

Improving finger millet, then returning it to farmers' fields



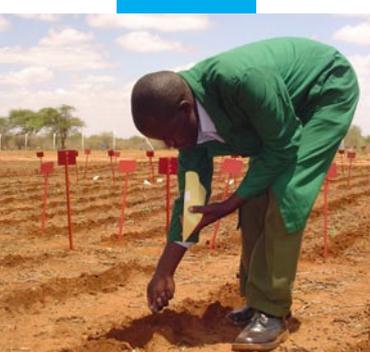
High calcium and carbohydrate content make finger millet a highly nutritious traditional cereal for infants and children and for the sick. Its small seed size deters pests, and its grains can be stored for over 10 years without significant deterioration. Yet, finger millet – a traditional subsistence staple grown in western Kenya and throughout East Africa – has faced declining use over the last 50 years due to changing farming systems and low productivity. That low productivity, however, can be improved.



Most farmers who still farm finger millet are using unimproved local varieties and traditional broadcasting sowing methods. According to the Treaty Benefit-sharing Fund Project, by using improved varieties and better agronomic practices, their yields of this nutritious grain could increase from 0.5–1.0 tonne per hectare to 3.0–5.0 tonnes per hectare. Giving small-scale farmers access to higher yielding finger millet varieties can contribute to economic development and poverty alleviation in Kenya.



To help farmers take advantage of this potential, the project evaluated and characterized finger millet genotypes and wild subspecies, identified those with high yield potential and blast disease resistance, and developed eight hybrids, three of which have advanced for further selection. Building from this new understanding, the project has initiated seed multiplication and on-farm demonstrations of two finger millet varieties in five districts of western Kenya.



Field day demonstration integrates agriculture and entertainment

Agricultural activities combined with music, theater and other types of entertainment proved to be the right formula to attract almost 500 students and farmers to the Funyula Field Day demonstration which was held to raise farmers' interest in finger millet by introducing them to the improved varieties. It was one of five field day demonstrations held across western Kenya, but by far the most successful, mainly because of the entertainment and the participation of other stakeholders, including the Kenya Plant Health Inspectorate, Lake Basin Development Authority, Kenya Agricultural Research Institute, and relevant local ministries and private seed companies.

Maseno University designed the project to make sure that the results of the field and lab work would lead right back into farmers' fields. The university had already identified promising finger millet lines and, with the support of the Treaty Benefit-sharing Project, conducted a baseline survey on the current state of finger millet production in the area, and established experimental plots across western Kenya for identifying and crossing finger millet genotypes. It also hosted field days that introduced more than 700 farmers to its findings. The finger millet varieties and their crop wild relatives collected in this project will be deposited in the Kenya National Gene Bank for long-term conservation.



Potential advantages and risks. Finger millet is a nutritious food that contributes to family food security. Farmers who adopt the improved varieties will not only have increased production that can be sold, they also can share the seeds with other farmers. The risks farmers would face in their fields are the same as those faced in experimental plots, such as drought, pests, weeds and animals. So, thinking ahead to what farmers would need to know, the project planted demonstration plots early in the season in anticipation of drought, guarded fields where there was a possibility of animals, such as monkeys, destroying the crops, controlled insect pests with insecticides and, where necessary, planted in screen houses – all information that can be passed on to farmers in the form of guidelines.

One of the threats – weeds – actually became a reality. When a demonstration field was attacked by witch weed (*Striga hermontheca*), the project observed that one of its newly crossed varieties, U15, was more resistant than P224, another newly crossed variety that was in the field. Thus, in *Striga*-infested areas, the project now recommends the use of its U15. Both P224 and U15 also have proven resistant to lodging and diseases, and have higher yields than unimproved varieties.

In just one year...

Objective I: Undertake agronomic evaluation and characterization of diverse finger millet germplasm.

The project has:

- ◆ evaluated and characterized 49 cultivated and 8 wild finger millet lines in 2009, and a further 54 cultivated and 8 wild lines in 2010,
- ◆ evaluated and characterized over 50 finger millet germplasm types and identified the lines with the highest yields and highest levels of blast disease resistance.

Objective II: Enhance genetics of finger millet diversity. The project has:

- ◆ hybridized African and Indian finger millet land races, using hot water emasculation and contact crossing methods to create 8 hybrids, 3 of which will be advanced for further selection.

Objective III: Undertake on-farm evaluation of selected improved finger millet genotypes. The project has:

- ◆ disseminated 5 tonnes of selected high yielding finger millet lines to small-scale farmers,
- ◆ held on-farm demonstrations and multiplied seeds of improved varieties,
- ◆ planted new hybrids P224 and U15 for demonstration in 5 locations of 5 western Kenya districts,
- ◆ held 4 successful field days in 4 districts to promote finger millet to a total of 698 farmers,
- ◆ mass produced, harvested and distributed seeds of improved finger millet to individual farmers for 2011 planting,
- ◆ distributed 200 kg of improved finger millet varieties from bulking and demonstration plots to 150 farmers for further multiplication.

Objective IV: Revitalize finger millet farming and utilization in western Kenya. The project has:

- ◆ designed a baseline survey of millet production in western Kenya,
- ◆ initiated the survey in 804 randomly selected households in 8 districts through interviews with farmers.

Still to come...

- ◆ Analyse the data from the baseline survey.
- ◆ Identify and make seeds of improved finger millet available to 500 small-scale farmers for a total of 800 farmers who will be able to grow improved finger millet varieties.
- ◆ Enhance finger millet diversity through hybridization with related wild species.

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