Zimbabwe Plant Breeders Association

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1. A LOOK AT DIVERSIFYING MAIZE GERMPLASM

Assessing the genetic value of exotic maize inbred lines in Zimbabwe

By

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Maize germplasm can be classified into two main categories which are temperate and tropical (including the sub-tropical), these classifications being based on the environmental conditions (particularly, day length characteristics) of the areas in which maize is grown around the world (Lanes et al., 2014). Maize has enormous genetic diversity that offers incredible opportunities for genetic enhancement, regardless of the current challenges constraining its production (Campos et al., 2004). Therefore, this available variation should be harnessed in order to protect and increase maize yields for future climate and social scenarios. According to Cairns et al. (2013), only a fraction of the available maize genetic diversity has been utilised to date.

Researchers have proposed introduction of exotic materials from other environments in breeding programs as a key strategy in improving genetic variation (Whitehead et al. 2006). Exotic germplasm integration and introgression have traditionally been used to broaden the genetic base of the local populations, a phenomenon key in crop improvement programs (Holland 2014). This strategy is usually under-utilized in Africa, regardless of its beneficial attributes in increasing food security, especially in the current environment which is becoming more and more unfavourable for maize production (Abadassi 2014). However, utilization of exotic germplasm is limited by maladaptation and beneficial alleles may also be masked outside its natural environment (Wang et al., 2017). Slow integration and careful selections are therefore required when using exotic germplasm in breeding programs.

This study focused on understanding gains (especially, those related to productivity of maize) that can be made when exotic maize populations are integrated with the locally adapted inbred lines. The Multi Environmental (MET) data demonstrated the potential of exotic germplasm, especially, germplasm with the temperate background, to increase grain yield potential and stability in our local populations. Furthermore, this temperate germplasm also showed ability to introduce earliness, whilst maintaining high yielding abilities in the local populations.

Interestingly, tropical and subtropical germplasm introduced a degree of lateness in the temperate germplasm.

Broadening the genetic base of maize and breeding climate-resilient and high yielding cultivars that are adapted to our diverse agro-ecologies, will undoubtedly depend on the efficient and rapid discovery and incorporation of novel alleles and haplotypes. Such diversity can be found in unexpected areas and global germplasm exchange should be encouraged.

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2. AMARANTH what do they want …

Results from a preliminary investigation conducted using virtual tools in this COVID 19 pandemic

By

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Amaranth is amoung the neglected and underutilised African leaf vegetables. Interestingly as the world celebrates 2021 as the International year of Fruits and Vegetable, Amaranth is mentioned as one of the *Five Lesser Known But Surprisingly Nutritious Fruits And Vegetables* (read more on The best thing about fruits and vegetables? Their diversity! | FAO Stories | Food and Agriculture Organization of the United Nations).

Farmers in Zimbabwe usually pick Amaranth growing wildly as weeds for use as vegetable or to feed their small stock such as rabbits. During the 2020/21 season 65 farmers in Mhondoro District ward 4 intentionally planted a known promising Amaranth variety. Seed of an improved dual-purpose line, Amaranth 1.0, was distributed before the rains and farmers were to produce and utilise it as they saw fit. The aim was to introduce Amaranth crop and get feedback on the attributes of importance to the producers and consumers. Such information would help in designing a crop improvement program for Amaranth.

During the season, feedback was relayed from the field-based extension officer based to the researcher in Harare via WhatsApp, including pictures of the crop. At the end of the season a survey questionnaire was prepared and data collected using KoBoToolbox (KoBoToolbox | Data Collection Tools for Challenging Environments). The major advantage of this application tool is that data collection can be done remotely without internet connection using a downloaded template. Data would be uploaded later when internet connectivity becomes available. These virtual tools came in handy under COVID19 restrictions with the added advantages of being fast, cheap and efficient.

For the majority of farmers, this was the first time they were intentionally planting Amaranth crop and using seed of an improved variety. Being a new crop focus by farmers was on yield contributing attributes and crop management aspects and these included -

- Response to good agronomic practices of time and method of sowing, spacing, fertilisation,
- Response to the growing conditions - moisture, insect pests, diseases,
- Ease of management and cost of production relative to other crop and how it fits within their farming system
- Plant growth and development attributes like time to first vegetable harvest, duration of vegetable harvesting period, flowering, lodging, plant height, days to grain harvest

All the participants used Amaranth as a vegetable, picking ready-to-harvest shoots or leaves. The attributes of importance to the consuming participants included

- Leaf size and colour,
- Preparation options and how it combines/blends with other relishes/ dishes,
- Cooking time,
- Taste and after-taste, smell, texture
- Shelf life of harvested vegetables
- Culinary attributes when dried to 'mufushwa'

A few participants fed harvested plants to their small stock and grain to their chicken and these were interested in the vegetative yield and grain yield respectively.

Participants found Amaranth 1.0 to have large green soft-textured leaves and green stems making it attractive, very tasty and free of unfavourable after-taste and smell. It combined well with other relishes such as meat and beans and amenable to various preparation methods including stir-fry, mixed with peanut butter or white sauce or fried with onion and tomato. However, the leaves were easily damaged by hailstorm, lowering the marketable product quality on the fresh market.

The participants found Amaranth to be a welcome addition which contributed to diversification of vegetable options. To further enhance adoption, they suggested running Amaranth related competition, having a dedicated Amaranth day, facilitate market linkages, provision of more information on production / technical know-how as well as making seed of improved varieties available in the shops.



Above are few pictures shared using WhatsApp as the season progressed

REMEMBERING Dr Alexander Ian Robertson

Photo: Agribiotech

On the 2nd of August 2021, the academic and scientific fraternity in Zimbabwe received with devastation the news of the passing on of renowned academic, researcher, and scientist, Dr. Alexander Ian Robertson. He passed on in Harare at the age of 82.

Dr. Robertson contributed immensely to the country`s academic and scientific advancement for nearly four decades, plying his trade at the intersection of business and agriculture. The "bambaira" [sic] protagonist championed robust policy discussions that raised awareness on the importance of root and tuber crops for food security and livelihoods development. His strenuous efforts led to the national re-discovery of the once bastardized "poor man`s crops" like sweet potato and cassava, as key sources of nutritional and economic utility.

In pursuit of establishing national consensus on key but difficult scientific policy positions, Dr. Robertson was fearless and resolute. He was comfortable with being a lone voice at conferences, often pulling key persons aside during tea breaks to make sure that he paints a clear perspective to his views. He believed in coalition through persuasion, ever-willing and patient to share in great detail his train of thought that shaped his convictions.

Even after retiring from his university teaching role, Dr. Robertson provided a valuable scientific bridge between academia and business to many university students whom he offered internships through his boutique company, Agri-biotech. He genuinely believed in the potential of young scientists, most of whom he successfully hand-held to global stardom. With limited resources at his disposal, he still provided remarkable support to these protégés, clearly demonstrating the power of determination and vision as inspiration to the scientific odyssey that awaited these budding experts.

Just about a month before his demise, Dr. Robertson was reflecting on the story of his life through a recorded zoom meeting with his Africa-Asia Network colleagues. In that video, he recalled some prejudices he held growing up until he realised that "I was a prisoner of my own culture…", he said. Far from being perfect, just like you and me, but through reflection and introspection, Dr. Robertson pursued truth and honesty in his professional conduct – virtues every academic and scientist will do well to espouse as the bedrock of ethical leadership.

Dr. Robertson may not be with us now, but the impact of his contribution to science and academia has a global effect, as most of his protégés are now holding eminent positions in both science and business across the world. It is in this reality that we draw solace and confidence that his legacy will live on.

You were a gift that kept giving, you withheld nothing that was in you for us, and today you rest empty, having filled up all of us with knowledge and inspiration to keep the dream of "feeding the country" alive and attainable. So for now Dr. Robertson, sleep, and continue to rest in peace.

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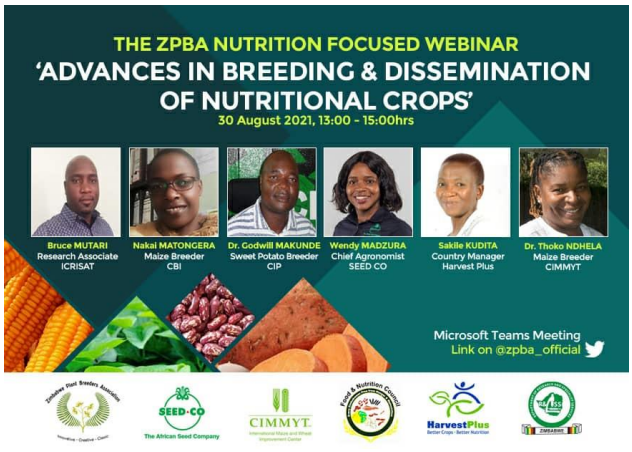
RECENT ZPBA ORGANISED EVENTS …

ZPBA now has a dedicated YouTube channel, visit to view some of the recent events and like us

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



UPCOMING EVENTS

i. APBA 2021 Conference

- This year a number of ZPBA is an ACTIVE participant, well represented with 6 members are giving presentations

Contact Us

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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 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

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THANK YOU SUBSCRIBED MEMBER

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