

Drought and Virus Tolerant Orange-Fleshed Sweet Potato

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Summary

Cultivars of orange-fleshed sweet potato (OFSP) from Sub-Saharan Africa have been identified and bred that are adapted to drought and heat stresses, and others that withstand infections by common viruses affecting the crop. A number of hybrid OFSP varieties were developed that reach harvest maturity within just 90 days and can escape the risk tuber filling is affected by shortened duration of growing season where rainfall is more uncertain towards the end of the season. OFSP varieties that are resistant to a complex of stunt virus (SPCSV), mottle virus (SPFMV) and insects like weevils, aphids and whiteflies that damage crops in the field and stored tubers have also been released in different countries.

Technical Description

Tolerance of OFSP to drought, heat, pests and diseases is achieved by cross-breeding various cultivars and land races with desired characteristics. Adaptations to drier and warmer conditions are made by selecting traits such as early maturation, deep roots, narrow leaves, erect growth and high vine survival. Resistance of OFSP to virus and insect pests is accomplished by mass selection based on observation of symptoms in the field and genetic marker techniques.

Uses

Drought tolerant OFSP varieties are especially suited for regions with a semi-arid and dry tropical climates in Eastern, Western and Southern Africa, which face negative impacts of climate change of rainfall. Virus resistant OFSP cultivars are particularly useful for regions with high infestation rates to increase food security and prevent severe outbreaks. Like regular OFSP, tubers can be cooked and roasted fresh, or milled into flour and mashed into puree for use in a range of products including breads, chapatis, cakes, juices, porridge etc. OFSP can substitute wheat-based products are related imports and is gluten-free. Peels and tubers can also be made into feed meal for animal rearing, as well as for starch extraction.

Composition

Tubers from OFSP varieties that are drought tolerant and virus resistant contain high levels of beta-carotene, also called provitamin A carotenoid, and gives its orange color. The beta-carotene inside tubers is largely retained when processed, making it perfect for manufacturing healthy foods for consumers in the region.

Means of application

Varieties of OFSP that are adapted to drought and resistant to viruses are propagated from seeds, tubers or vines, following the same procedures as non-adapted cultivars. 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	Dryland area, Highlands, Moist savanna.
Regions	Africa.
Developed in Countries	Kenya, Mozambique, Uganda.
Available in	Kenya, Mozambique, Uganda.
Solution Forms	Genetics.
Solution Applications	Improved variety, Insect control, Disease control.
Agricultural Commodities	Sweet Potato.
Target Beneficiaries	Small-scale farmers, Commercial farmers.

Commercialization

Commercialization Category

Commercially available

Startup Requirements

1) Awareness-raising with stakeholders about drought tolerant and virus resistant OFSP varieties, 2) Acquisition of specially-bred OFSP varieties, and 3) Training on propagation of healthy planting material for improved varieties

Production Costs

Prices of planting material for drought tolerant and virus resistant OFSP are the same as regular cultivars. In Kenya, a bag with 10 kilogram of OFSP vines are sold for less than USD20, including transport costs. For one acre (0.3 hectare) you typically need 20 bags of vines, making a total cost of USD400.

Customer Segmentation

Farmers, Agri-food processors, ???

Potential Profitability

Drought tolerant and pest resistant varieties of OFSP ensure that crops reach harvest maturity in areas where production of regular cultivars is undermined by these factors. The lower productivity of drought and virus tolerant OFSP varieties is counteracted by the reduced risk of crop failure. Every dollar invested in nutrition returns US\$ 30 in increased health, schooling and productivity. Farmers can earn an income by selling planting material. In eastern and central Uganda a single farmer can earn about US\$400 per month from the sale of planting materials and sweet potato products at the beginning of the rains.

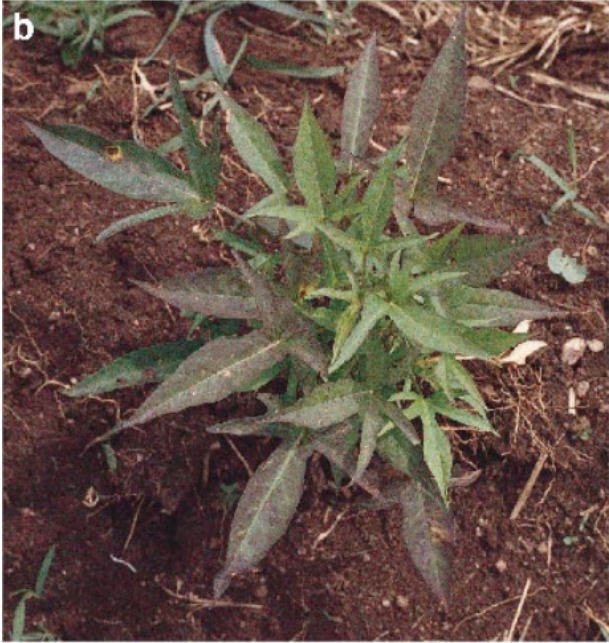
Licensing Requirements

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, Specially blended fertilizers, Relay intercropping of legumes with sweet potato, Silage production from sweet potato vines