Module 7: Planting Fruit Tree Seedlings

Goal

Using the tools provided, farmers will plant suckers and/or fruit seedlings using proper spacing and best practices.

Learning Objectives

1. Learn the proper timing for planting and outplanting a variety of fruit trees.
2. Learn how to properly space and orient fruit trees on their field.
3. Learn where and how to prepare planting holes and plant selected fruit tree seedlings and/or suckers.
4. Learn best practices for fruit tree care and maintenance after outplanting.

Venue and Timing

This module should take place at the beginning of the rainy season. Hold the workshop on a participant farmer's Forest Garden site with fruit tree seedlings ready for outplanting.

Relevant Technical Manual Chapters

Before this training event, the facilitator should read, review, and thoroughly understand the following chapters and sections in the Technical Manual:

- Chapter 5: Seedling Propagation (Caring for Your Seedlings in the Nursery section)
- Chapter 6: Fruit Trees (Rearing Fruit Trees section)
- Chapter 7: Outplanting Seedlings

Preparation

- Inspect the host farmer's nursery to ensure seedlings are ready for outplanting, at least 5 seedlings per participant. Remind the host farmer to harden off the seedlings.
- Understand the planting and care requirements for all species selected.
- Identify a section of the Forest Garden to practice pruning and harvesting skills.
- Prepare plantain and/or banana suckers, where relevant. If possible, identify a nearby location where suckers can be harvested so farmers can practice during the training.
- Invite host farmer's family to the workshop.

Supplies

- Measuring tape
- 5 sharpened machetes for pruning and harvesting
- Knives or razor blades for pruning roots and removing sacks
- 2 wheelbarrows for transporting seedlings
- 5 round shovels or appropriate digging tools
- 3 watering cans with water
- ½ wheelbarrow of wood ash
- ½ wheelbarrow of charcoal dust
- 1 wheelbarrow of compost or decomposed manure
- Soil for filling tree sacks
- Plantain and banana suckers, if relevant
- Sticks for marking planting rows
- String
- Host farmer's Forest Garden design

Total Time

Approximately 3 hours

Handouts in Farmer's Workbook

- Tree Spacing Diagram

Module 7: Planting Fruit Tree Seedlings

Summary of Activities

Opener: Review Forest Garden design (20 minutes)
- Review host farmer Forest Garden design
- Discuss plants to intercrop with fruit trees
- Agroforestry technologies, protection, and care

Activity 1: Learn where and how to prepare planting holes (30 mins)
- Mark where to plant the trees in the field
- Demonstrate preparing holes
- Farmers practice preparing planting holes

Activity 2: Outplanting Learn-and-Teach stations (45 mins)
- Teach a small group of 5 farmers how to extract and plant seedlings in the prepared holes
- The first group of 5 farmers teaches 5 new farmers how to extract, transport, and plant the seedlings
- Continue small group Learn and Teach until all farmers have practiced removing, transporting, and planting the seedlings

Activity 3: Caring for outplanted seedlings and suckers (45 mins)
- Discuss seedling/sucker care with large group
- Debrief the workshop activities

Take Home Activity 4: Outplant your seedlings (15 mins)
- Farmers plant suckers and outplant seedlings from nursery to field
- Follow-up

Opener: Review Forest Garden Design

Description

The host farmer reviews the Forest Garden design which was revised after Module 5 and explains which fruit trees farmers will practice with during the workshop. The facilitator should discuss options for planting vegetables and crops to intercrop among the young fruit tree seedlings as they grow.

Instructions for Farmers

- **Review host farmer Forest Garden design**
  Invite the host to the front and review her/his Forest Garden design.
  - What changes have been made to the design since Module 5?
  - What agroforestry trees will be planted this year? Where and why? What is the benefit of planting agroforestry trees dispersed throughout the field?
  - Which fruit species will we plant?
  - Where will we plant the trees today? (reference landmarks such as paths, depressions and structures to orient farmers to locations on the field)
  - Why is using proper spacing so important?
  - What crops will you plant in the field this season? next season?

- **Discuss plants to intercrop with fruit trees**
  The fruit trees we are planting today will take several years before they start bearing fruit. To maximize what you are getting from your Forest Gardens, you can plant other crops to harvest while the fruit trees are young.
  - How can you intercrop field crops with your fruit trees?
  - What crops are good to intercrop with fruit trees?
  - What else can be planted while your fruit trees are growing?
  - What considerations are there when planting crops among newly planted seedlings?

- **Agroforestry technologies, protection, and care**
  In addition to planting fruit trees, we will also continue planting our green walls, alleys, and contours. You must also continue to protect and care for them as they grow.
  - What does the host farmer need to still plant this year to meet the Year 2 evaluation criteria for agroforestry technologies? (see Year 2 evaluation criteria)
  - Are there gaps or holes in the green wall or alleys/contours that need to be replanted?
  - Are the green walls and alleys/contours well pruned and managed? If not, how could they be improved?
  - Is the dead fence still intact, or does it need to be mended or rebuilt to ensure protection?
  - Are all brush and weeds cleared from around the trees?

Activity 1: Where and How to Dig

Description

The facilitator demonstrates proper spacing for the types of fruit trees being planted and demonstrates best practices for preparing holes for planting seedlings and suckers.

Instructions for Farmers

1. **Mark where to plant the trees in the field**
   We will go to the field and practice spacing and marking the rows and points where we will plant the fruit trees.
   - When is the best time of year to plant?
   - What spacing should you use for the types of trees we are planting today?
   - If you plant near a fence, how much space do you leave between the fence and the tree?
   - If your land is sloped, do you plant in a straight line, or on the contours?
   - Should you plant in a grid, or using triangular spacing?
   - How do you ensure trees are planted in straight lines?
   - How do you ensure proper spacing and that the planting follows the original design?

2. **Demonstrate preparing holes**
   Watch how I dig the first hole in each row we will plant today and plant seedling or sucker.
   - How wide do you dig the holes?
   - How deep do you dig the holes?
   - How can you ensure there are plenty of nutrients in the soil for the young seedling?
   - What can you add to the soil before planting? If you do not have compost, what else can you add? Why do you add wood ash? Why do you add charcoal?

3. **Farmers practice preparing planting holes**
   Now, you will practice preparing the planting holes. Continue preparing them following my example.

Activity 2: Outplanting Learn-and-Teach Stations

Description

While the large group continues to prepare holes for outplanting, the facilitator takes a small group of five farmers to the nursery and instructs them on how to properly extract, transport, and plant the fruit tree seedlings. After instructing the first small group, those farmers teach the next small group under the supervision of the facilitator, and so on.

Instructions for Farmers

1. **Teach a small group of 5 farmers how to extract and plant seedlings in the prepared holes**
   I will take a group of 5 farmers to the nursery and show them how to remove the seedlings and carry them without damaging them. Everyone will have a chance to come to the nursery and practice. The rest of you will continue to prepare the holes and plant the seedlings and/or suckers as I demonstrated.
   - How and why do you harden off seedlings?
   - How do you protect roots when extracting seedlings in plastic sacks and bareroot beds?
   - When and how do you prune roots? How quickly must seedlings be planted after being extracted from the nursery?
   - What special precautions do you take when planting bareroots?
   - What are J-roots, and how do you avoid them?
   - What is the best time of day to plant?
   - How should seedlings be transported? For short distances? For long distances?
   - Why is it good to prepare the holes one to two weeks before outplanting?
   - How deep should the seedling be placed in the planting hole?
   - What do you do if the hole is too deep? Too shallow?
   - How should soil be packed into the hole around the seedling or sucker?
   - How much water do you need for each seedling or sucker? How often?
   - What should you do with all these plastic scraps that used to be nursery bags?

2. **The first group of 5 farmers teaches 5 new farmers how to extract, transport, and plant the seedlings**
   Remove the seedlings from the nursery, take them to the Forest Garden site, and plant them. Bring another small group of 5 farmers and teach them what you learned. When the second group has placed their seedlings next to the holes, then your group should start planting the seedlings.

   Second group, bring 5 more farmers to the nursery and teach them what you learned.

3. **Continue small group Learn and Teach until all farmers have practiced removing, transporting, and planting the seedlings**
   We will continue until everyone learns how to extract, transport and plant seedlings.

Activity 3: Caring for Outplanted Seedlings and Suckers

Description

After all the seedlings and suckers are outplanted, the facilitator brings the group together to discuss what they learned, answer any questions, and go over how to care for the outplanted seedlings and suckers. The facilitator also discusses any special considerations for caring for seedlings remaining in the nursery.

Instructions for Farmers

1. Discuss seedling/sucker care with large group

Now that we have outplanted our seedlings from the nursery and planted suckers, how do we continue to care for them in the field?

- What are the biggest risks to the newly planted seedlings?
- When should farmers check for dead seedlings or suckers to replace? How do you know if a seedling or sucker is dying? When should dead ones be replaced?
- How do you rake a firebreak?
- When should farmers start to check for weeds and pests?
- What is one thing you can do to mitigate weeds and moisture loss while providing organic matter to the soil? (mulch)
- Do you add mulch or fertilizer to the trees?
- How do you check for insects? What will you do if locusts or other insects come?
- Do you need to water the seedlings?
- What is a cuvette and how can you make one to help the trees?
- What other simple water conservation or irrigation techniques can you do (mulching, water bottles)?
- Which seedlings need to remain in the nursery longer? (mango and citrus) Why? How do you continue to care for those seedlings?

2. Debrief the workshop activities

Does anyone have questions about what we did today?

- Does the planting we did today resemble the plans the host farmer explained in the first activity? Did we put the trees in the right places?
- What did you learn?

Take Home Activity 4: Outplant your Seedlings

Description

Farmers will plant plantain and banana suckers (if available) and outplant their fruit and agroforestry seedlings from the nursery to their Forest Gardens based on their Forest Garden designs and using the techniques learned during this workshop and in Year 1.

Instructions for Farmers

1. Farmers plant suckers and outplant seedlings from nursery to field

When your seedlings are ready, outplant them to your Forest Gardens using the skills and best practices you learned today and in Year 1. Look at your Forest Garden design to decide where to plant. Look at the Year 2 evaluation criteria and be sure you will meet the performance expectations regarding green walls, alley cropping, and/or contours.

The lead farmer will come to your farm within the next few weeks to evaluate your progress. I will also visit your Forest Garden soon. If you are planting trees that grow from suckers, you should collect and prepare your suckers and then plant them at the same time you are outplanting your seedlings.

Follow-up

The lead farmer visits each participant within 2-3 weeks of the training event to check on progress and counsel on proper outplanting spacing and techniques. Within 4-6 weeks the facilitator will also visit.

Evaluation Checklist for Skills Learned in Module 7

At the end of the year you will be evaluated on the following practices that you learned and discussed during training events. Those in bold are topics that we discussed or practiced today. In demonstrating that you have completed the Year two evaluation criteria, you will be invited to continue into the third year of the project.

Year 2 Evaluation Criteria

- Green Wall
  - At least two rows planted, surrounding the entire site
  - At least part of the third row is planted
  - Dead trees and gaps from the first year are replanted
  - Proper spacing between rows
  - Proper spacing between trees within rows
  - Woven branches
  - Pruned into a hedge
  - Brush and weeds cleared
  - Dead fence surrounding green wall (for all projects where this is determined to be a requirement)

- Alley Cropping and/or Contour Planting
  - Minimum of 3 rows planted across cropping area
  - Agroforestry trees interspersed throughout site
  - Proper spacing between rows
  - Proper spacing between trees within rows
  - Contour lines followed (on sloped sites)
  - Coppiced or pollarded in year 2

- **Fruit Trees**
  - **At least 3 species of fruit trees/plants**
  - **Proper spacing between fruit trees planted**
  - **Trees appear to receive enough water**
  - **Each tree is weeded and mulched**
  - **At least 2 species of fruit root stock growing**
  - **Fruit trees for grafting are transplanted from beds to sacks or trenches**

- Compost
  - Three active piles, Passes stick test
  - Demonstrated product and use

- Permagarden
  - Raised or sunken beds
  - Amended soils, Mulching
  - At least six species/types
  - At least two new species/types that were not planted previously by the family
  - Rotation planting

Seedling Care Checklist

Use this checklist to identify the measures that farmers can take to protect their Forest Garden.

Protection from Fire

- Does the field have a fire break?
- Has the farmer weeded around newly planted trees?
- Does the farmer start fires on the farm for:
    - Smoking tobacco?
    - Cooking?
    - Distilling?

Protection from Pests

- Can the farmer identify common pests?
- Are any pests visible on the trees?
- Do trees have physical protections (thorny branches, sacks, sticks, etc.)?
- Are seedlings planted a far enough distance from the dead fence?

Protection from People

- Is the farmer sharing use of the field?
- If yes, has the farmer explained the importance of the new seedlings?
- Has the farmer started pruning the green wall trees?

Protection from Wind and Water

- Did the farmer mulch around the trees?
- Did the farmer use earthworks to preserve water?
- Is the field exposed to fierce winds?
- Remind the farmer about best practices for watering seedlings

Module 7: Facilitator's Notes

The facilitator should use the following pages to note down any questions or findings from the group that should be kept for or addressed at a later time. Depending on the module this may include species selection by group, crops identified in seasonal calendars, or anything else that should be noted.