	75,058	102,493,555
CIAT	Beans	Medium-large red bush beans		274,738	156,743	233,304,454
CIP	Potato	LTVR	362,398	277,293	1,664,417	2,394,571,616
IITA	Cowpea	Medium Duration Dual-Purpose Cowpea	859,172	296,287	70,513	96,274,848
CIMMYT	Sorghum	MDWSH	500,000	311,732	64,036	104,431,471
CIMMYT	Millet	LBFM	121,861	318,411	147,447	230,115,643
CIP	Sweetpotato	East Africa OFSP	1,000,000	323,386	419,430	655,243,829
ICRISAT	Sorghum	BP2	175,000	334,548	83,647	117,566,988
ICARDA	Lentil	Large Seeded, Rainfed Cereal System	100,000	372,000	218,888	304,095,605
ICARDA	Grasspea	Small Seeded Grasspea	100,000	376,255	159,479	221,560,495
CIMMYT	Millet	EBFM	329,105	380,416	176,160	218,396,836



Prioritizing Market Segments (within pipeline)

CIP

IITA

CIP

CIP

CIP

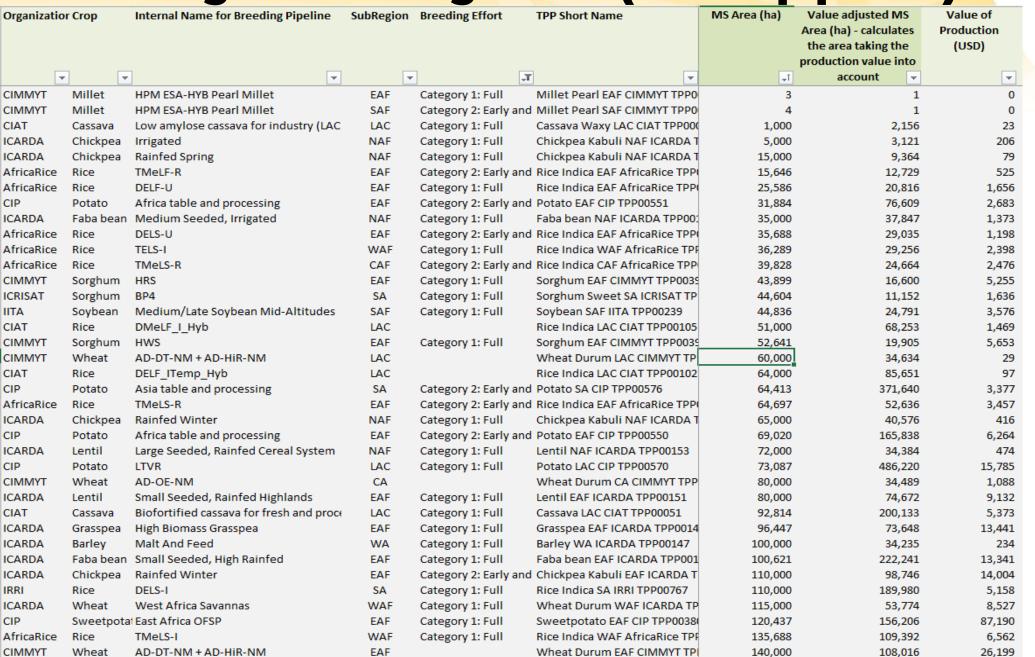
CIP

CIAT

Cassava

White cassava for industry (SEA; SA; SS

EAF



Category 0: Pre-bree(Cassava EAF CIAT TPP00059

145,918



11,577

99,402

Prioritizing Market Segments (within pipeline)

Organizati	or Crop	Internal Name for Breeding Pipeline	SubRegion	Breeding Effort TPP Short Name	MS Area (ha)	Value adjusted MS	Value of
						Area (ha) - calculates	Production
						the area taking the	(USD)
						production value into	
L	• •				▼ ↓	account 👻	•
IITA	Soybean	Early Soybean For Lowlands	EAF	Category 4: Late Testi Soybean EAF IITA TPP00242			59
ITA	Soybean	Early Maturing Soybean Mid-Altitudes	WAF	Category 4: Late Testi Soybean WAF IITA TPP0024			110
ITA	Soybean	Early Maturing Soybean Mid-Altitudes	EAF	Category 4: Late Testi Soybean EAF IITA TPP00246			134
ITA	Soybean	Medium/Late Soybean Mid-Altitudes	CAF	Category 4: Late Testi Soybean CAF IITA TPP00241			347
IITA	Soybean	Early Soybean For Lowlands	CAF	Category 4: Late Testi Soybean CAF IITA TPP00245			207
IITA	Maize	Intermediate And Late Yellow And Ora	WAF	Category 4: Late Testi Maize WAF IITA TPP00221	5,010		253
IITA	Banana	Mchare Banana	CAF	Category 4: Late Testi Banana Mchare CAF IITA TP			953
IITA	Soybean	Medium/Late Soybean Lowlands	CAF	Category 4: Late Testi Soybean CAF IITA TPP00237			415
IITA	Soybean	Medium/Late Soybean Lowlands	EAF	Category 4: Late Testi Soybean EAF IITA TPP00234			353
IITA	Soybean	Medium/Late Soybean Mid-Altitudes	WAF	Category 4: Late Testi Soybean WAF IITA TPP0024			1,078
CIP	Potato	Asia table and processing	SEA	Category 4: Late Testi Potato SEA CIP TPP00563	9,378		384
CIMMYT	Sorghum	ERS	SAF	Category 4: Late Testi Sorghum SAF CIMMYT TPP0			1,384
IITA	Maize	Intermediate And Late White Maize	CAF	Category 4: Late Testi Maize CAF IITA TPP00233	11,790		767
CARDA	Chickpea	Rainfed Spring	WA	Category 4: Late Testi Chickpea Kabuli WA ICARDA	T 15,000		12:
RRI	Rice	TMeLF-R	EAF	Category 4: Late Testi Rice Indica EAF IRRI TPP007	57 15,646		52
CIP	Potato	Asia table and processing	SEA	Category 4: Late Testi Potato SEA CIP TPP00564	15,678	145,736	597
CIP	Potato	Asia table and processing	SA	Category 4: Late Testi Potato SA CIP TPP00581	15,993	92,274	888
IITA	Soybean	Medium/Late Soybean Lowlands	SAF	Category 4: Late Testi Soybean SAF IITA TPP00235	17,974	9,938	1,203
CARDA	Faba bean	Large Seeded, Low Rainfed Cool	WA	Category 4: Late Testi Faba bean WA ICARDA TPPO	01 18,000	24,402	73
ITA	Soybean	Medium/Late Soybean Mid-Altitudes	EAF	Category 4: Late Testi Soybean EAF IITA TPP00238	22,630	12,738	1,67
CIP	Potato	Asia table and processing	SA	Category 4: Late Testi Potato SA CIP TPP00582	23,084	133,187	1,29
ITA	Maize	Early And Extra-Early Yellow And Orang	CAF	Category 4: Late Testi Maize CAF IITA TPP00209	23,580	9,987	1,53
CIMMYT	Sorghum	HRS	SAF	Category 4: Late Testi Sorghum SAF CIMMYT TPP0	039 23,978	4,847	2,84
CIP	Potato	Africa table and processing	EAF	Category 4: Late Testi Potato EAF CIP TPP00549	26,049	62,589	2,52
ICARDA	Faba bean	Medium Seeded, Irrigated	EAF	Category 4: Late Testi Faba bean EAF ICARDA TPP(001 30,000	66,261	369
ITA	Cowpea	Medium To Late Duration Cowpea	EAF	Category 4: Late Testi Cowpea EAF IITA TPP00201	33,129	9,505	1,584
CIMMYT	Sorghum	ERS	EAF	Category 4: Late Testi Sorghum EAF CIMMYT TPPO	34,299	12,970	1,73
ITA	Maize	Early And Extra-Early Yellow And Oran	CAF	Category 4: Late Testi Maize CAF IITA TPP00208	35,370	14,980	2,300
CIP	Potato	Asia table and processing	SEA	Category 4: Late Testi Potato SEA CIP TPP00109	42,964	399,376	1,504
CIMMYT	Millet	LWFM	EAF	Category 4: Late Testi Millet Finger EAF CIMMYT T	PP 45,600	21,116	5,23
CIP	Potato	Asia table and processing	SA	Category 4: Late Testi Potato SA CIP TPP00577	48,424	279,390	2,446
ITA	Soybean	Early Soybean For Lowlands	SAF	Category 4: Late Testi Soybean SAF IITA TPP00243	52,205	28,866	4,48
ITA	Cowpea	Medium To Late Duration Cowpea	SAF	Category 4: Late Testi Cowpea SAF IITA TPP00200	62,000	4,949	3,483
CIMMYT	Groundnut	Short Duration Groundnut	WAF	Category 4: Late Testi Groundnut WAF CIMMYT TP	P0 64,630	18,308	6,730
CARDA	Barley	Food And Feed	SA	Category 4: Late Testi Barley SA ICARDA TPP00142	65,000		3,353
ITA	Maize	Early And Extra-Early Yellow And Orang	CAF	Category 4: Late Testi Maize CAF IITA TPP00212	69,900		4,544
ITA	Cowpea	Medium Duration Dual-Purpose Cowp	SAF	Category 4: Late Testi Cowpea SAF IITA TPP00191	70,000		3,932
CIP	Potato	Highland Potato	LAC	Category 4: Late Testi Potato LAC CIP TPP00561	70,156		8,798
CIP	Potato	Asia table and processing	SEA	Category 4: Late Testi Potato SEA CIP TPP00107	72,106		2,365
	D.1.1.	A fairs to be a second se	EAE	C-+ 4.1-+- T+: D-+-+- FAE CID TODOOFEA	74.010	170 5 60	1.04



Country

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TPPs and MS

Breeding Pipelines

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Next steps



- > Over to you What are your prioritization decisions?
- Please decide where you prioritize and show in Breeding Portal before July 23 so that it is clear:
 - Which pipelines, market segments and countries you will continue to work on/in, and importantly those which you will not.
 - Which market segments will continue to be targeted but with a lower category of breeding effort?
 - How do you rank your pipelines? (Not in Breeding Portal)
 - What are the investment levels into each Breeding Pipeline? And into each Category of Breeding?



Guidance for assigning investment levels to Pipelines and Market Segments



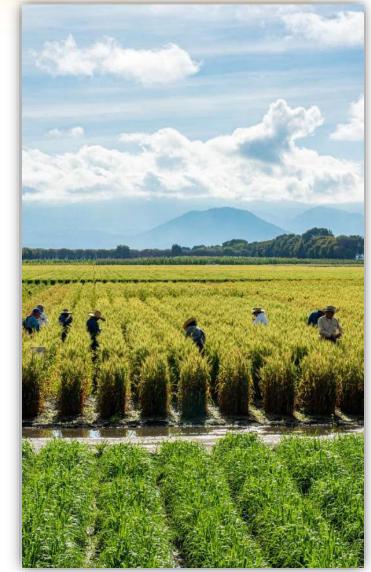
- Please keep simple and high-level
- > Use detailed data, then use this
- If not, make an estimate. Of the total funding you are managing for a program, what portion of the total spent on each pipeline and each MS?
- May help to think of it in terms of portion of breeding team's time, rather than direct expense of a pipeline or MS



Once completed

- Full transparency of CGIAR breeding strategies will become visible to all through Breeding Portal and GloMIP.
 - Market Segments and TPPs targeted by each
 Breeding Pipeline defined
 - Category of breeding effort associated with each TPP/MS
 - Investment per pipeline
 - > TPP details discussed 2 weeks ago
- > There is an e-learning module in the Breeding Portal to help with use.
- Requesting 4 crops to present July 23 how Goals 1 and 2 have been implemented.







Questions / Discussion

>Other priority setting criteria?

>What are our greatest opportunities?



AB Goals #3



<u>AB Goal #3</u>

 Building on the updated breeding strategy (as reflected in Goals) 1&2), Crop Leads contribute to designing a much stronger joint fund-raising strategy by aggregating highly relevant TPPs into product concepts. A product concept describes how the new product will appeal to its target market and investors, where and why we are investing and with what partners (from Goals 1&2).

AB Goal #3 - Resource Mobilization





Building on the updated breeding strategy (as reflected in Goals 1&2), Crop Leads contribute to designing a much stronger joint fund-raising strategy by aggregating highly relevant TPPs into product concepts. A product concept describes how the new product will appeal to its target market and investors, where and why we are investing and with what partners (from Goals 1&2).



AB Goal #3 - Resource Mobilization

- We need to work together across crops to develop a stronger pitch for resources. We suggest to aggregate highly relevant TPPs into clusters describing how products will appeal to its target market and investors, where and why we are investing and with what partners (derived from your prioritization in 1&2).
 - Climate resilience
 - Food security / reduced food price inflation
 - Improved nutrition
 - Reduced GHG emissions
 - New or increased income opportunities
- These can then be aggregated across crops to create a more compelling and CG level fund-raising strategy.





Thank You!

Questions and discussion