



# COFFEE BREEDING IN KENYA: ACHIEVEMENTS, GAPS AND PRIORITIES

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# OBJECTIVES OF COFFEE BREEDING IN KENYA



## Main Objectives

- To develop resistant/tolerant varieties that provides sustainable management of the **major coffee diseases** and **abiotic stresses**.
- To continuously improve yield and quality of the resistant selections.

# MAJOR COFFEE DISEASES IN KENYA



CLR in Low altitudes



CBD in high altitudes



BBC in windy and cooler high altitude areas



# BREEDING ACHIEVEMENTS



- Selection and subsequent improvement of yield and quality of 3 traditional varieties (SL28, SL34 and K7) – Released in 1930's
- Development and release of high yielding compact hybrid cultivar Ruiru 11, that combines good quality with resistance to major diseases of coffee (CBD & Leaf Rust) – Released in 1985
- Development and release of 3 lines of Batian cultivar that are also high yielding, of excellent quality and resistant to CBD and Leaf Rust – Released in 2010
- Ability to use modern selection technologies for enhanced development of new varieties – hypocotyl & leaf disc inoculation, MAS and efficient quality testing



- ➔ High Yielding
- ➔ Good Quality
- ➔ Resistant to CBD & CLR
- ➔ Early Maturing
- ➔ Compact/Dwarf
- ➔ Widely Adapted

**RUIRU 11 in Eastern Kenya (Low altitude marginal zone)**

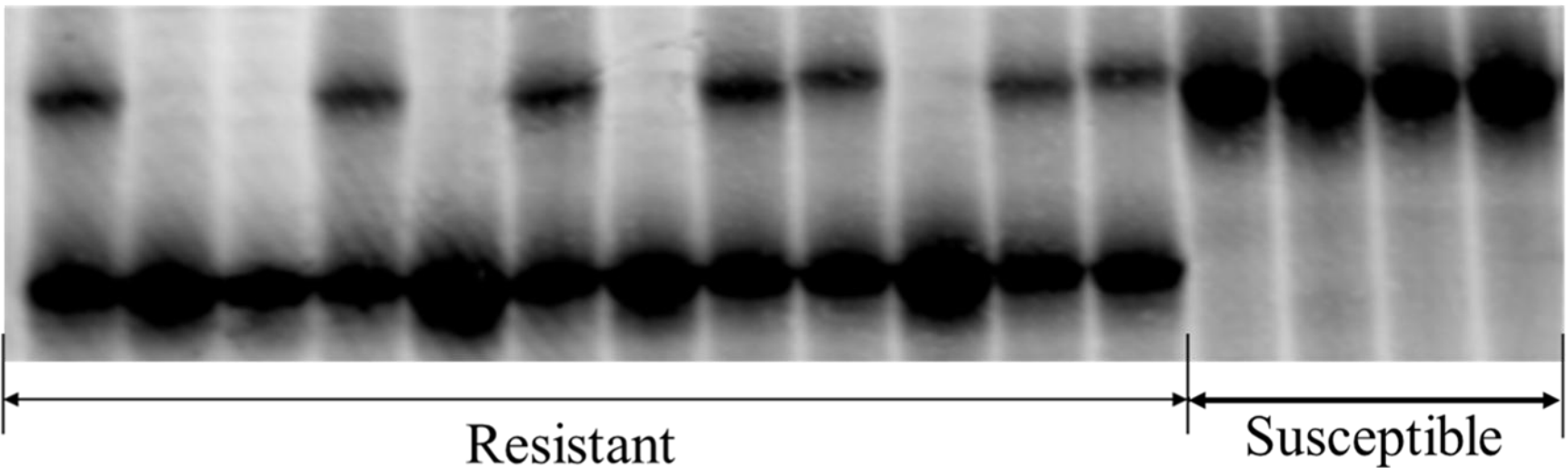
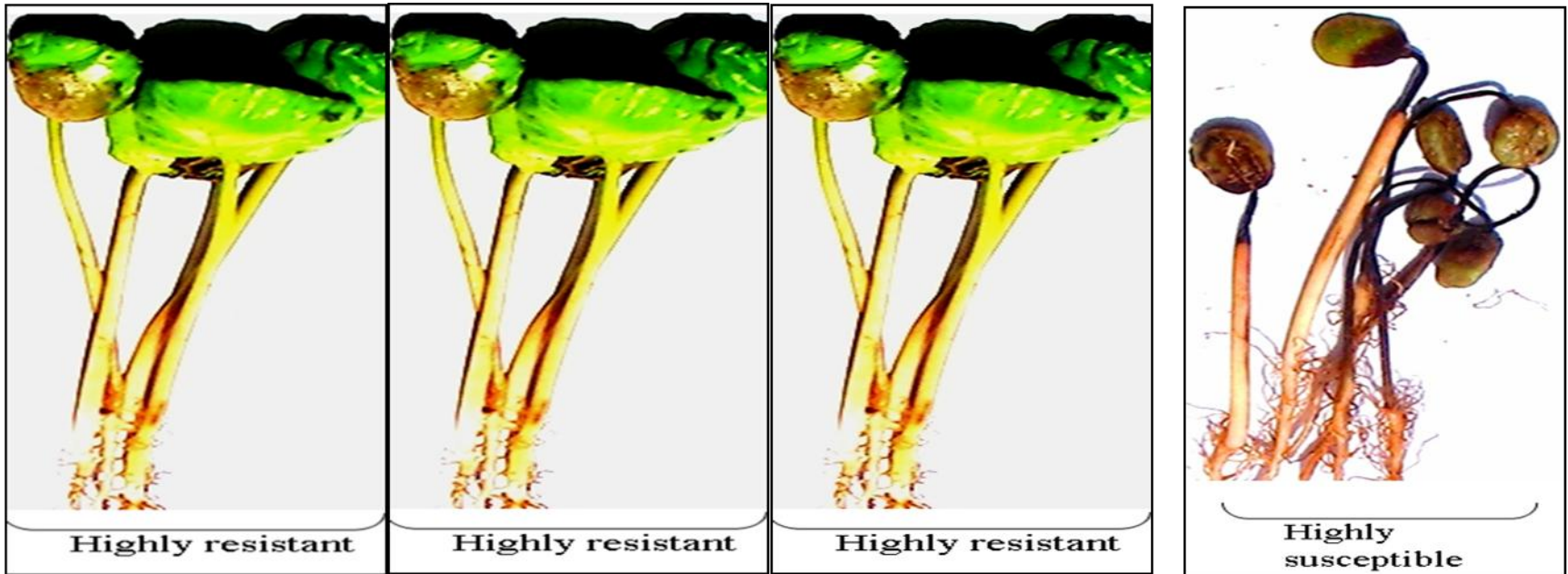


- ➔ High Yielding
- ➔ Good Quality
- ➔ Resistant to CBD & CLR
- ➔ Early Maturing
- ➔ Tall and Deep Rooted
- ➔ Widely Adapted

**BATIAN in Eastern Kenya (Low altitude marginal zone)**

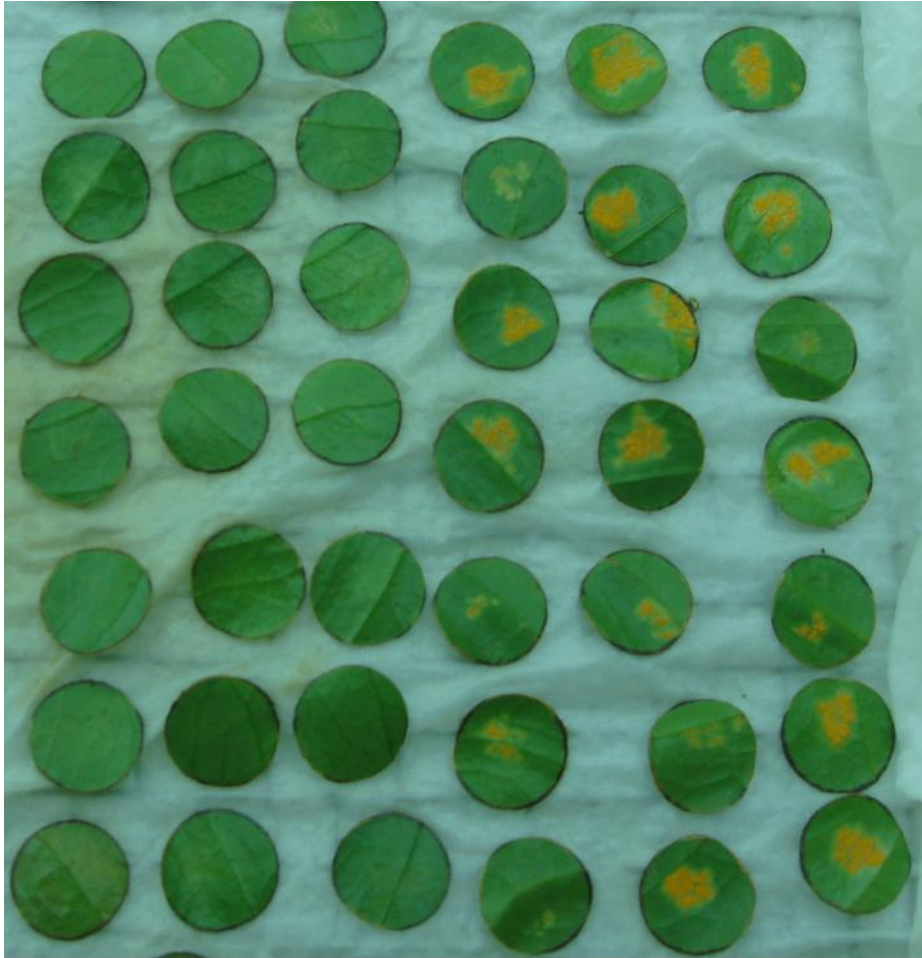
**OUR CAPACITY**

# MARKER ASSISTED SELECTION





# EARLY SELECTION FOR DISEASE RESISTANCE



Leaf Disc Inoculation for CLR



Hypocotyl Inoculation for CBD

# Selection for Cup Quality – Sensory Evaluation



# Well Equipped Analytical Laboratory



➔ Biochemical data

➔ Assessment of Toxins

➔ Pesticide Residue Levels

# Modern Tissue Culture Laboratory

## Advantages of TC

- Mass Production
- True to type plants
- Disease free plants
- Early Bearing\*\*\*

## Disadvantages

- High cost of production
- Requires high skilled labour



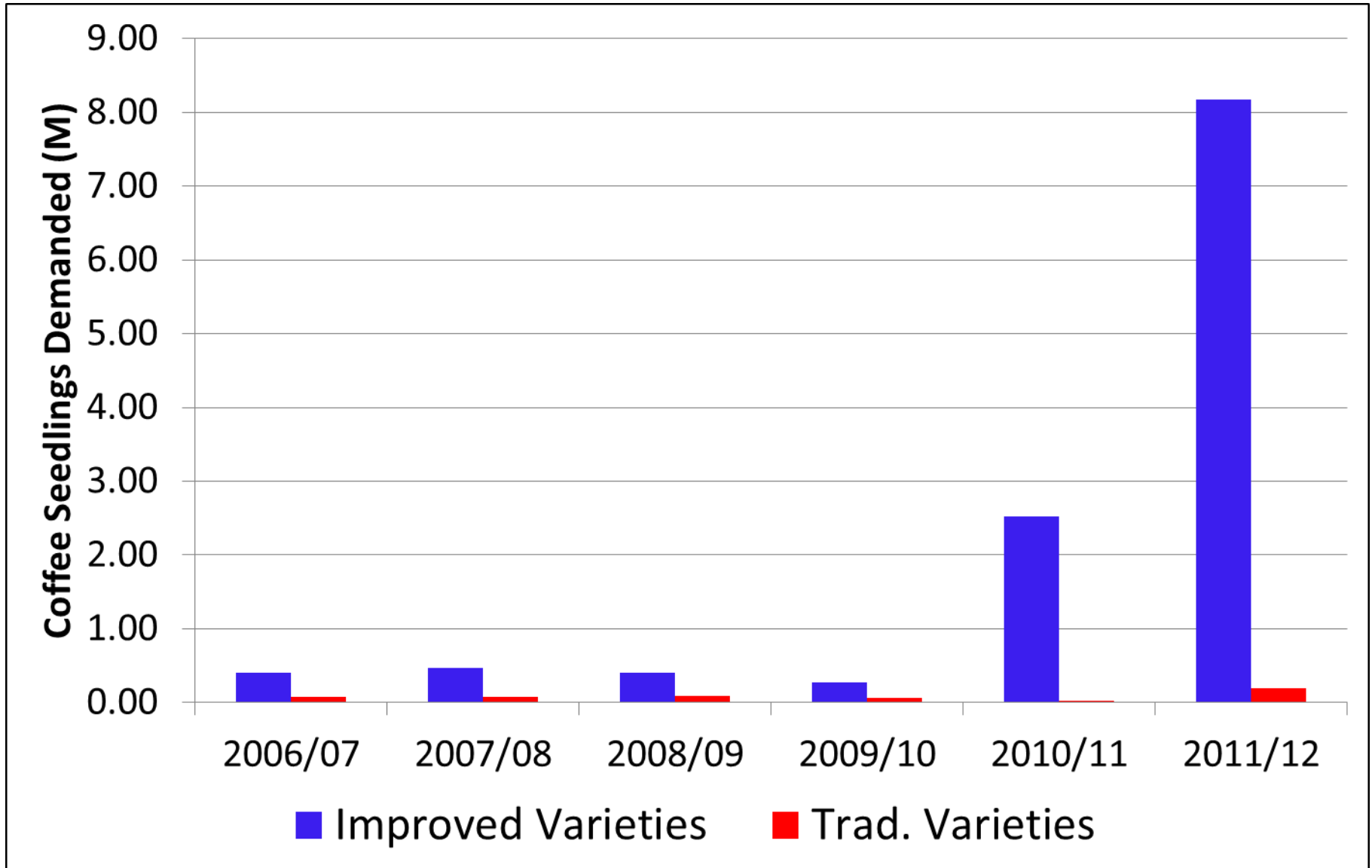


# GAPS and PRIORITIES



- **Breeding for durable resistance to CBD and Leaf Rust** without adversely affecting yield and quality.
  - Has been successful but an emerging challenge is the diverse variation within the pathogen to counter the narrow genetic base of Arabica coffee – 6 new races of CLR detected in Kenya
- **Selection for resistance to BBC** – Breeding programme being developed since the disease has become more widespread.
- **Climate change** – is changing dynamics of crop diseases and pests, reducing suitable coffee growing areas - necessitating breeding for tolerance to abiotic stresses (draught, salinity, high temperatures).
- **High demand of coffee planting materials** brought about by improved coffee prices and renewed interest in coffee growing

# Coffee Planting Materials Demand Trends





**Ahsanteni**

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