

MAXIMIZING MILLETS CROP CULTIVATION: ADVANCING CROP IMPROVEMENT FOR CLIMATE ADAPTABILITY, FOOD AND NUTRITION SECURITY

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Introduction:

Millet, a versatile and resilient crop, has gained significant importance in recent years due to its nutritional value, adaptability to diverse climates, and role in sustainable agriculture. Rich in essential nutrients such as fiber, protein, and minerals, millet is a valuable ingredient for a healthy diet. However, the scientific improvement of millet has received little attention until the United Nations recognized the year 2023 as the Year of Millets. This initiative has increased the emphasis on developing improved varieties that exhibit high yield, disease resistance, drought tolerance, and climate resilience. As the demand for millet continues to rise, it becomes crucial to enhance its cultivation through strategic initiatives.

In 2023, our organization under Nature Positive CGIAR initiative and collaborated with KALRO-Kibos in Kenya to establish a crossing block dedicated to millet varieties improvement. The crossing block serves as a central hub for millet improvement and technical training, ensuring the development of improved millet varieties for different purposes and farmers' needs. By focusing on enhancing millet cultivation, our aim is to contribute to food security, agro-biodiversity enhancement, and conservation, promote sustainable farming practices, and improve the livelihoods of millet producer farmers. This report highlights the progress and achievements of our millet cultivation enhancement initiative.

Activity Details:

1. Establishment of the Crossing Block:

We set an agreement with KALRO-Kibos in establishing a crossing block dedicated to millet improvement within the premises of the centre. Sites are already identified and some enhancement activities like installation of irrigation facility, screen house construction will be commenced in 2024. This crossing block will serve as the central hub for millet improvement and technical training, benefiting Kenya and the surrounding countries.

2. Systematic Collection of Farmer Varieties:

We have started the systematic collection of diverse farmer varieties of millet. So far, we have a collection made by previous initiatives from Kenya, Tanzania and Uganda at Nyando community seed bank based in Kisumu County, Kenya. The collected accessions went through purification to ensure true-to-type genotypes and will be utilized for characterization activity. This will make easy to retrieve the resource as well as it is a show case of farmers involvement from accessions identification to new varieties development. Furthermore, we will engage gene banks in 2024 and gather a wide range of millet accessions to ensure a comprehensive representation of local genetic diversity.

Activities for 2024 and onwards:

1. Purification of Collected Varieties:

Upon collection, the farmer varieties will undergo through rigorous purification processes. This will be done to identify a true to type genotypes ensure the genetic similarity seeds under one genotype name of the collected samples. This will be done in the research farm of KALROS-Kibos.

2. Phenotypic and Genotypic Characterization:

Comprehensive phenotypic and genotypic characterization will be carried out on the purified millet genotypes. This involves assessing various traits such as phenological, agronomic, and disease tolerance characteristic. Furthermore, we will assess the descriptive characteristics of the different genotypes. Genotypic characterization will also be performed to better understand the genetic makeup of the collected varieties for further genomic assisted selection to speed up the crop improvement time.

3. Crossing among selected genotypes:

Crossing will be undergone once the representative set of genotypes identified from the phenotypic and genotypic characterization. This involves the participation of different farmers group, pathologist, agronomists, and geneticists. Once genotypes identified, crossing will be done using modern breeding techniques that has been used during our recent breeding initiatives. Parallel to our breeding activities, we are committed to strengthening local expertise in cutting-edge breeding methodologies and genomics. We organize training sessions and workshops to impart knowledge and skills in these areas to the local farming community and relevant stakeholders.

Conclusion:

Our activity for enhancing millet cultivation has made significant progress in 2023, in identifying important stakeholder, location and accession and farmer varieties. we will emphasize on the importance of preserving and utilizing genetic diversity as a crucial resource for millet breeding and conservation. Our activities strive to raise awareness and promote the sustainable use of genetic resources to ensure long-term agricultural sustainability. By strengthening local expertise and prioritizing the preservation and utilization of genetic diversity, we are working towards sustainable and resilient millet production, ultimately contributing to food security in the region.