Cassava seed-bulking farms

Solution Holder is **Abass Adebayo** and can be contacted through **a.abass@cgiar.org**

Summary

Cuttings from cassava stems are the most commonly used planting material by African farmers because this kind of seed can be gathered from previous cropping phases and thereby allows to cultivate large areas of land. Distribution of cassava stem cuttings to growers is however problematic because the materials rapidly lose sprouting vigor when stored, and their sheer volume and weight drive up transport costs. These factors are severely limiting the supplies of improved, disease-resistant cassava planting material across major growing regions, which especially affects communities with poor road connectivity in remote rural parts of African countries. Smallholder farmers living in expansive agricultural landscapes of Africa can get much better access to high-quality cassava stem cuttings through seed-bulking farms that are scattered across communities. This approach allows to multiply planting materials closer to the fields where the crop is cultivated, thereby bringing down costs of production and transport, and avoiding over-reliance on seed companies and institutions that have limited geographical coverage. Seed-bulking farms can greatly accelerate the dissemination of improved cassava varieties and make planting materials available to farmers that are free of pests and diseases. This approach for multiplication of cassava cuttings offers opportunities for community-based enterprise development, and will enhance incomes and productivity of farmers and processors.

Technical Description

Cassava seed-bulking involves multiplication of stem cuttings from seed tubers or cuttings in a controlled environment which allows to obtain true-to-type planting material that is free from infestations by pests and diseases. One hectare of cassava seed farm can produce enough cuttings to plant 8-12 hectare of land at the recommended stem size of 25-30cm, thus permitting high multiplication ratios. Seed-bulking farms allows producers to obtain hardened planting materials closer to the fields, and are particularly effective for releasing and maintaining improved varieties, and controlling pest and disease infestations. The improvement in availability, access and quality of stem cuttings that can be realized by decentralizing its production make it possible to distribute large amounts in a short period of time at the start of rainy seasons. Reductions of transport times achieved by setting up cassava seed-bulking farms across communities that live in expansive regions hugely benefit the survival rates of planting materials and crop health throughout its growth, which gives rise to higher yields and resilience of the food crop.

Uses

Seed-bulking farms for cassava as a means to supply quality planting materials is suitable for all major growing areas in Africa because it can be implemented with simple facilities and limited capital investments. Individual farmers, community-based organizations and seed companies can set it up close to the fields where farmers cultivate the crop and bring early generation planting materials within reach of remote rural communities that rely on cassava for food and income.

Composition

The use of seed tubers and cloning methods for bulking of cassava cuttings in rural communities makes that all varieties can be multiplied through this technology, including hybrid types developed through advanced breeding. High-yielding, disease-resistant and bio-fortified lines of cassava are the most appropriate for seed-bulking farms because distributing such kind of planting materials creates large impacts on productivity and incomes along the food value chain.

Means of application

To start a cassava seed-bulking farm, a small number of the certified cuttings or seed tubers have to be obtained from varieties that are suitable for specific conditions in growing areas and meet preferences of consumers. Cassava seed-bulking should be done on farmer fields that are fertile and away from crop stands that are heavily infested by diseases and pests in order to promote multiplication and seed quality. In places where this is not possible the use of specialty blended fertilizers and chemical control agents is required for producing high quality planting materials. Seed-bulking farms should be kept free of weeds to promote growth. Advanced set-ups that include assets like drip irrigation and other mechanized tools can shorten harvesting cycles and reduce labor costs. Under optimal crop and soil management it is possible to multiply cassava cuttings in 6 months' time when seed tubers are used as starter, and after 8 to 10 months in case of unrooted stems. Seed-bulking farms have to be located within communities according to the size of the cultivation area and road connectivity, usually having sites for dispersed at distances of 1 to 20 km.

Agroecologies	All Agroecologies.
Regions	Africa South of Sahara.
Developed in Countries	Democratic Republic of the Congo, Kenya, Nigeria, Tanzania, Zambia.
Available in	Democratic Republic of the Congo, Kenya, Nigeria, Tanzania, Zambia.

Solution Forms	Management.
Solution Applications	Seed system, Vegetative propagation.
Agricultural Commodities	Cassava.
Target Beneficiaries	Small-scale farmers, Commercial farmers.

Commercialization

Commercialization Category

Commercially available

Startup Requirements

1) Identify suitable cassava varieties for local farming conditions to increase demand, 2) Training of farmers on appropriate practice for seed-bulking on farms, 3) Optimize production and distribution of cassava planting material according to agro-ecological conditions and road connectivity, and 4) Provide access to loans for the initial investment of setting up seed-bulking farms.

Production Costs

Multiplying planting materials of improved cassava varieties through seed-bulking farms is associated with slightly higher costs than the traditional use of cuttings from previous crop phases because it requires to land and inputs for producing high quality seed. The main investments to produce cassava planting materials are the purchase of seed tubers or cuttings from elite cassava varieties, and the labor for establishing, maintaining and harvesting farmer fields where multiplication takes place.

Customer Segmentation

Suppliers of cassava planting materials, Subsistence and commercial cassava producers

Potential Profitability

Improving the access of African farmers to clean planting materials for elite cassava varieties through seed-bulking farms close to fields where the crop is grown will make large increases in economic yields and input use efficiencies, and substantially reduce losses to due to pests, diseases and unfavorable weather. Interventions that enhance the quality of cassava seed system create benefits for all actors in the food value chain, from subsistence farmers and commercial food processors, whereby tackling malnutrition and augmenting incomes. Seed-bulking farms provide a major avenue for enterprise development in rural communities that will give rise to formal jobs in production and sales of cassava cuttings. The low level of investments required for

starting up multiplication of cassava seed on farms allows to maintain affordable selling prices for planting materials and create commercially attractive returns on investment.

Licensing Requirements

A certificate may be required to multiply and sell planting materials for cassava in some countries, but in others this service is unregulated.

Innovation as Public Good

Further information of seed-bulking farms for cassava planting material is offered as a Regional Public Good by the International Institute of Tropical Agriculture (IIITA).

Solution Images



Institutions

Accompanying Solutions

Disease resistant cassava varieties, Golden cassava varieties (Vitamin A fortified), Cassava varieties with high dry matter and starch content