APBAConf2025 MaRCCI Side Event

Theme: *Winning the Race Against Food Insecurity, Malnutrition, and Climate Change Through Genetic Innovation*

Date: October 6 – 7, 2025 **| Venue:** Elephant Hills Resort, Victoria Falls, Zimbabwe, Matetsi Room

Day 1: October 6th, 2025: Time 4:30 to 5:30 pm **| Day 2: October 7th, 2025: Time** 2:00 to 2:30 pm

Integrating Data Science and AI-Driven Image Analysis for Genetic Innovation in African Plant Breeding

Background and Rationale

Africa faces a triple burden of food insecurity, malnutrition, and climate change. Plant breeding is central to tackling these challenges, but traditional methods are slow and limited in capturing complex traits. Data Science and Artificial Intelligence (AI), particularly image-based analysis from drones and rovers, provide transformative tools for high-resolution, non-destructive phenotyping. These innovations accelerate breeding cycles, improve accuracy in trait selection, and enable climate-smart, nutrition-sensitive varietal development

Objectives

1. Demonstrate practical applications of AI-powered phenotyping.
2. Explore models integrating drone imagery with traits and environmental data.
3. Build breeder capacity to adopt and adapt AI and data science tools.

Speakers

- **Dr. Stephen Opiyo** – Patira Data Science (USA/Uganda)
- **Dr. Richard Edema** – Makerere University / MaRCCI, Uganda
- **Dr. Rogerio Chiulele** – CE-AFSN, University Eduardo Mondlane, Mozambique

Key Focus Areas

- AI and image analysis for agronomic traits.
- Spectral image analysis for traits.
- Stress detection (drought, pests, diseases, nutrient deficiencies).
- Hands-on demos with open-source tools (R, RStudio, QGIS).

Expected Outputs

- Greater awareness of AI-driven phenotyping for African breeding.
- Stronger breeder–data scientist collaboration.
- Identification of training needs and RSIF/APBA partnership opportunities.
- Positioning breeding programs for faster, climate-smart innovations.

Target Audience

Plant breeders, geneticists, data scientists, agronomists, ICT/remote sensing experts, and agricultural R&D policymakers.