Breeding Pipeline: Fonio 2011-2017

Evaluating fonio field trial at Cinzana Station.
Photo credit: Bettina Haussman

West Africa
Community of Practice

Project Partners

IER

Association des producteurs de fonio de Siguila et et de N'Gonye

Association des producteurs de fonio de N'Garalo et Torah

Coopérative Benkaditon de Mandela

University of Georgia

Union des Agriculteurs du Cercle de Tominian

Association des producteurs de fonio de Koro

National Ag Research Center
University outside of Region
Farmer Organization

Gender

Promoting equity through investments that favor the disadvantaged and vulnerable

Provision of fonio decortication equipment has **strengthened the fonio processing cooperatives** in the Mandela and Torah villages: Since 2013, the quantity of shelled paddy fonio passed from 5,850 kg to 13,600 kg; which is a **growth rate of about 231%.** Husking **lightens women's work** and adds value.

Farmer access to high quality, diverse seed varieties

2017: **Seed requirements increasing:** farmers from 3 districts requested over **3000 kg of 11 different ecotypes** of seed that would would cover 120 ha. Farmers chose based on gender, objectives, agroecology, and based on previous trials.

More appropriate variety testing under targeted conditions

2017: 29 mother trials and **386 baby trials** were undertaken on station and in **12 villages.** Objectives were to evaluate **fonio varieties** and **fertilization options.**

Look for intersections and interactions among multiple, interrelated pathways of change

Make the research process empowering: build social, technical, and methodological capital through the farmer-researcher and co-creation & co-evaluation processes

Capacity building seed production; Farmer managed seed production

2015: The associations who are members of the Mandela women's **cooperative** were **trained in seed production** techniques and then produced **173 kg** of 4 different varieties of fonio seed.

2017: training in 3 additional districts, 68 fonio seed production plots were installed in **14 villages** on 37 ha with **13 varieties.**

Stakeholder participation; Varietal testings; Multi-functional varieties

2014: A **multi-location analysis** revealed **highly significant differences** between ecotypes in terms of yield and earliness.
Farmers selected 6 fonio ecotypes of interest in demonstration plots:

- 4 of them have **yields 21-40% higher** than the local check variety.
- 2 are **early maturing.** Flowering periods are between 55 and 90 days, which allows each **farmer to choose** the variety which is compatible with her or his **cultural calendar.**
- The producers also identified genotypes with **big grains**. The thickness of grains is a favorable characteristic on the **market.**

Characterizing agrobiodiversity; modern breeding tools

50 Malian Fonio accessions were **genotyped by sequencing.** A Principal Component Analysis (PCA) revealed that the analysed samples mainly **clustered into 3 groups** that largely corresponds to geographic origin:

Value heterogeneity: build on and enhance diversity

Context

Fonio [*Digitaria exilis* Stapf,] is one of the **oldest cereals** in Africa and has many ecotypes. It grows well on degraded land and is usually grown at the **end of the crop rotation cycle**, providing farmers, particularly **women**, with both **self-provisioning** and income generation opportunities. Only a few fonio varieties are usually cultivated in Mali. **Yields vary** between 400-600 kg/ha and can reach 1000 kg/ha on farmer field depending on crop management. Farmers lack access to information about **new seed varieties**, agronomical advice, and cost-efficient processing options. There has been renewed interest in consuming fonio in the urban centers, as it is a suitable dietary alternative for people suffering from diabetes or obesity.

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