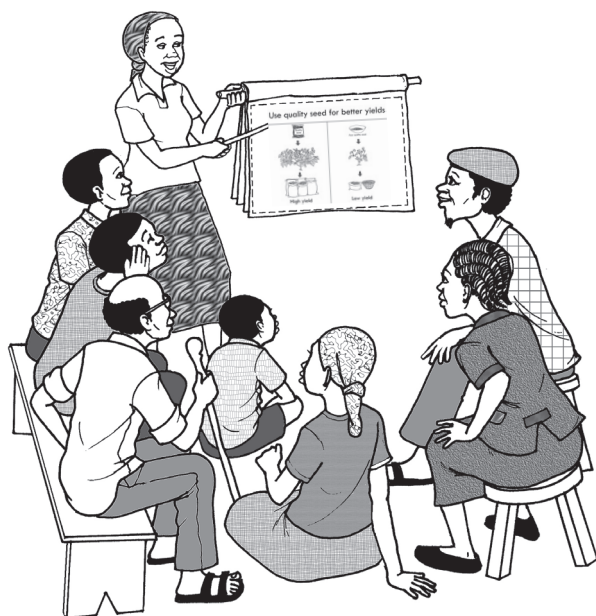


# African Eggplant (*Solanum gilo*) Vegetable Growing Module Training Set



## FACILITATOR'S GUIDE

This guide will help you use the **African Eggplant Vegetable Module Training Set**. The set is designed to encourage group discussion as well as provide information on the production techniques of african eggplant. As the facilitator, read through and familiarise yourself with the entire guide before facilitating any discussion for the first time.

## Using Visual Aids and Participatory Learning

We know that people learn better if they are actively engaged in the learning process. Studies have shown that we remember only 20% of the information we hear and 40% of the information we see and hear. However, when we see ideas represented visually and also actively engage with the information through discussion, debates, role-plays or other participatory teaching methods, learners retain 80% or more of the information that is presented to them.

Clearly as instructors, it is worth the time and effort to create participatory, multi-sensory presentations. **The African Eggplant Vegetable Module Training Set** is a tool designed to assist you in this effort. There is no one way to use it. We are always interested in improving our product, so if you have suggestions, comments, or questions please contact us.

This facilitator's guide is written in English but depending on your audience, you may need to make your presentation in the local language. Read through the guide and consider how you translate concepts into the local language.

# **PART 1. TRAINING CHECKLIST**

Make sure you can answer YES to each question before beginning the session.

- Did you gather background information about the group you are going to train?
- Did you review the facilitator's guide and charts?
- Do you understand the key issues to cover for each chart?
- Does the venue have enough seats and space?
- Do you have all the materials you need for the activities and discussions?

## **Outline of a training session:**

1. Welcome and introductions (5 minutes)
2. Review of the session objectives (5 minutes)
3. Large group presentation and discussion of the charts in the training module (Approximately 5 minutes per chart)
4. Ice breaker (5 minutes)
5. Break into small groups and answer the following: (20 minutes)
  - What are 3 things I learnt today?
  - What is 1 action I will take as a result of this training?
  - What questions do I still have about the topic?
6. Sharing of small group discussions in the large group (10 minutes)
7. Summarize and conclude the session (15 minutes)

## **PART 2. OBJECTIVES FOR THE TRAINING**

By the end of this training, participants will have learnt:

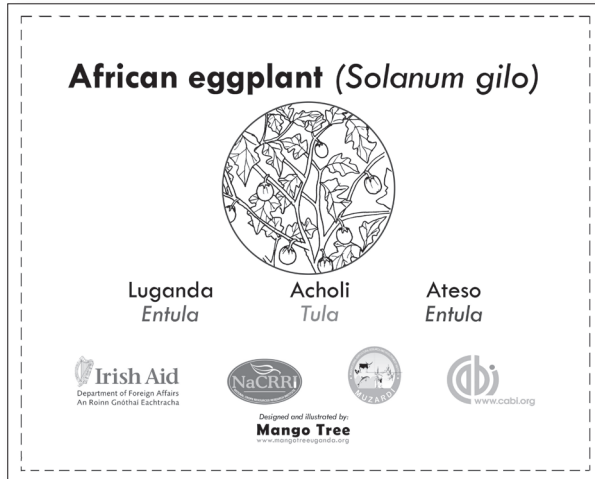
- The benefits of using quality seeds
- To conduct a germination test
- To selecting a good site for african eggplant vegetable growing
- To prepare quality seeds for planting
- To prepare and apply fertilizer/manure
- To plant african eggplant vegetables
- When and how to weed
- To manage pests and diseases
- To carry out proper harvesting
- The methods used to preserve vegetables

## **PART 3. HOW TO USE THE TRAINING SET**

- Show the first chart to the participants.
- Read the title of the chart.
- Ask participants to answer the question and explain what they know about the topic.
- Reinforce accurate information given and correct wrong information.
- Read the tagline on the chart.
- Ask participants if they have any questions about what has been discussed.
- Go to the next chart.

## PART 4. THE DISCUSSION SESSION

### A) THE VEGETABLE CHART SET

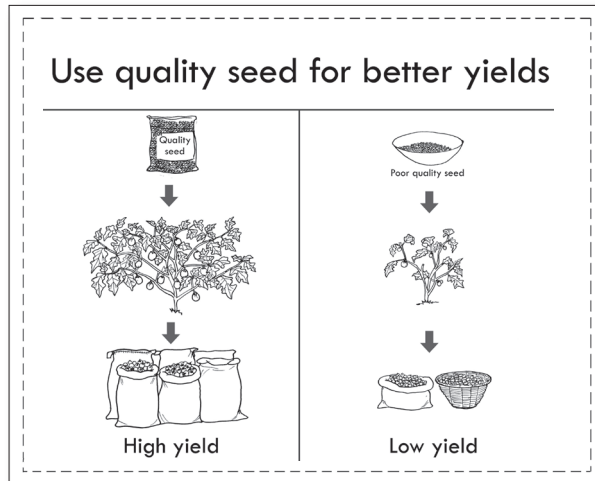


#### CHART 1: Logo chart\*

African eggplant is known by different names across the country: in Luganda *Entula*, in Acholi *Tula* and in Ateso *Entula*. African eggplants range in shapes, sizes and colour. The scientific name for african eggplant is ***Solanum gilo***.

The african eggplant fruit is usually picked and eaten as a vegetable.

\* ***This is a logo chart.***

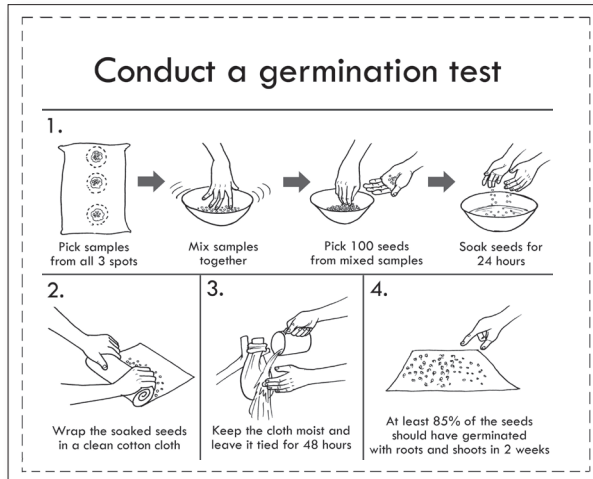


## **CHART 2: Use quality seed for better yields**

Use quality seeds of a recommended variety. Quality seeds are a fundamental requirement for good production. Home processed seed can also be of good quality if it is well processed and stored. Using quality seeds ensures:

- Lower seeding rate
- Higher seedling emergence, usually above 85%
- Vigorous seedlings
- More uniform plant stand
- Faster growth rate
- Better resistance to pests and diseases
- Uniformity in maturity
- The plant is more tolerant to drought

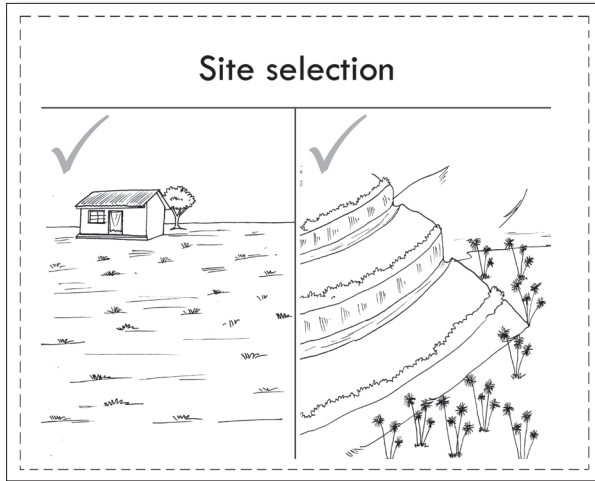
Quality seed should be of uniform size, colour and shape. It should also be free of foreign matter such as weed seed, chaff and should be pest and disease free.



## CHART 3: Conduct a germination test

Before sowing, test seed for viability and germination potential by conducting a quick germination test. Follow the steps below:

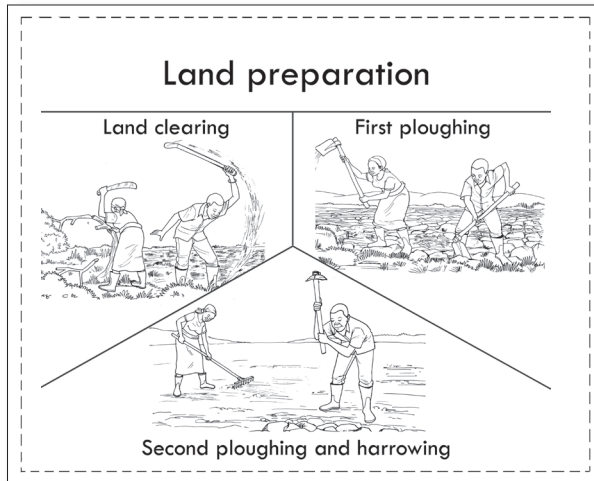
- Get representative samples of seeds from the top, middle and bottom of the seed bag.
- Mix the sample seeds and count 100 seeds to use for the test (for small seed quantities, farmers can count 20 seeds).
- Put the seeds in a container of water for 24 hours.
- Drain off the water and wrap the seeds in the soaked cotton cloth to create a bag holding the seeds.
- Tie the cloth bag to a stick. Tilt the stick to encourage drainage from the cloth bag. Keep the cloth moist by watering 3 times a day. Leave it tied for 48 hours.
- Untie the cloth bag and count the number of seeds that have fully germinated (both the shoot and roots have emerged).
- If 85 of the 100 seeds or 17 of the 20 seeds or more have both the shoot and roots emerged within 2 weeks, then it is quality seed which can be used for planting.
- If the percentage is slightly less than 85 of the 100 seeds, increase the seed rate at planting. If the percentage is less than 40%, discard the seed. Do not use the seed because it will have poor yields.



## CHART 4: Site selection

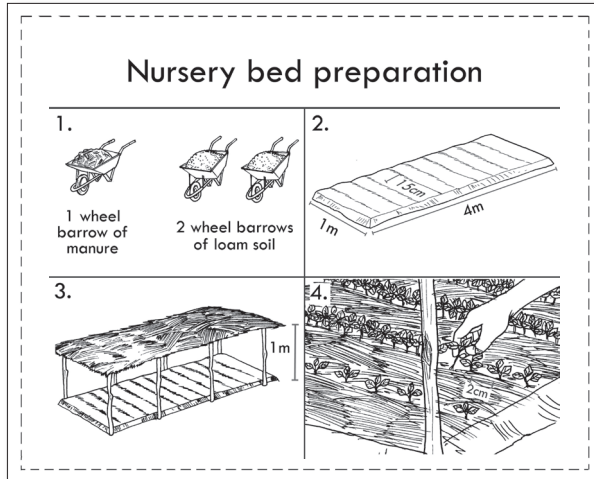
- Vegetables grow well on flatland, lowland and upland if terracing and raising of beds is practiced to control soil erosion.
- In lowlands, dig channels to drain or divert excessive water. Vegetables grow well in lowlands during the dry season (off season).
- Fertile loam soil is the best soil for growing vegetables.
- The site should not have tree shades as some trees have pests and diseases. They could damage the plants.
- The soil should not be rocky.
- The soil should be fertile or manure should be added.
- The soil should be well drained.
- Close proximity to home is ideal but vegetables are threatened by domestic birds and animals.
- The site should have good access to a water source.





## CHART 5: Land preparation

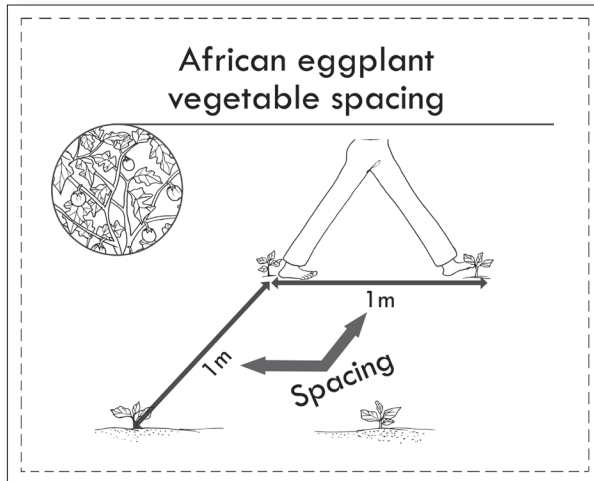
- Land preparation starts with clearing or cutting of all the tall grasses, removing trees including stumps, cutting down bushes, and removing stones and other obstacles from the field. This is done to ease the ploughing processes and all other farming activities.
- Do not burn the bushes because burning exposes the soil to erosion and also reduces soil fertility due to loss of nutrients.
- After clearing the land, plough the field for the first time and ensure that the soil has very small debris.
- If the field has perennial weeds, spray with herbicides such as weedmaster, glyphosate and roundup. Remember to contact an agriculture extension worker for guidance on herbicide.
- A second ploughing is followed by harrowing until the soil makes fine tilth (very small particles).



## CHART 6: Nursery bed preparation

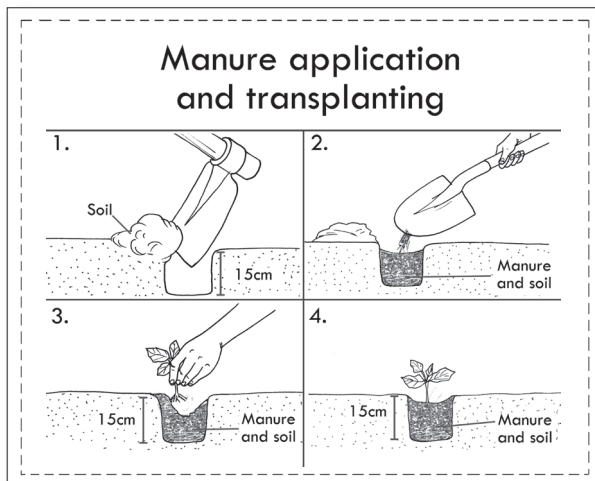
African eggplants grow best when propagated in a nursery bed and then transplanted into the main garden. To establish an african eggplant nursery bed, follow the guidelines below:

- When selecting a site for the nursery bed, ensure that it is not near drainage channels, not on a slope and near a clean source of water.
- The nursery bed should be raised at least 20cm from the ground. Recommended width is 1 metre by any convenient length. Loosen the soil for easy penetration of roots. Add well decomposed manure to the soil before sowing the seeds.
- Sowing of seed in the bed: Make drills 15cm apart and 2cm deep. Sow the seed and cover with a thin layer of soil. Apply mulch and water through the mulch. Continue watering to keep the soil moist. It is preferable to water in the evening. Seeds will germinate 10-14 days after sowing. Remove mulch from the seedlings and put it between rows.
- Set up a shade over the nursery bed. The shade should be 1m high. Ensure that the nursery bed is facing away from the sun. The shade roof should be made out of light materials to allow sunshine to reach the seedlings.



## **CHART 7: African eggplant vegetable spacing**

- Seedlings are ready for transplanting 1-1.5 months after germination.
- Give plants spacing of 1m between rows and 1m between plants. Apply well decomposed manure, about 2 handfuls per hole before transplanting.
- Water the bed heavily before transplanting.
- Transplant at the onset of rains. The following should be considered when transplanting:
  - Make sure that the roots do not break or get damaged.
  - Use a hand fork to pick out the seedlings.
  - Transplant in the evening from 3pm onwards
  - If the main garden is far, use a basin with water to transfer seedlings.
- Keep the garden free from weeds to avoid competition for nutrients.



## Chart 8: Manure application and transplanting

- Farmers are encouraged to use organic fertilizers to improve on their yields.

**Note:** *Inorganic fertilizers e.g UREA, NPK can also be used but only by following advice from an agriculture extension worker.*

When applying organic fertilizers, consider the following:

- Give the fertilizers time to decompose. This can be up to 1 - 2 months depending on the materials that you use.
- Organic fertilisers can be put directly in the hole where you intend to transplant the seedling or around the base of the seedling after it has been transplanted.

Manure application is done before transplanting. 10kgs of well decomposed manure is mixed with soil before it is filled directly into the holes in the garden.

Follow the steps below for transplanting:

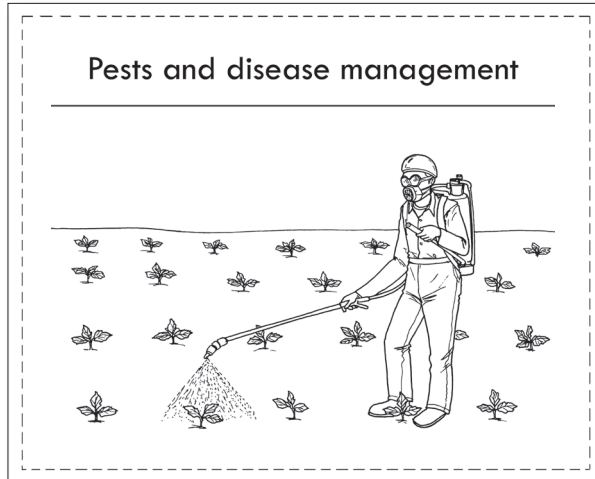
- Dig a hole of 2ft wide and 2ft deep.
- Fill each hole almost completely with manure using a spade or plate.

- Make a 2cm deep hole in the middle of the manure. This will be for the seedling.
- Cover the plant with the same mixture.

The following should be considered when transplanting:

- Make sure that the roots of the plants do not break or get damaged when you pick these out from the nursery bed.
- Use a hand fork to gently pick out the seedlings from the nursery bed.
- Transplant in the evening from 3pm onwards to avoid that the seedlings will get too much sun and heat.
- If the main garden is far from the nursery bed, use a basin with water to transfer seedlings from the nursery bed to the garden.
- Keep the garden free from weeds to avoid competition for nutrients.

Application of fertilizer should be repeated one month after transplanting. Use 100g - 120g per plant and spread the fertilizer in a 1 foot circle around the stem of the each plant.



## CHART 9: Pest and disease management

- Pest and disease management should be a continuous effort.
- Both organic and inorganic pesticides can be used to control pests and diseases.
- It is recommended to always seek advice from an agriculture extension worker on pest and disease identification and management.

**Note:** *The farmer should monitor the field to ensure quick action is taken in case of break out of pests and diseases. The farmer must also mulch.*



## **CHART 10: Weeding african eggplant**

- Timely weeding will lead to increased yield.
- Timely weeding minimizes competition for food and lights between weeds and african eggplant. It will give african eggplants better conditions to grow.
- Weeding also reduces pest and disease infestation at the early stages which will again lead to increased yields.
- Weeding should be done as soon as weeds emerge and before the flowering of weeds. This will reduce the risk of the weeds spreading.
- Thinning is done at the time of weeding. During thinning the less vigorous, off-types or relatives and diseased plants are also removed. The good quality thinned plants can be sold or consumed at home.
- Rouging of off-types should be done at flowering and at fruiting (early maturity) when its easy to identify the off-types.

## Harvesting african eggplant vegetable



### **CHART 11: Harvesting african eggplant vegetable**

African eggplants are usually ready to be harvested within 60-90 days from transplanting. Depending on the market demand, harvesting can be done 1-2 times a week. Harvesting will continue for 6 months where good agricultural practices are followed.

The african eggplants should be eaten within one week of harvesting. The fruits can also be processed into powder. To do this, follow the process below:

- Sort and clean the fruits in clean water.
- Cut the fruits into small pieces. Put the pieces on a clean and flat surface such as a mat or a tarpaulin.
- Spread under the sun until they are completely dry.
- Crush the dried fruits by using a mortar and a pestle.
- The powder should be kept in a clean and airtight container.
- The powder can be added to beans, groundnuts, beef stews to make them more nutritious.





## Chart 12: How to preserve african eggplants

There are several ways to preserve vegetables as explained below:

**Local refrigeration:** This is a 1m high construction made of bricks with 2 separate walls and sand/charcoal dust between the walls, preferably under a shade. Add an elevated water tank and use a small pipe to allow water to keep the sand/charcoal dust moist. The vegetables should be placed inside the structure on racks.


**Preservation using a pot:** African indigenous vegetables can also be stored for future consumption by placing harvested vegetables in a pot under a shade. Pile sand or charcoal dust around the pot and continue to keep the sand charcoal moist by regularly adding water. Do not pour water in the pot.

**Preservation using a solar dryer:** Vegetables can also be preserved by drying them using solar dryers after which they will be packaged for use during the dry season. Though vegetables can be dried traditionally under the sun, more nutrients are lost compared to the use of solar dryers, and it is therefore not a recommended practise.


# PART 5. THE DISCUSSION SESSION

## B) THE CROPPING CYCLE


African eggplant cropping cycle			
Land clearing and nursery bed establishment	1 <sup>st</sup> Ploughing	2 <sup>nd</sup> Ploughing and harrowing	Manure application and transplanting
Week 1	Week 2	Week 3	Week 4-5
Pest and disease management	Weeding african eggplant	Harvesting african eggplant	Harvesting and processing african eggplant seed
Week 6	Week 8-10	Week 13-25	Week 18-25




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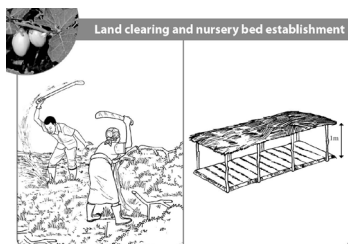


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### Week 1:

Land preparation starts with clearing or cutting of all the tall grasses, removing trees to avoid shade, stumps, bushes, stones and any other obstacles from the area to be used. This will ease the ploughing process and all other farming activities.



A germination test should be carried out during this period. Quality seed should have a germination percentage of at least 85% in 2 weeks. Contact agro-dealer and seed producers for quality seed.

Quality seed should be of uniform size, colour and shape; free of foreign matter such as weed seed and be disease free.

### Nursery bed preparation

Prepare a nursery bed on a flat area with well drained fertile soils, free of shade, near a water source.

Sow the seeds in rows 15-20cm apart with 1-2cm between plants. Cover the seeds with a thin layer of soil.

Manage the seedlings by watering and practicing continuous pests and diseases management.

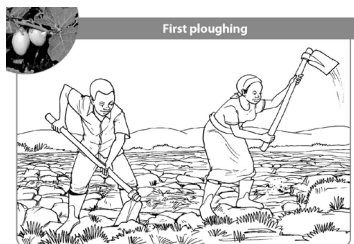
At about 3 weeks after sowing, harden seedlings by gradually reducing the frequency of watering and the amount of shade to prepare them for transplanting.

## Week 2:

First ploughing is done before the onset of rains to turn plant material into organic manure while also breaking the soil to allow more water to enter. This process also increases the amount of air available in the soil.

Depending on the resources available to the farmer, one can use a hand hoe, an ox plough or a tractor.

If your field has perennial weeds such as couch grass, spear grass or wandering jew, you need to spray the field using herbicides like glyphosate, round up and weedmaster. Always contact an agriculture extension worker or an agro-dealer for more guidance on herbicides.



## Week 3:

Carry out second ploughing and harrowing to obtain a finer tilth.

Remove any trash or other obstacles which can hinder seed germination.

Also start to harden seedlings in the nursery bed by gradually reducing the frequency of watering and the amount of shade. This will prepare them for transplanting.



## Week 4-5:

The seedlings should be ready for transplanting in 4-6 weeks when they have 4-7 true leaves.

The recommended plant spacing for eggplant is 1m between rows and 1m between plants.

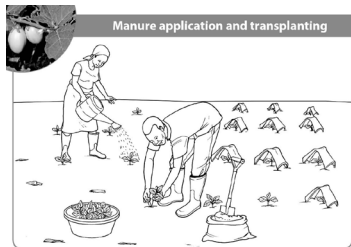
Water seedlings adequately before transplanting.

Transplant seedlings in the cool hours of the day preferably in the evening.

Where inorganic manure (NPK 17:17:17) is used, it should be applied 1 month after transplanting. Subsequent applications should follow after 2 months.

If organic manure is used, it is applied at transplanting.

**Note:** Take care the roots of seedlings are not damaged in the process of transplanting.



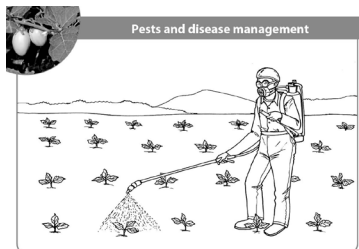
## Week 6:

Pest and disease management should be a continuous effort.

Both organic and inorganic pesticides can be used to control pests and diseases.

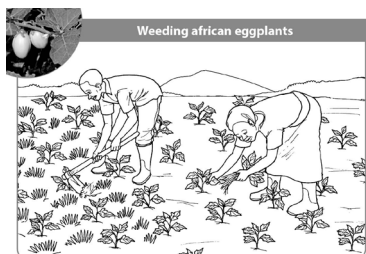
It is recommended to always seek advice from an agriculture extension worker on pest and disease identification and management.

**Note:** The farmer should monitor the field to ensure quick action is taken in case of break out of pests and diseases. The farmer must also mulch.



## Week 8-10

Timely weeding will lead to increased yields because it will minimize competition for nutrients and light between the nakati plant and weeds.



Weeding will also reduce pest and disease infestation at the early stages which will again lead to increased yields.

Weeding should be done as soon as weeds emerge and especially before the flowering of weeds. This will reduce the spreading of the weeds.

Thinning is done at the time of weeding. During thinning the less vigorous, off-types or relatives and diseased plants are also removed.

The good quality thinned plants can be sold or consumed at home.

### **Week 13-25:**

African eggplant is ready for harvesting 60-90 days after planting.

Harvesting can continue for 4 - 6 months at one week intervals.

African eggplant is harvested by picking the mature fruits.



### **Week 18-25:**

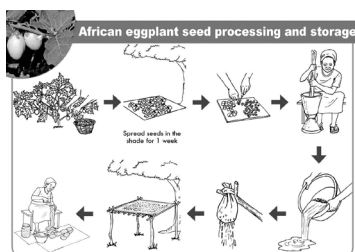
**Step 1:** Hand pick and collect mature and ripe fruits in a plastic container

**Step 2:** Place the picked fruits under shade for 1 week.

**Step 3:** Slice the fruits into 4 parts using a knife.

**Step 4:** Put the fruits in a mortar and lightly crush them using a pestle. Avoid using too much force as this can destroy the embryo within the seed which will lead to seeds being unable to germinate the following season.

**Step 5:** Fill a container with clean water and add the crushed fruits. Stir to allow the pieces of flesh and skin sticking on the seeds to float. Gently remove the floating fruit skin and seed and



then and tilt the container to allow any other floating seeds to pour out. The quality seeds will remain at the bottom. Repeat the washing several times with fresh water until all the flesh and skin are completely removed.

**Step 6:** Place the washed seeds in a bag or cotton cloth and hang in the shade for about 24 hours to remove excess water.

**Step 7:** Place the partially dried seeds on a flat plastic surface like a tarpaulin which is raised off the ground and not under direct sun light. Loosen any clump of seeds and stir 2 to 3 times daily so that seeds dry uniformly.

**Step 8:** Clean and package the seeds and store them in a cool, well ventilated and dry place.

## **Facilitator's Notes**

### **How to make compost manure**

#### **Materials:**

Dry materials: Sorghum, maize, millet straws, bean, soybean, groundnut haulms, napier grass

Green materials: Weeds, hedge trimmings and food peelings

Animal wastes: Cow dung, poultry litter, goat and sheep droppings

Covers: Top soil, wood, plastic sheeting, carpet scraps and dry grass

Mixer: Water and a turn stick

1. Prepare a pit of reasonable depth. It can be any length depending on the amount of materials available.
2. Lay twigs or chopped dry materials at the bottom.
3. Add compost materials in layers, alternating moist and dry.  
Moist ingredients: food scraps, tea bags and seaweed. Dry materials: straw, leaves, sawdust pellets and wood ashes.

4. Add manure, green manure (napier grass and grass clippings) or any nitrogen source.
5. Keep compost moist. Water occasionally, or let rain do the job.
6. Cover with anything you have - wood, plastic sheeting, carpet scraps, topsoil or dry grass/straw to keep it moist, but not soaked and sodden.
7. Turn every few weeks give the pile a quick turn with a pitchfork or shovel.
8. Once your compost pile is established, add new materials by mixing them in, rather than by adding them in layers. Mixing or turning the compost pile is key to aerating the composting materials and speeding the process to completion.

**Note:** *If you want to buy a composter rather than build your own compost pile, you may consider buying a rotating compost tumbler which makes it easy to mix the compost regularly.*

## **References:**

Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA-2012); Production of Quality Seed of African Indigenous Vegetables - ***Training Manual***

National Agricultural Research Organisation; Nakati (*Solanum aethiopicum*) - ***Seed Production Brochure***.

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