LEARNING FACILITATING MATERIALS

NATIONAL PROFICIENCY LEVEL 2

TRADE AREA: **CASHEW AND MANGO PRODUCTION**

UNIT 2

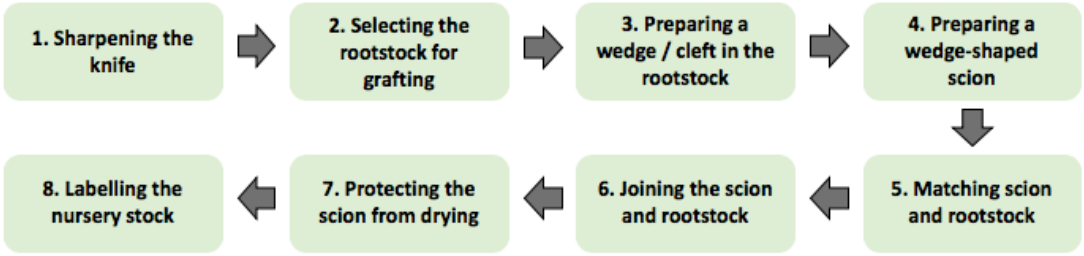
GRAFTING OF ROOTSTOCKS IN A NURSERY

This publication has been produced with the assistance of the Ghana Skills Development Initiative (GSDI) III, a project implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in cooperation with the Council for Technical and Vocational Education and Training (COTVET) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ), co-funded by the European Union (EU) and the Swiss State Secretariat for Economic Affairs (SECO). The contents of this publication are the sole responsibility of GIZ and COTVET and can in no way be taken to reflect the views of the stakeholders.

UNIT INTRODUCTION

Welcome to Unit 2 of your learning journey in cashew and mango production. This guide explains the main steps in grafting of rootstocks in a nursery. In addition, you will also learn about selecting and harvesting the correct scions for grafting.

The flow chart below shows the grafting process in 8 steps and will guide you throughout this unit:



Do you already know why it is important to graft cashew and mango seedlings with the correct scions?

If you follow the steps for scion selection, harvesting and grafting of rootstocks in the right sequence, you will produce improved and higher-quality seedlings. Do not miss a step! Apply your knowledge and skills accurately to increase your success rate in grafting and to produce many healthy cashew and mango seedlings.

The learning material covers six sub-units:

1) Selecting rootstock for grafting
2) Preparing rootstock
3) Selecting scion
4) Harvesting Scion
5) Grafting
6) Nurturing grafted seedlings

Each sub-unit contains theoretical and practical exercises. Each module includes written materials, visuals as well as self-assessments to test your knowledge and skills.

The benefit of learning this information is to develop improved cashew and mango seedlings that produce a lot of high-quality cashew and mango fruits. You can use your grafting skills either to set up your own nursery and sell improved seedlings to farmers in your community, or to plant the improved seedlings on your own farm.

Even though this learning material provides essential information on grafting of rootstocks in a nursery for National Proficiency Level 2, you should also look out for new information, innovations and technological advances during your practical work that expand your knowledge and skills.

Are you ready to start your learning journey on cashew and mango? Let's start!

TABLE OF CONTENT

ICONS

LEARNING OBJECTIVES

ATTENTION

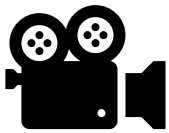
PRACTICALS HANDS ON

CROPPING CALENDAR

SELF ASSESSMENT

WELL DONE!

TAKE A BREAK!



WATCH VIDEO

ABBREVIATIONS

Here are some commonly used abbreviations.

cm	Centimetre *(1 cm = 10 millimetre)*

1. DEMONSTRATE SKILLS FOR SELECTING ROOTSTOCK FOR GRAFTING

a) Describe seedling rootstocks

Seedling rootstocks are newly planted trees, sown from cashew or mango seeds. The seedling rootstock is the part of the plant comprising the root system and the stem.

<u>The two (2) essential components for grafting are:</u>

1. Rootstock
2. Scion

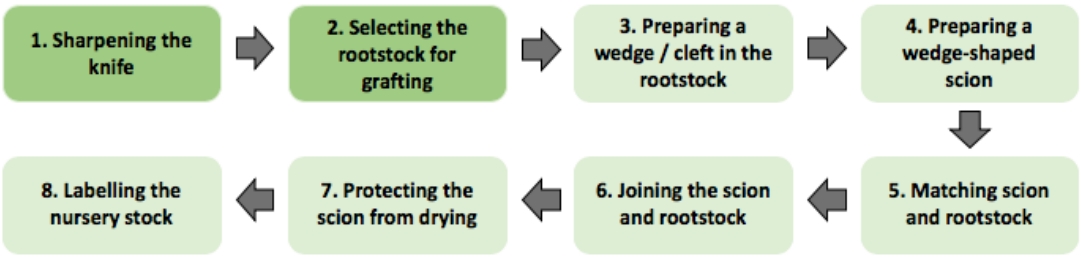
The rootstock is the plant on to which another clone – the scion – is grafted.

Source: GIZ/ComCashew – Nursery with batches of rootstock seedlings

b) State the importance of rootstock selection for grafting

The selection of a strong rootstock, free of any pests and diseases, is important to produce high-quality grafted cashew and mango seedlings. A strong and healthy rootstock increases the survival rate of the grafted seedling and when transplanting the grafted seedling on the field.

The dark green fields indicate the steps of the processing process you are currently studying.



Source: GIZ/ComCashew – Nursery with seedlings and grafted seedlings

c) Identify the qualities of a good rootstock for grafting

To select a rootstock, look for a healthy and strong seedling, free of pests and diseases.

Healthy Cashew Seedling **Healthy Mango Seedling**

Source: https://agromint.com/product/local-cashew-seedling-2/
Source: https://www.worldagroforestry.org/sites/default/files/users/admin/mango-grafting-manual.pdf

Healthy and strong cashew and mango seedlings are mature enough for grafting, if they have the following features:

Table 1: Features of mature seedling for grafting

Healthy Cashew Seedling	Healthy Mango Seedling
• 45 to 60 days old	• 6 months old
• 2 to 4 mature green leaves	• 10 to 12 mature green leaves
• the size of the stem should have the size of a pencil	• the size of the stem should have the size of a pencil
• the size of the stem should be the same thickness as the scion	• the size of the stem should be the same thickness as the scion
• free of pests and diseases	• free of pests and diseases

d) Outline the procedure for selecting rootstock

Use the checklist to follow steps 1 to 6 in selecting rootstocks. Rate your own performance critically and honestly after you have completed each activity.

 Excellent  Okay  Try Again

Activities	Rate
1. Examine the batches of rootstocks that you sowed: • 45 to 60 days ago, for cashew • 6 months ago, for mango	
2. Examine each rootstock individually on the features stated in Table 1	
3. Select only those rootstocks that match all criteria for quality rootstocks for either cashew or mango	
4. Pick the rootstocks and take them to the grafting site	
5. Keep the immature rootstocks that do not match all criteria for quality rootstocks in the same batch. The rootstocks need more time to grow!	
6. If you find any rootstocks that have been attacked by pests or diseases, take the rootstocks out of the batch and treat them in a different location to avoid the spread of pests and diseases to healthy rootstocks	

In the middle of difficulty always lies an opportunity. Enjoy your learning journey.

e) Select rootstock for grafting

Practical Exercise: Go to your nursery and select rootstocks for grafting considering all the factors you have learned so far. You will continue to work with the same rootstocks in the following practical exercises.

SELF ASSESSMENT

1. Describe seedling rootstocks.

2. State the importance of rootstock selection for grafting.

3. Identify the qualities of a good rootstock for grafting.

4. Outline the procedure for selecting rootstocks.

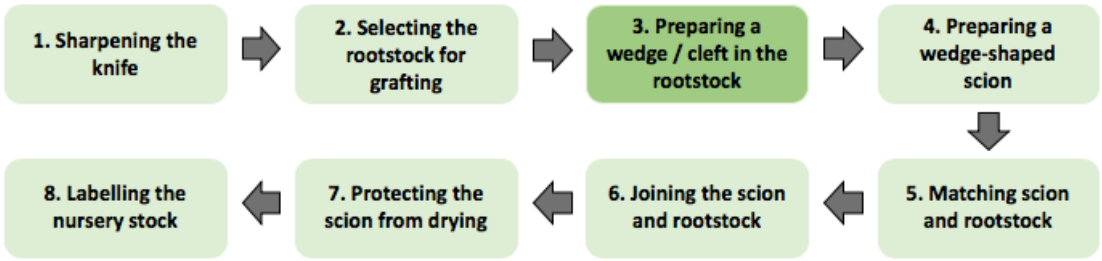
Well done! You have completed the first set of questions. This is very encouraging. Let's move on to proceed on your cashew and mango learning journey.

2. DEMONSTRATE SKILLS FOR PREPARING ROOTSTOCK

a) Explain rootstock preparation

Before you graft a scion on the rootstock, you need to prepare the rootstocks that you selected for grafting. Rootstock preparation is the process of trimming the seedling and cutting a wedge in the stem.

The dark green field indicates the step of the processing process you are currently studying.



Source: Yeboah (2018) – Grafting Training in Cashew

For more information on rootstock preparation, watch video on *Cashew Nursery Establishment and Grafting – Peace Corps Ghana* from Minute 3:57 to 4:22, and watch video on *Improved planting material - How to do cashew grafting* from Minute 1:25 to 2:45, and watch video on *Mango V Grafting Technique with Result* from Minute 0:08 to 1:02.

b) State the importance of rootstock preparation

The scion and the rootstock can only grow together in order to form a new plant, if both - the rootstock and the scion - are cut and joined in the wedge of the rootstock.

<u>In rootstock preparation, it is important that:</u>

1. rootstocks and scions have the same size
    - If the scion is heavier than the stem of the rootstock, the stem can break, and the survival rate of your grafted seedlings decrease.
2. you trim each stem down to 5 - 8 cm above soil level
3. you cut a wedge into the stem.
    - Make a smooth vertical cut of approximately 2.5 - 3 cm at the centre of the top downward towards the bottom rootstock

1 2

3 4

Source: World Agroforestry Centre – Preparation of mango rootstocks

c) State the tools used for rootstock preparation

The following tools are required for rootstock preparation:

- The most important tool for rootstock preparation is a very sharp **Knife**.
  - You need a sharp knife to make precise cuts
  - Sharpen your knife until you can slice a piece of paper with it easily, that means it is sharp enough

Source: https://www.duebuoiagriculture.it/en/pr/grafting_knife_260c/1402.html

- Use very sharp **Secators** to cut the stem of the rootstock

Source: https://www.grube.de/freund-bypass-gartenschere-64-276/

d) Outline the procedure for preparing rootstock

Use the checklist to follow steps 1 to 4 in preparing rootstocks. Rate your own performance critically and honestly after you have completed each activity.

 Excellent  Okay  Try Again

Activities	Rate
1. Take one of the rootstocks that you have already selected.	
2. Pluck off some leaves, but make sure that you keep a few leaves growing below the graft union.	
3. Cut the top of the rootstock horizontally at a height of • 5 cm for cashew above soil level • 6 to 8 cm for mango above soil level	
4. Make a smooth vertical cut at the centre. Cut downward towards the boom of the rootstock • 2.5 cm for cashew • 3 cm for mango	

Never give up on a dream because of the time it will take to accomplish it.

e) Prepare rootstock for grafting

Practical Exercise: Go to your nursery and prepare the rootstocks that you have already selected. Consider all factors that you have learned so far in preparing your rootstocks for grafting.

Source: https://puebloman.com/2013/09/18/grafting-mangos/

SELF ASSESSMENT

1. Explain rootstock preparation.

2. State the importance of rootstock preparation.

3. Outline the procedure for preparing rootstock.

Congratulations! You have completed the second set of questions. Let's move on to the next chapter.

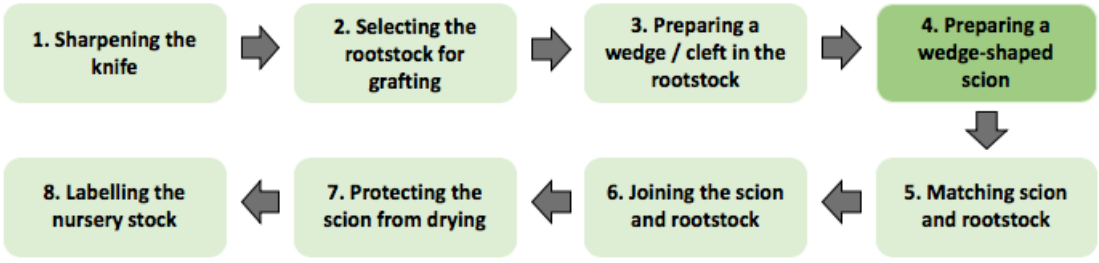
3. DEMONSTRATE SKILLS FOR SELECTING SCION

a) Define the term "Scion"

A scion is a young shoot or twig of a tree (in this case of a cashew or mango tree), that was especially cut for grafting. The scion normally has one or more newly sprouted buds, that are leaves or blossoms that have not yet unfolded.

Source: World Agroforestry Centre – Mango scions

The dark green field indicates the step of the processing process you are currently studying.



For more information on selecting scion, watch video on *Cashew Nursery Establishment and Grafting – Peace Corps Ghana* from Minute 4:22 to 5:46.

b) State the importance of scion for grafting

The quality of the scion determines the quality of the entire plant. If you want to produce cashew and mango seedlings that develop into highly productive trees, you have to select scions from mother trees.

Mother trees are highly productive trees that generate quality yields.

Select the scions from mother trees to determine the quality for your grafted seedling:

- If you choose a scion from a cashew or mango tree that is highly productive and generates quality yields, your grafted seedling will have the same characteristics.
- If you choose a scion from just any tree (not a mother tree) your grafted seedling might not perform well and generate low yields.

c) Identify the qualities of a good scion for grafting

The qualities of a good scions are:

- pencil size in thickness
- erect and 12 - 15 cm long
- bulky and straight
- greenish brown in colour
- matured with swollen but not broken terminal bud
- clean and free from diseases and pests

Obtain your scion from well-established and well-maintained scion banks. Only obtain your scion from farmers' fields, if the farmer has already identified and marked high yielding mother trees during harvest season.

Precondition cashew scions before harvesting by removing all leaves 4 - 7 days before harvesting. For mango scions, remove all leaves 7 - 10 days before harvesting.

Ensure that the scion is free from diseases and pests.

d) Select scion for grafting

Practical Exercise: Go out to your farm and find the best scion for grafting considering all the factors you have learned so far.

Source: GIZ/ComCashew – Preconditioning cashew scions

Don´t harvest the scions yet! Just precondition the scion. You will learn how and when to harvest scions in the next chapter.

SELF ASSESSMENT

1. Define the term “scion”.

2. State the importance of scion for grafting.

3. Identify the qualities of a good scion for grafting.

You are making great progress! You have completed another set of questions. Take a break or start with the next chapter.

4. DEMONSTRATE SKILLS FOR HARVESTING SCION

a) State the factors to consider in scion harvesting

You have already preconditioned your scions by removing all leaves 4 - 7 days before harvesting. Now it is time for scion harvest.

Consider the following factors in harvesting scions:

- Harvest scions early in the morning or late in the evening to protect them against the sun and from drying
- Harvest scions on the day of grafting
- Protect scions from drying by wrapping them in a moist tissue immediately after cutting, for example in a:
    - wet newspaper
    - wet cloth
    - dry grass
    - hessian cloth
- Place the wrapping material with the scions inside in a polythene bag or in a cool container to transport scions to the grafting site.

You can increase the survival rate of your grafted seedlings, if you graft the scions immediately after harvesting them. Do not use scions later than three days after harvesting them.

Source: GIZ/ComCashew - Cashew scions

For more information on harvesting scions, watch video on *Cashew Nursery Establishment and Grafting – Peace Corps Ghana* from Minute 5:46 to 6:52, and watch video on *Improved planting material - How to do cashew grafting* from Minute 1:02 to 1:25.

Harvest cashew scions in April, May and June.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

b) State the uses of cutting tools for harvesting scion

The following tools are required for harvesting scion:

- For harvesting scions, use the same sharp **Knife**
  - You might have to sharpen it again!

Source: https://www.duebuoiagriculture.it/en/pr/grafting_knife_260c/1402.html

Using a sharp knife so you do not harm the scions and do not expose them to any diseases that can attack the scion on the unclean cuts.

- Use very sharp **Secators** to cut the scions from the tree

Source: https://www.grube.de/freund-bypass-gartenschere-64-276/

c) Outline the procedure for harvesting scion

Use the checklist to follow steps 1 to 6 in harvesting scion. Rate your own performance critically and honestly after you have completed each activity.

 Excellent  Okay  Try Again

Activities	Rate
1. Go to the same scion bank or farmers' field in the early morning where you already prepared your scions	
2. Cut the scions with a sharp knife or secators at a length of 12 – 15 cm	
3. Wrap the scions in a moist tissue and in a polythene bag immediately after cutting	
4. Keep the polythene bags in a cool container	
5. Label all scions bundles properly by indicating the: • Type of tree • Cultivar/clone • Date of harvesting	
6. Transport scions in moist cloth and keep them cool in a shady place or in a cool box.	

Believe that you can do it, and you are halfway there.

d) Harvest scion for grafting

Practical Exercise: Now you have learned what factors to consider when harvesting scions. So, go and harvest the scions you had previously selected from mother trees on farmers' field or from a scion bank.

SELF ASSESSMENT

1. State the factors to consider in scion harvesting.

2. State the use of cutting tools for harvesting scions.

3. Outline the procedure for harvesting scion.

Great success, you are almost done! Let's tackle the two last chapters.

5. DEMONSTRATE SKILLS FOR GRAFTING

a) Explain the importance of grafting

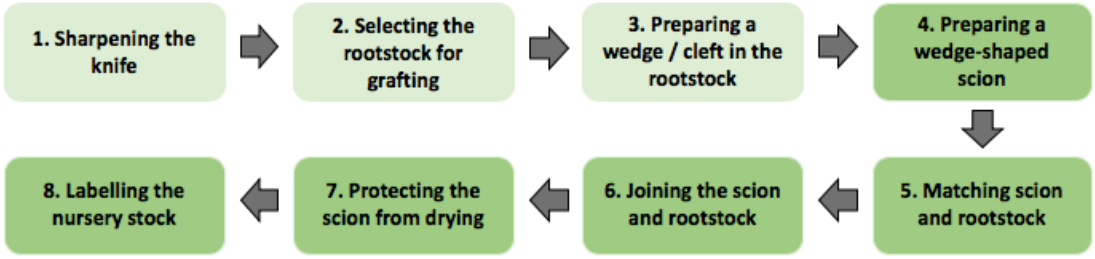
Grafting is important to generate uniform trees that are/have:

- high yielding
- pest and disease resistance
- good nuts
- good fruit sizes

By grafting scions from selected mother trees on your rootstocks, you transfer desirable characteristics of the mother tree to the rootstock.

If you graft a scion from a mother tree, that is resistant to pests and diseases, and produces high volumes of good quality cashew or mango fruits on your rootstock, you will most likely see these qualities in your grafted cashew and mango seedling as well.

The dark green fields indicate the steps of the processing process you are currently studying.



Source: http://www.scielo.br/pdf/rbf/v40n1/0100-2945-rbf-40-1-e-586.pdf

For more information on grafting, watch video on *Cashew Nursery Establishment and Grafting – Peace Corps Ghana* from Minute 6:52 to 9:13, and watch video on *Improved planting material - How to do cashew grafting* from Minute 2:45 to 5:33, and watch video on *Mango V Grafting Technique with Result* from Minute 1:02 to 5:14.

Grafting cashew seedlings is conducted in the same time as scions are harvested in April, May and June. Remember! Scions must be grafted within three days after harvest.

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

b) State the factors to consider in grafting

In grafting scions to rootstocks, it is important that the stem of the rootstock and the scion have the same size (diameter). This way they will be able to grow together and the freshly cut surface is not exposed to drying out or to pest and disease attacks.

The success rate of most grafters is at 85 %.
To compensate for the shortage of 15 %, it is necessary to raise additional 15 % grafts.

If you plan on planting/selling 100,000 grafted seedlings, the number of rootstocks to be grafted must be: 100,000 + (15 % of 100,000) = 115,000.

Source: GIZ/ComCashew – Grafted cashew seedlings

c) State the function of tools for grafting

The following tools are required for grafting:

- For grafting you need your **sharp knife** again.

Source: https://www.duebuoiagriculture.it/en/pr/grafting_knife_260c/1402.html

Is your knife still razor blade sharp? If not, sharpen it again to perform a successful grafting procedure!

d) State the materials for grafting

The following materials are required for grafting:

- **Polythene graft tape** to join your scion and rootstock together
- **Poly caps** to protect the grafts from drying
- **Cotton** to clean the tools with **disinfectant** before and after grafting
- **Scions** that are not older than 3 days

Source: GIZ/ComCashew – Grafting materials

Using unclean grafting materials can lead to contamination and infection of the rootstock and/or the scion. Always keep your grafting materials clean!

e) Outline the procedure for grafting seedlings

The grafting procedure for joining scion and rootstock starts at step 4 in the grafting process and continues until step 8.

- Step 4: Trim the scion to a wedge shape by cutting off the boom tip
- Step 5: Place the scion into the cleft you cut into your rootstock
- Step 6: Join scion and rootstock together by using polythene grafting tape
- Step 7: Cover the scion and grafted shoot with a poly cap
- Step 8: Label your grafted seedlings

There are four (4) different grafting methods:

1. Wedge / cleft grafting
2. Side grafting
3. Tongue grafting
4. Chip bud grafting

The most common method for grafting cashew and mango seedlings in Ghana is wedge / cleft grafting.

Let's examine step 4 to 8 for wedge / cleft grafting in detail now.

Step 4: Trim the scion to a wedge shape by cutting off the boom tip

- Use a knife to cut the lower end of the scion to a V-shape by removing the wood on both sides of the scion
- Try to make the V-shape 2 – 3 cm long. This will increase the survival rate of your grafted scion

Source: World Agroforestry Centre – Preparation of mango scions

Source: GIZ/ComCashew – Scion preparation

Step 5: Place the scion into the cleft that you have already cut into your rootstock.

- Slide the sharpened end of the scion into the slot you have cut in the rootstock
- Insert the scion as deep as possible into the cut in the rootstock and align the two parts
- Make sure the scion and the rootstock are in close contact and quite firm
- It is important that both - the scion and rootstock - have exactly the same thickness at the contact location
- If this is not the case, remove the scion and repeat the sharpening at a thinner end or cut the rootstock at a thicker part of the stem
- Then repeat the joining and check if the scion and the rootstock match better

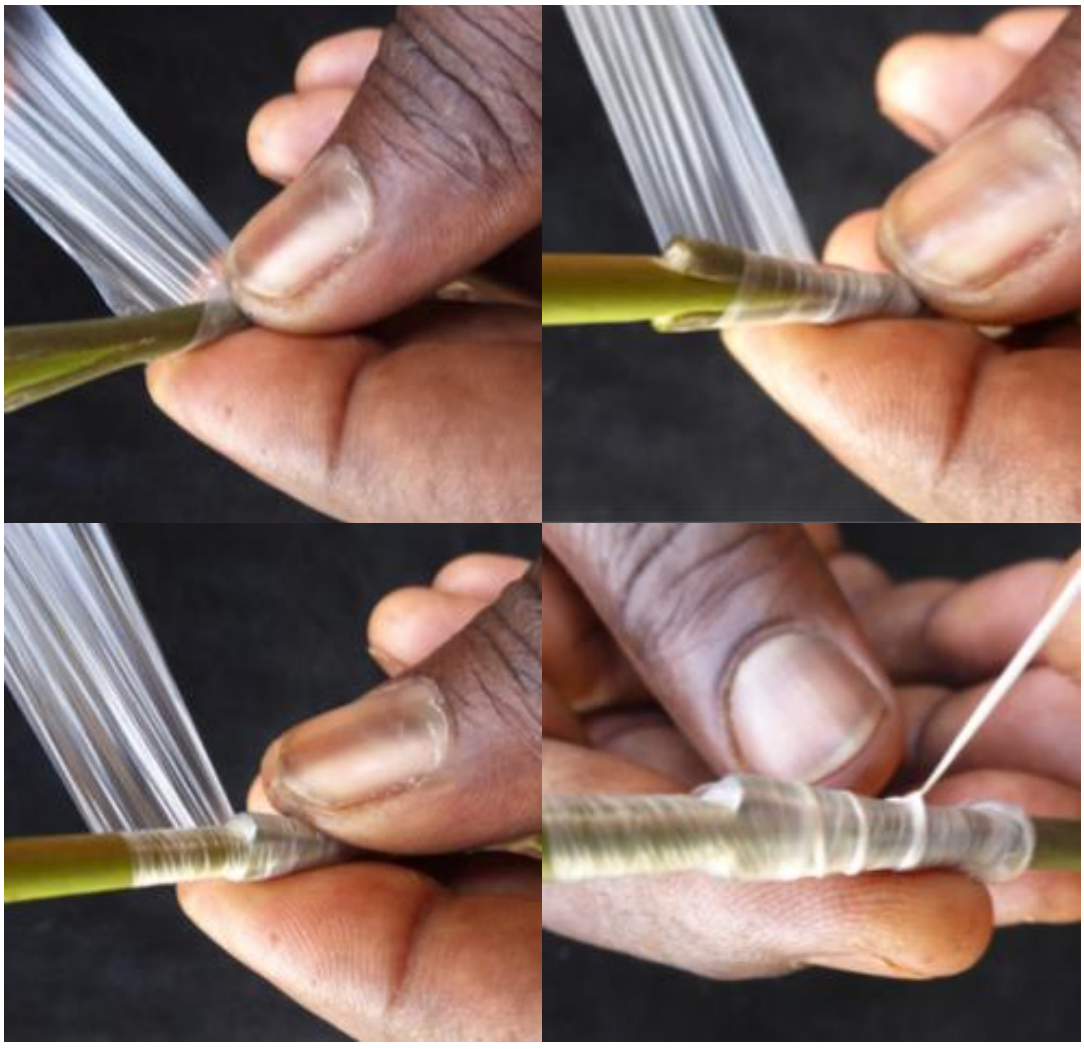
Source: GIZ/ComCashew – Joining scion and rootstock

Source: GIZ/ComCashew – Graft union

Step 6: Join scion and rootstock together by using polythene grafting tape.

- Tie the graft union with a 1.5 cm wide and 30 cm long polythene graft tape
- Start tying from the rootstock end of the graft (i.e. below the graft union) and wind the polythene graft tape upwards. Overlap the rounds of tape at the point of the graft union
- Cover the graft union towards the top of the scion
- When only 6 or 7 cm of the tape remain, wind downwards to overlap the tape again
- Finally, fix the tape with a simple knot, so:
    - the scion and the rootstock will grow together as one plant
    - the graft is protected from drying and less exposed to diseases and pests

1 **2**



3 **4**

Source: World Agroforestry Centre – Wrapping technique with polythene graft tape

Source: GIZ/ComCashew - Female grafter joins scion and rootstock together

Step 7: To protect the scion from drying out, cover the scion and grafted shoot with a poly cap.

The poly cap cover will stop the scion from losing water through surface evaporation.

Source: GIZ/ComCashew – Covered scion

Step 8: Label your grafted seedlings

Each batch of grafted seedlings must be easily identified. Information on the label should include:

- variety name and code
- date of grafting
- any plant treatments undertaken or required

Put two labels on each lot, one at the beginning of the row and one at the other end of the row.

f) Demonstrate procedures for grafting seedlings

Practical Exercise: Pick the seedling rootstock that you have prepared already and one of scions that you have harvested. Start grafting your seedlings.

SELF ASSESSMENT

1. Explain the importance of grafting.

2. State the factors to consider in grafting.

3. State the materials used for grafting.

4. Outline the procedure for wedge / cleft grafting seedlings.

Great success, you are almost done! Let's tackle the last chapter.

6. DEMONSTRATE SKILLS FOR NURTURING ROOTSTOCK

a) Explain nurturing practices of grafted seedlings

Nurturing practices include:

- watering of grafted seedlings
- checking for pest and disease
- treating pest and disease
- cleaning the nursery from any rubbish to avoid contamination
- providing enough shade for the newly grafted seedlings

A nursery with a 50 % shade net is a good environment to keep and nurture grafted cashew seedlings.

Nurturing the grafted seedlings is your daily task at the nursery. All the plants that you have sown, grown and grafted so far, need care in order to survive and grow into healthy seedlings.

Source: GIZ/ComCashew – Grafted seedlings in nursery

b) State the importance of nurturing grafted seedlings

Nurturing your grafted seedlings is important to provide the plant with the necessary water and protection against pests and diseases.

In nurturing your grafted seedlings, you prepare them for successful transplanting on the field.

Graft care is important, so the grafting wound can heal and develop into a strong graft.

- You must inspect grafts for signs of sprouting after 2 - 3 weeks
- Loosen poly caps when the leaves and the new sprouts have fully expanded (4-7 days after sprouting)
- Remove lateral shoots growing below the graft union

Source: https://www.agric.wa.gov.au/mangoes/propagating-mangoes

Source: GIZ/ComCashew – Well healed grafting wound

Possible consequences of neglecting grafted seedlings are:

- pest and diseases
- drying out
- slow growth

It is important to keep the rate of lost grafts low in order to save grafting materials, time and money.

Some of the common pests and diseases of seedlings and rootstocks in cashew nurseries are:

1. **Cashew leaf miner**

Acrocerops sp.

Source: Awudzi (2018) – Cashew leaf miner

Mode of attack and symptoms:

- The larva of the leave miner scrapes and covers the upper leaf surface with a gelatinous secretion which dries and gives a silvery appearance

Procedure for pest control:

- Physical control
  - Practice good nursery sanitation
  - Prompt removal & destruction of affected leaves to prevent spread of the infestation (Practicable at the nursery stage).
- Chemical control *(Study Unit 3 on Pest and Diseases Management, NC 2 Level)*

2. Cashew Mosquito Bug

Helopeltis spp.

Source: Awudzi (2018) – Sap-sucking bugs

Mode of attack and symptoms:

- Both nymphs and adults feed on young shoots, leaves, young nuts and apples. The injection of toxic saliva into the plant tissue results in damage to flush leaves and stems by the presence of brownish-black patches, which result in dieback. In severely damaged seedlings, the entire leaves are destroyed.

Procedure for pest control:

- Chemical control *(Study Unit 3 on Pest and Diseases Management, NC 2 Level)*

3. Cricket

Gryllus sp.

Source: https://bugguide.net/node/view/846888

Mode of attack and symptoms:

- Crickets cut the stem of young cashew seedlings which, in many cases, results in the death of the plant.

Procedure for pest control:

- Chemical control *(Study Unit 3 on Pest and Diseases Management, NC 2 Level)*

4. Caterpillars / Defoliators

Source: http://invasives.wsu.edu/defoliators/galleries/gallery_larvae.html

Mode of attack and symptoms:

- Caterpillars feed on young developing leaves of cashew. These caterpillars are the larval stage of moths.

Procedure for pest control:

- Chemical control *(Study Unit 3 on Pest and Diseases Management, NC 2 Level)*

5. Termites

Source: https://www.orkin.com/termites

Mode of attack and symptoms:

- Termites destroy seedlings and young plants by biting on fresh stems.
- This results in the wilting of leaves and death of the plant.

Procedure for pest control:

- Chemical control *(Study Unit 3 on Pest and Diseases Management, NC 2 Level)*

6. Seedling blight

Mode of attack and symptoms:
The disease caused by *Septocylindrium sp.* causes wilting and withering of leaves as a result of root rotting.

Procedure for pest control:

- Preventative control
  - Ensure good soil drainage to reduce disease incidence
  - Ensure seedlings germinate promptly
  - Avoid over-shading
- Chemical control *(Study Unit 3 on Pest and Diseases Management, NC 2 Level)*

Source: GIZ/ComCashew – Seedling blight

c) State the uses of tools for nurturing grafted seedlings

The following tools are required for nurturing grafted seedlings:

It is necessary to water the plants regularly, at least once or twice a day depending on the weather conditions (heat and rain). You can water your rootstocks in different ways, depending on the equipment you have available:

- by hand with a **Watering Can**

Source: https://www.diy.com/departments/sankey-green-plastic-watering-can-13l/244059_BQ.prd

- through a **Water Pipe System** (motor pump, pedal pump, etc.) connected to **Garden Hoses**

Source: https://www.diydoctor.org.uk/projects/installing_an_outside_tap.html

Source: https://www.indiarubbers.com/pvc-hose.html

- through an installation of pipes connected to a **Natural Water Reserve** (for example, Lake Volta)

Source: https://hiveminer.com/Tags/dji,volta

d) Outline the procedure for nurturing grafted seedlings

Use the checklist to follow steps 1 to 8 in nurturing grafted seedlings. Rate your own performance critically and honestly after you have completed each activity.

 Excellent  Okay  Try Again

Activities	Rate
1. Carefully place the plants in a stress-free environment to harden the grafted stems	
2. Keep nursery clean of any rubbish	
3. Water the grafted seedlings once or twice a day (depending on the weather) • Overwatering of recently grafted plants is a common fault encountered as there is minimal loss of water through leaves. • Do not overwater the grafted plants!	
4. Inspect grafts for signs of sprouting after 2 - 3 weeks	
5. Inspect grafts for signs of insect and disease attack	
6. Treat insect pests and disease	
7. Loosen poly caps when the leaves of the new sprouts have full expanded (4 - 7 days after sprouting) and signs of growth are visible	
8. Remove binding (grafting) tape when the wound is fully healed, about 2 - 3 months from the grafting date • Be careful not to injure the stem when removing the tape/strip.	

Success is the sum of small efforts repeated day in and day out.

e) Perform nurturing of grafted seedlings

Practical Exercise: Go to the nursery and nurture your grafted seedlings considering all the factors you have learned. Help them grow to their full potential!

Source: GIZ/ComCashew – Nurtured and healthy grafted seedling

SELF ASSESSMENT

1. Explain nurturing practices of grafted seedlings.

2. State the importance of nurturing grafted seedlings.

3. Outline the procedure for nurturing grafted seedlings.

Congratulations! Well done! You have completed this entire unit successfully.

REFERENCES

Peace Corps. (2012). *Cashew Nursery Establishment and Grafting – Peace Corps Ghana.* Retrieved from: https://www.youtube.com/watch?v=_OOItOiVryc

Grafting Lesson Official. (2019). *Mango V Grafting Technique with Result*. Retrieved from: https://www.youtube.com/watch?v=TL6Y2dIfkCk

ACi. (2013). *Improved planting material - How to do cashew grafting*. Retrieved from: https://www.youtube.com/watch?v=fO3FuAnVT_M

Yeboah, J. (2018). *Grafting Training in Cashew.*

Yeboah, J. (2018). *Nursery Management.*

World Agroforestry Centre. (n.d.). Mango Grafting Manual. Retrieved from: http://www.worldagroforestry.org/sites/default/files/users/admin/mango-grafting-manual.pdf