



# Fighting Iron Deficiency

## New Improved High-iron and Zinc Beans Released in Tanzania



**Building  
Nutritious  
FoodBaskets**



## Fighting Iron Deficiency- New Improved High-iron and Zinc Beans Released in Tanzania

Tanzania has, for the first time, officially released two high-iron climbing bean varieties (MAC44 - Selian 14 and RWV1129 -Selian 15). Tanzania joins other countries in the region that have released high-iron bean varieties such as Rwanda, Burundi, DR Congo and Uganda.

The drive to release the high-iron beans was informed by the high prevalence of anemia globally and Tanzania, especially among the children under five, adolescent girls, and expectant mothers. The Tanzania Demographic and Health Survey and Malaria Survey Indicator Survey (TDHS-MIS) 2015-16 shows that anemia prevalence in children aged 6-59 months is at 58% with 26% mildly anemic; 30% moderately anemic; and 2% severely anemic. In some districts the statistics are worrying for example Shinyanga at 71% of children. Almost half (45%) of Tanzanian women of reproductive age (15-49 years) are anemic; with 33% being mildly anemic; 11% moderately anemic and 1% severely anemic. Anemia prevalence is highest in Zanzibar (60%), especially in the Kaskazini Pemba region (72%).

Iron deficiency is one of the most common micronutrient deficiencies in the world, affecting women, children, and infants most severely. Iron deficiency can cause anemia, where the body lacks red blood cells to carry oxygen from the lungs to other parts of the body. Iron deficiency among children and women of child-bearing age is a public health problem in many countries. Anemia is prevalent for women due to blood loss during childbirth, menstruation and generally increased requirement for iron. Globally, each year, 17,000 deaths in women of reproductive age attributed to iron deficiency anemia out of which 70% occurs in Africa. Other effects of iron deficiency include decreased physical performance and physical activity, decreased cognitive performance, depression and fatigue. According to the Global Nutrition Report of 2014; at least 40% of women of reproductive age suffer from anemia resulting from iron deficiency. This poses a major public health problem requiring appropriate nutrition interventions.

### What are high-iron beans and how can this help address the challenge of iron deficiency?

The high-iron beans are a special type of conventionally bred biofortified beans that contain high levels of iron and zinc. Biofortification enhances the nutritional value of staple food crops by increasing the density of vitamins and minerals in a crop through either conventional plant breeding, agronomic practices or biotechnology. Examples of these vitamins and minerals that can be increased through biofortification include iron, zinc and provitamin A Carotenoids.

Two high-iron climbing beans varieties; MAC44 (Selian 14) and RWV1129 (Selian 15) are now officially released in Tanzania. Selian 14 contains iron levels in the range of 75.17-85.35ppm and zinc levels in the range of 26.38-41.65ppm while Selian 15 contains iron levels in the range of 74.22-81.35ppm and zinc levels in the range of 27.38-42.55ppm. In addition, they are high-yielding and have acceptable seed color/type/size. They are highly preferred by farmers and consumers.

The research and release efforts were led by Selian Agricultural Research Institute (SARI) in partnership with ARI Uyole, ARI Maruku and the International Center for Tropical Agriculture (CIAT). The efforts were supported through the partners at the Pan Africa Bean Research Alliance (PABRA), The

Building Nutritious Food Baskets (BNFB) project, Tropical Legume III projects, Swiss Development Corporation (SDC), The United States Agency for International Development (USAID) and The Global Canada Affairs.

Together with farmers, these new varieties were tested in various agro-ecologies ranging from 1000 to 2000m above sea level in the regions of Arusha, Manyara, Kagera, Iringa and Mbeya. Studies were also conducted to ensure that these new crops have sufficient amounts of the nutrients needed to improve nutrition among the beneficiaries prior to the the national government official release.

The new varieties will complement already released and local non-biofortified bean varieties available in Tanzania and provide flexibility for both smallholder and commercial farmers in selecting variety of their choice, help to address iron and zinc deficiency in vulnerable groups (children under five and women of reproductive age) and at same time, provide income to bean value chain actors. To ensure seed availability, the research institutes are partnering with seed enterprises (individual, farmer group and seed companies) for massive seed production.

Common beans are one of the most popular food legumes consumed in Tanzania. They are a natural source of protein for both rural and urban populations. Introducing high iron and zinc rich beans in the diets is a highly cost-effective intervention for addressing iron deficiency and anemia.

**RWV1129**  
(Selian 15)



**MAC44**  
(Selian 14)



#### Traits in MAC44 (Selian 14)

- **Name:** SELIAN 14
- **Growth habit:** Climber
- Medium seeded
- **Iron:** 75.17-85.35ppm
- **Zinc:** 26.38-41.65ppm
- **Yield potential:** >2000 kg/ha
- **Maturity:** 90-110 days
- Best suited for mid to high-altitude area
- **Cooking time:** 19-40 minutes
- **Resistance/tolerant:** Anthracnose and Bean Virus

#### Traits in RWV1129 (Selian 15)

- **Name:** SELIAN 15
- **Growth habit:** Climber
- Large seeded
- **Iron:** 74.22-81.35ppm
- **Zinc:** 27.38-42.55ppm
- **Yield potential:** >2000 kg/ha
- **Maturity:** 90-110 days
- Best suited for mid to high-altitude area
- **Cooking time:** 19-40 minutes
- **Resistance/tolerant:** Anthracnose and Bacterial blight



**Characteristics**    **MAC 44 (Selian 14)**    **RWV 1129 (Selian 15)**

Leaf shape



Flower colour



Pod  
curvature/  
Pod beak  
Matured  
pod/seed



Plant growth  
type  
Branching  
and pod load



Dry seed  
colour



**For further enquiries, please contact:**

**Director**

Selian Agricultural Research Institute (SARI)

Email: selianresearch@gmail.com

**Dr Jean-Claude Rubyogo**

Seed Systems Specialist  
International Center for Tropical Agriculture (CIAT)

Email: j.c.rubyogo@cgiar.org

**Dr**

**Richard Kasuga**

Senior Country Coordinator (Tanzania)  
Building Nutritious Food Baskets Project (BNFB)

Email: r.kasuga@cgiar.org

