

Gender and Nutrition considerations in Demand Led Breeding: Experiences from Rwanda

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The breeding programme in Rwanda was set up with the farmer in mind. Farmer selected the varieties that come out of bean research from Rwanda Agriculture and Animal Resources Development Board (RAB) because it was high yielding, marketable and nutritive, resistant or tolerant to multiple abiotic and biotic production constraints. Gender participation in the breeding process is mandatory and influences and orients the breeder in breeding new varieties that are most preferred by men and women farmers along the value chain. In Rwanda, prior to variety release, breeders ensure that the released varieties have traits that both men and women farmers value.

In 2010 and 2012, ten (11) High Iron Beans (HIB) varieties were among thirty (30) released varieties (Table 1). These varieties are a geographic representation of Rwanda's biodiversity. The beans types are climbing, semi-climbing and bush beans taking into account market demands, yields, nutritional values, and the gendered division of labour

Nutrient deficiencies in women of productive ages and children have been noted in various studies in Rwanda, and the released high iron beans are addressing these deficiencies for smallholder farming households.

Name	Year of release	Origin	Yield (kg/Ha)	Iron content (ppm)	Growth type	Agro-ecological zone
RWV3006	2012	RAB	3,800	78	Climber	Mid-high altitude
RWV3316	2012	RAB	4000	87	Climber	High altitude
RWV 3317	2012	RAB	4000	74	Climber	High altitude

MAC 42	2012	CIAT	3500-4000	87	Climber	High altitude
RWV 2887	2012	RAB	3800	85	Climber	High altitude
RWV 1129	2010	ISAR	3000	77	Climber	High-Mid altitude
CAB 2	2010	ISAR	4000-4500	95	Climber	High altitude
MAC 44	2010	CIAT	3500	78	Climber	Mid -Low altitude
G2331	2010	CIAT	4000	67	Climber	High-Mid altitude
RWR 2245	2010	RAB	2500	76	Bush	Mid-Low altitude
RWR 2154	2010	RAB	1500-2000	71	Bush	Mid-Low altitude

Table 1: Beans varieties released in Rwanda in 2010 and 2012

Among the released varieties RWR 2245 released in 2010, was preferred by both men and women because of its high yield, adaptability to low soil fertility, early maturing, tolerant to drought, large seed size, marketability and delicious taste amongst others. Men were more interested in the marketability of the beans, storage quality, processing quality, non-shattering (which is often considered a quality preferred by women as it increasing drudgery during harvesting and can result in post-harvest losses). Women, on the other hand, were more attracted to the colour, fast cooking, tender leaves, snap quality and good taste linked to food security (Figure 1). RWR 2245 is very popular in Eastern Rwanda, in Nyagatare, Gatsibo, Ngoma, Bugesera and Kayonza Districts and Ruhango in the South with a yield ranging from 1,800 to 2,000kg/Ha at farm level.

Nyagatare district has more men grow RWR 2245 because of its market demand in Uganda and local market, while more women grow it in Nyagatare and other districts mostly for its colour, fast cooking and taste. The traits that make RWR 2245 a market niche is its red mottled colour (red speckled with white) and the fact that it is biofortified.

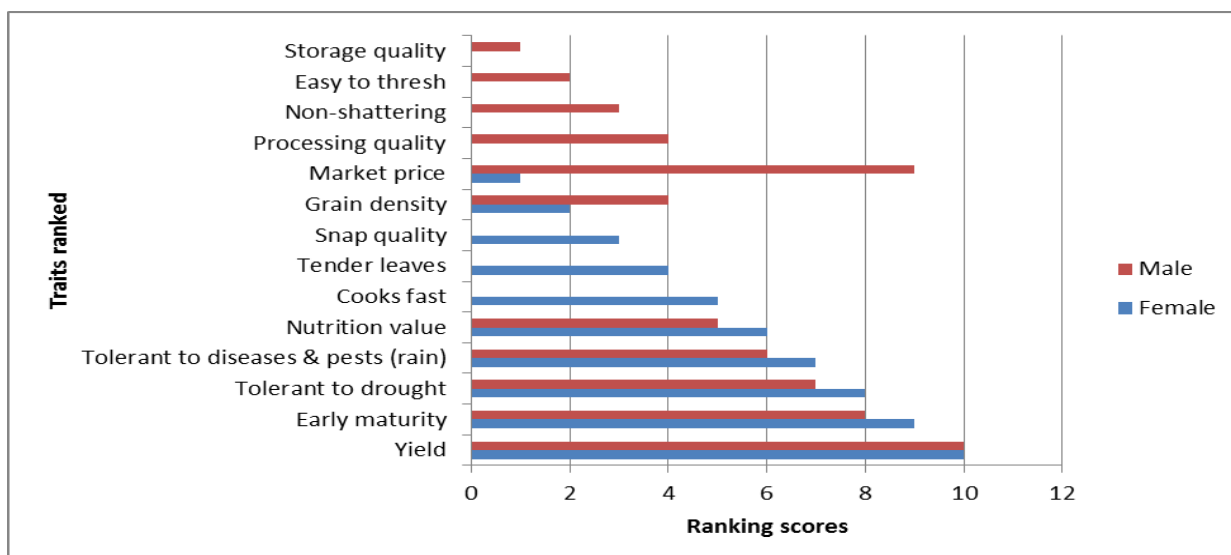


Figure 1: Trait preferences of men and women farmers for RWR 2245

Over the past four years, seed multipliers and researchers have reported RWR 2245 to be more susceptible to anthracnose with a decreased yield of 500 kg/ha. Despite its decrease in yield, farmers are still growing RWR 2245 as the other traits are still the same.

As a replacement strategy, the Bean program at RAB has developed a new variety with the same basic traits as RWR 2245. This new variety - RWR 3194 will be among some eight varieties lined up for release this year (Figure 2). RWR 3194 is not only high yielding (2,100 kg/ha compared to 2000kg/ha), but it is large seeded with an iron content of 86-94 ppm compared to 76 ppm in the RWR 2245; It is resistant to angular Leaf Spot, Anthracnose, Bean Common Mosaic Necrosis Virus, Common Bacterial Blight, Halo blight, *Fusarium solani*, *Pythium spp.* Rhizoctonia and Rust. Already women have shown their interest in RWR 3194 because of its seed size, which is slightly bigger than RWR 2245.



Figure 2: RW2245 and RWR 3194 from left to right

Breeding beans demanded in the market

The potential of beans is slowly building into big businesses. Breeding of beans specific to processing is a niche market that is growing in Rwanda and which was considered when selecting RWR 2245. Private sector interest and interaction has brought to the fore good bean varieties that are highly demanded in the market. RWR 2245 is a variety that is mainly for pre-cooked beans and bean flour. RAB, in partnership with Farm Fresh Ltd – a bean processor and marketer of pre-cooked beans have worked to identify the ideal variety for pre-cooked beans. The company packs pre-cooked beans that are high in iron as well as mixed beans in Kigali. The pre-cooked beans are sold to both low and middle income in retail markets, schools and institution consumers across Eastern Africa in Figure 3.



Figure 3: RWR 2245 processed as pre-cooked beans at Farmfresh Ltd.

PANOVITA Ltd. Is another bean processing company (Figure 4). They process bean flour made from RWR 2245. Their products can be found in the retail market (supermarkets) and wholesaler markets (schools and refugees' camps). They mostly target pregnant women, lactating mothers and children under five. You can find most of the products in Rwanda, as they are still expanding their processing unit and looking for external markets.

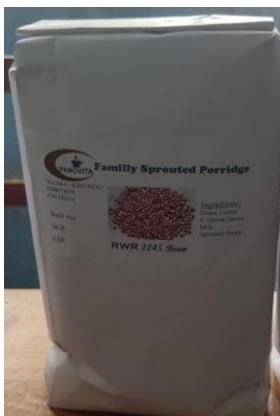


Figure 4: RWR 2245 processed as bean flour by PANONITA Ltd.

In conclusion, we can say that breeding priorities should be made based on several factors. Having information on the varietal and trait preferences of men and women farmers is not enough. There is need for information on the trait and varietal preferences of other value chain actors like processors. Other with market data (possible gender-responsive customer's profiles and market segments); is needed guide the choice on possible varietal replacement strategies and product profiles for future breeding in the country keeping in mind specific country breeding strategies and targets which could be on household food and nutrition security, income generation, gender equality etc.