Purple-fleshed sweet potato (high in antioxidants)

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Summary

Sweet potatoes with a purple colored flesh have been introduced from Hawaii and Japan into African farming systems and markets over the past decade. In compared to white or yellow sweet potatoes the purple-fleshed types have two to three times more antioxidant activity that boost the body's growth, immune system and brain activity. Eating purple-fleshed sweet potato (PFSP) is improving the dietary balance and tackles vitamin deficiencies that widely occur in subsistence farming and poor communities due to low intake of vegetables and fruits. The high levels of antioxidants in PFSP has advantages for people of any age, promoting early childhood development as well as keeping adolescents and elderly healthy and active.

Technical Description

The distinct color of purple-fleshed sweet potato is a result from its high levels of anthocyanins, a type of flavonoids with a strong antioxidant effect that neutralizes harmful compounds in the body that damage cells. Sufficient intake of these natural protective agents is of crucial importance to reduce risks of heart disease and cancer, and lead a healthy and active life. Purple-fleshed sweet potatoes have a rich, almost winey flavor with a creamy texture. They are denser and drier than regular sweet potatoes, which is why moist cooking methods and longer times are recommended. After cooking tubers can be preserved for several months in airtight containers which allows to realize year-round supply of healthy food in rural and urban communities.

Uses

Purple-fleshed sweet potato are prepared for eating in the same way like white and orange colored sweet potatoes by cooking and frying them fresh, or making them into puree or flour that can be stored or sold to bakeries or other food manufacturers. The tubers from PFSP have a low glycemic index which means that blood pressure and sugar levels are not affected much like by other starchy staple foods, making them suitable for people with diabetes and hypertension. Residues from vines and peels as well as deformed tubers of PFSP can be turned into a silage that makes a nutritious fodder for all types of ruminant and pigs.

Composition

There are PFSP varieties with white and purple skins that both have the characteristic deep purple flesh inside the tuber. Pigmentation of the tubers comes from anthocyanins which is the same as found in blueberries, strawberries, purple carrots and blue tomatoes, among other vegetables and fruits. Next to providing a source of energy and anthocyanins, PSFP varieties also contain high levels of potassium, fiber, vitamin C and vitamin B6.

Means of application

The multiplication, planting, management and harvesting of PSFP varieties is exactly the same as for other types of sweet potato. Planting materials are propagated from seeds, tubers or vines. Cuttings from vines are most commonly used for planting and easy to make yourself. Slips from tubers or cuttings from vines are nursed by planting them in beds or placing the bottom of the stem in water. The healthy slips or cuttings are planted by inserting these at an angle in the soil, using a spacing of 50cm between rows and 30cm from plant to plant.

Agroecologies	All Agroecologies.
Regions	Africa.
Developed in Countries	Kenya, Nigeria, Uganda.
Available in	Kenya, Nigeria, Uganda.
Solution Forms	Genetics.
Solution Applications	Improved variety.
Agricultural Commodities	Sweet Potato.
Target Beneficiaries	Small-scale farmers, Commercial farmers.

Commercialization

Commercialization Category

Commercially available

Startup Requirements

1) Awareness-raising with farmers and food processors about the nutritional benefits of purple-fleshed sweet potato over non-fortified types, 2) Acquisition of improved PFSP varieties, and 3) Training on propagation of healthy planting material and management of crops

Production Costs

Multiplying or purchasing purple-fleshed sweet potato cuttings has the same cost as other types of the tuber crop. In Kenya, a bag with 10 kilogram of sweet potato vines are usually sold for less than USD20, including transport costs. For planting a field measuring one acre (0.3 hectare) you need 20 bags of vines, making a total cost of USD400.

Customer Segmentation

Sweet potato growers, Sweet potato seed multipliers, Food manufacturers

Potential Profitability

There is a high demand for bio-fortified sweet potato on local and regional markets for fresh consumption or processing into chips, puree or flour that is further sold to bakeries and other food manufacturers. In Rwanda tubers from orange-fleshed varieties are sold at 25% premium over white and yellow fleshed sweet potato. Leftover vines and low-grade tubers from sweet potato can be turn into silage that is providing a nutritious fodder for all types of ruminant livestock and pigs to supplement grass-based diets throughout the year. In general, for every dollar invested in enhanced nutrition there is a return of US$ 30 owing to better health, schooling and productivity. Farmers can earn an income by selling planting material. Surveys in eastern and central Uganda demonstrate a single farmer can earn about US$400 per month from the sale of planting materials and sweet potato products.

Licensing Requirements

No license needed

Innovation as Public Good

Regional public good, International Potato Center is responsible for breeding

Solution Images

Institutions

Accompanying Solutions

Community-based cutting production, Tent-style greenhouse production of vines and cuttings, Raised bed production and weed management, Specialty blended fertilizers, Relay intercropping of legumes with sweet potato, Silage production from sweet potato vines