# Zimbabwe Plant Breeders Association

*Innovative. Creative. Exceptional*

## ZPBA NEWSLETTER Issue 1 of 2023

IN THIS ISSUE

# 1. Climate-smart tobacco genetics rolled out

By

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**Figure 1:** Tobacco Research Board (TRB) climate-smart tobacco varieties under trial in Masvingo, Zimbabwe.

## 1.1 Introduction

The Tobacco Research Board (TRB) has developed superior tobacco genetics since the 1950's and these are not cultivated in Zimbabwe only but well sought after in the region due to their wide adaptability, high yield potential, multi-disease resistance nature, and outstanding quality. To ensure growers continue to derive value from tobacco growing, breeding effort is an ongoing exercise with new genetics being put on the market to counter emerging challenges such as climate change and new pathogen variants.

In an exciting development, TRB announces the release of new tobacco hybrids bred for profitable production in marginal areas (previously excluded from tobacco production). The marginal tobacco growing areas such as Masvingo, Midlands, Matabeleland North, Gokwe North, Gokwe South and Matabeleland South are characterized by low rainfall, high temperatures, and dry conditions. The occurrence of such weather elements are now also prevalent in some seasons in the traditional tobacco growing districts. Their occurrences are being attributed to fluctuating seasonal variabilities and climate change. The new genetics are drought-hardy with a fast speed to topping, medium to fast ripening, multi-disease resistance, root knot nematode resistance (double dose), and gives an average yield potential of >2500 kg $ha^{-1}$ under dry and hot conditions. Thus, growers outside the traditional tobacco growing regions will especially benefit from the use of these new genetics. Additionally, growers in the traditional regions may also benefit from use of these genetics as a management tool for double cropping and maximum use of farm resources such as barns. The new tobacco genetics are T78, T79, T80, and T81 (denoted 'T' for trial/test). These are now available on Limited Release Program during the 2023-24 tobacco growing season.

## 1.2 Climate Change and Tobacco Production in Zimbabwe

Traditionally tobacco production in Zimbabwe was concentrated to north, eastern and central parts of the country (**Fig 2A**) and varieties were developed specifically to cater for these production environments. Climate change-associated shocks coupled with the recent increases in the tobacco grower base in Zimbabwe has seen the crop being also grown outside of these traditional areas (**Fig. 2B**). These dynamic changes in the tobacco production matrix spurred breeding efforts to explore genetics that can be combined to create a new class of varieties with a fast speed to topping to attain the 18 -19 reapable leaves and guarantee yield. Thus, the genetics have a drought escape mechanism; good management and growing conditions after topping results in accumulation of biomass thus further improving the economic yield.

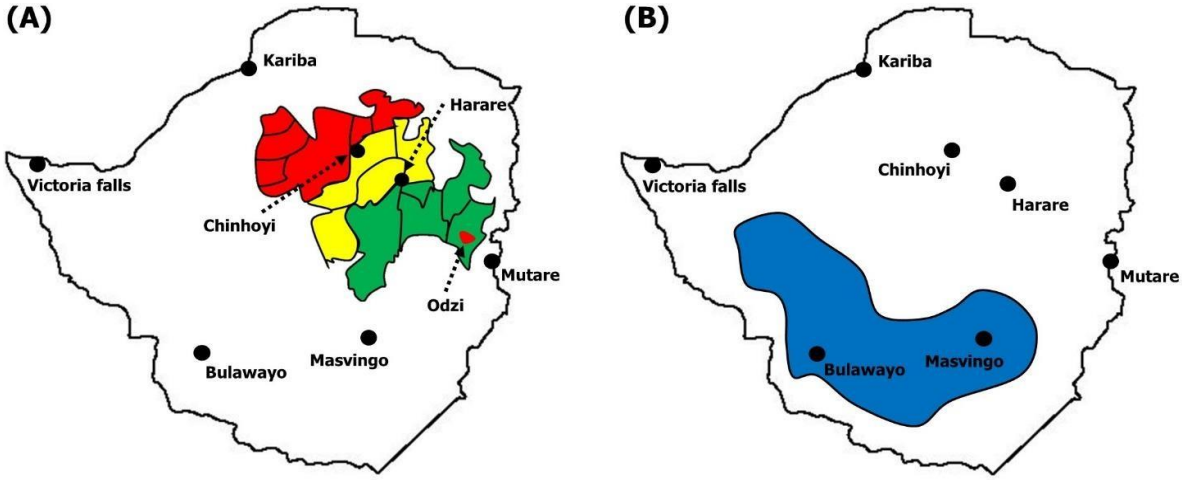


**Figure 2 (A&B):** Map of Zimbabwe with (A) sample points indicating traditional tobaccoproducing regions and (B) sample points representing new tobacco growing regions. Redindicates fast-growth, yellow indicates medium growth, green indicates slow-growth, andblue indicates new growing regions.

The new genetics field performance was primarily selected for fast speed to attainment of 18-19 reapable leaves and also proofed to vagaries of weather elements through selection of key physiological and biochemical parameters. This was done using rigorous gaseous exchange tests employing state-of-the-art Infrared Gas Analyses (IRGA technology **(Fig 3).** This enabled the acquisition of precise physiological measurements of fundamental processes such as photosynthesis, stomatal conductance, transpiration, and intercellular carbon under simulated drought stress conditions to select genotypes that could withstand imposed stresses. Furthermore, additional information on growth habit, root architecture (root volume and root depth), fertilization response, and capacity to recover and provide high leaf yield after extended drought stress periods were used as a criteria. Thus, the newly released genetics' performances are underpinned by rigorous and meticulous scientific tests.


**Figure 3:** TRB technician using an Infrared Gas Analyzer (IRGA) to take key physiological measurements on the new drought-tolerant tobacco varieties. Photo credit: TRB.

### 1.3 Characteristics of Limited Release Varieties

The varieties can grow and produce good yields with short rainfall seasons as well as in low rainfall locations. Furthermore, the varieties are multi-disease resistant, fast growing(speed to topping is 6-8 weeks after planting). Although these varieties are fast in growth, they considerably slow down after topping allowing accumulation of biomass, uniformly ripen, and mature without putting the farmer under harvesting pressure. Yields of at least 2500 kg $ha^{-1}$ are guaranteed in marginal areas and in a severe drought year. The new genetics feature a wide variety of cured leaf styles ranging from lemon to deep orange/mahogany;this allows growers to select varieties that will meet demands of their merchants.

### 1.4 Conclusion

The golden leaf, as it is commonly known, should be cultivated by any willing farmer, regardless of where their farms are located. The development and introduction of varieties appropriate for marginal areas contribute significantly to ensuring that no one and no location is excluded from tobacco production. The release of these new geneticsis also in support of the Tobacco Value Chain Transformation Strategy.

***For more information, contact*** *Kutsaga Research Station's Plant Breeding Division on voip number +263868 800 2604 or Email: tobres@kutsaga.co.zw or visit Kutsaga Research Station.*

# 2. HEKHANI SEEDS- a new ZPBA Corporate member

By

Dr. Shorai Dari (Operations Manager Hekhani Seeds and Services

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## WHO WE ARE

Hekhani Seeds is a newly established seed company focused on enhanced access to good quality seed of oilseeds and alternative cash crops

## VISION

To be recognized as the most trusted provider of seed and services for oil seed crops in Africa in terms of seed quality, product performance innovations and consumer value while protecting the environment and driving local partnerships.

## MISSION

Hekhani Seeds seeks to improve crop productivity and profitability for smallholder farmers through our commitment to continuous product innovation and adherence to the highest standards and seed quality control regulations.

## PURPOSE

Our purpose is to access and promote leading genetics for healthy communities. Our approach is to ensure that everybody wins: that farmers are prosperous, agriculture becomes more sustainable, and consumers have safe, healthy and nutritious food.

## OUR IMPACT

**Job creation for small scale farmers**

- Empowering small scale farmers, community seed banks , seed growers and processors will create employment across the value chains for several crops

**Increased agricultural productivity**

- Provision of good quality seeds and boosting agricultural production to empower small-scale farmers

**Women and youth economic empowerment**

- Targeting 2000 households led by women in rural Zimbabwe

**Healthy seeds, healthy lives = strong communities**

- Strengthening sunflower, sesame, soyabean, castor bean, groundnuts and canola value chains for healthy communities

## OUR VARIETIES

**Sunflower**

- Hysun 33

**Soyabean**

- Mhembwe
- Bimha

**Groundnut**

- Guinea Fowl

**Maize**

- **ZS265**

**For more information visit**

Hekhani Seeds and Services, 4 Bannockburn Close, Mt Pleasant, www.hekhani.co.zw

## 3. THE 2023 ZPBA Annual event hosted by MSU

- Announcement


Meet you in the MSU Senate Room or online on 19 May 2023 08:30- 14:00 CAT

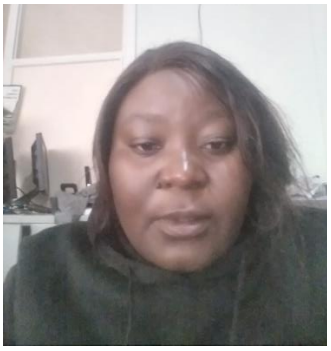
## • Meet the Speakers

**Jackline Chepkoech,** Team Lead, SEQART AFRICA, Kenya

*'Improve genetic gains using molecular markers through DArTseq™'*

**Thelma F. Madzima, Ph.D.,** Associate Professor, Division of Biological Science, School of STEM, University of Washington Bothell, U.S.A.

*'Genomic approaches to understanding crop responses to environmental stress'*



**Ronica Mukaro,** Maize breeder, Crop Breeding Institute, Zimbabwe

*'Genetic trends in DR&SS maize breeding and low cost options to improve breeding efficiency'*

**Francis Mukoyi,** Senior Breeder, Tobacco Research Board, Zimbabwe

*'TRB Introduces Climate-Smart tobacco genetics'*

**Brenda T. Makaure, Ph.D,** Lecturer Dept of Agronomy and Horticulture, Midlands State University, Zimbabwe

*'Phenolic Acids and Plant Antioxidant Capacity Enhance Growth, Nutrition, and Plant-Microbe Interaction of Vigna unguiculata L. (Walp) Grown in Acidic and Nutrient-Deficient Grassland and Savanna Soils'*

**Pardon Chidoko,** Great Zimbabwe University

*'Sorghum production systems and farmers' trait preferences in Masvingo, Zimbabwe: Implications for breeding and varietal selection'*

**Brighton Makovere,** University of Zimbabwe

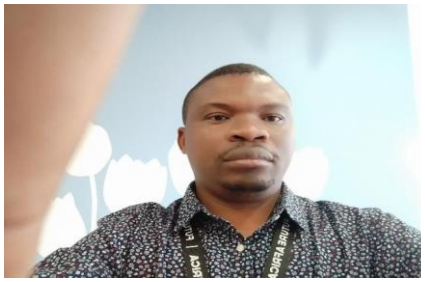
*'Inheritance of Key Traits in Finger Millet. Eleusine. coracana (L.) Gaertn and its Breeding implications in Developing Sustainable Varieties in Semi-Arid Regions'*

**Nyasha J. Kavhiza,** People's Friendship University, Russia

*'Engineering vegetative desiccation tolerance in crops using resurrection plants as models: A tool for climate-smart plant breeding'*

**Tanaka Nhidza,** Bindura University of Science Education

*'Thinking Inside The Box, The power of creative constraint'*



**Alec Magaisa,** University of Zimbabwe

*'Sorghum lines with adaptive root traits for drought and heat stress tolerance'*

**Tafadzwa Manjengwa,** Chinhoi University of Technology

*'An evaluation of the drought-associated morpho-physiological adaptations and a biomarker (proline) in sorghum germplasm collection as indicators of their survivability under moisture limiting conditions'*


Contact Us

Telephone: +263 (0)784 618719 (send your name if you want to be on the ZPBA WhatsApp group)

Email: zimplantbreedersassociation@gmail.com

Website: http://zpba.org.zw/

YouTube: https://www.youtube.com/channel/UC6Yf7YvujHjNCMuJUJt5kgw



## WHO IS ZPBA

**ZPBA** is a **membership-based**, **not-for-profit**, **non-political**, **professional association** of Zimbabweans based locally or abroad active or interested in plant breeding and/or plant breeding-related fields (e.g. seed agronomist, seed inspectors, seed technologists, geneticists, germplasm conservation specialists, biotechnologists, molecular biologists, etc.) launched on the **26th of January, 2016** at Holiday Inn, Harare with financial assistance from FAO.

**ZPBA** is legally registered as a **Trust** in Zimbabwe: registration number 1791/2018. The **ZPBA Board of Trustees** consists of the elected **Executive committee of the ZPBA** who are bound by both the Trust Deed and the ZPBA Constitution.

### Membership benefits include

Professional and personal development; **Shared costs on human resource development**; Networking; **Timely Communication (especially for events, internships, job vacancies, scholarships)**; Voting rights; **Discounted rates for events**; Sense of pride in the profession and industry

For **Corporate members** you are entitled to one representative and to bring visibility to your institution, you will acknowledged at ZPBA organized events as well as being featured on the ZPBA website

## WANT TO BE A SUBSCRIBED MEMBER?

What are you waiting for, visit Apply for Membership – Zimbabwe Plant Breeders Association (zpba.org.zw). Pay your subs and receive your unique membership ID.

## THANK YOU SUBSCRIBED MEMBERS

Thank you to members who continue to pay their subscriptions as well as those who support fundraising initiatives. Such contributions make it possible for your association to keep going.