

ENHANCED KNOWLEDGE IN SEED MULTIPLICATION, STORAGE AND CONSERVATION, TRAINING REPORT



Funded by Agricultural Biodiversity Community (ABC) through Dhan Foundation and coordinated by Participatory Land Use Management (PELUM) Kenya,

The exchange visit and the training were held at The Grow Biointensive Agriculture Centre of Kenya (G-BIACK), Thika, Kenya on July 11, 2019.

Table of Contents

Executive Summary.....	3
1.0 Introduction and Welcoming Remarks	4
2.0 Soil Fertility Management in seed production.....	4
3.0 Seed saving.....	7
3.1 Benefits of saving seeds;.....	7
3.2 Pollination	7
4.0 Seed harvesting, Cleaning and Drying.....	9
4.1 How to clean dry seeds.....	9
4.2 How to clean wet seeds	11
4.3 Testing the best seeds for germination	12
5.0 Storage of seeds in the seed bank	13
5.1 Challenges of storing seeds.....	14
6.0 Participants Way forward	14
7.0 Site Farm visit.....	15
8.0 List of Participants.....	16

Executive Summary

Enhanced knowledge in seed multiplication, storage and conservation training was held on 11th July at G-BIACK, Thika. The 1-day training was organized and coordinated by Participatory Land Use Management (PELUM) Kenya, and brought together 13 resource participants from 2 of its member organizations, RIDEP and CREP.

The trainer and lead facilitator of the training was Samuel Nderitu, Director G-BIACK. He engaged the participants through practical sessions and site visit within the G-BIACK demonstration farm. Participants also visited a neighboring farmer at his farm and saw the different types of crops grown.

The purpose of the exchange visits and the training was to build the capacity of the participants with the knowledge on seed multiplication, storage and conservation with practical lessons for easier understanding. Visiting different demonstration farm sites and engaging in practical sessions was an eye opener. The farmers had a chance to interact with different seeds and ask different questions.

Participants learnt different types of seed, how to dry seeds, germination of seeds as well as seed storage. They also learnt about companion gardening and how to apply compost on their farms. Difference of heavy feeders, heavy givers and light feeders and how to apply each on the farm.

Farmers also visited a farmer within the locality. The participants were able to identify some of the mistakes the farmer had on his farm based on the knowledge they had gained from the training. For example, they identified that his seed storage methods were not correctly done because he had exposed the seeds to moisture. However, the farmer was conversant with the right method of storage but did not practice due space and availability of the storage facilities. The farmer also shared water challenges he faced and his work around, that ensured his farm always had something growing. During the dry season he planted different types of vegetables and during the rainy season, he planted other types of crops such as maize and beans.

As a way forward, participants agreed to form seed conversation committee groups within their locality to ensure more seeds are saved. They also agreed to start growing organic food at household level as well as checking seed germination before planting. It was also agreed that the knowledge gained will be shared with other farmers and this would be done through demonstrations for easier understanding.

1. Introduction and Welcoming Remarks

The mandate of PELUM Kenya is to ensure empowered and prosperous communities deriving their livelihoods from sustainable land use. In an effort to undertake its mandate, PELUM Kenya is promoting an integrated approach to participatory, ecological land use management for improved livelihoods among the small-scale farmers in Kenya.

It is on this account that PELUM Kenya organized the 1-day training in order to empower farmers on seed multiplication, storage and conservation.

The report below gives an account of the proceedings.

2. Soil Fertility Management in seed production

After introduction and welcoming of the participants, Mrs. Peris Nderitu, one of the directors at G-BIACK, took the farmer participants through seed fertility management in seed production. She started by emphasizing on the need for healthy soil which is an important component in organic farming.

For good and fertile soils farmers were encouraged to use compost manure, practice companion gardening for health, rotation, garden space, nutrition and good use of the garden. A companion garden has heavy feeders, heavy givers and light feeders.

- Heavy feeders include; maize, Sukuma, Irish potatoes, pumpkins and tomatoes
- Heavy givers include; legumes, beans, groundnuts and cowpeas.
- Light feeders include; root crops, arrow roots, onions, carrots and sweet potatoes.

During planting, she emphasized on the need to start by planting heavy feeders. However, the soil must have enough compost manure because heavy feeders required a lot of nutrients. After harvesting of heavy feeders, the heavy givers follow and lastly light feeders. This she said was because heavy feeders require more nutrients than the light feeder. She further said that giving a lot of compost manure to light feeders would only result to big leaves but little food.

It is important to note that;

- If a farmer decides to replant a heavy feeder within the same place, then it is not advisable to plant the same family of the heavy feeders because it will not yield good results.
- Never start by planting heavy feeders if the farm does not have enough compost
- Never do deep digging without enough compost because it will spoil the soil.
- Spread the entire farm with compost. Avoid putting manure in the planting holes only as the nutrients will not spread evenly.
- Always start by planting at the seed bend then transfer the best seeds to the farm for better yields



Mr. Nderitu demonstrating to participants how to plant seeds in the seed bend and to identify the best for planting on the farm.





Participants learning how to prepare compost manure and vermi culture. The compost should be let to decompose for at least 3 months. Most farmers do not allow their compost to decompose thus feeding their farm with non-nutritional compost. A good farmer should have as many types of compost as possible.



3. Seed Saving

The session was facilitated by the lead facilitator, Mr. Samuel Nderitu, Director, The Grow Biointensive Agriculture Centre of Kenya (G-BIACK). He took the participants through the history of seeds, the need to save seeds, types of seeds, challenges faced during pollination, steps to harvest, clean and store seeds and the longevity of the saved seeds.

3.1 Benefits of saving seeds;

- Helps to engage in the cycle of life; this involves the process of getting the seeds, drying, germinating, planting in the field to the point of planting in the farm. The process is a cycle because the same seeds are used for the next season.
- Preserve heirloom varieties; heirloom plant species are grown from seeds that are passed down from generation. The heirloom seeds can be found from existing local seed swamps, own seed circle of neighbors and friends as well as organizations that save organic seeds.
- It encourages genetic diversity, the number of genetic characteristics in the genetic makeup of a species. More variation has a greater adaptability and selective breeding has monoculture.
- Helps to save money; one does not have to buy seeds every season

What to save and what not to save

There are different types of seeds but not all seeds are good for saving.

Heirloom are the best seeds to save because they have open pollinated seed varieties, they are over 50 years old.

Hybrid seeds on the other hand are not good for saving because;

- They are bred for specific characteristics by crossing two varieties
- The seeds germinate but they do not breed true to parents
- Seeds from hybrid may produce plants whose taste, color and size may not be desirable.

3.2 Pollination

Pollination is the transfer of pollen from the anther to the stigma. Pollination impacts seeds quality and quantity and optimum conditions for successful pollination are not the same for all plants.

Self-pollination occurs in tomatoes, beans, lettuce and peas cross pollination by wind, birds or insects occurs in cucumber, okra, peppers, carrots, corn and radishes.

Pollination Control Techniques

If a plant requires wind, insect or birds for pollination, one can use physical distance separation, growing only one variety for saving and exchanging seeds with other seed savers, bagging and hand pollination as well as cages to exclude bees and hand pollinating.



4. Seed harvesting, Cleaning and Drying

How to harvest flower seeds;

Do not deadhead, wait for the petals to fall off, seed head or pod will be exposed, cut the flower several inches below seed head and dry seed head in paper bag. The seeds should fall to the bottom and it can take 1 to 4 weeks.

The ideal time to harvest the seed will always vary from seed to seed. Some seeds like melon are always ready for harvest when the fruit is ready whereas other seeds like squash and cukes should be left on the vine and eaten after.

Cleaning vegetable seeds

Dry seeds include; beans, broccoli, chillies, maize, eggplant, lettuce and pepper.

4.1 How to clean dry seeds

- Start by drying the seeds in the sun
- Separate the seeds from the chaff using screens.
- Have all the 6 tray screens with different sizes of wire mesh.
- Put the screens together with No 6 being on the top and No 1 below all the other screens.
- The final product is what remains on the last screen tray
- One can also use a fan to blow off or winnow gently in the wind to remove any other unwanted elements for a final product

Cleaning Vegetable Amaranth





Hands on practical session of cleaning vegetable amaranth seeds.



4.2 How to clean wet seeds

Wet seeds include; berries, cucumber, melon, pumpkin, squash and tomatoes.

In most wet seeds one can place in mesh strainer and gently wash with water patting underneath strainer towel. Some seeds however must ferment first to remove germination inhibiting substances. Some of this include tomatoes and K-apele.



Mr. Nderitu demonstrating how to cut a tomato for easier scoping of seeds

Cleaning tomato seeds

- Cut the tomatoes across so as to expose the seeds for easy scoping of the seeds.
- Remove only the seeds and put them in a container.
- Add water to the container and mix with the seeds for easier separation of the seeds.
- Leave it to rest for 48hrs. This will help the seeds and the flesh to separate well.
- Scope all the ones on the top, pour out the water and rinse the seeds again.
- What is left after rinsing are qualified seeds ready for germination.



Demonstration of how to clean tomato seeds.

Drying tomatoes seeds

- Spread the seeds on a plastic, glass or ceramic plate to dry. Do not put on paper or waxed paper. Always use a non-sticking material.
- Spread the seeds and dry in an airy, dry location such as air conditioned room
- Keep humidity between 20-40%
- The drying should take at least 2 weeks or more.
- Always be sure to label the seeds. The seed type, date collected and the characteristics of the seed.

4.3 Testing the best seeds for germination

- Have a pastry dish and soak cotton wool in water on it.
- Put 20 seeds separate. They should not touch each other.
- Cover the seeds
- Put a sticker on the cover indicating the date you soaked, name of the seeds and variety
- Check the seeds every day. Once the first seed germinates, indicate on the sticker the day of germination.
- Keep adding water until germination has taken place in most seeds.
- After 1 week check all the seeds that have germinated and indicate the percentage. If the percentage of the germinated seeds is high, then the seeds are good for planting.

NB: Moisture is the only factor of germination and germination rates will decline with time.

5. Storage of seeds in the seed bank

Principles of a good seed bank

The temperature should be constant. A cool room to avoid heat

Should have containers or jugs that are air tight to avoid oxygen from getting in

The room bank should be very neat and clean. When getting in, one should disinfect their shoes

Knowledge on the seeds, seed harvesting and processing



Learning session at G-BIACK seed bank.



5.1 Challenges of storing seeds

- There is temperature variation
- Moisture fluctuation – if the weather is humid when drying, put desiccant also known as silica gel in a container with seeds and remove after 7 – 8 days.
- Sometimes after drying, some seeds will have mold or mildew on seeds and moisture on the inside of the storage container. One can use desiccant to prevent.
- Insects invade the seeds. However, the safest way to prevent this is by freezing and adding diatomaceous earth
- The seeds get animal pests. This can be prevented by using tightly closed containers

After storage the seeds can last for as long as 5 years but this depends on the type of seeds. Seeds that can last for up to 5 years include brussels sprouts, cabbages, cauliflower, celery, cucumber, eggplant, lettuce, melon, radish, spinach, squash and turnip.

Others have a medium life of 3- 5 years and they include; beans, beet, broccoli, carrots, leek, pepper, pumpkin and tomatoes. And least are the short lived of 1-2 years and they include; corn, onions, parsley and parsnip.

Recommendations

- Always check reference to see how seeds can be saved
- Use heirloom varieties to be sure your seeds breed true.
- Always consider starting out with a self-pollinating plant
- For cross pollinating plants, grow one variety and share with other seed savers,
- Always test your seeds before planting

6. Participants Way forward

The participants shared what they had learnt throughout the day and things they planned to do. The CEOs of CREPP and RIDEP to follow up and ensure that the Action plan is implemented.

Action	Who to do it	When
1. Sharing with farmers the information and knowledge gained including informing farmers on the importance of growing seeds from the seed bend to the farm	All the participants,	Continuous
2. Using compost manure and giving it enough time to decompose and practicing organic farming as household level	All the participants	Continuous
3. Form seed saving & conservation committees within farmer groups.	The farmers with support of the extension officers	This will be done within a duration of 3 months
4. Always ensuring there is seed testing and germination before planting	The farmers	Continuous
5. Every farmer to have a seed bank and ensure all the requirements are met.	The participating farmers	Continuous
6. Train more farmers on seed saving and seed bulking	The extension officers in the group	Continuous

7. Site Farm Visit

Participants later visited the farm of Mr. George Mburu, who practiced organic farming and kept livestock such as cows, rabbits and chicken for sale. The farmer despite water challenges in the village, never left his farm bare

During the dry season, he planted only vegetables for sustainability. But during the rainy season he planted other types of crops such as maize and beans.



8. List of Participants

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