RTB Project reporting – a global repporting on sweetpotato progress (Theme 2, 2012)

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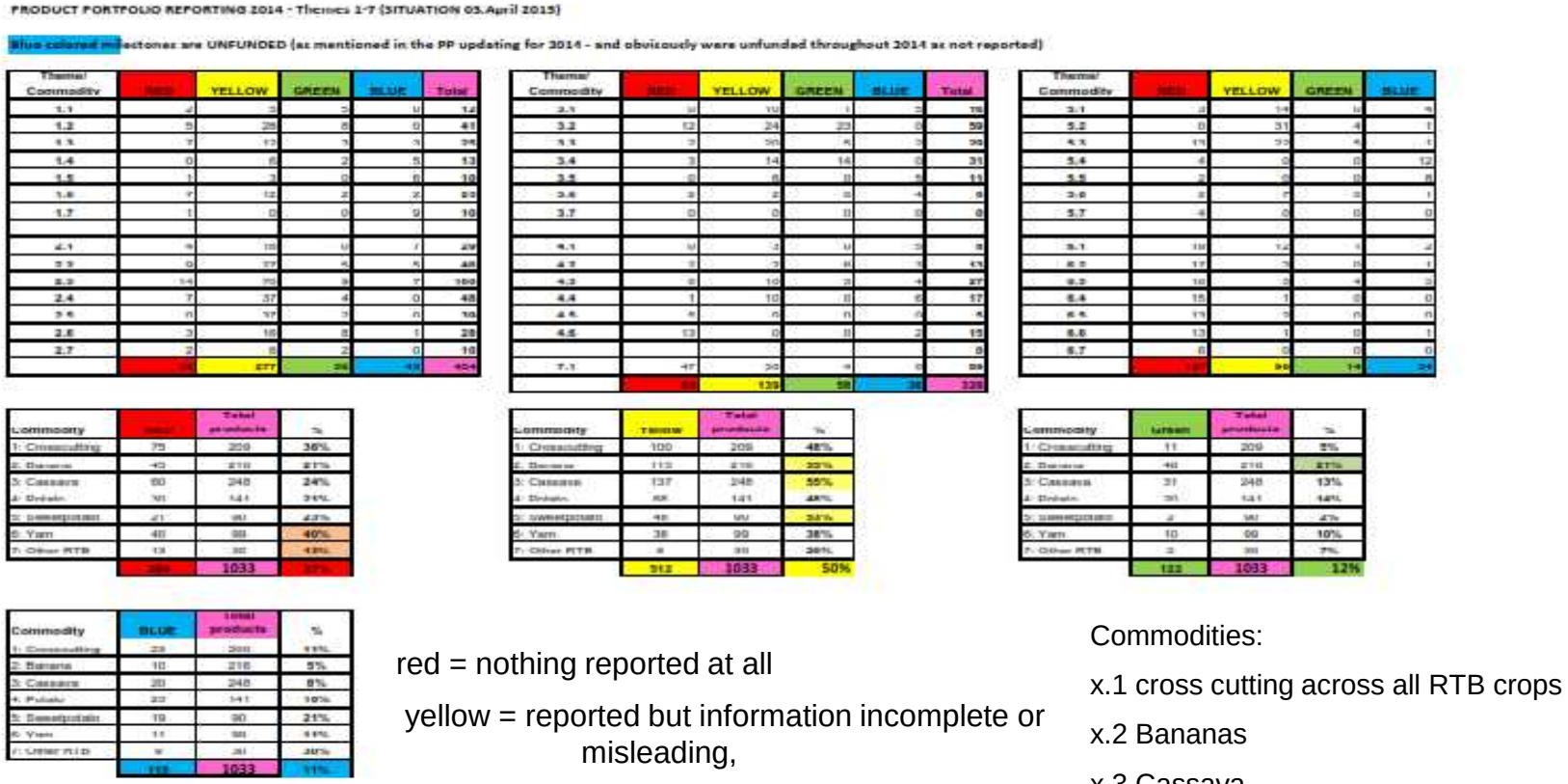
Overview of RTB reporting (CRP 3.4)



PRODUCT PORTFOLIO REPORTING 2014 - Themes 1-7 (SITUATION 05.April 2015)

Blue colored milestones are UNFUNDED (as mentioned in the PP updating for 2014 - and obviously were unfunded throughout 2014 as not reported)

Theme/ Commodity	RED	YELLOW	GREEN	BLUE	Total
1.1	4	5	5	0	14
1.2	5	28	8	0	41
1.3	7	13	3	3	26
1.4	0	6	2	5	13
1.5	1	3	0	6	10
1.6	7	12	2	2	23
1.7	1	0	0	9	10
2.1	5	16	0	7	28
2.2	0	17	4	4	25
2.3	14	15	3	7	39
2.4	7	27	4	0	38
2.5	0	17	3	0	10
2.6	3	16	6	1	26
2.7	2	6	2	0	10
	56	277	39	43	454

Theme/ Commodity	RED	YELLOW	GREEN	BLUE	Total
3.1	9	10	1	3	23
3.2	12	24	23	0	59
3.3	7	20	4	3	34
3.4	3	14	14	0	31
3.5	0	0	0	0	0
3.6	3	2	0	0	5
3.7	0	0	0	0	0
4.1	0	2	0	0	2
4.2	0	2	0	0	2
4.3	0	10	2	0	12
4.4	1	10	0	0	11
4.5	0	0	0	0	0
4.6	13	0	0	2	15
					0
7.1	47	30	4	0	81
	95	139	50	28	312

Theme/ Commodity	RED	YELLOW	GREEN	BLUE
5.1	3	14	1	4
5.2	0	31	4	1
5.3	19	33	4	1
5.4	4	0	0	12
5.5	0	0	0	0
5.6	3	7	3	1
5.7	4	0	0	0
6.1	10	14	4	2
6.2	17	3	0	1
6.3	10	0	4	0
6.4	15	1	0	0
6.5	19	3	0	0
6.6	13	1	0	1
6.7	0	0	0	0
	95	99	14	24

Commodity	RED	Total products	%
1: Cross-cutting	75	209	36%
2: Banana	40	210	21%
3: Cassava	60	248	24%
4: Potato	30	141	21%
5: sweetpotato	21	90	23%
6: Yam	40	99	40%
7: Other RTB	10	30	33%
	289	1033	28%

Commodity	Yellow	Total products	%
1: Cross-cutting	100	209	48%
2: Banana	113	210	54%
3: Cassava	137	248	55%
4: Potato	68	141	48%
5: sweetpotato	48	90	53%
6: Yam	38	99	38%
7: Other RTB	8	30	26%
	512	1033	50%

Commodity	Green	Total products	%
1: Cross-cutting	11	209	5%
2: Banana	40	210	19%
3: Cassava	31	248	13%
4: Potato	20	141	14%
5: sweetpotato	2	90	2%
6: Yam	10	99	10%
7: Other RTB	3	30	7%
	122	1033	12%

Commodity	BLUE	Total products	%
1: Cross-cutting	23	209	11%
2: Banana	10	210	5%
3: Cassava	20	248	8%
4: Potato	22	141	16%
5: Sweetpotato	19	90	21%
6: Yam	11	99	11%
7: Other RTB	9	30	30%
	113	1033	11%

red = nothing reported at all

yellow = reported but information incomplete or misleading,

green = completely reported, no comments,

blue = unfunded throughout 2014

Commodities:

x.1 cross cutting across all RTB crops

x.2 Bananas

x.3 Cassava

x.4 Potato

x.5 Sweetpotato

x.6 Yam

x.7 Others

What are Themes?

Theme 1: **Genebank & Germplasm** (Conserving and accessing genetic resources)
Theme 2: **Breeding** (Accelerating the development and selection of varieties with higher, more stable yield and added value)
Theme 3: **Disease & Pest Management** (Managing Priority Pest and Diseases)
Theme 4: **Seed Systems** (Making available low-cost, high-quality planting Material for Farmers)
Theme 5: **Food Security & Health** (Developing Tools for More Productive, Ecologically Robust Cropping Systems)
Theme 6: **Post-Harvest** (Promoting Postharvest Technologies, Value Chains, and Market Opportunities)
Theme 7: **Impact** (Enhancing Impact through Partnerships)

Here we will talk today only about sweetpotato and breeding Theme 2 commodity sweetpotato = 2.5.

Breeding sweetpotato is devided in RTB into 5 product lines:

Product line 2.5.1. Breeding tools, strategies, and approaches: sweetpotato
Product line 2.5.2. Trait capture and gene discovery: sweetpotato
Product line 2.5.3: Population development and pre-breeding sweetpotato
Product line 2.5.4: Variety development sweetpotato
Product line 2.5.5: Aligning research with farmers' and end-users' priorities: sweetpotato

Each product line has products which must be ready in 201x or 201x and each products has milestones annually or biannually – against these milestones someone has to report to – a set of parameters from: achieved in percentage, summary (120 words), report with code and author, ... (5 or 6 yes or no parameters) such as "strategic value chain", and finally funding source.

Example: 2.5.3. Product 2: OFSP pre-breeding populations with high expression of sweetpotato virus disease (SPVD) tested (to be delivered in 2017) and for 2014 there was the milestone "b" to be reached and this was: "Working paper on SPVD resistant clones and families and field evaluations in East Africa of true seed families provided by CIP-Lima edited (to be reached in 2014).

Here we will talk today only about sweetpotato and breeding Theme 2 commodity sweetpotato = 2.5.

Breeding sweetpotato is devided in RTB into 5 product lines:

Product line 2.5.1. Breeding tools, strategies, and approaches: sweetpotato
this product line has currently 11 products

I give two products per product line one from the region SSA and one outside the region SSA**.**

2.5.1. product 1: Molecular tools to characterize genepools in use and documented at all sweetpotato breeding platforms / SBP (2017) – **milestone c:** Molecular characterization by SSR of potential parents in at least the two base populations realised for CCCAP / China (2014, CIP). **Summary** (<120 words): East Asia produces more sweetpotatoes than any other region of the word. Ninety-four accessions from Japan, China and Korea hold in trust at CIP's genebank were characterized using 59 SSR primers. We obtained 7.4 alleles per primer, a mean polymorphic information content (PIC) of 0.74 and a mean power of discrimination (DL) of 0.83. Jaccard similarity coefficients ranged between 0.27 and 1 with a mean of 0.46. A dendogram showed that East Asian breeding material has high genetic variability and seven clusters were formed from which accessions could be chosen to identify mutually heterotic genepools. Our work might serve to create a yield jump in East Asian breeding programs by systematic heterosis exploitation.

2.5.1. product 4: Magnitude of heterosis exploitation in sweetpotato breeding based on grouping breeding populations into two genepools available for two breeding programs (2016) – **milestone c:** Estimates of heterosis effect in population hybrids with East African genepool A and B determined at CIP-Uganda (2014). **Summary** (<120 words): The objective is to test if genepools (A and B) in Uganda are mutually heterotic. Eight parents were selected in each genepool. Crossings between genepools were made by A8xB8 factorial cross design and within genepools by A8xA8 and B8xB8 diallel cross design. The seed generated was used for Uganda and Mozambique. In each country 20 genotypes were multiplied for each cross combination and planted in field trials with 1m row plots (2 plot replications). Trials were conducted at Namulonge and Sereve / Uganda and Umbeluzi (irrigated and not irrigated) / Mozambique. From the first harvest at Namulonge a heterotic increment of 13% was estimated for storage root yield. The populations are also used by the GTSPI project for genomic selection.

Here we will talk today only about sweetpotato and breeding Theme 2 commodity sweetpotato = 2.5.

Breeding sweetpotato is devided in RTB into 5 product lines:

Product line 2.5.2. Trait capture and gene discovery: sweetpotato Breeding tools, strategies, and approaches: sweetpotato - this product line has currently 4 products

I give two products for this product line one from the global program and one from global + regional programs**.**

2.5.2. product 2: Genotypes and QTL Gene(s) for heat & drought resistant sweetpotato identified (2017); **Milestone a:** New source (genotypes) of major gene(s) for drought and heat tolerance identified (2014); – **Summary** (< 120 words): A heat stress evaluation with nearly the entire sweetpotato germplasm available at CIP was conducted in North Peru a climate with winter averages between 25°C and 28°C during daytime (around 16 °C during the night) and summer averages that can reach over 40 °C during day time (20 °C or even 30 °C during night). A large fraction of the sweetpotato germplasm is much more adapted to heat stress as expected. In the group moist and sweet clones 133 accessions were observed with storage root yields >20 t/ha. In the group dry and starchy clones 66 accession were observed with storage root yields >10 t/ha.

2.5.2. product 3: Genotypes and gene(s) for early bulking (the <100 day sweetpotato) identified (2016); **Milestone a:** New source of genotypes and major gene(s) for early bulking identified among advanced breeding material (2014); Summary: Information is given about early bulking clones (33 varieties) from a new publication and 53 new sources and clones, respectively. For the new source 128 promising clones were evaluated in Peru. Harvest was conducted after 100 days at 5 locations, namely Huaral, Piura, San Ramon, Pucallpa, and Satipo (storage root yields were 8.4, 23.0, 19.6, 13.4 and 14.9 t/ha). In the group “moist and sweet” root yields larger.

Here we will talk today only about sweetpotato and breeding Theme 2 commodity sweetpotato = 2.5.

Breeding sweetpotato is devided in RTB into 5 product lines:

Product line 2.5.3. Population development and pre-breeding sweetpotato - this product line has currently 7 products

I give two products for this product line one from the region and one from global programs**.**

2.5.3. product 5: OFSP breeding populations for drought prone areas in sub-Saharan Africa with emphasis on Southern Africa developed (2016); **Milestone a:** Two genetically separate breeding populations identified developed with new drought screening techniques at CIP-Mozambique for drought prone areas with medium expression of SPVD resistance & improve storage root quality (2014); **Summary:** The two distinct breeding populations (from two crossing blocks with 55 and 68 parents) were established in Mozambique at IIAM stations in Maputo and Gurue. These crossing blocks produced in 2014 a total of 83,173 botanical seeds. In total 21,995 seeds (mainly polycrosses) were distributed to six national programs: Two NARS programs in Southern Africa, two NARS programs in East and Central Africa, and two NARS programs in West Africa. Most of the male parents which were used have a known history of giving high yields under drought conditions. The females parents were selected from promising material in advanced yield trials. In the future we want to introduce more drought adapted clones in crossing blocks.

2.5.3. product 7: Reciprocal recurrent selection to determine the potential selection progress and limits for high iron and zinc in an experimental high iron and zinc hybrid populations tested (2017); M**ilestone b.** Field evaluations of intra-genepool cross combinations tested (2014). **Summary:** Breeding for high storage root iron and zinc contents is challenging in sweetpotato. Despite indirect gains through improving b-carotene contents only very little progress has been made for iron and zinc. Two factors are critical to final decide if iron and zinc contents merits breeding efforts. First, the iron bioavailability in sweetpotato (this is subject of other reports) and the magnitudes of genetic gains for iron and zinc. This report describes a heterosis exploiting breeding scheme to allow high inbreeding for the quality traits iron and zinc without sacrificing heterozygosity needed for yield performance. The study has reached the evaluation of intra-genepool field evaluations. Our approach might serve other crops as a model to conduct inbreeding for quality traits.

Here we will talk today only about sweetpotato and breeding Theme 2 commodity sweetpotato = 2.5.

Breeding sweetpotato is devided in RTB into 5 product lines:

Product line 2.5.4. Variety development sweetpotato - this product line has currently 4 products

I give two products for this product line one from the region and one from global programs**.**

2.5.4. product 1: Early released sweetpotato varieties (4 to 5 years instead of 8 to 10 years) from CIP population improvement (especially clones from product 2.5.2.1) with IT status for global dissemination by accelerated breeding scheme (ABS) and farmer participatory selection developed and tested (2016); **Milestone c:** Report on variety releases in Southern Africa with accelerated breeding scheme (ABS) available (2014); **Summary:** The objective is to select rapidly for high yielding adapted OFSP varieties. In Southern Africa ABS has been adopted in Mozambique in 2006 followed by NARS breeding programs in Malawi and Zambia about 3 years later. Since ABS has been introduced in these countries 26 varieties have been released in Mozambique, Malawi, and Zambia within 4 to 5 years comprising 1 year for crossing and multiplication, 1 year for selection in early breeding stages and 2 years for selection in later breeding stages. These varieties selected through ABS are: Gloria, Tio Joe, Irene, Bela, Delvia, Cecilia, Ininda, Lourdes, Esther, Melinda, Erica, Jane, Namanga, Sumaia, Mathuthu, Kadyaubwerere, Chipika, Kaphulira, Anaakwanire, BV07/008, BV07/016, Olympia, Kokota, Chumfwa, Chiwoko and Kanga (white).

2.5.4. product 4: Early released sweetpotato varieties (4 to 5 years instead of 8 to 10 years) from CIP population improvement realized for different variety types (2017); **Milestone b:** Release of 2 to 3 PFSP varieties for dry land tropics by ABS in cooperation with INIA (2014, CIP). **Summary:** Only partially achieved and not with INIA – 1 PFSP was released with IIAM (target achieved only to 60%)

Here we will talk today only about sweetpotato and breeding Theme 2 commodity sweetpotato = 2.5.

Breeding sweetpotato is devided in RTB into 5 product lines:

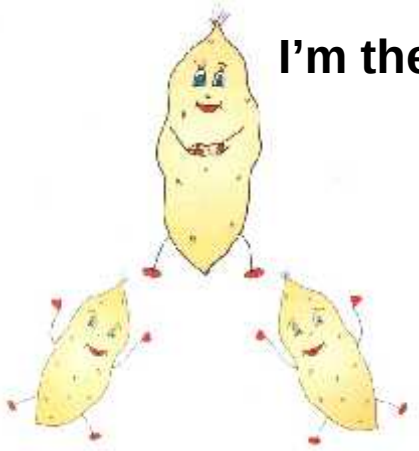
Product line 2.5.5. Aligning research with farmers' and end-users' priorities: sweetpotato – this product line has currently 5 products

I give two products for this product line both from regions**.**

2.5.5. Product 1: Bi-annual communication & press releases of material and tools published (2012 to 2016); **Milestone c:** At least two press releases: The 1st about "Mutually heterotic genepools across different regions of the world; The 2nd about "Yield jumps expectationsin sweetpotato due to heterosis and breeding with two genepools published (2014). **Summary:** Three press releases have been made with emphasis on sweetpotato breeding: The first: Heterosis Exploiting Breeding – Schemes for Rapid Yield Enhancement. The second press release was: "Getting Sweetpotato varieties to Farmers Faster: The Accelerated Breeding Scheme (ABS)" – Solid evidence generated since 2005 in Peru and Mozambique has shown that the ABS efficiently reduces the time (8 to 4-5 years) from crossing to varietal release within a given sweetpotato population. The third press release is "Strengthening Local Capacity to Breed Better Sweetpotatoes". Organization and revolution of conventional sweetpotato breeding.

2.5.5. Product 4: Next generation OFSP (dry & starchy) variety disseminations & follow up of breeding target in farmer participatory approaches (2017); **Milestone a:** Baseline of OFSP dry & starchy variety dissemination into Bangladesh & farmer participatory breeding target priority studies documented (2014); **Summary:** Sweetpotato is mainly cultivated in river belt of Bangladesh and has a huge potentiality in saline areas. In 2010-11, 298,000 MT were produced from 30,364 ha (BBS, 2011). Mainly two local varieties (red skin and white skin variety) are used and red skin color is preferred. Farmers are not aware of beta carotene rich OFSP varieties and the baseline of OFSP consumption is estimated to be 0.35% of total consumption in Bangladesh. In the Horticulture Project (funded by USAID, CIP has been promoting OFSP varieties (BARI SP-4 and BARI SP-8). In collaboration with TCRC and BARI the project initiated OFSP participatory variety evaluation in southern Bangladesh. Two OFSP clones (CIP-440001 and CIP-440014) have been released through farmer participatory variety evaluation.

I'm the gain



Thank-you for your Attention