

Bruchid Resistance Breeding Pipeline: 2009-2017



Farmer managed seed production and dissemination

A contingent of the 121 farmers in the FRN will be recruited to produce seeds on QDS arrangement.

Mwampashe Joseph BR Beans QDS Seeds Farmer

" I have been an active member in the **SUA FRN** for about **4 seasons**, I am **excited about Bruchid resistant beans**, they are tasty, have comparatively better yield, mature early and demonstrate a degree of resilience to poor rainfall. After experiencing the better yield I have decided to **promote** these varieties, I am producing Quality Declared Seeds (QDS) for distribution to needy farmers. In 2016/2017 I **produced and sold 800Kgs** of the seed. From my visits to Chunya District I learnt that the District has a serious shortage of beans as it relies on deliveries from Mbeya, I approached a **village government** at Mapogoro Village that offered a piece of land for multiplication of the improved seeds. I am promoting the new varieties alongside the use of Utupa (*T. Vogelii*) through the **church** as it is the only **institution** in the village with large number of followers to **accelerate** the uptake".

Contextualized scaling

Promote seed policies that encourage cultivars for specific niches

SUA has made **preparations for certification** of **Bruchid introgressed beans** with Tanzania Official Seed Certification Institute (TOSCI) **starting in 2017** and **expected completion in 2021**.

Southern Africa Community of Practice



FRN

Social innovation



Stakeholder participation in variety setting:

Participatory selection was carried out in 3rd season of on-farm trials in the 3 locations and 1 on-station trials at SUA. 4 bruchid resistant lines have been selected by farmers based on adaptation to local production conditions with high yield, early maturity and tolerance to foliar diseases under natural field infestation. These included **ML3** and **ML10** resistant to both bruchids species and **ML8** and **ML11** resistant to only *Z. subfasciatus*. **ML9** was also selected by farmers for its yield, good seed size and colour for culinary purpose.

Modern breeding tools:

Molecular biology lab established at Sokoine University. Lab has served as a **node for several breeding research projects** and for marker assisted breeding. Increased inventory of Bruchid resistant material.

Multi-functional varieties:

A total of **60 multi-lines of Kablan-kefi** and **Soya** were generated that contain **PA/Arcelin2** (Bruchid resistance) with **phaseolin null** and resistance to **CBMV**.



Project Partners

DARS Chitedze Ministry of Agriculture Malawi

Sokoine Univ. of Agriculture

Oregon State Univ.

University of Puerto Rico

Achieve detectable, heritable variation for traits of interest among progeny generated:

PCR based arcelin- like **DNA markers** and **SDS seed storage proteins gel analysis** revealed the presence of target storage proteins (APA) in F1s indicating that the **APA locus is transferable by breeding**. Regularly these markers have been used and validated for continuous selection of breeding lines.

The diagnosis:

Bruchid damage was apparent in beans in all surveyed areas where measures were not taken to protect beans during storage.

Understanding local preferences and knowledge:

A **baseline survey (n=178)** in six major bean-producing areas of Tanzania led to the **choice of six farmer preferred lines (FPVs)**. Selection criteria used by farmers were **market demand, maturity, productivity (yield/ha), resistance to biotic and abiotic stress (drought tolerance, water logging and disease resistance), cookability & palatability**.

START HERE

LEGEND:

Results

CCRP strategies

COLLABORATIVE CROP RESEARCH PROGRAM

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