



Millets

finger millet (*Eleusine coracana*) isiZulu: uphoko
pearl millet (*Pennisetum glaucum*) isiZulu: unyawothi

Millets are a group of diverse small-grain grasses that have provided staple foods and fodder in the semi-arid tropics of Africa and Asia since the founding of ancient civilisations, thousands of years ago. Of the many types, farmers in KwaZulu-Natal grow finger millet and pearl millet. Both are quick growing, summer annuals that have fairly few insect pests or diseases. These grasses grow in clumps and tiller (produce many stems from each plant) especially in good conditions.

FINGER MILLET

Finger millet is one of the most important small grains in Africa. Of all major cereals, this crop is one of the most nutritious and tasty. The plant is hardy, and has adapted to a variety of conditions: rainfall as low as 275mm and up to 1 000mm and more, and cool to hot temperatures of up to 35°C. It also grows at elevations ranging between 500m and 2 400m – higher than most tropical cereals. The grain can be stored for up to 10 years without insect damage, carrying communities through seasons of drought when other crops don't produce.

However, this food that has been a staple for thousands of years, is becoming scarce. The crop has received little attention from the scientific community, and with a global trend to fast food, the production of finger millet has declined to only 5-million tons worldwide. In South Africa, finger millet deserves urgent conservation and promotion as a crop that can provide quality food in an ever more variable and dry climate.



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Finger millet, an ancient staple grain, is becoming scarce.

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It is thought that finger millet was domesticated during the Iron Age in the east African highlands. The oldest archaeological remains were found in Axum in Ethiopia dating back 5 000 years. It continues to grow abundantly in the regions around Lake Victoria, with Uganda being the biggest producer. It was introduced to India about 3 000 years ago, where a great diversity of varieties has developed.

Finger millet is recognisable by the finger-like spikes of its seed head that curl into a fist as they mature and dry. It grows up to 1.5m in height, reaching maturity within 3–6 months. It prefers fertile, well-drained sandy to loam soils, but tolerates heavier soils as well as some water-logging, salinity and alkalinity. Birds and the invasion of closely related weed grasses are key challenges for farmers. There are two subspecies of African finger millet: a wild form (*E. coracana subsp. africana*) and a cultivated form that is typical in KZN (*E. coracana subsp. coracana*). It is difficult to tell the plants apart when young, and they easily cross-pollinate resulting in poor hybrids the next season.

Delicious, nutritious, ancient grain

Finger millet is prepared in many ways: cooked like rice; ground to make porridge or flour for breads and cakes; and popped. Sprouted grains are readily digestible and recommended for infants and the elderly. It is especially suited to malting – the sprouting and then heating of the grain – because of the high conversion of starch to sugar that results in sweet and tasty beer. The time-consuming process of dehulling and grinding the tiny grains is probably the biggest reason for the decline in popularity of the crop, and appropriate technology to assist smallholders with this should be a priority.

It is well worth the effort to revive finger millet. It contains 5–8% protein, 65–75% carbohydrates, and 15–20% dietary fibre. The starch is in a form that digests slowly making it an endurance food. It has high levels of the amino acids methionine and lysine that are lacking in most starchy diets of maize, rice and cassava. As with other millets, the seed coat is a rich source of vitamins and nutrients, as well as phenolic acids and tannins in darker seeds. Although these limit the digestibility of the grain, they are beneficial in preventing aging and diseases including diabetes and cancer. Finger millet is high in manganese, phosphorus and iron, has useful amounts of copper and comparatively higher chromium, magnesium, molybdenum, zinc and selenium. It has the highest calcium content of all cereals, at a whopping 350mg/100g per portion.

PEARL MILLET

Pearl millet is the most widely grown type of millet worldwide. Archaeological evidence suggests that it was first domesticated in the Sahel region in Mali 4 500 years ago, and this remains the centre of diversity. From here it spread to India by 2 000 BC, and to south and east Africa. India is the largest producer in area and production, growing half of the world's pearl millet.

Pearl millet grows up to 4m in height. Extensive roots and quick growth contribute to it being the crop that is most tolerant to extreme heat and drought. It thrives in hot, dry climates and can manage on just 200mm of rain a year. It grows best in light, well drained loam soils but can tolerate many adverse soil conditions including acidity, and high aluminium and salt content. It does poorly in clay soils and cannot withstand water-logging. Pearl millet has distinctive long seed heads that could be mistaken for Bull rushes. The tightly packed, small, round seeds range in colour from cream, through the greys to purple – like tiny pearls. It is used as a high quality “emergency” animal fodder because of its quick growth, and can be grazed fresh or fed as hay or silage fodder.

Delicious, nutritious, ancient grain

Although growing conditions affect the availability of nutrients, pearl millet is a high energy crop with more nutrients than popular grains like wheat, rice and maize. Pearl millet is on average 70% carbohydrates, 9–21% protein, and 5% fats with comparatively high levels of iron, phosphorus, calcium and B-complex vitamins. The way millet is prepared affects the nutrient value, especially if nutrient-rich outer layers are removed – milling the grain into flour reduces the calcium and magnesium by nearly 70%, but malting the grain increases the availability of the iron and zinc.



Pearl millet is a versatile grain. It can be cooked whole like rice, roasted or steamed as a couscous; ground into meals that can be used as porridge or baked as cakes; and fermented for breads and drinks. In Niger millet flour is mixed with dried goats cheese and dates to make a nutritious food for long journeys through the Sahara Desert.