

# Africa RISING genetic intensification in Central Tanzania and Zambia

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## Key messages

- High yielding resilient varieties of legumes (groundnut, pigeonpea, & bambara nut); cereals (drought tolerant Quality Protein Maize (QPM), sorghum & pearl millet), have been developed. *Glyricidia sepium* and other fodder species has been evaluated and shared.
- Two new varieties of orange fleshed sweet potato (OFSP) are being promoted to address Vitamin A deficiency in Zambia.
- In Zambia 3 QPM varieties with 11-40% yield genetic gain have been identified.
- These new varieties, expand options for production being tolerant to the target agro-ecologies, Increase productivity by 2-3 fold and enhance nutrition option for smallholder farming communities.

## Objectives and approach

**Purpose:** Evaluate and deliver new crop and fodder varieties for sustainable intensification in dryland agro-ecologies of central Tanzania (Manyara, Kongwa and Babati) and Zambia.

**Approach:** On-farm testing under researcher and farmer management were used as appropriate. Farmer participatory evaluations were used to identify farmer and market preferred varieties and inform variety release. Fodder species were evaluated on-farm and options for propagation and inclusion in livestock feeding regimes tested. Seed systems were also tested for OFSP.

## Key results

### New resilient crop and fodder varieties developed and deployed

- **Cereals:** Two drought tolerant QPM varieties (CZH132019Q (T283-34) & CZH132003Q (T283-31) released in Tanzania (Figure 1) and three new generations of QPM lines were identified in Zambia
- **Legumes:** one groundnut variety have been released (Table 1) and four pigeonpea varieties namely Ilonga 14-M1, Ilonga 14-M2, Kiboko and Karatu-1 in Mlali have been evaluated and readied for inclusion in intensification and scaling activities.
- **OFSP:** The variety Olympia had faster multiplication rates and therefore targeted for scaling-up efforts.
- **Fodder trees:** Local leguminous and exotic trees species e.g. *G. sepium* have been tested for local adaptability and readied for promotion.

### Crop improvement pipelines strengthened

- **Dryland Legumes:** Resilient legumes such as bambara nut, groundnut and pigeonpea with up to 126% yield advantage have been shared with NARS.
- **Resilient and nutritious cereals.** NARS partners have accessed and tested nutrient dense pearl millet, sorghum and QPM and readied them for National Performance Trial (NPT).
- **Seed systems:** Vine production systems and evaluation standards have been evaluated for scaling out investments in Zambia.

## Significance and scaling potential

- **Significance:** The new crop and fodder genotypes can unlock food, nutrition and income security by increasing productivity and stabilizing production.
- **Scaling:** Under investment by private sector in these open pollinated crops requires appropriate and contextualized scaling models. These are being currently being evaluated and partnerships built.

## Partners

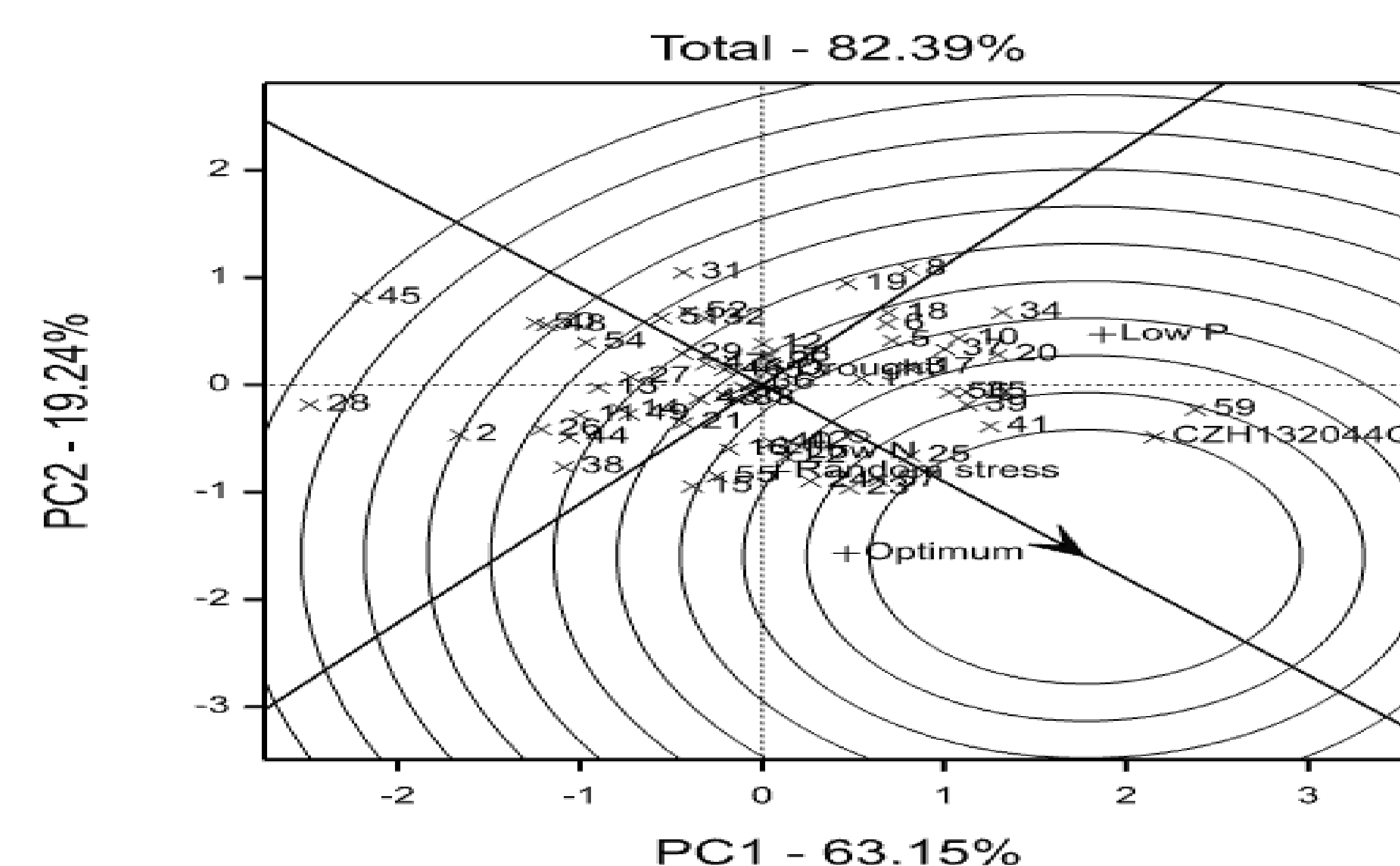


**Photos:** A- Farmers select QPM and groundnut varieties in Manyusi and Mlali villages respectively; B- *G. sepium* nursery and OFSP Olympia variety planting material evaluations.

**Photo credits:** W. Munthali, A. Kimaro and M. Lungu.

Variety	Grain yield (Kg/ha)			% Gain over local check
	Kiteto	Kongwa	Mean	
ICGV-SM 02724	2546	2674	2623	122.1
ICGV-SM 99568	1827	1386	1562	32.3
ICGV-SM 03519	1650	1598	1619	37.1
ICGV-SM 05650	2177	1870	1993	68.8
Local check	1084	1246	1181	0.0
ICGV-SM 01513	1698	1459	1555	7
<b>F.Prob</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	<b>&lt;.001</b>	
<b>CV</b>	<b>25.7</b>	<b>31.1</b>	<b>35.3</b>	
<b>L.S.D</b>	<b>475.5</b>	<b>432.8</b>	<b>387.8</b>	

**Table 1:** Performance of selected groundnut lines in Kongwa and Kiteto districts during one of the test growing seasons.



**Figure 1:** Performance and stability analysis of QPM genotypes identified three well adapted materials over two years of testing.