

## LEARNING FACILITATING MATERIALS

### NATIONAL PROFICIENCY LEVEL 1

### TRADE AREA: **CASHEW PRODUCTION**

### UNIT 6

## **HARVEST AND POST-HARVEST HANDLINGS OF CASHEW APPLES**



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 6 of your learning journey in cashew production. This guide explains the main steps of harvest and post-harvest handlings of cashew apples.

Do you already know why it is important to follow Good Agricultural Practices (GAP) for harvest and post-harvest handlings?

If you follow the steps for harvest and post-harvest handlings in the right sequence, you will produce a lot of high-quality cashew apples. Do not miss a step! Apply your knowledge and skills accurately to achieve a product of very high quality for your customers.



In this unit, you will learn about the main steps of harvest and post-harvest handlings of cashew apples. The learning material covers four sub-units:

- 1) Harvesting cashew apples
- 2) Detaching raw cashew nuts from the apple
- 3) Handling cashew apples
- 4) Transporting cashew apples

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 produce a lot of high-quality cashew apples for 25 years. Remember that the meticulous application of harvest and post-harvest handlings affects the quality of your valuable end product - the cashew apple.

The better the quality of your cashew apples, the higher your selling price! If you produce good quality products, your customers will always buy from you.

Even though, this learning material provides essential information on harvest and post-harvest handlings for National Proficiency Level 1, 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 cashew learning journey? Let's start!

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## ICONS



LEARNING  
OBJECTIVES



ATTENTION



PRACTICALS  
HANDS ON



CROPPING  
CALENDAR



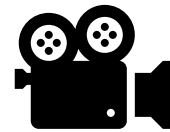
SELF ASSESSMENT



WELL DONE!



TAKE A BREAK!



WATCH VIDEO

## ABBREVIATIONS

Here are some commonly used abbreviations.

<b>cm</b>	Centimeter (100cm = 1 m)
<b>g</b>	Gram (1000g = 1kg)
<b>GAP</b>	Good Agricultural Practices
<b>HPH</b>	Harvest and Post-Harvest Handlings
<b>kg</b>	Kilogram (1kg = 1000g)
<b>m</b>	Meter (1m = 100cm)
<b>RCN</b>	Raw Cashew Nuts

## 1. DEMONSTRATE SKILLS FOR CASHEW APPLE HARVESTING

### a) Explain harvesting of cashew apples

Cashew apple harvest entails picking and collecting cashew fruits (apple and nut).

- You can pick the cashew fruit from a net below the tree
- You can also collect the cashew fruits, as soon as it dropped on the ground

Cashew apples have six maturity stages:

1. Green apple with green nut
2. Light green apple with ripe dry nut
3. Light yellow apple color with ripe dry nut
4. Yellow / orange apple with ripe dry nut (ready for picking/collecting)
5. Light orange apple with ripe dry nut (ready for picking/collecting)
6. Deep orange or red apple with ripe dry nut (ready for picking/collecting)



Source: <https://www.shutterstock.com/search/cashew+fruit>



Pick and collect cashew apples during the harvest season from January to May.

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



**b) State the importance of harvesting cashew apples**

It is important to pick and collect the cashew fruits every day.

Plug and collect the cashew fruits during cool temperatures in the early morning, before the sun or insects spoil the highly perishable cashew apples.



Source: GIZ/ComCashew - Collection of cashew fruits after dropping



If you want to sell the raw cashew nuts, eat and sell the cashew apples on the local market, let the cashew fruits drop to the ground or on a net under the tree. Gently collect and pick the matured fruits from the ground or net to prevent bruising of the apple (method 1 and 2).

If the cashew apple has not started fermentation and has not been attacked by insects, you can also use it for cashew apple processing.



If you only want to process the cashew apple, plug the cashew fruits from the tree. If you plug the cashew fruits from the tree, the nut might not be mature yet (method 3).

For more information on raw cashew nut maturity, study Unit 7 *Harvest and Post-harvest Handlings of Raw Cashew Nuts*.

c) Identify the methods of harvesting cashew apples

There are three (3) effective methods for harvesting cashew apples:

1. Collecting cashew fruits from the ground after dropping



Source: *GLZ/ComCashew – Picking cashew fruits after dropping*



For more information on collecting raw cashew nuts, watch video on *Cashew harvest and Post-harvest Training* from Minute 4:10 to 5:06



## 2. Picking cashew fruits from a net under the tree after dropping



Source: <https://fruitcollector.net/?lang=de> - Picking cashew fruits after dropping

### 3. Plugging cashew fruits from the tree with a rod or by hand



Source: GIZ/ComCashew - Use of the improvised harvesting rod



If you are new to cashew apple harvest – Do not plug from the tree!  
Collect cashew fruits from the ground (method 1) or pick cashew apples from a net under the tree (method 2) after dropping.



It is not easy to assess the ripeness of the cashew fruit, when it is still on the tree. Plugging the cashew fruits can result in losing your entire raw cashew nut harvest, if the raw cashew nut is not matured yet.

**d) State the factors to consider in selecting cashew apples for harvesting**

After harvesting, it is important to make a pre-selection of high-quality cashew apples for fresh consumption or further processing.

The factors to consider in selecting high-quality cashew apples are:

- Size
- Shape
- Firmness
- Defects
- Color
- Taste

These are the features of high-quality cashew apples:

- Fresh
- Wholesome
- Intact
- Firm (no signs of wilting)
- Clean
- Spotless (no stains or perforations)
- Sweet
- Low astringency
- Low acid taste
- Weight ranging from 100g to 140g
- Red or yellow skin color



*Source: GIZ/ComCashew - Fresh high-quality cashew fruits*

Discard green or perished cashew apples. Remove cashew apples that present diseases, deformations, defects or injuries.

The cashew apples rejected due to their size, defect shape or skin color can still be processed into cashew apples sweets, provided they are matured and appropriate for human consumption.



e) **State the functions of equipment for harvesting cashew apples**

A more refined method for harvesting cashew apples is to place or hang **harvest nets** directly under the cashew trees.



Let the ripe cashew fruits drop onto the net and pick them in the early morning.

The advantages of harvest nets are higher yields and a higher quality of cashew apples because:

- insects cannot attack the fruits as easily on the net as on the ground
- the fruits start fermenting and composting faster when dropped on the ground
- fruits are easily detectable
- weeding under the tree is required less frequently



Source: <https://fruitcollector.net/?lang=de>

Use white **plastic baskets, tray or cardboard boxes** with small holes on all four sides for proper ventilation during harvest, packing and transport of cashew fruits.



Source: <http://storagebasketsbiritsuku.blogspot.com/2017/01/white-storage-baskets.html?m=0>



Source: Moura, et. al. - Fresh cashew fruits transported in white basket after harvest



f) **Harvest cashew apples**



Practical Exercise: Go to the farm for your apprenticeship and harvest cashew apples early in the morning.



Source: GIZ/ComCashew – Fresh cashew fruits after dropping

## SELF ASSESSMENT



1. Explain the two (2) most effective methods for harvesting cashew fruits.

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1. State five (5) features of high-quality cashew apples.

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2. State the reason for collecting and picking cashew fruits instead of plugging from the tree.

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

## 2. DEMONSTRATE SKILLS FOR DETACHING NUTS FROM CASHEW APPLES

### a) Explain nut detachment in cashew apple harvesting

After cashew fruit harvest, the best way to detach the cashew nut from the cashew apple is by using a nylon thread that is fixed to two short wooden sticks.



Source: GIZ/ComCashew - Detaching cashew nut from cashew apple

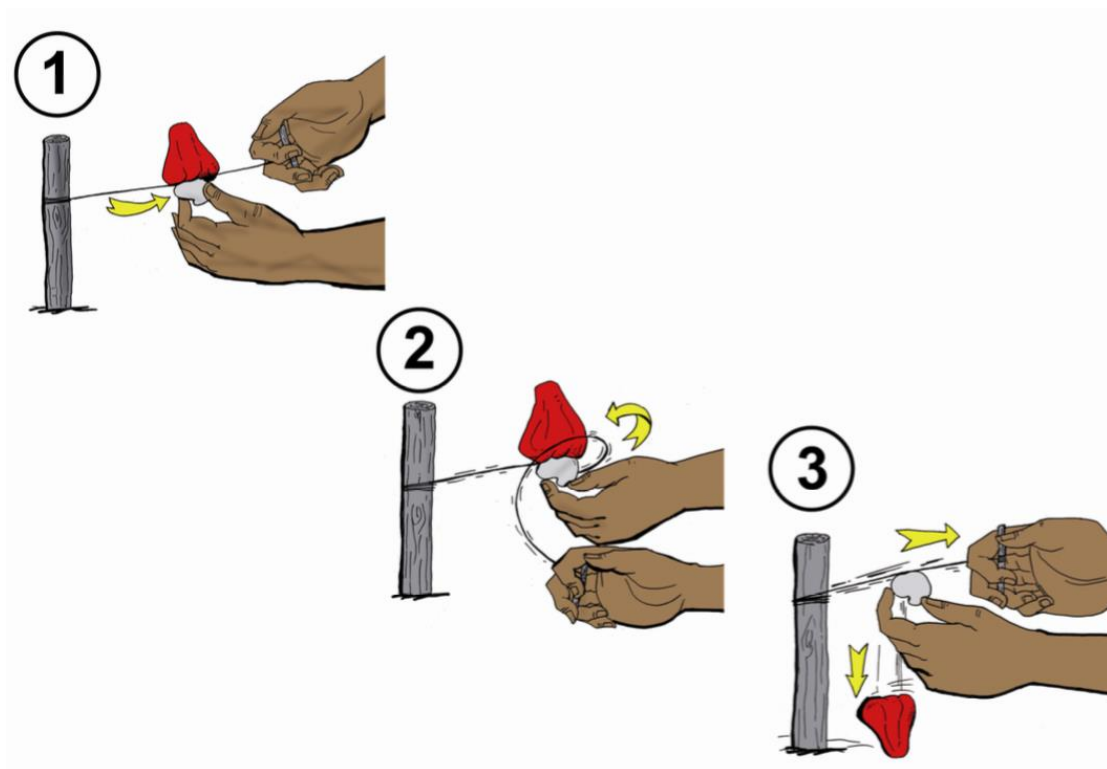
This is how you detach the raw cashew nut from the apple:

- Hold one of the short wooden sticks down in front of you, using your left foot
- Pick one cashew fruit at a time
- Hold the nut with your left hand
- Holding the other wooden stick in your right hand, wind the string around the base of the nut once, where the nut is attached to the apple
- Pull the string tightly and detach the raw cashew nut from the apple
- Let the apple drop into a separate basket
- Put the neatly detached nut in another basket



Source: GIZ/ComCashew – Detaching cashew nut from cashew apple with foot on the wood

You can also put a wooden stick in the ground in front of you. Use your left hand to hold the nut and your right hand to wind the nylon thread tightly around the base of the nut. Pull the string tightly to detach the raw cashew nut from the apple.



Source: GIZ/ComCashew – Detaching cashew nut from cashew apple



The detachment of raw cashew nuts from the apple takes place from January to May, immediately after the cashew fruits have been collected/picked.

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

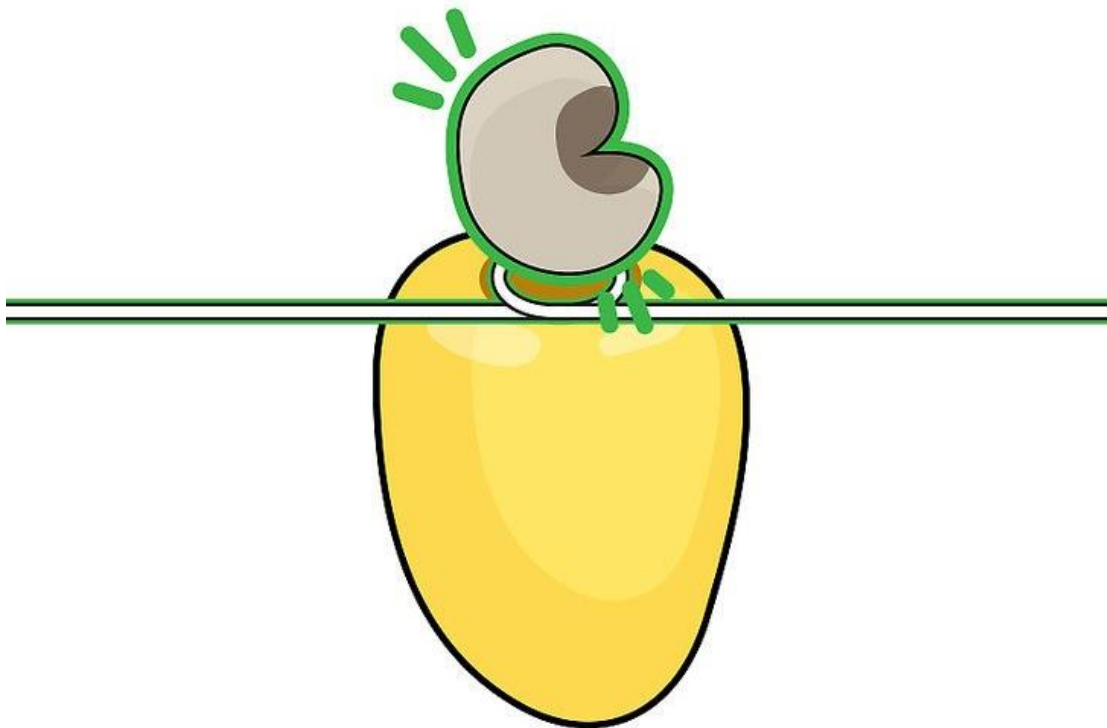
**b) State the importance of nut detachment in cashew apple harvesting**

It is important that the nut is neatly detached from the apple to maintain a high-quality product of both – cashew apple and raw cashew nut.

The quality of the cashew apple is affected when the raw cashew nut is not neatly detached.



With a clean break, little juice from the cashew apple is lost. This means that the apple will keep longer.



Source: <https://www.wikihow.com/Harvest-Cashews>



Do not detach the cashew nut from the cashew apple, if you want to keep the apple for a longer period than 24 hours. In that case, you need to store the cashew apple with the attached nut in a cool place.



### c) State the tools used in nut detachment

The following tools are required for nut detachment:

- The best way to detach the cashew nut from the cashew apple is by using a **Nylon Thread** that is fixed to two short wooden sticks.
  - The length of the nylon cord (0.5 - 1 m) depends on the sitting or standing position and the height of the person doing the separation.
  - Pay attention to the position of your hands and fingers while you separate the nut.
  - Clean the nylon thread, before and after usage and store it safely, out of reach of children.



Source: <https://merrilywequiltalong.com/aurifil-invisible-nylon-thread-1094yd-clear>

- You can also use a sharp **Knife** to detach the cashew nut from the apple.
  - Pay attention to your hands and fingers while you cut between the apple and the nut.
  - Clean the knife, before and after usage and store it safely out of reach of children. Caution! Handle knife safely to reduce risk of injuries.



Source: <https://www.knivesandtools.de/de/pt/-kizer-bush-1034a2-brown-g10-survivalmesser-justin-gingrich-design.htm>



If you use a knife for the separation, ensure that the nut is neatly detached from the apple.

d) **State the factors to consider during nut detachment**

Only detach the cashew nut from the cashew apple, if you want to eat or process the cashew apple immediately. Ensure that you do not damage the cashew apple with the nylon string or the knife, while you detach the nut. Do not cut into the cashew apple! It is important that the cashew apple remains intact, without bruises or cut to ensure a high-quality product.



After some practice, using the nylon tread is much faster than using a knife.



Source: GIZ/ComCashew - Women detaching cashew nuts from cashew apple on farm

**e) Outline the procedures used to detach nuts**

Use the checklist to follow steps 1 to 9 in detaching cashew nuts from cashew apples. Rate your own performance critically and honestly after you have completed each activity.



Excellent



Okay



Try Again

Activities	Rate
1. Prepare your nylon thread or knife	
2. Pick a cashew fruit	
3. Wind the string around the base of the raw cashew nut once	
4. Hold the raw cashew nut	
5. Pull the string tightly and detach the raw cashew nut from the cashew apple	
6. Carefully drop the cashew apple into a basket	
7. Ensure that the raw cashew nut is neatly detached, without any flesh/pulp left on the nut	
8. Put the neatly detached raw cashew nut into another basket	
9. Remove and discard immature, diseased, shrivelled and damaged apples	

*Remember, the learning journey never ends.*



For more information on detaching raw cashew nut from the cashew apple, watch video on *Cashew harvest and Post-harvest Training* from Minute 4:10 to 5:06



f) Detach cashew nuts



Practical Exercise: Go to the farm for your apprenticeship and detach raw cashew nuts from the apple, using a nylon thread.



Source: GIZ/ComCashew - Neatly detached cashew apples



## SELF ASSESSMENT

1. Outline the process of detaching raw cashew nuts from cashew apples.

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2. State how to safely use the tools in detaching raw cashew nuts from cashew apples.

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3. Describe the features of a neatly separated cashew apple.

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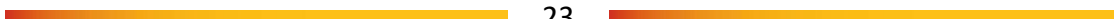
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*Congratulations! You have completed the second set of questions.  
Let's move on to the next chapter.*





### 3. DEMONSTRATE SKILLS FOR HANDLING CASHEW APPLES

#### a) State the importance of handling cashew apples with care

Cashew apples must be handled with care because they are highly perishable and therefore, deteriorate quickly. Perished cashew apples are worthless. They can neither be consumed, nor processed into more valuable products.

After detachment, the cashew apple keeps approximately 6 hours without cooling. You need to market your cashew apples in a day, if you want to sell a high-quality product at a good price.

Do not detach the cashew nut from the cashew apple, if you want to keep the apple for a longer period than 24 hours. In that case, you need to store the cashew apple with the attached nut in a cool place.



Source: GIZ/ComCashew – Cashew apples sold on a local market

**b) State the equipment used to pack cashew apples**

Pack and transport cashew apples in same **plastic boxes, trays** or **cardboard boxes** that you use for harvesting. Use white or light-colored boxes with holes on all four sides to reduce heat during storage, packing and transport.

Add a layer of 1 cm thick foam in the bottom of the box, to reduce the occurrence of marks on the apples, which increase perishability.

Stack boxes carefully to allow ventilation between boxes. The bottom of the upper box should never touch the cashew apples box below it.



Source: Moura, et. al, - Unloading boxes with cashew fruits



**c) State the factors to consider in handling cashew apples**

Cashew apples are highly perishable foods and therefore must be:

- Eaten within 6 hours without cooling
- Processed within 6 hours without cooling
- Send to a cooling facility within 6 hours
- Stored in a cool place to prevent quick decay

After packing cashew apples, label each load with the following information:

- Company / Farmer Name
- Amount (in kg)
- Field Manager
- Area
- Date

The labels enable the identification of farmers, in case you encounter any post-harvest problems while marketing/processing the cashew apples.



*Source: GIZ/ComCashew - Marketing of fresh cashew apples on the roadside.*

d) **Demonstrate handling of cashew apples**



Practical Exercise: Go to the farm for your apprenticeship and carefully pack cashew apples in the recommended boxes for transport.



**SELF ASSESSMENT**

1. Explain how cashew apples are packed.

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2. State the information that are required on cashew apple labels.

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*You are making great progress! You have completed another set of questions. Take a break or go ahead and start with the final chapter.*



#### 4. DEMONSTRATE SKILLS FOR TRANSPORTING CASHEW APPLES

##### a) Explain transport requirements for cashew apples

Cashew apples are transported in the same boxes that you use for harvesting and packing.



Only place one layer of cashew apples in each box!



Source: Moura, et. al. – Packing and transporting cashew apples

Ideally, the transporter has a cooling system to keep the cashew apples fresh during transport.

As you load the cashew apple boxes into a closed transporter with a cooling system, leave a 40 to 50 cm space between the ceiling of the transporter and the surface of the boxes, for protection and ventilation.

When you load the cashew apples onto an open truck, ensure that you transport the cashew apples only in the morning, when temperatures are low. Use a light-colored cover and also leave a space of 40 to 50 cm between the cover and the surface of the boxes, for protection and ventilation.



Avoid transporting of cashew apples in the sun.

**b) State the factors to consider in transporting cashew apple**

Cashew fruit processors source their raw materials - cashew apples - only from plantations within a radius of maximum 40 km.

- Cashew apples need to arrive at a cool storage place or processing factory with a cooling system within 6 hours after harvest.
- Cashew apples with raw cashew nuts still attached need to arrive at a cool storage place or processing factory with a cooling system within 24 hours after harvest.

Place the cashew apples boxes and trays in the vehicle carefully, and never throw them.

Instruct the driver of the vehicle to avoid high speed and bumps, as possibilities for damage is high at this stage.

If your car breaks down and the cashew apples are exposed to the sun or no longer cooled, you run the risk of losing your entire load.



*Source: Paiva - Cashew apples on truck*

c) **State the tools and materials used in transporting cashew apples**

Harvest workers keep the cashew apples in **plastic baskets, trays or cardboard boxes**. Transport cashew apples to a cool storage facility in the same baskets.



Source: <http://storagebasketsbiritsuku.blogspot.com/2017/01/white-storage-baskets.html?m=0>

Ideally use or rent a transporter with a cooling system or a cool storage place, if you want to process the cashew apples yourself.

If you sell the cashew apples to your customers, advise them on the correct transport requirements and procedure to ensure that your product does not lose quality during transportation.

d) **Transport cashew apples**



Practical Exercise: Go to the farm for your apprenticeship and load cashew apples for transport.



## SELF ASSESSMENT

1. Outline transport requirements for cashew apples.

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2. State the factors to consider in transporting cashew apples.

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*Great success, you already finished this entire unit!*



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