



OVERVIEW OF BEAN PROGRAM ACTIVITIES AND ACHIEVEMENTS

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*ECABREN Steering Committee, Kampala
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Justification

- **Why beans?**

Beans regarded as:

- **“Meat”** for the poor (MINAGRI 1988, Sperling et al 1992)
- A **near-complete** food (CIAT, 1995)
- **No** co-relation with **heart diseases**; (D-Blackberry, 2004);
- **Vegetable meat** for the rich (Schneider, 2002)
- Increasingly becoming a **cash crop** (NISR , 2012)

Key outputs / activities

- **To develop and promote utilization of high yielding, multiple diseases resistant, marketable and nutrient rich bush, climbing and snap bean varieties;**

Objectives cont...

- **to develop and promote integrated soil fertility, diseases and pests, and staking management technologies to complement and sustain bean productivity;**

Cont...

- Value addition of bean based products
- to develop organizational mechanisms and arrangements to strengthen linkages between actors in the bean commodity value chain in order to enhance competitiveness and marketability of beans, and

- to enhance capacities of stakeholders across the production to market value chain.
- Promotion of gender based research and development agenda

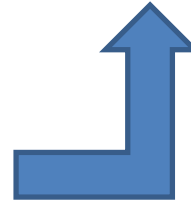
Output 1.1.3: Variety evaluation, selection and release

- **Variety development and participatory selection (All stations)**
- Crossing and populations development
- Selection among segregating populations
- Diseases nurseries and other introductions

Research: Years of selection



Bean value chain in Rwanda at glance: From seed to processing



Main breeding activities

- Preliminary yield trials
- Intermediate yield trials
- Advanced yield trials
- Multilocation/NPTs/Adaptability trials (on-station/on-farm)

Typical bean variety improvement scheme showing priority traits in breeding populations in different RAB stations

Eg. Popn	Seed colour/Market class				Yield	Disease resistance					Other traits			
	Red mottle	Red	Navy	Yellow		Anth	ALS	Rust	R/rots	BCMV	Fe/Zn	Snap quality	Al ³⁺	Drought
A	+	+	+	+	+	-	+	+	+	+	+	+	+	+
B	-	+	+	+	+	+	+	+	+	+	+	-	+	+
C	+	+	+	-	+	-	+	-	+	+	+	+	+	-
D	+	+	-	+	+	+	-	+	+	-	+	+	-	+
E	-	+	-	+	+	+	-	+	-	-	+	-	-	+
F	-	-	+	+	+	+	+	+	+	+	-	-	+	+
D	+	-	+	-	+	-	+	-	+	+	+	+	+	-
H	+	+	+	+	+	+	+	+	+	+	+	+	+	+
I	+	+	+	-	+	+	+	-	+	+	+	+	+	-
J	-	+	+	-	+	+	+	-	+	+	+	-	+	-
X	-	+	+	-	+	+	+	-	+	+	-	-	+	-

NB: + = presence; - = absence of trait among the progenies; Anth = anthracnose; ALS = angular leaf spot; Fe/Zn = Fe/Zn density; Al³⁺ = Al-toxicity; snap quality = length, tenderness, color, slenderness ...

Breeding populations by generation and plant type at Rubona research station 2014 A

Popn No.	Block	Generation	Source	Type	No. of lines	No. of reps
1	B1	BC1F1	Rubona	Climbing	20	2
2	B14-1	F1	Rubona	Climbing	96 + 10 Parents	1
3	A3-6	F1	Rubona	Climbing	5	1
4	B1-1 /A3-8	F2	Rubona	Climbing	81 + 8 Parents	2
5	B14-2	F2	Rwerere	Climbing	171 + 3 Parents	1
6	A3-7	BC1F3	Rubona	Climbing	5	2
7	B3/A7	BC1F4	Rubona	Climbing	127 + 10 Parents	2
8	A3-3	BC2F1	Rubona	Bush	16 + 6 parents	2
9	A3-2	F1	Rubona	Bush	25 + 7 parents	1
10	A3-4	BC1F3&f3	Rubona	Bush	137 + 6 parents	1
11	A3-5	F3	Thesis FM	Bush	27 + 6 parents	2
12	A1-2	F1	Rubona	Snap	15 + 6 parents	2
13	A1-3	F1	Rubona	Snap	11 + 8 parents	2
14	A1-4	F2	Rubona	Snap	11 + 8 parents	2
15	A3-1	BC1F3	Rubona	Snap	13 + 5 parents	2
16	A1-1	F3	Rwerere	Snap	160 + 2 parents	2
17	Green house	F1	Rubona	Bush	20 parents/sources	New crosses

#

Nurseries: Maintenance of differential lines, other sources of resistance and breeder/pre-basic production (1.5 ha)		
Block	Multiplication	# varieties
A9-1	Seed increasing land races (Gifirizone....)	8
A9-2	ALS Differentials	5
A9-3	Anthraco nose Differentials	5
A9-4	Rust Differentials	7
A14-1	Maintenance of MBC, VRA, MAC.....VAB	48
A14-2	MBC71	1
A14-3	MBC25	1
C1	Seed maintenance of 215 NUA lines high in Iron	215
C2	seed maintenance of 117 ALB,35 SMC lines high in Iron	152
C3	Physiological characteristics associated with high iron and zinc	20
C4	SNAP BEANS	8
C4-C8	Seed multiplication of potential sources of high iron and zinc from East Africa	97
C8	seed multiplication of potential varieties high yielding from Rwerere	4
C8-C11	Seed multiplication of potential varieties for high yield, drought resistance, Al toxicity resistance and high iron content	18
	Seed increase of yellow bean varieties received from Burundi	11
	Seed increase of bean varieties received from Muhanga	3

#

Trial	Type	Source	Selection objective/criteria	#lines	# rep
PYT and IYT	Bush	CIAT	Root rot disease resistance	300	2
	Climbing	PYT SAZD 2013A&B	Yield & MCR	75	2
	Bush	PYT SAZD 2013A&B	Al-toxicity tolerance	61	2
	Bush	PYT SAZD 2013A&B	Yield & MCR	61	2
	Climbing	IYT SAZD 2013A&B	Yield & Fe content.	21	6
AYT	Bush	IYT SAZD 2013A&B	Yield, MDR, Market & Fe content.	35	6
Multilocation trials	Climbing	AYT SAZD 2013 A&B	Yield, MDR, Market & Fe content.	18	3
	Climbing	AYT SAZD 2013 A&B	Yield, MDR, Market & Fe content.	16	3
	Climbing	AYT EAZD 2013 A&B	Yield, MDR, Market & Fe content.	14	3
	Bush	AYT SAZD 2013 A&B	Yield, MDR, Market & Fe content.	13	3
	Climbing	MYT I SAZD 2013 A&B	Yield, MDR, Market & Fe content.	7	3
	Climbing	MYT I NAZD 2013 A&B	Yield, MDR, Market & Fe content.	10	3
	Bush	MYT I SAZD 2013 A&B	Yield, MDR, Market & Fe content.	8	3
	Bush	MYT I EAZD 2013 A&B	Yield, MDR, Market & Fe content.	5	3
	Climbing	MYT II SAZD 2013 A&B	Yield, MDR, Market & Fe content.	5	3
	Climbing	Regional Nursery 2013 A&B Rubona	High iron content	4	3
	Climbing	MYT II NAZD 2013 A&B	Yield, MCR, Market & Fe content.	6	1
	Climbing	MYT II EAZD 2013 A&B	Yield, MCR, Market & Fe content.	5	3
	Bush	MYT II SAZD 2013 A&B	Yield, MCR, Market & Fe content.	3	3
Bush	MYT II EAZD 2013 A&B	Yield, MCR, Market & Fe content.	9	3	
Adaptability/NTPS	Bush	Regional Nursery 2013 A&B Rubona	High iron content	6	3

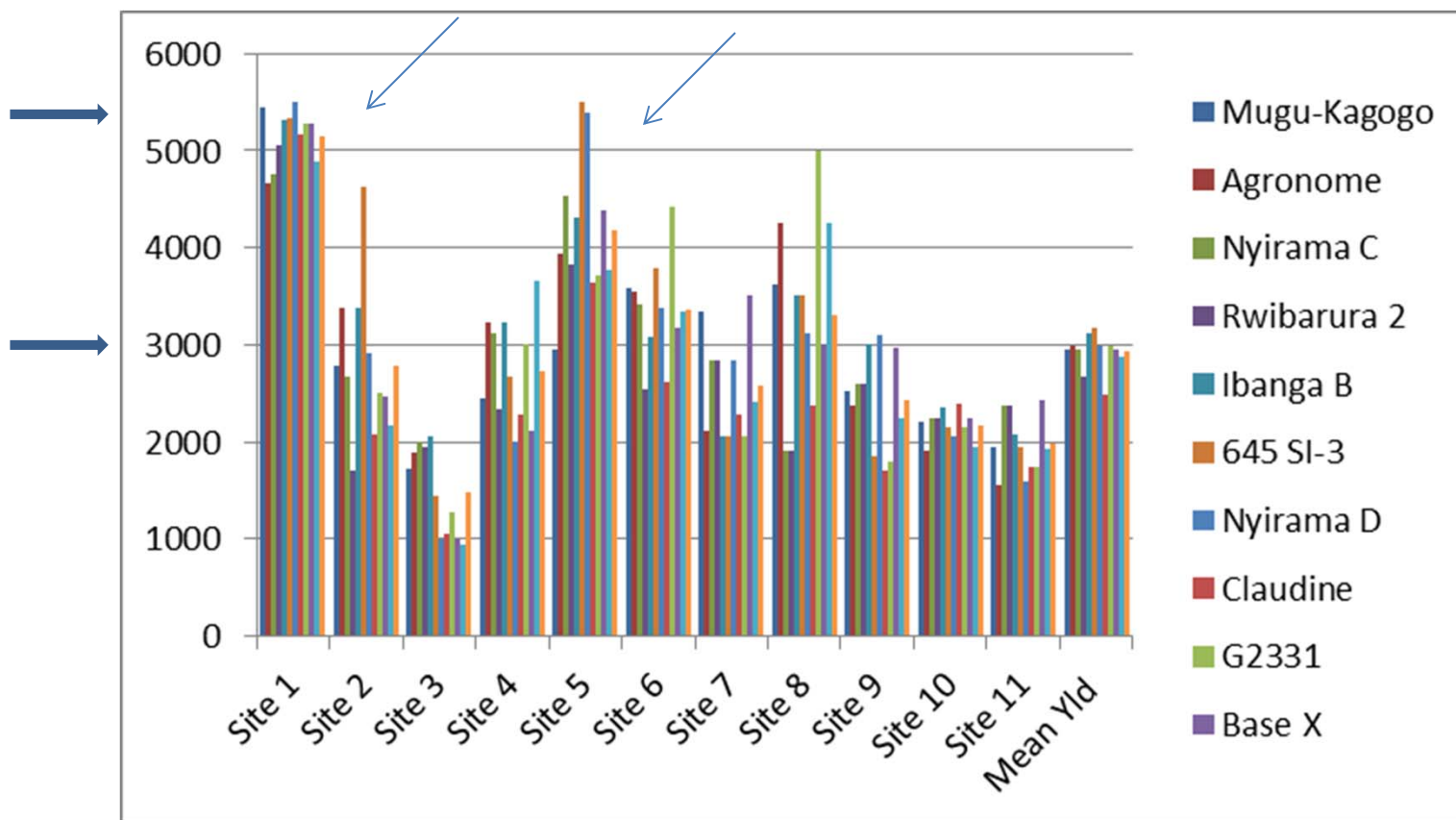
SAZD = South Agriculture Zone Division; EAZD = East Agriculture Zone Division; NAZD = Northern Agriculture Zone Division; PYT = Preliminary; IYT = Intermediate; AYT = Advanced; MYT/ECM =Multilocation yield trials; MDR = Multiple diseases resistance; NTP = National performance trials.

Nurseries for niche varieties

Trial	Plant type	Source	Objective	Entries	Reps
NPT canning beans	Bush	MYT II EAZD 2013 A&B	Adaptability test	7	3
Snap beans	Bush and climbing	Snap bean trial 2013B Rubona	Adaptability test	9	3

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MULTILOLOCATION (NTP) YIELD TRIALS



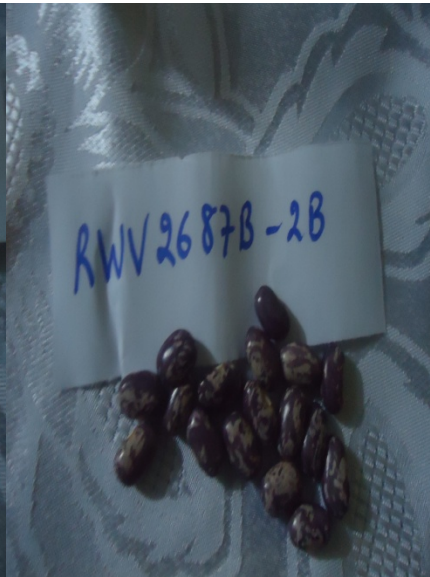
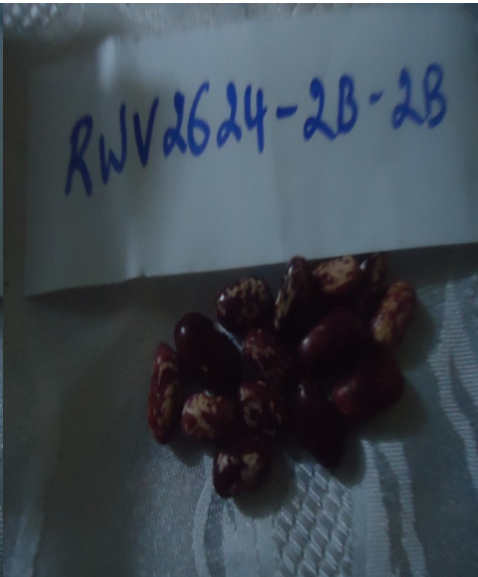
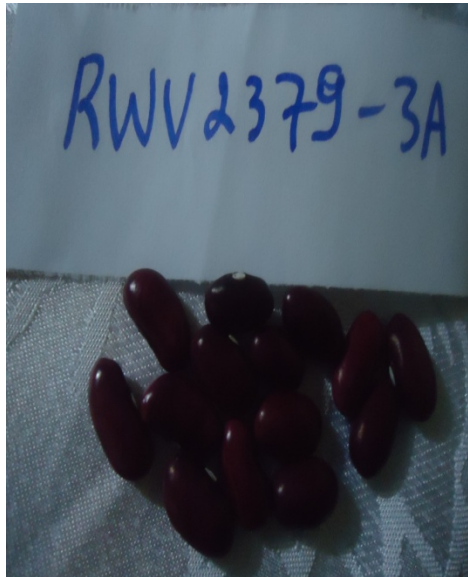
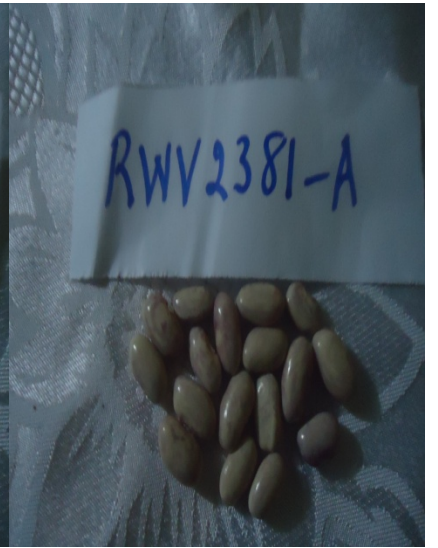
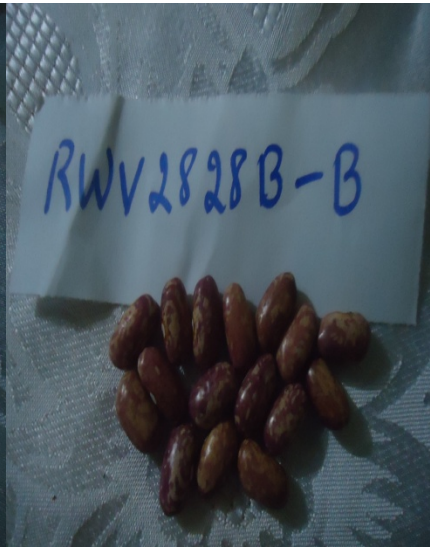
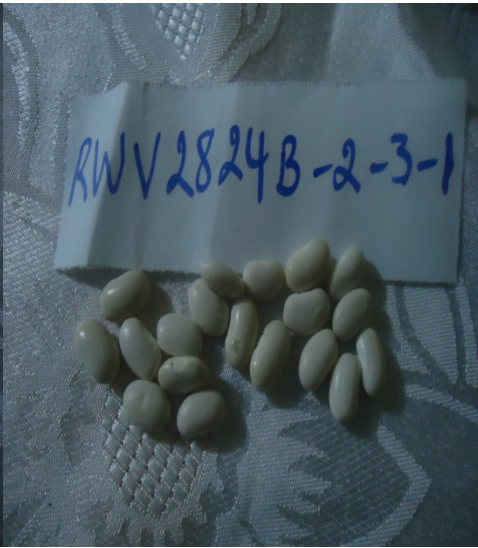
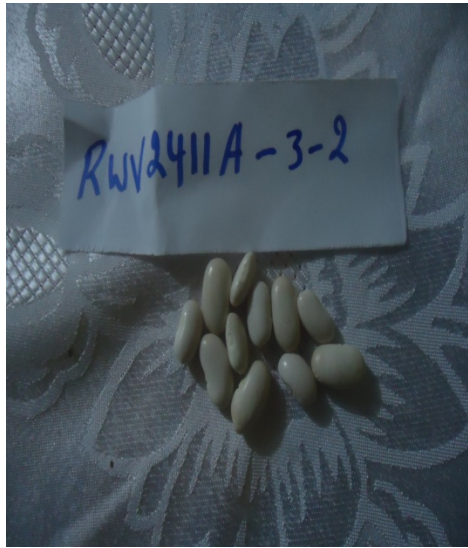
1.Rwerere	2.Kinihira	3.Gakenke	4.Janja	5.Ruhunde
6.Nyamiyag	7.Kinigi	8.Nyagahiga	9.Rugerero	10.Nyundo
11.Rushashi				

Bush beans in drought prone zone

Variety	Mean Yld	% over IC	% over LM
KAB06-8-35	1335	91	154
RWR1668	1469	100	170
Local check	865	59	100
KAB06-8-27	1246	85	144
ECUADOD I	948	65	110
ECAB111	1302	89	110
BOA5-1/16	1439	98	166
ECUADOR II	1035	70	120
NR1263-1/A	1257	86	145
NUA566	1054	72	122
BOA5-1/8	1350	92	156

Participatory variety selection by gender

Occupation	Female	Male	Total
Farmers	24	31	55
Traders	0	7	7
Local administration	2	3	5
Representative of cooperatives	0	4	4
Total	26	45	71



RWV2385



RWV2805-5C



RWV2844



Local check



RWV374D-5B-1



RWV374D-4B



RWV2411A-3-2



RWV2350A-2B



Participatory selection by gender

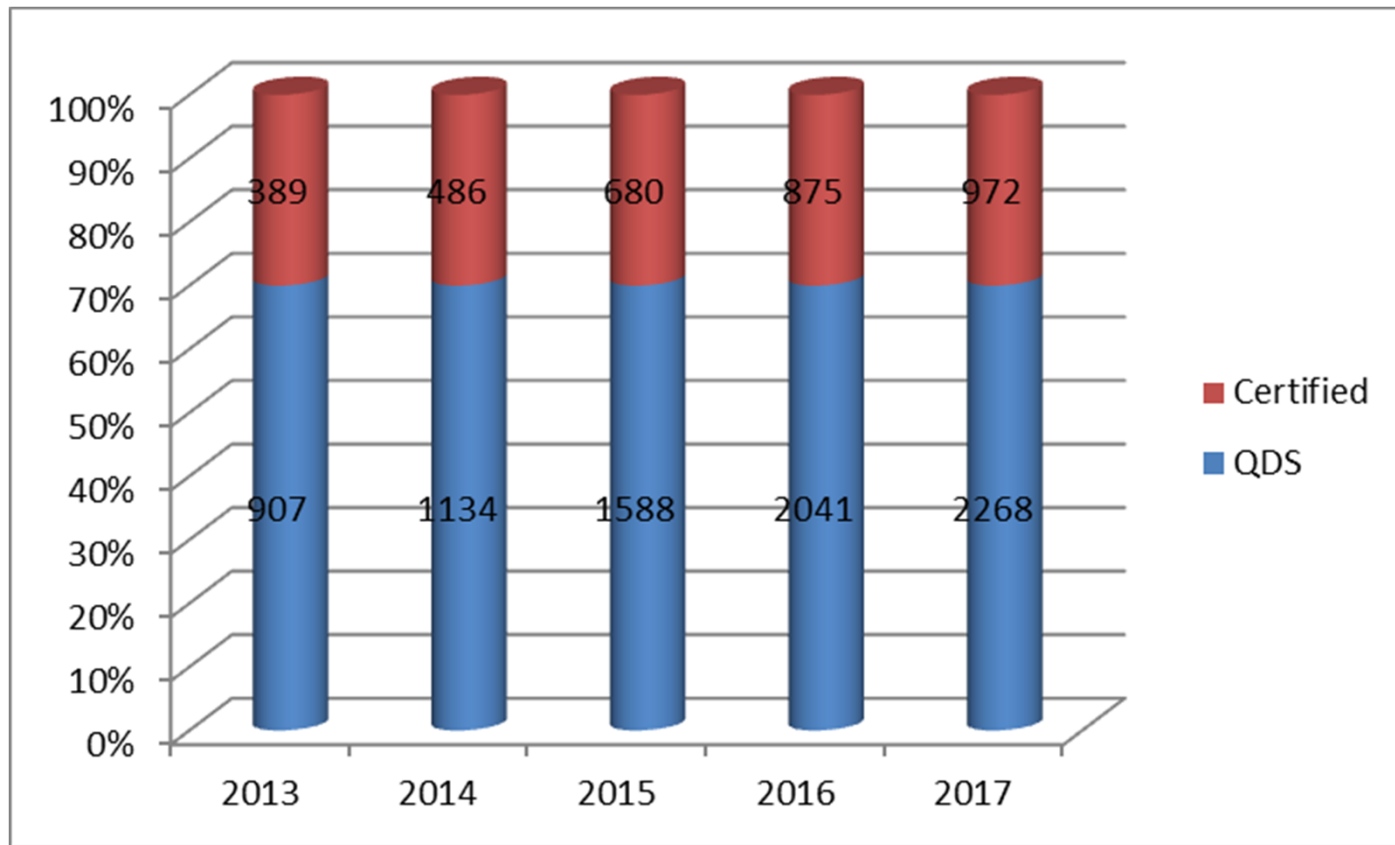


Gender Participatory Variety Selection

Positive criteria for Men	Positive Criteria for women
1.Colour	1.Tolerance to diseases
2.High yield	2. Tolerance to poor soil fertility
4.Market demand and price	3. Fast cooking (related to less consumption)
5.Early maturing	4. colour (red, red mottled)
5. Fast cooking (related to appearance like brilliance and softness of coat)	5.Leaf texture/softness
6. Taste	6. small size that that swells
7. Uniformity (one color of grains) that have high demand and/or high price on market	7. Capacity to regenerate after long time of draught (appear new green leaves)

Year	Breeder	Prebasic	Basic	Certified
2013	0.6	4.7	77.8	1296
2014	0.7	5.8	97.2	1620
2015	1.0	8.2	136.1	2268
2016	1.3	10.5	175.0	2916
2017	1.4	11.7	194.4	3240

Commercial seed production 2013 - 2017



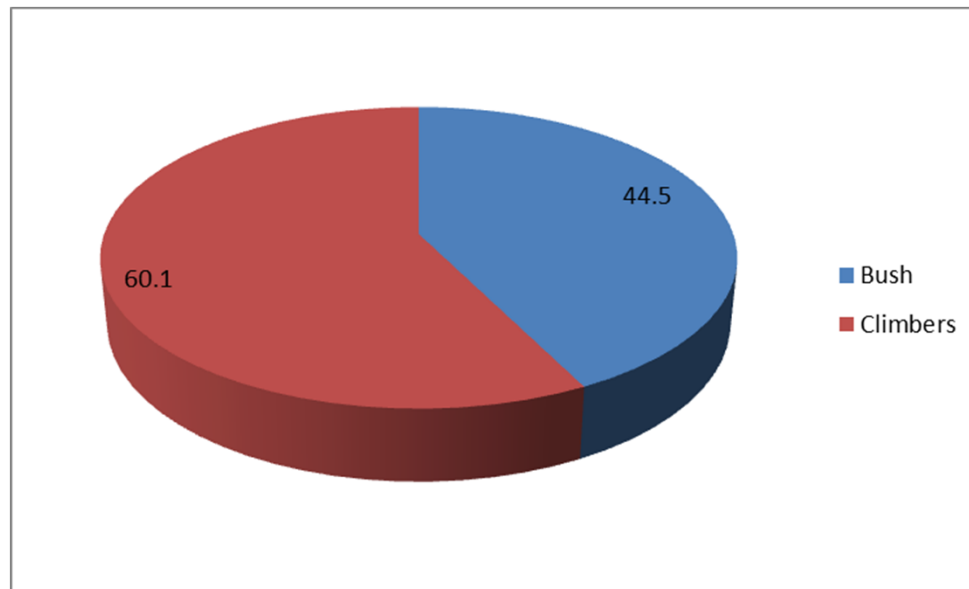
- Certified seed estimated at 30%; QDS at 70%

Seed production 2012/2013

2013	Breeder to basic	Certified
Planned	83	1296
Produced	205	1046
% over plan	247	81

- Projects on dissemination and partnerships worked

Bush vs Climbing Bean Seed Production

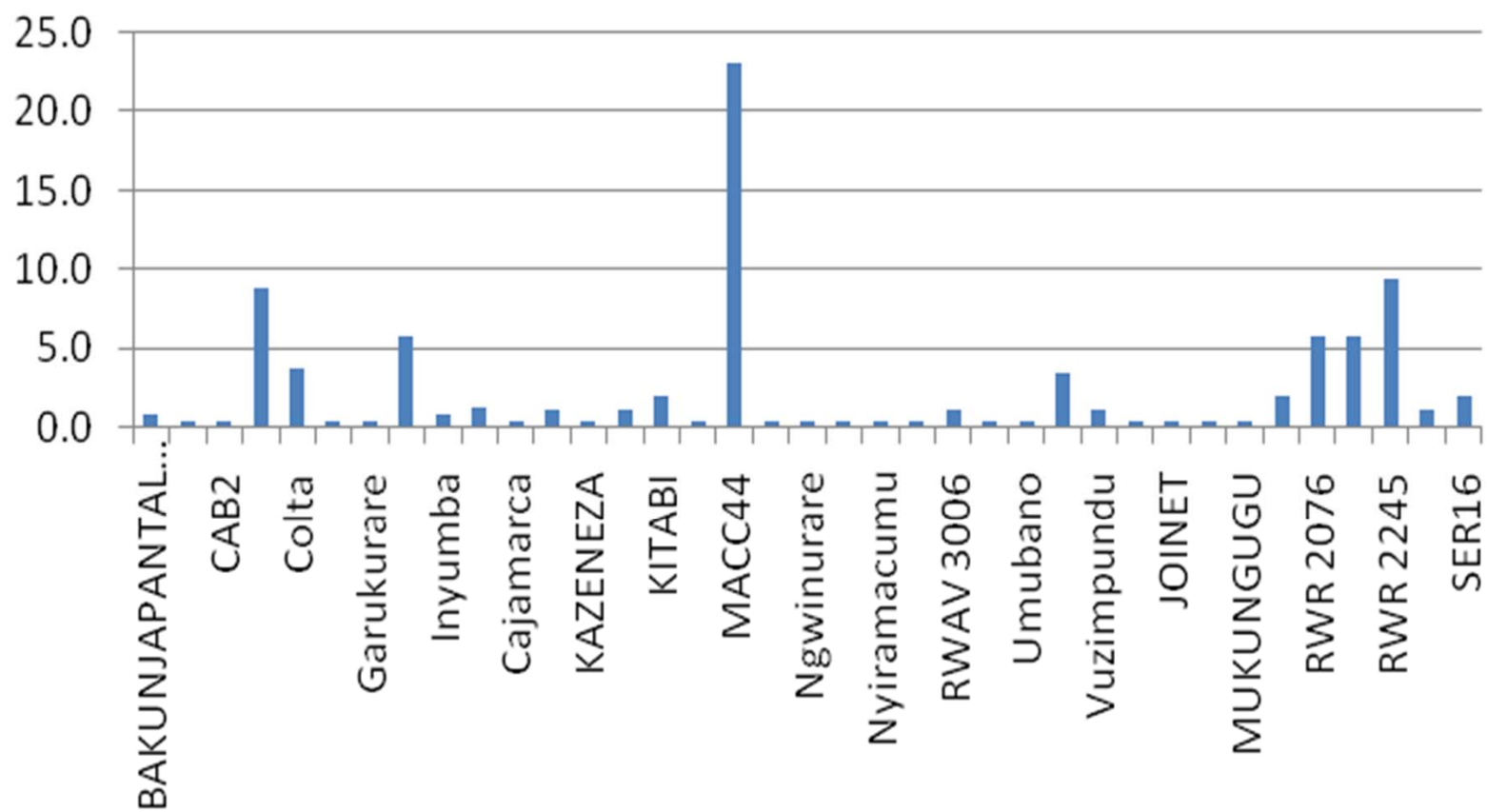


- Why more climbers?
- Favourable policy such as CIP in climbing bean growing environments
- More partners, especially FC's
- IMBARAGA Federation

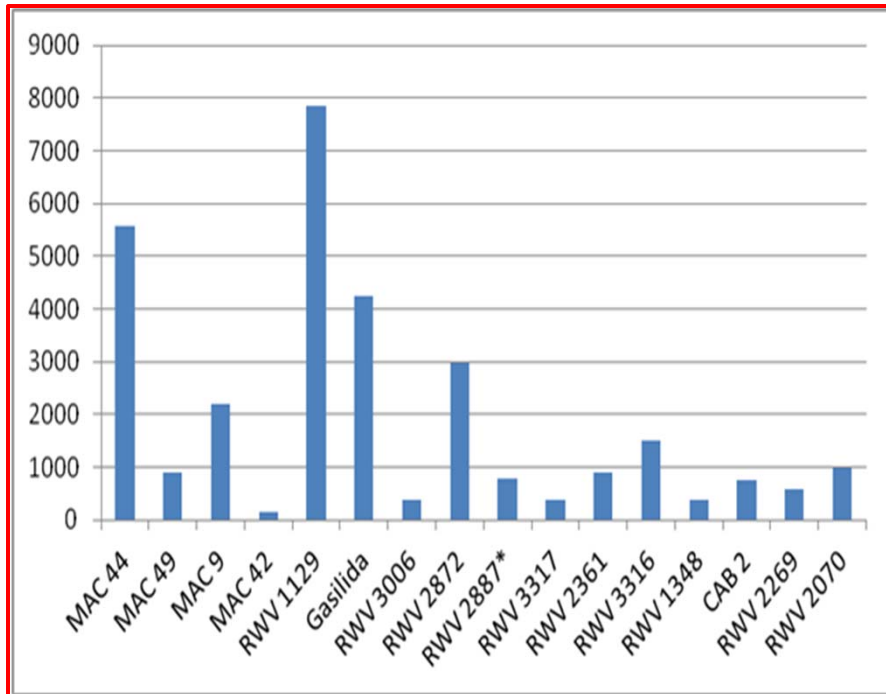
Partnerships

Type of organization	Name of institution	Zone of operation	Category
Research institute	RAB	All	Breeder/Pre-basic/Basic
Seed Company	Win Win Agrotech Ltd	East/North	Certified/Quality Declared
Seed Company	RISCO Ltd	East	Certified/Quality Declared
Seed Company	APC Ltd	North/West	Certified/Quality Declared
Farmers Federation	Imbaraga	North/West	Certified/Quality Declared
NGO	DRD	North/West	Certified/Quality Declared
NGO	DERN	North/West	Certified/Quality Declared
Project	HarvestPlus	All	Certified/Quality Declared
Cooperative	Imbarutso	East	Certified/Quality Declared
Cooperative	KOREMU	East	Certified/Quality Declared
Cooperative	PSM	West	Certified/Quality Declared
Cooperative	COAMV	North/West	Certified/Quality Declared

Improved varieties known by farmers

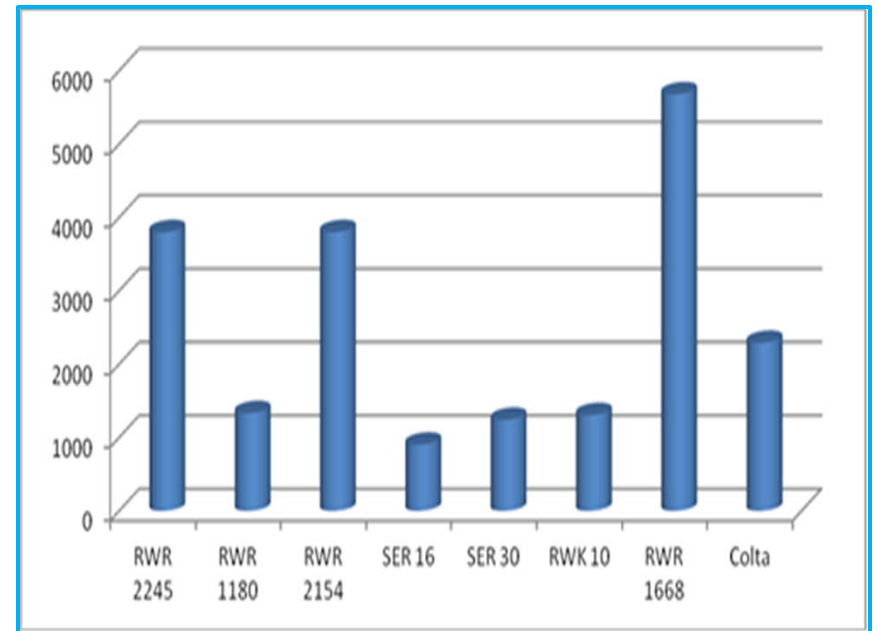


Varieties produced

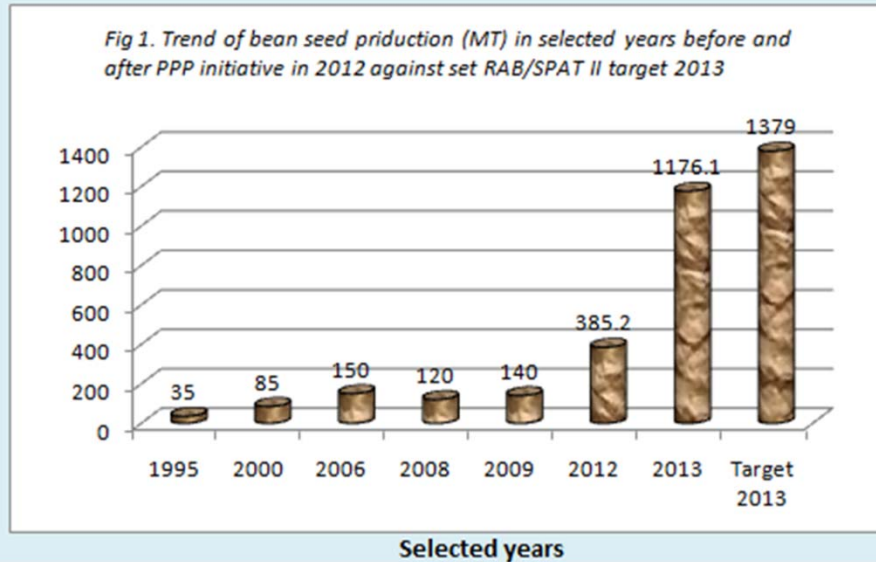


Climbers (16)

Bush beans (8)



Progress of seed production in 20 years



- Progress being made in increased seed production and dissemination since 1995

Number of beneficiaries 2011- 2013

Year	Households	Number of individuals		Total
		Male	Female	
2011	1,300	3,120	3,380	6,500
2012	4,400	10,560	11,440	22,000
2013	19,000	45,000	49,400	94,400
Total	24,700	58,680	64,220	122,900

Integrated crop management innovations

Staking challenges and innovations



Participatory evaluation of staking innovations

Option	Yield (kg/ha)	Group	Farmer preference (N=60)	
			(%)	Ranking
50,000 (no trellises)	3,180	A	25.0	5
16,700 (+ trellises)	2,928	A	91.7	1
20,000 (+ trellises)	2,900	A	70.0	2
23,300 (no trellises)	2,849	A	36.7	4
15,000 (+ trellises)	2,492	A	68.3	3
No stakes at all	1,727	B	8.3	6

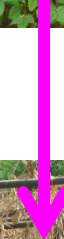
Innovations that reduce wood density and maintain yield



6th



1st



Farmer Augustin's Demo on staking innovations using strings to reduce dependency on wood



Farmer Theresa displaying harvesting beans on a string staking demo



Fertilizer demos



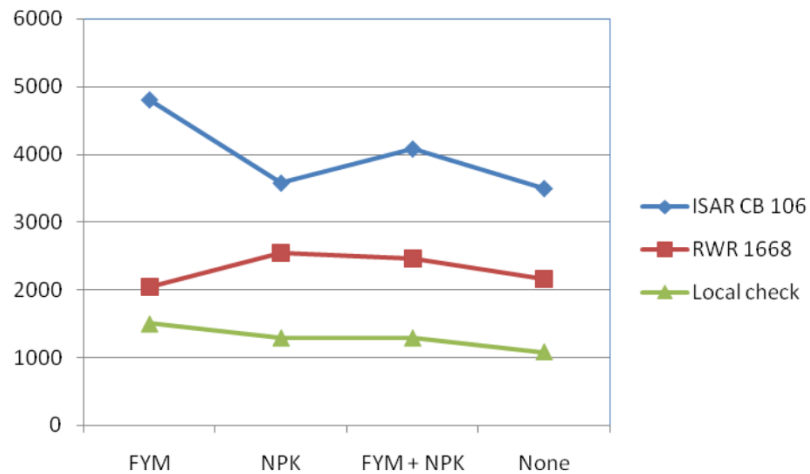
Demonstration of staking options



Agro-forestry in solving staking for small farmers



Integrated soil fertility management

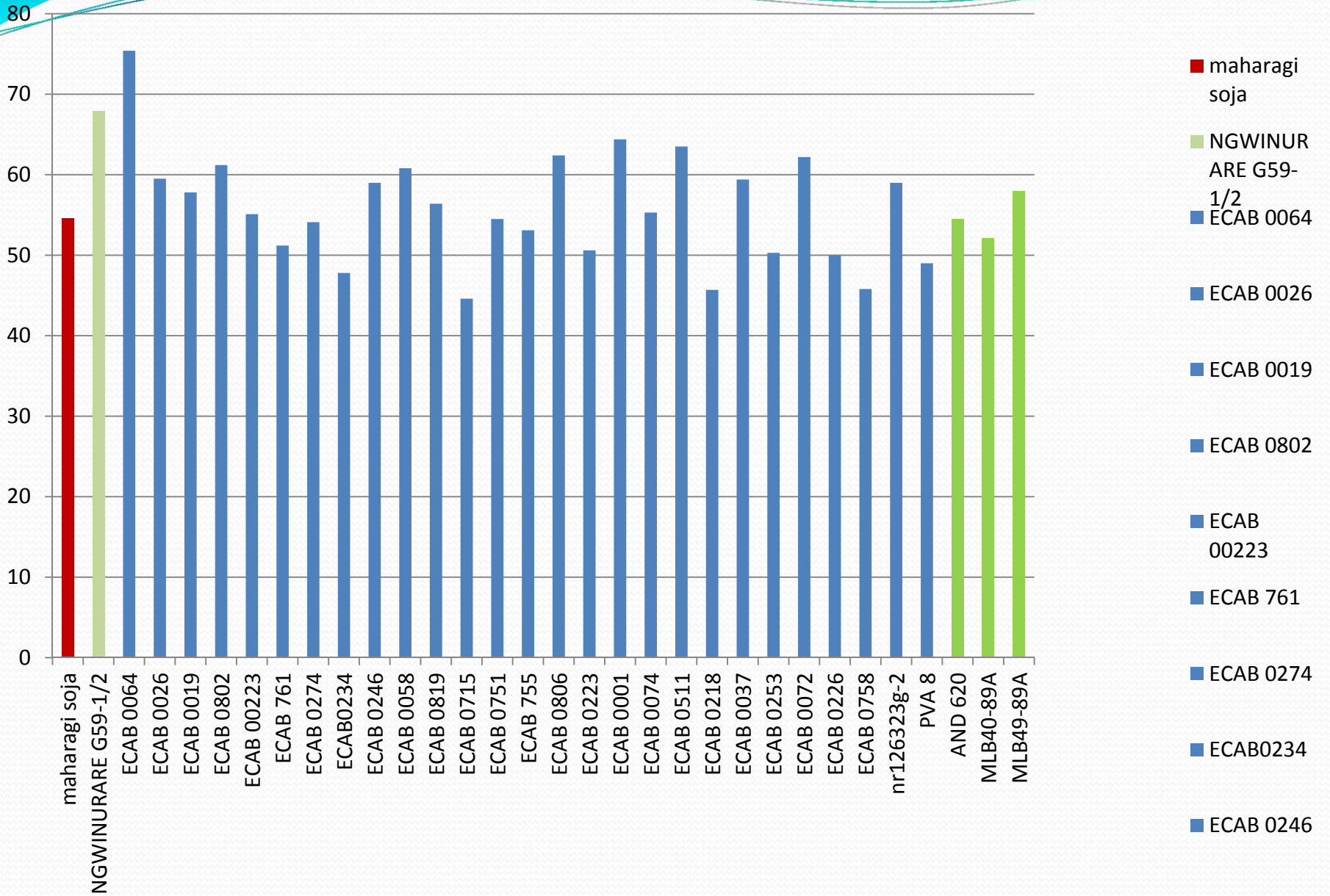


- Genetic potential of variety very important

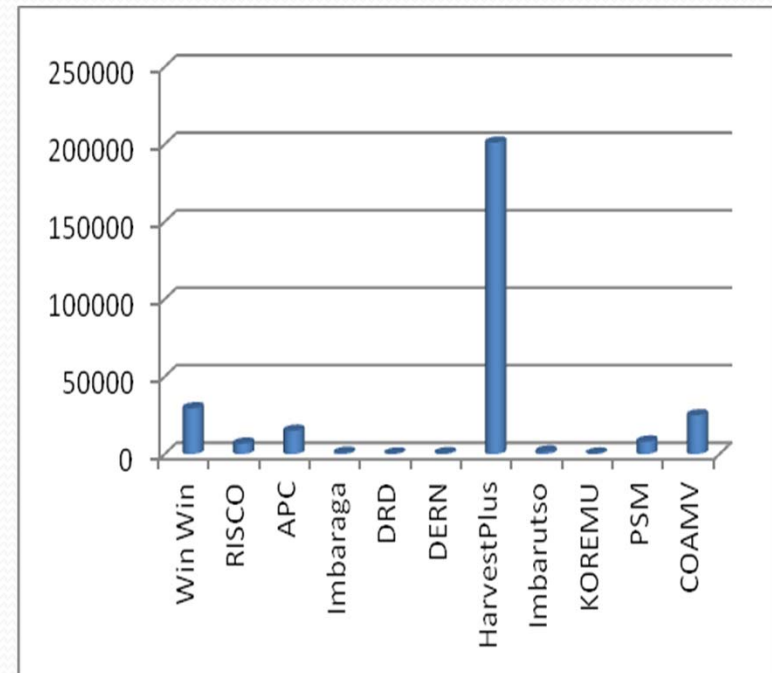
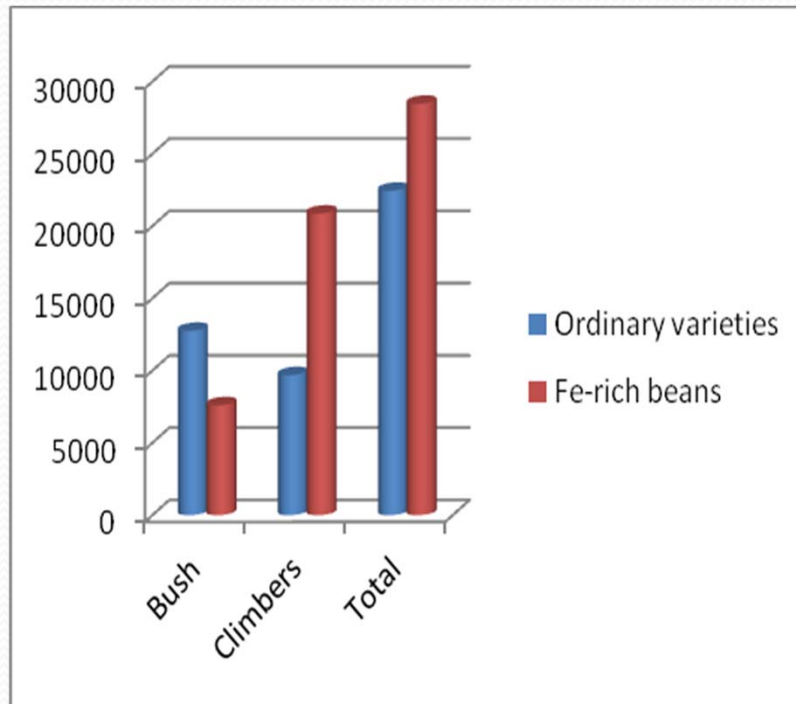
High Iron and Zinc bean promoted

<i>Release name</i>	<i>Pedigree code</i>	<i>Bean type</i>	<i>Average Fe (ppm)</i>	<i>Average Zn (ppm)</i>
• ISAR-SCB-103	RWR2154	Bush	75	37
• ISAR-BB-102	RWR2245	Bush	75	34
• Pre-release	RWV3316	Climber	93	31
• ISAR-CB-104	CAB2	Climber	85	37
• Pre-release	RWV2359	Climber	84	38
• ISAR-CB-102	RWV1129	Climber	81	34
• Pre-release	RWV2361	Climber	79	29
• ISAR-CB-107	MAC44	Climber	78	31
• Pre-release	RWV3006	Climber	77	36

ETHZ results: Fe ppm in RAB (Rwanda) Beans



Promote existing bean for household consumption and marketing





EVALUATION OF CULINARY PROPERTIES OF NEWLY RELEASED COMMON BEAN VARIETIES IN RWANDA

Dr V. Hilda, L. Butare, A. Musoni, J.
Nyiramugisha et al

Introduction

- **Beans and human nutrition**
 - ✓ Vital role - **protein** - growth / maintenance / development ; cognitive growth and development
 - ✓ Contribution to national dietary protein - 65%
 - ✓ Complex carbohydrates - **energy** (32%)
 - ✓ Provides **micronutrients** - iron, folates, zinc and vitamins A and B
 - ✓ **Soluble fibres** - 9 - 13 g / 100g - so lowers cholesterol
- **So beans are a near to perfect food** (CIAT, 1995).



Problem statement

- Traditional **long cooking hours** of dry bean - laborious and expensive.
- In villages **firewood / water** are scarce.
- **Charcoal** affect the environment.
- In order to enhance desired traits and mitigating the challenges in cooking bean, breeding was done.
- Sixteen new varieties were released by RAB and evaluated for their culinary properties.

Objectives of the study

- **To assess the culinary properties of newly released bean varieties by RAB:**
 - ✓ Determining their cooking time,
 - ✓ Assessing the water absorption capacity during soaking and cooking,
 - ✓ Determining the percentage splitting of seed coat and cotyledon during cooking.

Materials and methods

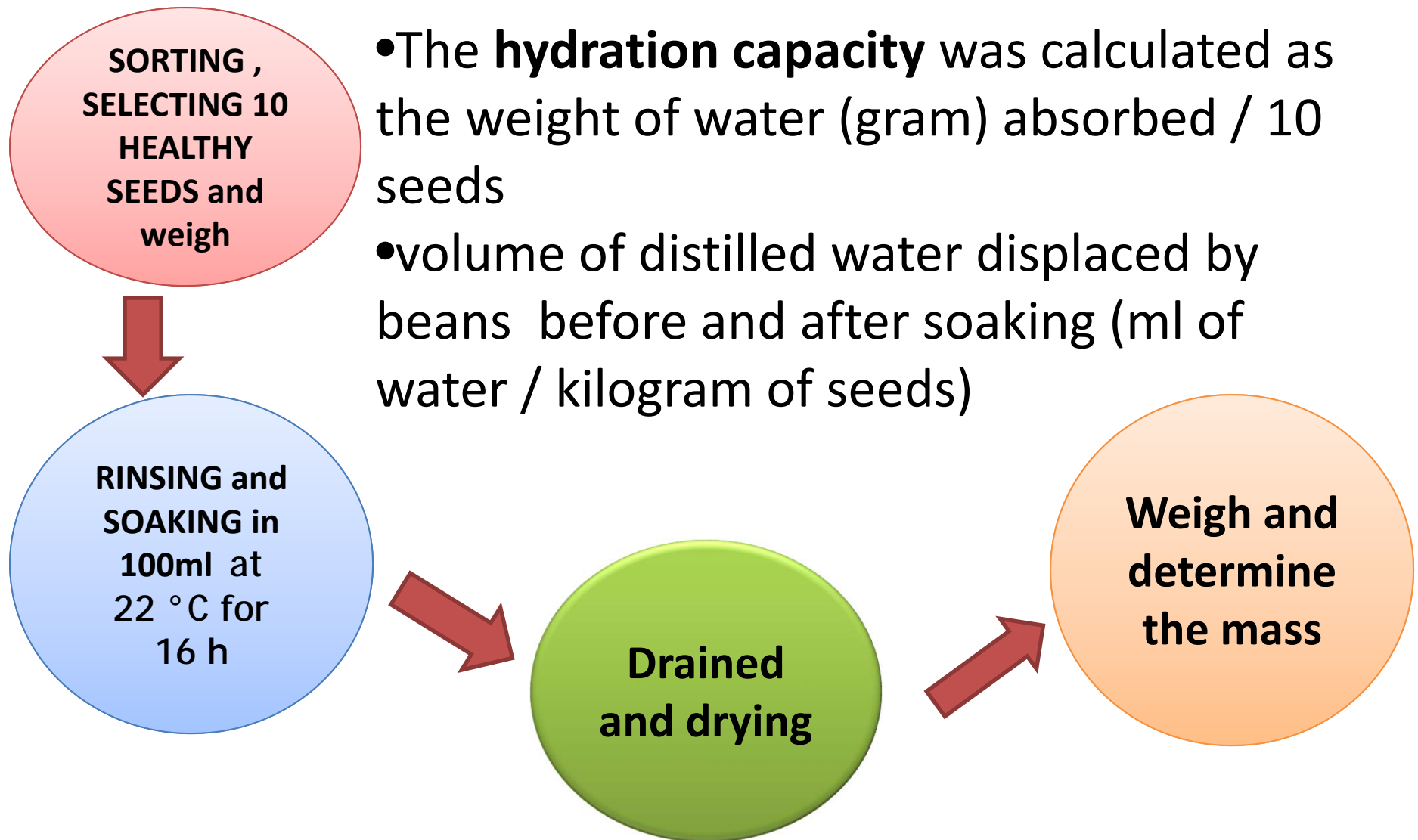
- **Bean Samples:**

- ✓ 16 newly released varieties

- ✓ Obtained from RAB

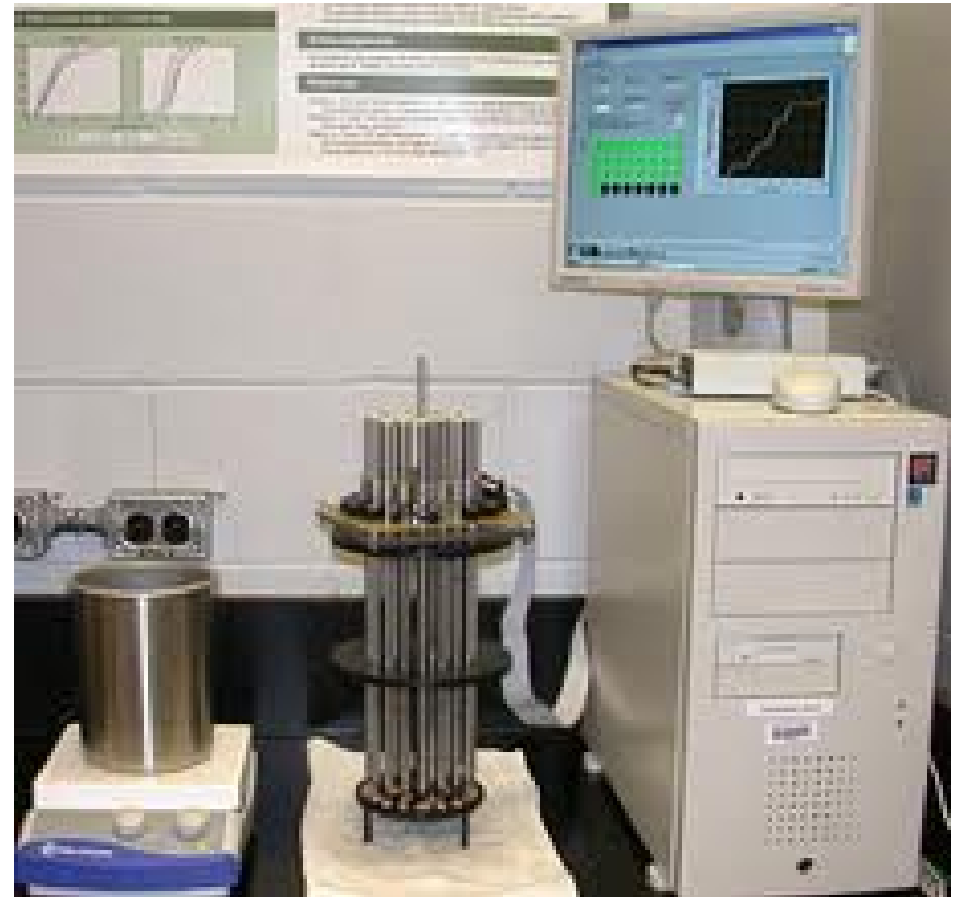
		RWR	
MAC 44	MAC 9	2361	CAB 2
	RWR	RWR	
GASIRIDA	2154	2245	GITANGA
RWV	RWV	RWV	RWV
3006	3316	2070	2887
	RWV	RWV	RWV
G 2331	2872	3317	1129

Assessing the water absorption capacity during soaking and cooking (Shimelis and Rackishit,2005) :

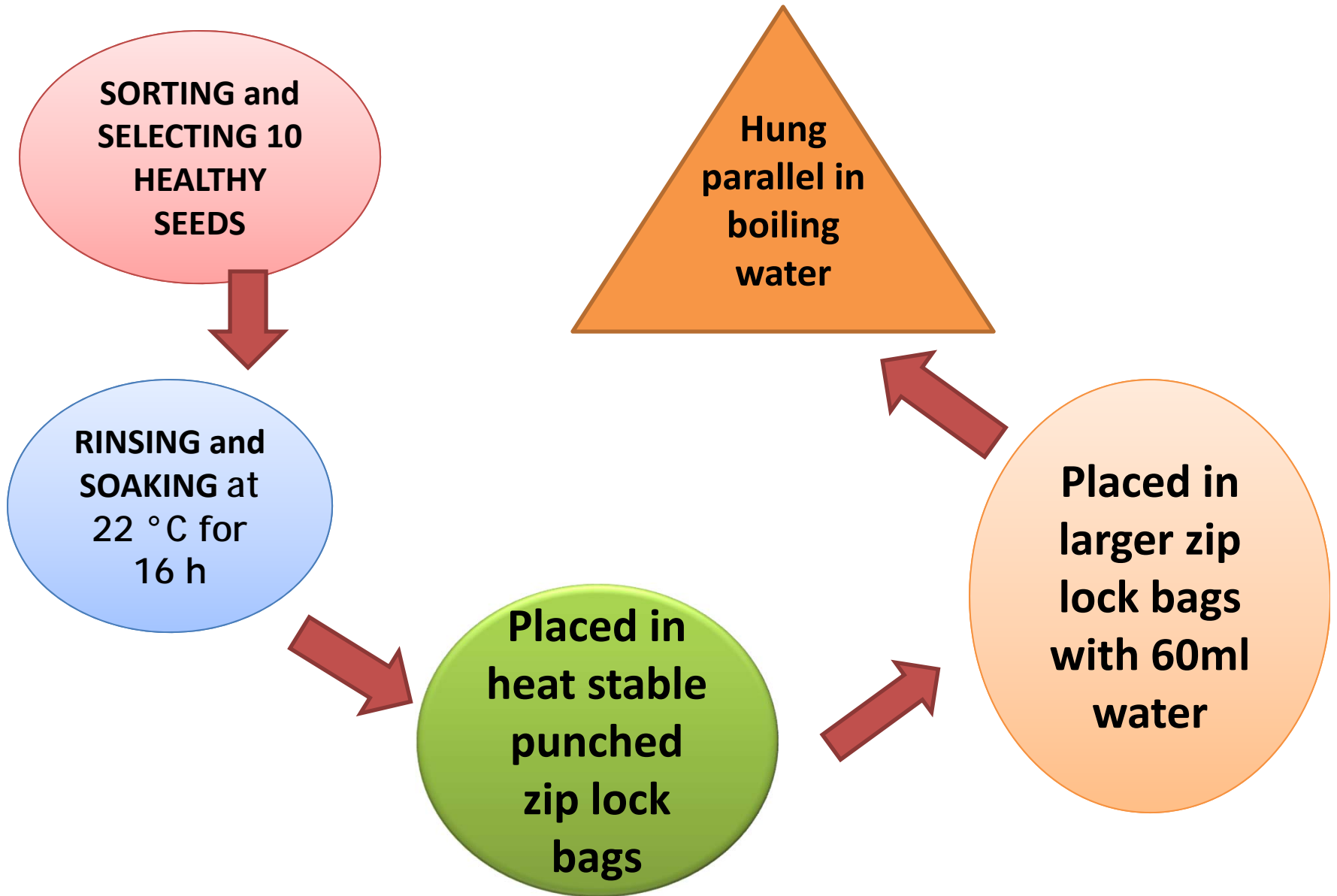


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- **Sample preparation and cooking method** [the procedure standardised by the Texas A & M University, University of Pretoria and Eduardo Mondlane University, Mozambique (Waniska *et al*, USAID, 2008)] :
- **Tactile sense:** A seed is deemed to be cooked when it can be squeezed easily.



Determination of cooking time:



Continued....

- Duplicate sub-samples (10 seeds each) were also maintained
- Bean samples were **withdrawn** taken using a **spoon at 2minutes interval** and
 - ✓ tested for softness
 - ✓ by squeezing the seed between the fore finger and the thumb.

Splitting of cooked beans:

- the **tendency of seeds to split during cooking** was determined by adopting the method described by Van Buren *et al* (2003).
- The **number of beans with split seed coats and cotyledons** **was counted** as the number of splits.
- The degree of splitting was calculated as follows:

$$\frac{\text{number of split seeds}}{\text{number of whole seeds}} \times 100$$

Results of the study

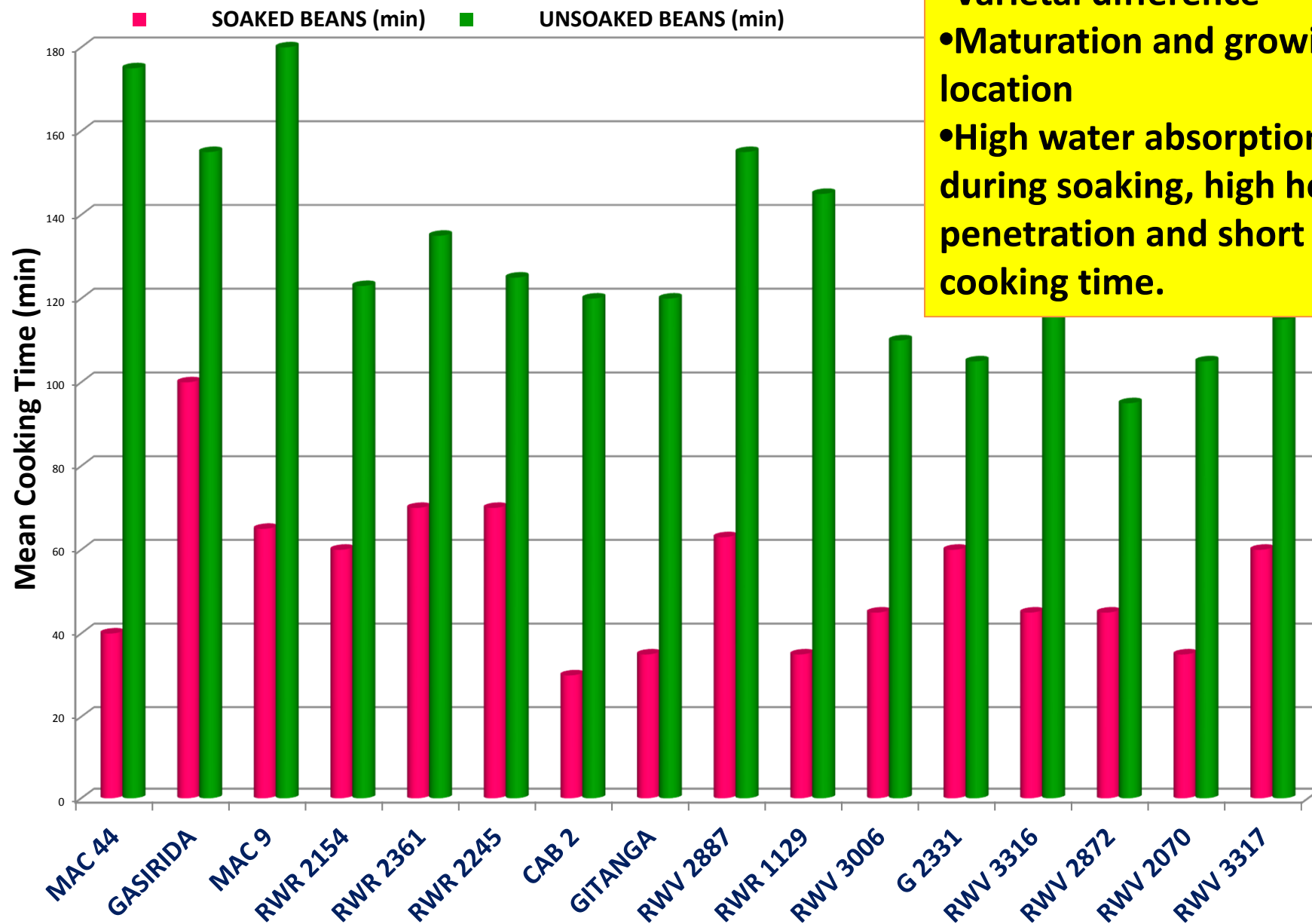
Cooking time (minutes) of beans:

Cooking time (minutes)	HIGH	LOW
Soaked	GASIRIDA (100±10.8 ^a) = 1 hr 40 min	CAB 2 (30±0.00 ^a) = ½ hr
Unsoaked	MAC 9 (180±15.47 ^b) = 2 hrs 40 min	RW 2872 (95±4.08 ^b) = 1hr 35 min

Continued...

- Pearson correlation (2 tailed) analysis - **positive (0.32)** in the cooking time **between soaked and un-soaked** bean seeds.
- The probable reason for these differences in cooking time:
 - 👍 was due to the **differences in bean varieties** (Fig:1).
 - 👍 **maturation and growing location** of seeds may also have contributed in variation of cooking time (Hsieh *et al*, 1992).
- The **16hrs soaking** enabled the **absorption of enough water** compared to unsoaked cooked bean seeds which had hard seed coats and testa that absorbed less water.
- Therefore, the **higher water absorbed during soaking the more heat penetration and shorter the cooking time.**

Fig 1: Cooking time of beans



- Positive between soaked and unsoaked
- Varietal difference
- Maturation and growing location
- High water absorption during soaking, high heat penetration and short cooking time.

Splitting of seed coat and cotyledons during cooking:

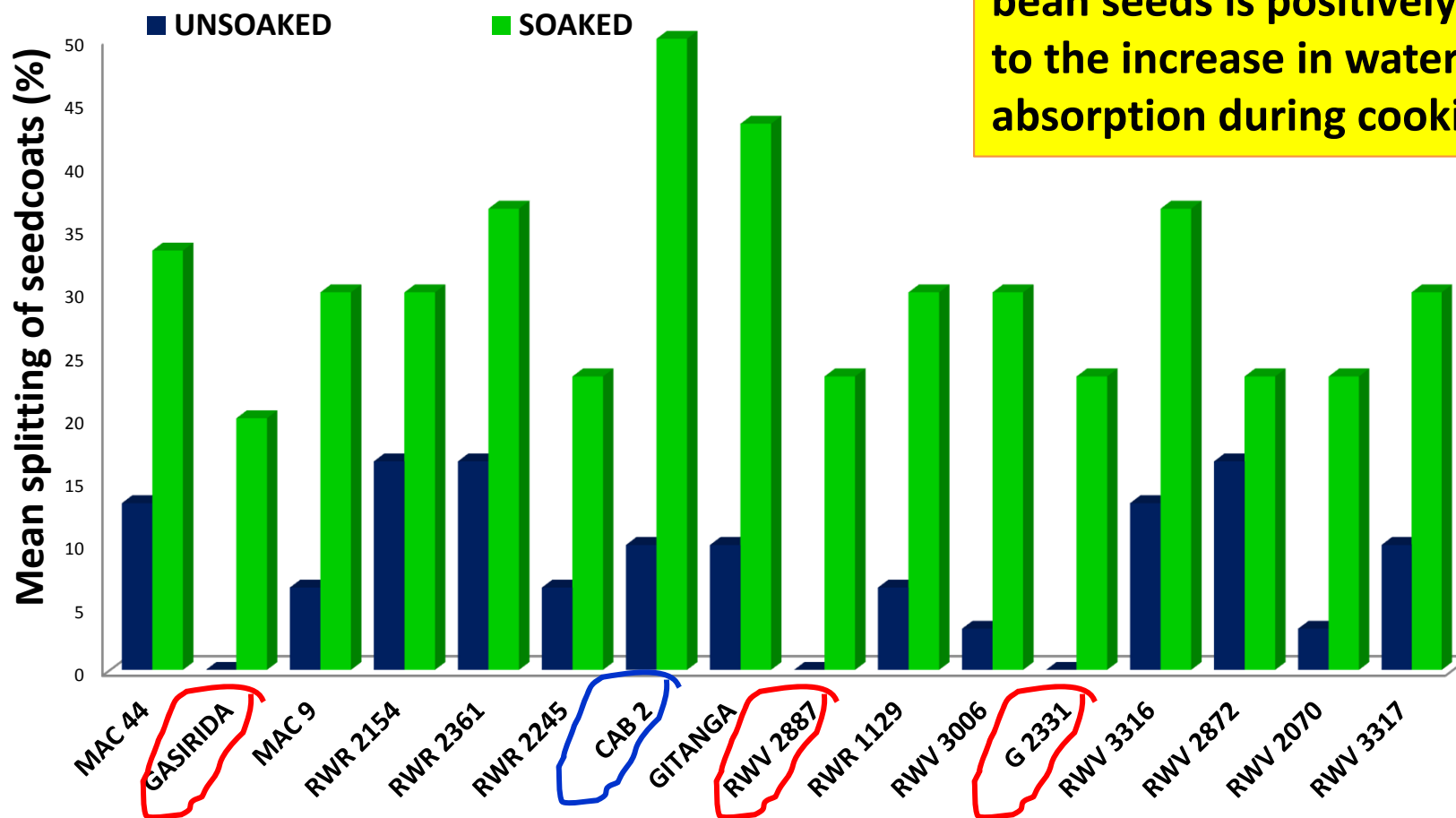
SPLITTING	HIGH	LOW
Soaked	CAB 2 (50±23.33 ^b %)	GASIRIDA (20±8.16 ^b %)
Unsoaked	RW 2152(16.66±4.72 ^a %)	GASIRIDA (0%)
	RW 2361 (16.66±4.72 ^a %)	RW 2887 (0%)
	RW 2872 (16.66±4.72 ^a %)	G2331 (0%)

Continuation.....

- **Pressure build-up within the seeds** during cooking gave rise to the development of fissures in the seed coat, cotyledon and cell wall of the soaked and unsoaked beans.
- It has been postulated that the incidence of splitting during cooking of bean seeds is positively related to the increase in water absorption during cooking (Van Buren J, *et al* 1986).
- Pearson correlation analysis was significant (0.47).

Fig: 2 Mean Splitting of seed coat and cotyledons

- High % of splitting in soaking
- Low % of splitting in unsoaked
- Unsoaked beans – 0% - 16.66%
- soaked beans –23.33% -50%
- splitting during cooking of bean seeds is positively related to the increase in water absorption during cooking.



Water absorption of un-soaked and soaked beans during cooking (g/10 seeds)

Water absorption	HIGH	LOW
Soaked	MAC 44 (8.2 g /10 seeds)	G 2331 (3 g / 10 seeds)
Unsoaked	RWV 2070 (7.66 g / 10 seeds)	RWR 2245 (4.13 g / 10 seeds)

Continued

- **Cooking of soaked beans absorbed little water** than unsoaked beans. **So soaking reduces the amount of water used during cooking.**
- Pearson correlation (2 tailed) analysis was highly significant (0.57) in the water absorption evaluated between soaked and unsoaked bean seeds.

Continued

- During cooking some beans **showed fissured seed coat** - contributed to increased water uptake which is a characteristic of cooking unsoaked beans which first soaked before they cook hence showing a statistically high water absorption capacity than that of pre-soaked beans.
- **Cooking of soaked beans absorbs little water** than un-soaked beans and this implies that soaking reduces the amount of water used during cooking.
- Soaking beans before cooking reduces the cooking time due to the onset of the structural degradation of the bean seed coat.
- Water absorption continues during cooking due to the added effect of cooking temperature and start solubilisation (Abbu-Ghannam, 1998).
- Pearson correlation analysis proved to be highly significant (0.57) in the water absorption evaluated between soaked and un-soaked bean seeds.

Take home message

- Soaking overnight decreases cooking time
- Soaking reduced the amount of water in cooking.
- The fast soaked and quick cooking (30 to 50 minutes) varieties to be encouraged for cultivation are **CAB₂, Gitanga, MAC 44, RWR 1129, RWV 3006, RWV 3316, RWV 2872 and RWV 2070.**
- Extension to the farmers and especially to women is vital



Train partners on utilization of selected bean based food baskets

- It was done by RAB- ASARECA in partnership with KIST
- Training of trainers



Selected bean based food baskets

- Bean bread
- Bean cookies
- Bean cakes
- Bean soup
- Bean bagia

BEAN BASED FOOD COMPOSITION

- **Recipes for Bread:**
- C Beans (20%) wheat Composite flour: 1kg
- C -Salt 10g
- C -Dry Yeast 25g
- C -Sugar 26g
- C -Oil 10kg
- C -Water 640g



BEAN BASED FOOD COMPOSITION

- **Recipes for Bean cookies:**
- C Beans (20%) wheat Composite flour: 254g
- C -Sugar 140g
- C -Milk 50ml
- C -Salt 2.2g
- C -Oil 72g
- C -Baking Powder 3g



BEAN BASED FOOD COMPOSITION

- **Recipes for Bean Cakes:**
- C Beans (20%) wheat Composite flour : 200g
- C -Sugar 180g
- C -Oil 160g
- C -Eggs 4g
- C -Baking Powder 4g
- C -Salt 1g
- C -Vanilla 10g



BEAN BASED FOOD COMPOSITION

- **Recipes for Soup flour (1kg):**
- C -Bean flour 700g
- C -Moringa 100g
- C -Potato 80g
- C -Leeks 20g
- C -Garlic 20g



BEAN BASED FOOD COMPOSITION

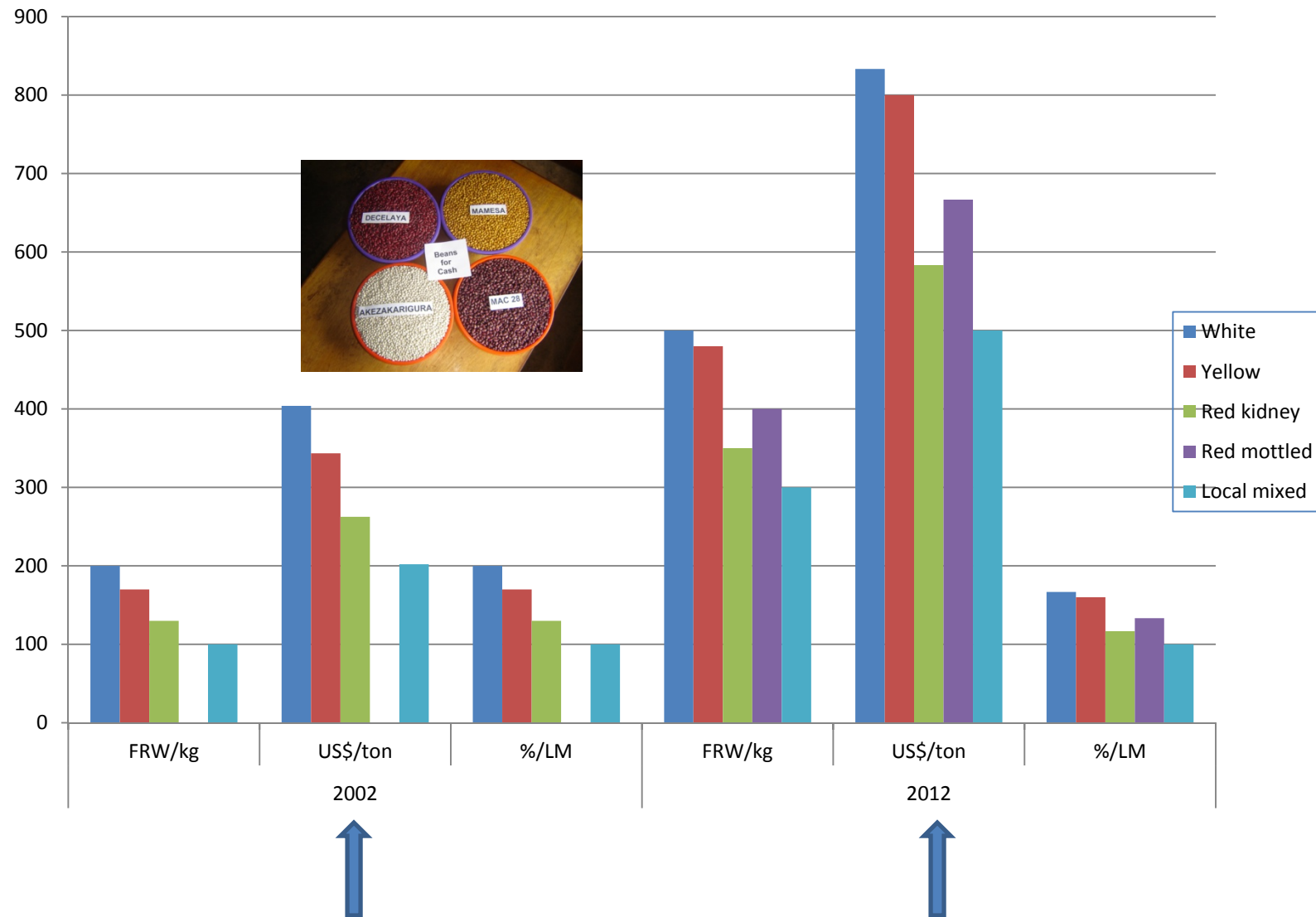
- **Karasev-Cold Extruded:**
- C -Bean flour: 150g
- C -Rice flour: 50g
- C -Salt: 5g
- C -asafoetida: 2g
- C -Oil (for frying): 5g



Market survey 2012

Actor	Sell at .../ton	Difference
Producer to collector	120,000 - 150,000	100,000
Collector/Trader to wholesaler	240,000 - 250,000	100,000 – 130,000
Wholesaler to retailer	260,000 - 270,000	20,000 – 30,000
Retailer to consumer	280,000 - 300,000	30,000 – 40,000

Differential prices for certain market classes



Dry Bean Varieties in the market 2013

Common varieties:

RWD 1180, MAC44, “Mutiki”, Colta, MAC 31, Sugar, CAB2 (Nyiramata), Kinyombwa, Decelaya

Most preferred variety:

RWR 1180 large bean “Mutiki” (its supply is very low)

Colta is the second preferred bean in the market.

Prices of dry bean products in the market

Open markets (red-mottled)

- ❖ RWR 1180 @ 450 fr/kg,
- ❖ MAC 44 @ 400 fr/kg,
- ❖ Red mottled
- ❖ Mixed variety – 350 fr/kg

Supermarkets

- ❖ Red mottled easy to cook variety – 900 fr/kg
- ❖ Colta easy to cook variety (45min)- 1400 fr/kg
- ❖ CAB2 easy to cook variety- 1400 fr/ kg

Characteristics and sources of dry beans

Characteristic of Bean supplied:

Well sorted, good quality, well dried, easy to cook (the supermarket)

Sources:

- ❖ Open Air market; Eastern part of Rwanda: Bugesera, Kibungo, Uganda.
- ❖ Super market: Mostly from Tanzania and also Italy, China, Congo, Tanzania

Quantity, price and payment methods

Quantity supplied and sold: 150kg per week for the open market.

: Average of 20 tonnes per month for the shops and super markets

Price determination method: Negotiation for the open air market and shops

:Fixed depending with market price for Supermarkets

Payment method: mostly cash, mobile money and rarely short term credit for open markets and shops.

:Direct payment or through bank account for the supermarket

Unique thing on Dry bean market:

- The easy to cook variety is fetching more price than double than the normal variety. Also the variety is mostly imported.
- RWR 1180 and Colta bean supply is lower than the demand.

Snap Beans

Common varieties: Iminyarwanda, imizungu both large and small size.

Most Preferred variety: Iminyarwanda??

Price: 200 to 500 fr/kg

Source: Muhanga, Kamonyi

Quantity supplied and sold: 50kg/ day

Characteristic of Bean Supplied: Should be clean, well sorted depending with the size, free from pest and diseases

Unique thing in Snap bean market:

- ❖ Interestingly enough the traders have no issue with the variety supplied.
- ❖ This market mostly target the people with health issues i.e. diabetes
- ❖ The variety of the snap bean does not affect the price.

Fresh Beans

Common varieties: Mixed variety, RWD 1180,
Decelaya

Most Preferred variety: well cleaned large variety.

Characteristic of Bean Supplied: Clean, well sorted
depending with the size, free from pest and
diseases, well matured,

Price: Buys at 100 fr/ kg in pods and shells then
sells at 700- 800 fr/kg

Source: Gisenyi, Nyabugogo, byumba

Fresh beans: Quantities and pricing

Quantity supplied and sold: Average 100kg
fresh pod/ day

Price determination method: Negotiation

Payment method: Cash payment

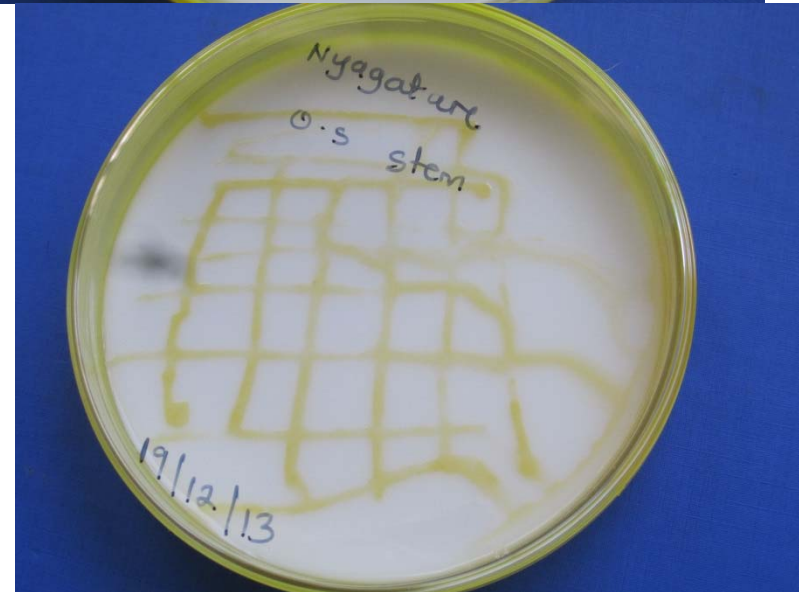
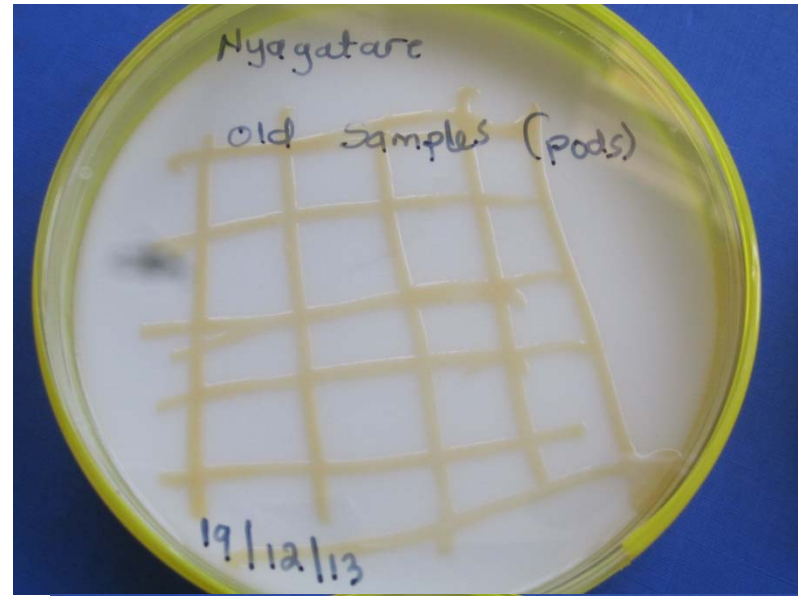
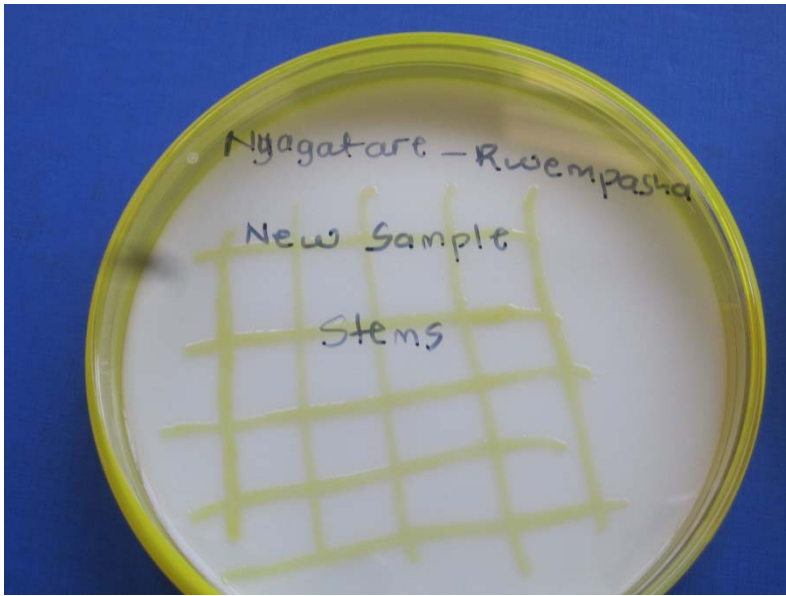
Unique thing in this market: The seller margin
seems very much attractive

Summary the bean markets

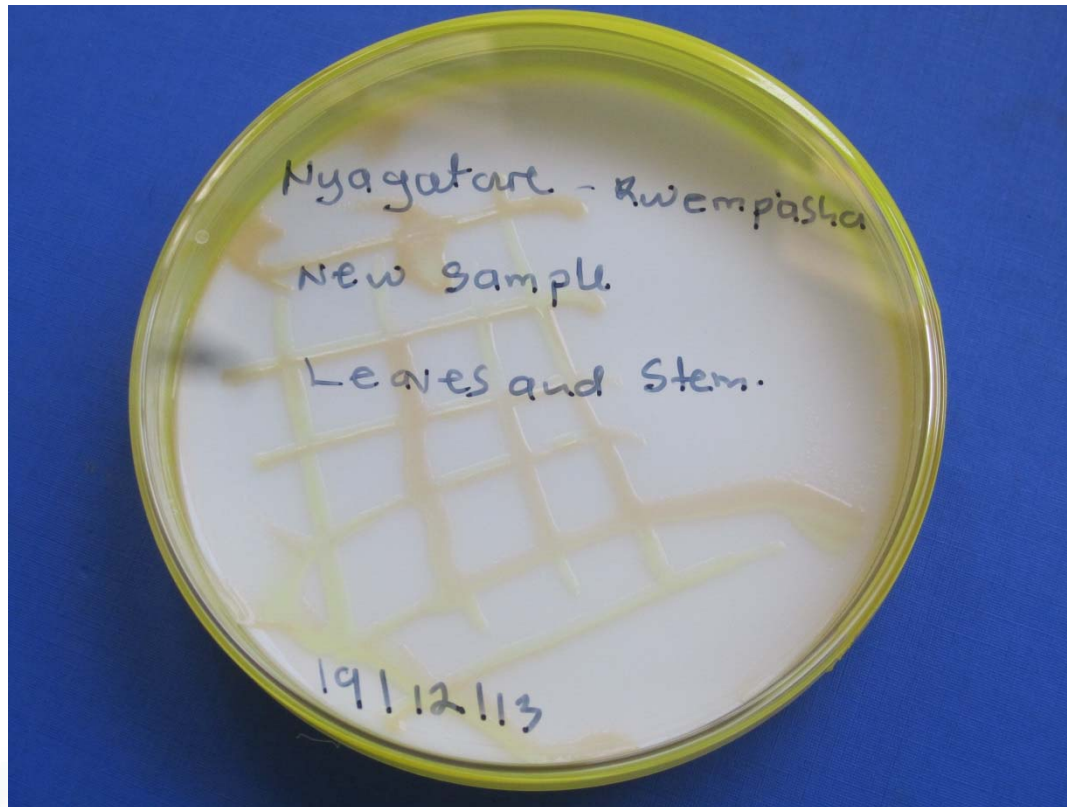
- In the open market and shops the traders did not label the bean product. Also they packed the product in khaki envelopes after the customer has purchased.
- Most of the traders argued out that packaging or labeling has no impact on the price.
- All traders are willing to buy from other sources.

Emerging challenges

- **DISEASES**



Xanthomonas like bacterial
isolations from seeds, pods and
stems



Xanthomonas like bacterial isolations from leaves and stems

Thanks for attention

