



What is a

SEED

HOUSE

?

Alternatives for the Disposal of Cotton By-Products and Accessory Crops in Africa
Beyond Cotton Project (Project-Country: Tanzania)

WHAT IS A SEED HOUSE?

Technical Data Sheet

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This handbook is part of the Beyond Cotton project, which aims to support smallholder cotton producers and public institutions in African countries (Benin, Mozambique and Tanzania) to commercialise cotton by-products (such as crude oil and cottonseed cake/meal) and products from cotton rotation and associated crops (maize, beans, grasses, beans, sweet potatoes, chickpeas, etc.). The trilateral South-South technical cooperation project is an initiative of the Brazilian government, through the Brazilian Cooperation Agency (ABC) of the World Food Programme's Centre of Excellence against Hunger (CoE/WFP) in Brasilia, with financial support from the Brazilian Cotton Institute (IBA). This document is an integral part of the Community Seed House Management Training and will cover its construction, structure and organisation, seed selection, use and storage.

WHAT IS A SEED HOUSE?

A seed house is an initiative of a group of people to form an appropriate place to store native seeds, where the farmer withdraws an amount of borrowed seeds, with the commitment, next year, to return double or more. The way of return and the management of the house are built by the community itself through an agreement between the participants. They are created to provide the community with a place to ensure that the seeds will be safe and will not be attacked by pests, diseases, or rodents.



WHY IMPLEMENT A SEED HOUSE?

- I.** Seed houses make it possible for farmers to have at the beginning of planting seeds of good quality and in sufficient quantity for the necessary cultivation and replanting;
- II.** By saving the seeds it is possible to keep the local varieties preserved;
- III.** It is an important strategy for self-sufficiency and conservation of genetic diversity;
- IV.** It is an achievement of food security and sovereignty;
- V.** It is a space for learning among the members. They develop in diverse areas such as management, quality, organization, in addition to strengthening the bonds of cooperation and solidarity;
- VI.** Guarantees autonomy to farmers in relation to seeds and their productive independence;
- VII.** It allows the recovery of local, traditional plants, knowledge and flavors lost over time.

HOW TO CREATE A SEED HOUSE?

① *Gather people interested in the community!*

Invite the community to a meeting, discuss what a seed house is, how it works, why to have one in the community.

IMPORTANT: Make clear the goals of setting up a seed house, what the benefits are and what the challenges will be. After the formation of the house, outline the strategies of how to sensitize more people in the community.

② *Sensitize the community!*

Community participation is important for the seed house to function and thrive. The group is responsible for strengthening the actions of the house, so it is important to raise some questions at the beginning of the process, such as:

- What are the causes of the losses of local varieties (native seeds)?
- What consequences does this have for the community?
- Why are seeds missing before planting?
- Has this happened before in the community?
- What measures have been taken?
- Do we have the financial conditions every year to buy the seeds sold in the market to plant all the area we have available?
- Does buying these seeds imply also buying chemical fertilizer and pesticides that they require?
- If so, do we have money for the whole process?

③ *Draw up strategies for seed house organization!*

With the community united, let's get to work! Define which seeds will be worked, where to find them and how to store. Important questions will guide organization strategies:

- What are the most planted species in the community?
- With how many varieties of each species?
- How will the identification of the species that we will work on be made?
- How will the seeds be acquired?
- How many seeds are needed to serve the community?
- How to ensure the preservation of the chosen species?
- How will the selection of seeds be made?
- How will the storage be done?
- Do we have a location available in our community or are we going to build it?
- How much are we going to spend so that we can have our seed house? And where are we going to get the appeal?
- What will be the capacity of the warehouse?
- How many and what capacity of containers will we need?
- For how many plantings and replantings should we guarantee seeds?
- In addition to the container, what other equipment and utensils will we need?
- Where will our seed house operate?

④ *Building our seed house!*

With the questions answered earlier, let's split the responsibilities! Define the activities to be performed and who leads each of them. To make the seed house come true, you can use the chart below as an example. It is important that everyone who will integrate the seed house

has tasks and is a participant in the process. It is also important to establish a schedule of meetings to monitor how the activities of each one are and, if necessary, reorganize and redivide the tasks.

Activity	How to do it	Who to do	When to do
Seed collection	Look in other communities for people who can donate seeds;	Farmer X	15 days for collection

⑤ *Assembly of creation and approval of the internal rules of operation of the seed house!*

With the space chosen and/or built, gather everyone and everyone who was involved in the process for the assembly of creation. In this House, we are going to elect the steering committee and define the rules for the operation

of the seed house. For example, how many kilos each member can borrow, what percentage should be returned, what is the quality of the seed returned, that is, the rules that will make up the internal regulations of the seed house.

HOW DOES A SEED HOUSE WORK?

Anyone can be a member of the seed house, male or female, even if they are from the same family. As long as you are willing to work

collectively and defend the proposal with commitment!

What species can be stored in a seed house?

- Species adapted to local conditions;
- That have local use for human and/or animal food, crafts, ritual, medicinal, commercial, or other reasons important to the group;
- That they have the productivity appropriate to the local conditions;
- Which are suitable for long-term storage;
- In case of plants such as cassava, potatoes and other species, not possible to store, the house can map the species present in the community and the farmers who watch over each species and make this information available in the seed house.



What are the governing organs of the seed house?

The General Assembly and the Management Committee are the governing bodies of the seed house, and the:

General Assembly is the supreme organ of the seed house. It is composed of all members, who have the right to voice and vote. In it, the internal regulations of the seed house are defined, which provides for its operation and any change in these regulations. In the Assembly, the management committee of the seed house is elected and it is decided on the inclusion and exclusion of members.

The **Steering Committee** is composed of two men and two women from the community. These people should have knowledge about the seeds and availability of time. The term of office of this committee is defined by the shareholders' meeting and recorded in the bylaws.

The duties of the management committee are:

- Group mobilization
- Take care of the seed house;
- Register the associates and catalog the seeds of the house;
- Control the loan and return of seeds;
- Check the quality of the returned seeds;
- Take care of the storage in the seed house;
- Record the activities developed and account for the movement of the seed house;
- Ensure that the Internal Regulations of the house are complied with.

How are loans made?

Borrowed quantity: at the beginning, when the stock is still low, a maximum quota per member should be established. For instance. Maximum of 20kg per member. Loans are made in the period of planting. The minimum and maximum loan amount is defined by the internal regulations of the seed house.

Amount to be returned: it is defined by the shareholders' meeting and normalized in the bylaws. Usually, the amount borrowed is returned and a little more. At the beginning of the work with the seed house, the returns are usually higher to ensure a minimum stock. The seeds are returned to the houses at harvest time.



Important aspects considered in the return of seeds:

- Beautiful, well-formed and whole seeds, dry and clean;
- Varietal purity: the returned seeds must be of the same variety that was borrowed;
- Health: seeds without infestation of fungi and insects.

On the basis of these conditions, seed shall be classified into categories:

GOOD (G) – Quality seed, without the need for additional work and that can be transferred directly to the storage gallons;

AVERAGE (A) – Seeds that need complementary work such as drying and cleaning, that is, before being stored will undergo a drying or some other treatment;

REJECTED (R) – Seeds rejected for lack of quality (spoil, not uniform, with the presence of insects, etc.). In this case, the assembly of the seed house defines which treatment should have the member who returns these seeds, such as not allowing new seed loans for a certain period.



WHAT PRECAUTIONS SHOULD WE TAKE WHEN SELECTING NATIVE SEEDS?

The care of the seeds that will be stored in the seed house begins before the harvest!

Pre-Harvest

- Days before harvest, one should mark, with a ribbon, the best plants of each area divided in the ground.
- Do not choose the plants from the edge of the field and those isolated from the others, because they are in different conditions.
- Do not choose plants with grains, fruits or seeds from diseased plants or attacked by pests.

- The seeds to be stored should come from **healthy, vigorous and productive plants.**

Observe the size of the plant, fruits and grains produced by each plant, evaluate the uniformity of the seeds, size, colors, the chosen seed will have the characteristics similar to the selected plant.



Note the plants of the same size and production pattern, do not select plants of different sizes!

Watch closely for signs of disease or pest attack. Do not select diseased and attacked plants!





Harvest

Harvesting should be carried out as soon as the maturation or harvest point is identified, ensuring seeds absent from insect attack, as well as damaged by the weather.

THE LATER THE HARVEST IS CARRIED OUT, THE GREATER THE RISKS OF LOSSES IN SEED QUALITY

OBSERVATIONS FOR HARVEST POINT

CULTIVATION	HARVEST POINT	OBSERVATIONS
Corn	Straw well dried. When bending, the insertion of the spike breaks easily. Black dot at the base of the grain. Threshing easily.	Bend below the spike. Remember to cut the tips of the ears and store the central grains of the ear.
Sorghum	Black layer on the insertion of the grain in the straw. Threshing easily. When biting, feel the farinaceous point.	Black layer appears from the tip to the base of the bunch.
Peanut	When 70% of the pods of each plant have dark spots inside. When you run your fingers, the seed integument comes loose easily.	When approaching the original color of the seed (pink, red, reddish-white)
Bean	Starting: when the plants go from yellow to dry. Scavenger: dried pods, chestnuts and green leaves.	Leaves falling, with pods of green coloration for brown-grey.
Sunflower	When stem and chapter (head) are dark brown to brown. Collect a sample and observe, after 3 days, if there is no change in shape (wilt) or color.	Leaves still green, Sunflower not fully dried.
Cotton	Harvest by stages - 1st harvest when 50% of the capuchins are open.	Harvest the capuchins from the bottom of the plant separately
Sesame	As soon as the fruits begin to “pop”. When the plants reach complete ripening.	As soon as the fruits begin to “pop”. When the plants reach complete ripening.



Selection

It should be done in the crop, identifying plants with desirable characteristics, such as: medium or high size; strong stem, well rooted, with a greater number of bunches, pods or capuli; fewer chapters or spikes; large leaves, spikes, bunches, chapters, pods, or large capuchins; well-stuffed spikes; in addition to other desired characteristics, such as resistance to pests, diseases and drought.

Two types of selection are made, according to the destination of the seed:

- The first selection is the one in which the family selects with more care and criteria the seeds that will be used by itself in the next planting (Family Seed). These seeds will be harvested in the three areas that have been demarcated;
- The second selection is the one that will be made throughout the crop. These seeds will be destined for their exchange or commercialization (Neighbor's Seed).

How to make the selection?

Selection of seeds for the next planting (Stratified Selection)

Farmers who choose to divide the seed field into three plots (good, medium and weak) should:

- Harvest 50 ears, chapters, bunches or pods from each street in separate bags and identified with the area and street number;
- Thus, from each bag with 50 ears, bunches or pods, the top 15 should be selected.

Selection of seeds for exchange or commercialization (Massa Selection)

- This second selection is carried out by harvesting throughout the seed field, discarding only those plants that do not present the pattern of variety, and the plants that are withered or with attack of pests and diseases.
- Harvest at least 300 ears, bunches, pods, for seeds of the next harvest, thus ensuring genetic diversity;
- Choose, every 10m, the best ear, bunch or pod, which comes from the best plant with the desired characteristics.

DO NOT THROW THE EARS, BUNCHES, CHAPTERS OR PODS ON THE GROUND, SO THAT THEY ARE NOT ATTACKED BY FUNGI, MOISTURE OR OTHER CONTAMINANTS



WHAT PRECAUTIONS SHOULD WE TAKE WHEN GUARDING NATIVE SEEDS?

Drying of the seeds: When being harvested, the seeds present more moisture than suitable for storage, so we must dry them before. The first action is to decrease the amount of moisture they have. This ensures preservation for longer and is the main measure to prevent attacks of fungi and molds.

How to dry: Place the seeds on cloths or tarps stretched out on the patio and ensure that they receive sun in the early hours of the day and after 4 pm. One should not leave the seeds in the serene. It is best to collect or cover with plastic canvas. It should also not catch the midday sun, so as not to diminish the quality of the seed. Below are some details for the crops of corn, rice and beans.



Maize	Rice	Bean
<p>Before harvesting: The plants should be folded below the ear to aid drying and prevent the penetration of water into the ears, obtaining better quality seeds.</p> <p>After harvesting: After manual threshing they should be dried on tarps, with periodic movement to avoid excessive heating of the mass of the seeds, capturing the first hours of the day of solar rays.</p>	<p>Rice seeds can be dried in terraces, in layers of 5 to 10cm and should be revolved periodically.</p>	<p>For small quantities of beans, the drying of the whole plants and subsequent manual trail allows obtaining a better quality product. The drying of the seeds can be carried out in terraces on top of tarps. They can be spread in layers from 2 to 15cm thick, revolving them at intervals of no more than 30 minutes</p>

How to know if the seeds are dry: Squeeze the grain with the nail or with the tooth, if the seed is not marked it is because it has reached the ideal point of drying. Another test is to shake the seeds in your hands, feel and hear the dry noise when they hit each other.

WELL-DRIED SEEDS CAN BE STORED FOR A LONGER PERIOD.

What are the most appropriate packages to store the seeds?

The most suitable packaging are pet bottles, glasses with lid, cans and drums. Air cannot be allowed in, keeping it more safely than in cloth or paper bags.



Drums

To protect yourself from rats and storage pests, metal or plastic drums should be used. The drums should be well cleaned and dry. To decrease the humidity, it is important to place at the bottom of the gallon a layer of a finger of fine dry sand. It is also important to stir the seeds while placing them in the drum so that there is no air between them. The gallon should be filled up to the top. One way to take all the air out is, after filling the gallon, put a piece of lit candle on top of the seeds and close the gallon with the candle lit to burn the oxygen and not allow the insects to survive.



Wooden box lined with plastic, cans, bottles, pets and glass bottles

Seeds in smaller quantities, farmers can use the containers they have on their property, such as pets, cans, bottles, bottles and others.



Cans

20-liter cans, after being well filled, should be tightly closed and sealed with beeswax on the edges, melted soap and / or clay.



Glass bottles and pets

Plastic soda bottles should be filled fully, and there should be no spaces left between the seeds so that there is no air in the bottles. They should be tightly closed and sealed with beeswax on the edges, melted soap and/or clay.

What natural treatments are needed to conserve the seeds?

We can use some natural methods to avoid attacks of pests and diseases. The seeds must be dry before being stored.

Lime

Place a thin layer of lime on each 20cm layer of seeds;

Beeswax

Some farmers seal their silos, boxes or cans with beeswax and nothing else. When they open the silo, the seed is still very beautiful.

Dried and ground orange peel

20 grams of dried and ground peel for each pound of seed.

Eucalyptus leaves

Put a thin layer of fresh and strong-smelling eucalyptus leaves (citriodora) to each palm of seeds or intersperse between the bags. Once dried, the leaves should be changed. Suitable for maize seeds.

Wood ash

Controls pests of stored grains. To control the weevil of beans and maize 1kg of ash is mixed in 20kg of the clean and dried seed;

The place of storage of the seeds is of paramount importance. It should be ventilated, cleaned and dried. Avoid contact of the containers with the ground, because of the humidity. It is essential to use shelves in the seed house to place pots, glass and smaller containers and wooden platforms for drums and gallons.

HOW TO DO GERMINATION TEST?

The germination test is used to control seed quality and vitality, indicating when seeds should be renewed.

- ① Take a sample of 100 seeds from the lot that will be analyzed. This withdrawal should be done at random, that is, do not select seeds for the test;
- ② Sow in a box with moistened sand. Cover the seeds with a thin layer of sand.
- ③ The spacing should be about 5 times the planted width. For example: in beans, the spacing should be equal to the width of a thumb;
- ④ Wait a period of 7 to 14 days. This period varies by species;
- ⑤ Then evaluate the number of seedlings with normal development, making a count of them.



If of the 100 seeds, 80 germinate, this means that the samples obtained 80% of the germination. The minimum acceptable value of germination percentage varies according to the species. Seed houses do not have to follow exactly these values, but for practical reasons it is important to consider them as an indicator. The lower the germination percentage, the more seeds will be needed to sow the same area.

Culture Name	Germination
Cotton	65%
Peanut	60%
Rice	80%
Bean	80%
Sesame	80%
Sunflower	70%
Castor bean	70%
Maize	85%
Sorghum	70%



APENNDIX

Suggested documentation for good seed house management.

SEED HOUSE CONTROL FILES

Member registration: must gather the data of the associates. It will allow you to know the number of associates, where they live and other information.

MEMBER REGISTRATION					
Seed House:			Founded in:		
Full name	Address	Community	Profession	Document	Date of affiliation

INVENTORY CONTROL FILE

Control the loan and returns, act as a map of the seeds that leave and return to the house. The first part is filled in on the loan and the second on the return.

Seed House:				Culture:				Storage location:					
LOAN								RETURN					
Name	Community	File #	Quality G/A/R	Quant.	Data	Signature	Obs.	Data	Variety	Quant.	Quality G-A-R	Signature	Obs.

TERM OF COMMITMENT AND RESPONSIBILITY

They work as a receipt for the proof of seed loans to the partners. You can use a 3x4 photo next to the registration to facilitate the identification of the members.

Identification Form n. _____

SEED HOUSE TERM

I received it from the Seed House _____ the amount of _____ of seeds of _____ for planting the crop _____.

I declare to be aware of my commitment to return to the Seed House _____% (_____) of the seed received, soon after harvest, in perfect storage conditions, according to the rules of the Seed House.

For taking full responsibility for what I state above, I sign below.

Local: _____ Data: _____

Full name: _____

Document: _____

Locality: _____

STORAGE GALLON LABELS

They tell you what kind of seed is inside the gallon that was returned, what storage date, what number of the stored material card, and to which community the seeds belong.

Seed: _____	File n. _____
Variety: _____	Arrival date: _____
Community: _____	
Producer: _____	

NATIVE VARIETY RESCUE FORM

They identify the varieties of the seed house and bring information such as color, grain shape, plant size, and cycle. Fundamental to monitor if the seed is maintaining its natural characteristics.

Variety name: _____ Name of the farmer: _____
Community: _____ Seed color: _____
Seed type: _____ Height of the plant: _____
Type of plant: _____ Type of fruit: _____
Woodworm: _____

Cycle: _____ Month planting: _____ Month you harvest: _____

Plant: () Single () Intercropped with beans () Intercropped with another plant _____

Production: _____ Planted for: () consumption () trade () creation

With whom he got seed: _____

There are more people who plant in the community?

Amount redeemed: _____ Local: _____ Data: _____

Who rescued: _____

STORED MATERIAL IDENTIFICATION FORM

TO CONTROL THE MATERIAL STORED IN THE SEED HOUSE. Each one should have a file containing information about him, because it brings the notes of how the plant behaved in the field.

Plant Name: _____ Variety name: _____
Arrival date: _____ Location: _____
Quantity: _____ Harvest: _____

Origin:

() purchase () donation () return () trade () research institute () consumption

Seed aspect: () G () A () R

Information about the plant: _____

History of use of the variety: _____

Planting conditions: _____

Information given by:	Filled by:	Data:
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