



Fonio harvest . Credit Bioversity International/G. Meldrum

Fonio: Tasty early-maturing cereal for diversified production systems in West Africa

Fonio is an ancient cereal native to semi-arid and sub-humid regions of West Africa where it has been cultivated for thousands of years and remains an important subsistence crop today. The nutritious grain is appreciated by consumers for its good taste. The crop has a critical role in the food security of rural households because of its early maturation and for this reason has traditional ceremonial value among many communities in the region. Despite its valuable characteristics and widespread cultivation, fonio has received limited attention from research and development, which could help to strengthen its role in diversified production systems for climate resilience and income generation.

General features

Cultivated in semi-arid lands of the Sahel, fonio has low water requirements and can escape drought because of its fast maturation. Fonio is considered the world's fastest maturing cereal. Germination occurs just three to four days after sowing, and grain is produced as soon as six weeks after planting. Sowing of fonio typically occurs during May or June before the beginning of the brief rainy season and the plants are harvested in September. The fonio harvest breaks the famine period, providing food during a time of critical shortage before other crops such as sorghum and maize are ready for harvest. In addition to drought tolerance, fonio is able to thrive in poor soils without the use of fertilizers and is resistant to flooding. Because of its low nutrient demands, fonio is typically planted later in crop rotation cycles, after maize or sorghum.

Nutrition

Compared to other commonly consumed cereals in West Africa, fonio is an excellent source of protein and is rich in amino acids methionine and cysteine, which are deficient in rice, maize, and sorghum. Also in comparison to these other cereals, fonio supplies the greatest amounts of iron, zinc, magnesium and vitamin B6. Fonio is furthermore a good source of fibre, calcium, copper, and folate. Fonio is considered safe for people with gluten intolerance and has a low glycemic index, which makes it an ideal source of carbohydrates for diabetics. However, antinutrients present in fonio may decrease the bioavailability of certain nutrients. For example, phytate forms

Fonio is a focus crop of the programme "Linking agrobiodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk" that is supported by the International Fund for Agricultural Development (IFAD), the European Commission and the CGIAR Research Programmes on Climate Change, Agriculture, and Food Security (CCAFS) and Agriculture for Nutrition and Health (A4NH)



Threshing of fonio . Credit: Bioversity International/G. Meldrum

complexes with iron which can interfere with its absorption. Unfortunately, the phytate content of fonio is not completely eliminated during processing.

Processing

Harvesting fonio can be challenging due to high seed shattering. Threshing to separate the grains is typically done by beating or trampling the straw. After threshing, the grains are dried for 3-4 days. Removing the multiple seed coats that encase the grains is difficult due to the small size and fragility of the grain. Dehusking and milling are done manually using a mortar and pestle with the addition of sand, and may take hours to complete. As a result of the laborious processing, in many areas, women are turning towards grains that are easier to process. Mechanical threshing and dehulling machines for fonio have been developed that facilitate the processing but access to such technology is not easy for all rural communities.

Fonio is often made into couscous to serve with fish or meat, boiled, made into porridge or soups, or ground into flour to make bread. It may also be popped and eaten as a snack. Common recipes incorporating fonio include fôyô, kini, and tô. In Mali, common products developed for the market include parboiled fonio and djouka (mixed with peanut).



Tô. Credit <http://www.ucodal.com/>

Fonio Tô

Ingredients

1 kg milled fonio
3-4 liters water
Potash, lemon, or tamarind sauce
Sauce (tomato sauce, okra sauce, spinach or green leaves sauce, peanut or peanut butter sauce)
Flour (fonio, cassava, millet, sorghum, maize, etc.)

Preparation

Boil water in a cooking pan. Pour milled fonio into the pan, stirring regularly until obtaining a porridge consistency. Add to the fonio a pinch of potash dissolved in water, lemon or tamarind juice. Add a sufficient amount of flour to the porridge by small portions for the preferred consistency. Continue to cook porridge while stirring vigorously until obtaining a thick, smooth, and homogenous paste. Cover and cook over low temperature for about 5 minutes. Pour dough into an appropriate container. Cool down a little bit before serving with an accompanied sauce. One sauce that may be used, for example, is Maafe, a traditional West African stew or sauce, which uses meat (or may be vegetarian) and also incorporates vegetables and legumes, adding a variety of nutrients to this dish.

Credit: UCODAL: *Fonio, food products in West Africa. Discover fonio. Available at: <http://www.ucodal.com/>*



Factsheet and literature review by
Victoria Rose

Fonio before and after dehulling at processing centre in Tominian. Credit Bioversity International/G. Meldrum.



Bioversity International is a member of the CGIAR Consortium. CGIAR is a global research partnership for a food-secure future.

Bioversity International is registered as a 501(c)(3) non-profit organization in the US. Bioversity International (UK) is a Registered UK Charity No. 1131854.

Bioversity International
Via dei Tre Denari, 472/a
00054 Maccarese (Fiumicino), Italy
Tel. (+39) 06 61181 Fax. (+39) 06
6118402
bioversity@cgiar.org

www.bioversityinternational.org www.ier.gouv.ml

Institut d'Economie Rurale
BP 258, Rue Mohamed V
Bamako, Mali
Tel. (+223) 20 22 26 06/20 23 19 05
direction@ier.gouv.ml