Tent-style greenhouse for multiplication of sweet potato vines and cuttings

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Summary

Low-cost and easy-to-build greenhouse structures allow to multiply large amounts of healthy sweet potato vines and cuttings in time before the onset of the growing season. Tent-styled greenhouses combined with manual or drip irrigation enable to maintain optimal soil moisture, and the screen nets keep vines free of pests and diseases. Farmers can also use the greenhouses for retaining a stock of sweet potato vines as starter material and thereby avoid degeneration of planting material.

Technical Description

Tent-style designs of greenhouses minimize costs of construction as they can be built with cheaper screen netting and locally available building materials. Multiplying vines and cuttings for sweet potato inside the greenhouses enhances production of tubers because it ensures that sufficient planting material is available to farmers and allows to plant a larger area of land with the crop. Sweet potato vines and cuttings that have been nursed using greenhouses are of high quality and free of pathogens which increases their survival upon planting, a critical stage in the production of the crop.

Uses

Net tunnels protect cutting from insect vectors and allow them to harden before transplanting to the open field. They are especially useful in regions with high pest and virus pressures and where dry/warm conditions are creating large risks of planting vines directly on farms.

Composition

A tent-styled greenhouse is made of commonly used screen nets and construction materials. The design of net tunnels can be easily adapted in accordance to the need of farmers and their financial resources, with different sizes ranging from 2 square meter to an entire field. Under good management, the low-cost greenhouses can last more than 3 years.

Means of application

Constructing tent-styled greenhouses for multiplying sweet potato vines is not complicated and requires little training. The build involves erecting posts, installing cables, sinking cable anchors, connecting cables and anchors, stretching screen nets and burying edges of screen nets. A drip irrigation system connected to a water tank can be installed for maintaining optimal soil moisture.

Agroecologies	All Agroecologies.
Regions	Africa.
Developed in Countries	Kenya.
Available in	All Countries.
Solution Forms	Equipment.
Solution Applications	Seed system, Vegetative propagation.
Agricultural Commodities	Sweet Potato.
Target Beneficiaries	Small-scale farmers, Commercial farmers.

Commercialization

Commercialization Category

Commercially available

Startup Requirements

1) Renting/buying land for constructing multiplication site, 2) Installation of screen house, supporting posts, anchors and cables, and 3) Purchase of drip irrigation system (optional)

Production Costs

Materials for constructing the tent-style greenhouse cost around USD 3.40 per square meter. The total investment needed to set up a net tunnel for multiplication of sweet potato vines is amounting to USD 7.66 per square meter which includes building materials, purchase of vines, transportation, labor and training.

Customer Segmentation

Small-scale farmers, Commercial farmers, Agro-input suppliers

Potential Profitability

A pilot project for multiplication of sweet potato in tent-styled greenhouses in Kenya has demonstrated that farmers can earn USD 4 per square meter from sales of vines, which can go up to USD 9 per square meter under intensive production. At this return rate the sales of vines hence allows for the investments for greenhouse to be recovered within five months. In the United States it was shown that multiplication of sweet potato in high tunnels yields two times more marketable cuttings in comparison to an open field system.

Licensing Requirements

No license needed

Innovation as Public Good

Regional public good, International Potato Center is responsible for breeding.

Solution Images







Figure 2. Constructing the tent-style screen house: 1) erecting posts, 2) installing cables, 3) sinking the anchors, 4) anchor, cable and connector close up, 5) stretching the screen, 6) framing the antechamber (entrance), 7) burying the edges, 8) exterior screen house view.

Institutions



Accompanying Solutions

Orange-fleshed sweet potato, Community-based cutting production