

UNIT

3



# Varietal Decisions on Citrus



LEARNING / FACILITATING MATERIALS

CITRUS PRODUCTION  
NATIONAL CERTIFICATE I



CAADP



NEPAD  
TRANSFORMING AFRICA



implemented by

**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH





# Introduction

The study of citrus varieties is important because the variety determines the yields, capital requirements and climatic conditions; hence, it is important to know the varieties and the area for cultivation. To set up a citrus farm it is necessary to make appropriate varietal decisions to meet market demand and to be able to produce on large scale.

The variety also determines the cost of production, materials to use and profit to be made.

This learning material covers all the Learning Outcomes for varietal decisions in citrus for the **Certificate I programme**



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# Demonstrate knowledge of the various varieties of citrus.

In this LO, you will learn to identify major varieties of citrus produced in Ghana, state the characteristics of the varieties of citrus and describe the agronomic requirements of each variety.

## PC (a) Identify the major varieties of citrus produced in Ghana

Have you eaten sweet orange before?

What about tangerine and lime?

Identify figures 1, 2, 3, 4 and write their names under them as you remember.



fig 1



fig 2



fig 3



fig 4

## Types of citrus and their varieties

There are many types of citrus but the common ones cultivated in Ghana include orange, tangerine, lime and lemon. The different types have different varieties and each variety has unique characteristics. Their characteristics can be told from the shape of the fruit, the taste, and the nature of the leaves

### Varieties of orange, tangerine, lime and lemon

Sweet orange has many varieties but besides the local ones the most common commercial varieties include Late Valencia, Red blood, Mediterranean and Washington navel.



### Varieties of Lemon

Below are some examples of varieties of lemon

- **Bush lemon:** It is very hardy, and has a thick skin with a true lemon flavor; the zest is good for cooking.
- **Eureka** grows year-round and abundantly. Also known as "Four seasons" (Quatre Saisons) because of its ability to produce fruit and flowers together throughout the year.
- The **Femminello St. Teresa** or **Sorrento** is native to Italy. This fruit's zest is high in lemon oils. It is the variety traditionally used in the making of limoncello.
- **Jhambiri (C. jhambiri)**, also known as rough lemon and bush lemon, has a rough skin, lemon yellow exterior and a very sour pulp. It is widely used as a rootstock in Ghana.
- The **Lisbon** is a good quality bitter lemon with high juice and acid levels, the fruits of Lisbon are very similar to Eureka. The vigorous and productive trees are very thorny, particularly when young.

## Varieties of lime

Some varieties of lime include:

- Kaffir lime (*Citrus hystrix*)
- Key lime (*Citrus aurantifolia*)
- Musk lime (*Citrofortunella mitis*)
- Persian lime (*Citrus x latifolia*)
- Rangpur lime (Mandarin lime), a mandarin orange - lemon hybrid
- Spanish lime (*Melicoccus bijugatus*)
- Sweet lime (*Citrus limetta*)
- Wild lime (*Adelia ricinella*)
- Limequat (lime x kumquat)

## PC (b) State the characteristics of the varieties of citrus.

### Characteristics of the varieties of citrus:

Examples of these are:

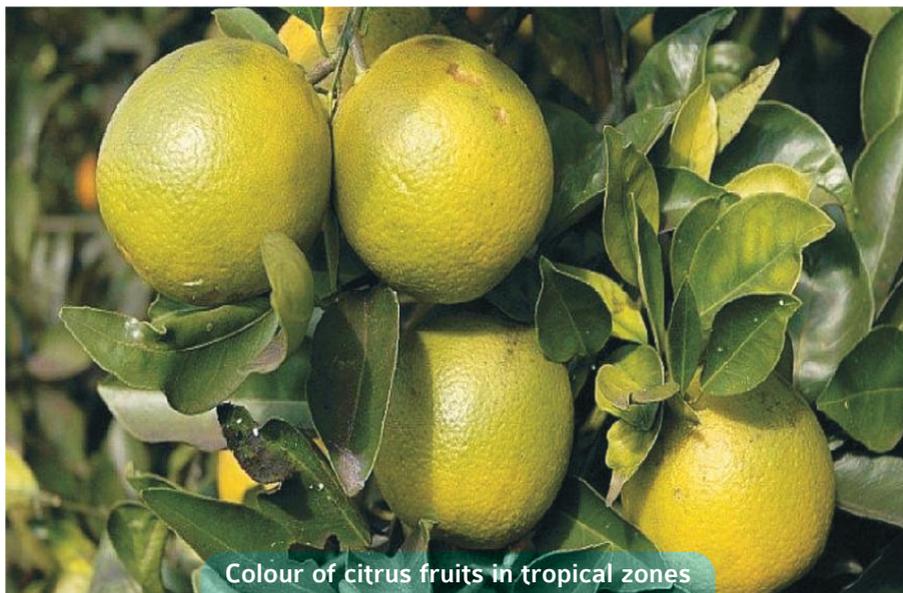
Citrus fruits consist of several layers

- i. a waxy rind that protects the outside of the fruit),
- ii. a white coating called mesocarp that protects and covers the inner contents
- iii. edible citrus sections that contain pulp or juice sacs.

## PC (c) Describe the agronomic requirements of each variety

Agronomic requirements cover the climatic conditions, nutritional requirement and cultural practices necessary for growing citrus. The different varieties of citrus have similar agronomic requirements such as nutrients, rainfall, temperature, humidity. The cultural practices under agronomic requirements include pruning, pests and disease management and soil amendments.

Citrus grows well in the tropical zones like Ghana and are mostly sweet. Their skins remain pale greenish and do not develop a bright orange colour due to high temperature before harvest.



Colour of citrus fruits in tropical zones



Peel of mature oranges remains greenish-yellow in tropical climates.



## Self-assessment

### PC (a)

1. State three varietal names each of the following citrus types

	<b>Tangerine</b>	<b>Lime</b>	<b>Lemon</b>
i	_____	_____	_____
ii	_____	_____	_____
iii	_____	_____	_____

### PC (b)

1. After observing the different citrus plants and tasting their fruits, outline the unique characteristics of matured fruits considering taste, toughness of skin, colour and nature of leaves. Use the table below to complete the task.

Citrus Type	Characteristic				
	Taste	Toughness	Skin	Colour	Nature Of Leaves
Sweet Orange					
Tangerine					
Lemon					
Lime					
Grapefruit					

**PC (c)**

1. Write briefly on the following:
  - i. pests and diseases management  
soil amendments

## Demonstrate understanding of economics of the various varieties.

In this LO, you will learn about the market demand and supply of various varieties, state the maturity period of each variety, estimate the yield per hectare per variety and estimate the capital requirements for the various varieties.

### PC (a) Describe the market demand and supply of the various varieties

In LO 1, we discussed the different varieties of citrus, their characteristics, agronomic requirements and their importance in order to make appropriate varietal decision.

In groups of four, interview 5 consumers each to find out their taste and preference with regards to citrus using the following questions as a guide;

1. Which of the following citrus types do you often consume?
  - a. Sweet orange
  - b. Tangerine
  - c. Lime
2. How many citrus fruits do you take in a week?
3. Which variety of the type do you often take?
4. At what price do you purchase them?

Use this table to compile the information gathered

Citrus type	Times per week	Variety	Average Price
orange			
tangerine			
lime			
Grapefruit			

In groups of three, interview citrus producers using the above guide.

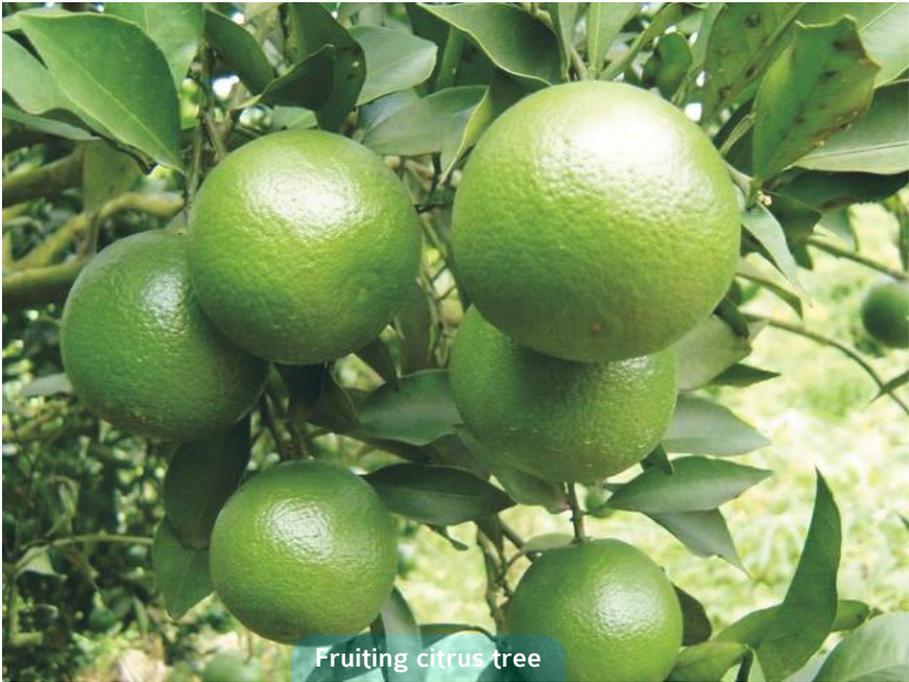
What varieties of citrus do customers often purchase from farmers? At what prices do they purchase them?

## PC (b) State the maturity period of each variety.

### Maturity periods for citrus varieties

Maturity period for sweet orange

After transplanting budded seedlings, the tree may take three to four years to start bearing fruit normally.



For the first two to three years of production, called the juvenile phase, orange trees may bear flowers and produce a smaller number of large, thick-skinned fruit. Most orange flowers do not turn into fruit, and drop from the tree at the end of the bloom. Once the flowers bloom, Washington Navel oranges take seven to 12 months and "Valencia" oranges take 12 to 15 months to ripen. Due to the length of the maturing process, "Valencia" trees can carry both mature and developing oranges at the same time.

## Maturity period for lime and tangerine

The maturity periods for tangerine and lime follow similar pattern as that of orange.

## PC (c) Estimate the yield per hectare per variety.

Generally citrus tree density varies from about 150 to 220 trees/ha.

Yields per hectare per variety

Good yields of citrus fruits are: orange - between 400 and 550 fruits per tree per year corresponding to 25 to 40 tons per ha per year; grapefruit - 300 to 400 fruits per tree per year and 40 to 60 tons per ha; lemons - 30 to 45 tons per ha per year; mandarin - 20 to 30 tons per ha per year.

Visit the following websites for more information:

<http://www.hort.purdue.edu/newcrop/morton/orange.html>

<http://www.fruit-crops.com/lemon-lime-orange-tangerine-grapefruit/>

## PC (d) Estimate the capital requirements for the various varieties

### Capital requirements

In citrus production, the capital requirements include land, labour, planting materials (seedlings), agro-chemicals, tools, equipment and soil amendments.

The planting distance used for a particular variety will determine the number of plants that can be accommodated on a hectare of land. In an orchard of normal density, tree spacing would be 7.3 m between rows and 3.5 m to 5 m between trees.

**NB:** 1 acre of land is being used as the standard

18 X 22 foot spacing is recommended for Washington Navel and Valencia varieties. Using this spacing, an acre of land can accommodate 60 trees (150 per hectare).

4 litres of weedicide is used for 1 acre of land.

1 litres of insecticide is used for an acre of land.

About 220kg of fertilizer for one acre of land

In citrus production tools required are hoe, cutlass, sickle, earth chisel whiles equipment such as pick sacks, tractor, knap sack sprayer.

Agro-chemicals, soil amendments, labour, tools and equipment are similar with all the varieties in citrus.



## Self-assessment

**Pc (d)**

1. Complete the table below

Citrus type	Variety	Planting distance	Seedlings per hectare	Av. Yield per hectare
Tangerine				
Lemon				
Lime				

2. Identify the following tools and equipment by their names and state their uses.



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