



# Introduction to Pineapple Production



LEARNING / FACILITATING MATERIALS

PINEAPPLE PRODUCTION  
NATIONAL CERTIFICATE I



TRANSFORMING AFRICA



DEUTSCHE ZUSAMMENARBEIT

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# Introduction

Welcome to the start of your career in pineapple production as a business.

A career in pineapple production has never been as popular as it is now; competition is strong and the standards are getting high based on market demand and value chain approach. Pineapple farmers must aim higher, and see it as an opportunity for a lifelong career.

There have been significant changes in pineapple production worldwide over the years offering new techniques, products and opportunities. Many career options are also available.

This unit will introduce you to job opportunities within the pineapple value chain, such as overview in pineapple production worldwide and Ghana, its botany, market orientation and economic importance.

Congratulations for making the decision to study pineapple production. You have taken the first step towards a very interesting and satisfying career.

This learning material covers all the learning outcomes for introduction to pineapple production for the Certificate I programme.

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## Demonstrate knowledge in the overview of pineapple production worldwide

On completion of this LO, the learner will be able to:

- State origin of pineapple,
- Identify the major commercial pineapple producing countries.
- Describe the cultivated varieties in major producing countries.
- State the environmental conditions prevailing in major producing countries.
- Identify international and local markets.

### PC (a) Origin of Pineapple.

Have you ever tasted pineapple before? Can you imagine where it originated from? Historians believe that the pineapple originated in Brazil in South America and imported to Europe later. It is also believed that Christopher Columbus and his crew members were probably the first few people from the European continent to have tasted the fruit.

They imported the fruit and cultivated it in hot houses. Members of European royal families soon developed a liking for it. It gradually became available to the rich, the noble and the elite. James Dole did a lot to popularize the fruit and make it affordable with his pineapple plantations in Hawaii. His goal was to have the convenient canned pineapple in every grocery store in the country.



Picture 1: Pineapple fruit

## PC (b) Major Pineapple producing countries

Pineapple is produced worldwide and some of the major producing countries include, Philippines, Brazil, Costa Rica, Thailand and China with Ghana at the 26<sup>th</sup> position on international market as at 2013.

## PC (c) Cultivated varieties

With your experience, mention three of the common cultivars you know.

- 1 .....
- 2 .....
- 3 .....

Major varieties of pineapples cultivated are Smooth cayenne, MD2, Sugar loaf and Queen.

**Smooth cayenne:** Has cylindrical shape, high fruit productivity, fruit is large and yellow, fresh colour, few slips, very good canning, leaves are spineless and have high fruit quality.

**MD2:** The MD2 is sweeter than the other varieties. It grows to a uniform size, ripens evenly and has a longer shelf life than other varieties. It has high brix and low acidity between 0.4- 0.45%.

**Sugar loaf:** This is conical in shape, it has spines on the leaf. It remains green when ripe, the skin is difficult to peel when ripe and it produces a lot of slips at the base of the fruit.

**Queen:** Has conical fruit form, productivity is moderate, fruit size is small and sweet, golden fresh fruit colour, few slips, fruits are not good for canning and therefore eaten fresh, leaves have spines and unpleasant to work in.



**Picture 2:** MD 2 Pineapple fruit



**Picture 3:** Sugar loaf pineapple

## PC (d) Environmental conditions in major producing countries.

Pineapple plant grows within tropical and sub-tropical regions up to 35N/S of the equator. The optimal climatic conditions for growing pineapple are an average temperature of between 21 – 27C and relative humidity of 70-80%. The growth rate is reduced and the flesh of the fruit becomes acidic with lowered sugar content outside this temperature range. Injury occurs from transpiration and respiration at temperatures above 27C. The crop is grown with annual rainfall of 1200-1500mm.

The pH of the soil lies between 5.0- 6.5. With regard to soil texture, pineapple does best in light, friable, well-aerated free-draining clayey-sandy soils.

## PC(e) International and Local Market

Some of the international markets are Central America, North America and Europe.

Local markets includes: market centres, hotels, restaurants, institutions and processing industries.



### Self-assessment

1. State one (1) origin of pineapple  
.....
2. State three (3) major commercial producing countries of pineapple  
.....  
.....  
.....
3. List three(3) major cultivated varieties of pineapple  
.....  
.....  
.....
4. Describe the characteristics of sugar loaf and MD2.  
.....



5. Apart from South America which other continent is next in importance in pineapple production.

.....

6. List four (4) major environmental conditions favourable for pineapple production

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7. State two (2) each of international and local markets for pineapple

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8. What can Ghana do to improve production level?

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## Demonstrate knowledge of pineapple production in Ghana

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On completion of this LO, the learner will be able to:

- a) State the historical development of pineapple production in Ghana
  - b) Identify areas of pineapple production in Ghana.
  - c) Identify and select the varieties of pineapple grown in Ghana.
- 

### PC (a) State the historical development of pineapple production in Ghana

Pineapple production in Ghana over several years has been on a small to medium scale. The export of pineapple started in 1985 by the Seafreight Pineapple Exporters Group (SPEG). The proximity of West Africa to Europe was recognized as a strong value proposition for growing pineapple in Ghana. There were only five flights per week into Europe from Accra and because of the limited space available, the quality of the fruit sent to Europe was high and Ghana established a strong reputation for producing good pineapples. Only 10% of production, however, could be exported due to the constraints. As more airlines began flying to Accra, production was able to ramp up, but still was unable to meet the huge demand in the European market. So in the 90's TIPCEE (Trade and Investment Program for a Competitive Export Economy) helped establish SPEG to promote higher export volumes. They were able to get transport time down from 21 days to 13 days, which reduced spoilage rates on arrival in Europe and increased Ghana's share in the market. The export of pineapples remained strong until 2003 when the European importers began asking if their Ghanaian counterparts could supply the MD2 variety. There are three main types of pineapple grown in Ghana. Sugarloaf is conical and very sweet, and is only sold in the local market. Smooth cayenne is a sweet, juicy variety that lacks the bright yellow colour that most people associate with good pineapples. MD2 is a variety that was introduced by Del Monte in Costa Rica and though not great for making juice, it is aesthetically-pleasing (more yellow than smooth cayenne), which the housewives in the UK associate with a good pineapple. Also, it is a little more square-shaped than smooth cayenne, so it sits on the supermarket shelf better. The market for fruits in Europe is defined by the supermarkets and retailers, which have huge leverage and influence over what is produced. When Tesco and Marks and Spencer and the other chains in Europe began demanding MD2, which is grown primarily in Costa Rica, instead of smooth cayenne, which is grown in Ghana and elsewhere, the Ghanaian exporters, and the industry as a whole, had a choice to make. Among the SPEG members, most felt they should switch from smooth cayenne to MD2. There was a small minority who felt they should stick with the variety they were good at planting and could achieve high quality fruits, which was

smooth cayenne. MD2 is more costly to grow in Ghana due to the climate conditions and soil. For smallholders and commercial farmers alike, it is more expensive to grow an acre of MD2 than it is of smooth cayenne. In Costa Rica, on the other hand, which has ideal growing conditions for MD2 and massive economies of scale, the cost of production is much lower. So, by reducing the cost of production, the Costa Ricans were able to neutralize the Ghana's cost advantage from lower freight costs. When the switch to MD2 occurred, it was an uphill battle and the Ghanaian exporters were never able to catch up to the Costa Ricans. In 2004, the industry began to decline and has never quite been able to recover. If there is a way for Ghana to compete, it is going to be all about producing top quality smooth cayenne pineapples. We will never be competitive on a serious level with Costa Rica for MD2, which is what the European market demands. But by focusing on smooth cayenne, which has better juice than MD2, and by leveraging big companies like Coca-Cola, pineapples in Ghana might make a comeback. It remains to be seen how that will take place, but with a buyer like Coca-Cola demanding high volumes on a weekly basis, the industry could adapt and change quickly, which would be nice.

**PC (b) Identify areas of pineapple production in Ghana.**

Areas of cultivation in Ghana: Coastal areas, Accra plains, Eastern region (Aburi-Nsawam), Central region (Kasoa and Awutu areas) and the in and Volta region (Sogakope, Vakpo, Ho and Adidome.)

**PC (c) Varieties of pineapple grown in Ghana:**

The varieties of pineapple grown in Ghana are: Smooth cayenne, Sugar loaf and MD2.



## Self-assessment

1. Aburi and Nsawam are major pineapple producing areas in Ghana?  
**True / False.**
2. List three(3) major cultivated varieties of pineapple in Ghana.

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## Demonstrate knowledge of the botany of the pineapple plant

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On completion of this LO, the learner will be able to:

- a) Outline the taxonomy of pineapple plants.
  - b) Describe morphology and physiology of the pineapple plant.
  - c) Describe the characteristics of the varieties of the pineapple plant grown in Ghana.
- 

### PC (a) Outline the taxonomy of pineapple plants

**TAXONOMY:** It is the science of describing, identifying, categorising and naming plants. The categories for classification in the correct order are as follows: Kingdom, Division, Class, Order, Family, Genus and Species. From the above the family name of pineapple is Bromeliaceae and the Botanical name *Ananas comosus* is derived from the genus and species.

### PC (b) Morphology and physiology of pineapple plant

Morphology describes the outer/external structure of pineapple. The morphology of pineapple is a short herbaceous perennial with 30–80 trough-shaped and pointed leaves 30–100 cm long, surrounding a thick stem. The airy [inflorescences](#) has about 100–200 flowers. Each flower consists of 3 calyxes, 3 bluish corollas, 6 filaments and a carpel with three parts of stigma.

Physiology deals with internal workings of pineapples (photosynthesis, respirations, transpirations and flower induction).

### PC (c) Characteristics of pineapple varieties grown in Ghana.

The characteristics of the various varieties of pineapple grown in Ghana are: Smooth cayenne, Queen, Sugar loaf and Md2.

**Smooth cayenne:** Has cylindrical shape, high fruit productivity, fruit is large and yellow, fresh colour, few slips, very good canning and leaves are spineless. Has high fruit quality

**Queen:** Has conical fruit form, productivity is moderate, fruit size is small and sweet, golden fresh fruit colour, few slips, fruits are not good for canning and therefore eaten fresh, leaves has spines and unpleasant to work in.

**Sugar loaf:** This is conical in shape; it has spines on the leaves. It remains green

when ripe, the skin is difficult to peel when ripe and it produces a lot of slips at the base of the fruit.

**Md2:** The MD2 is sweeter than the other varieties. It grows to a uniform size, ripens evenly and has a longer shelf life than other varieties. It has high brix and low acidity between 0.4- 0.45%.



## Self-assessment

1. What is the importance of taxonomy in pineapple plant?  
.....
2. List any two (2) morphological features of pineapple plants  
.....
3. List any two (2) physiological functions in pineapple plants  
.....
4. Which variety of pineapple is most preferred for international market?  
.....
5. Among the varieties of pineapple you know, which of them has a high brix.  
.....
6. Explain why pineapple is not produce in the Northern Ghana?  
.....  
.....
7. Describe the pineapple varieties listed below

Pineapple varieties	Description
Sugar loaf,	
Queen,	
Smooth cayenne	

## Demonstrate understanding of market orientation in pineapple production

On completion of this LO, the learner will be able to:

- Identify the types of markets available.
- Determine the quantity and quality requirements of the market.
- Select a variety of pineapples for a specific purpose.
- Develop and implement a production plan to respond to the market needs.

### PC (a) Identify the types of markets available.

#### International Market:

Major international markets are: Central America, North America, Europe and Middle East.

#### Local market:

The local market includes: market centres, hotels, restaurants, institutions and processing industries.

### PC (b) Quantity and quality requirements of the market

#### Quantity requirements:

**Table 1. Major Pineapple Producers as at 2008 (FAOSTAT)**

Country	Production (metric tons)	% of world total
Brazil	2,491,974	12.93%
Thailand	2,278,566	11.82%
The Philippines	2,209,336	11.46%
Costa Rica	1,678,125	8.70%
China	1,402,060	7.27%

### Quality requirements:

Adherence to the following standards: GAP, Fair trade and HACCP.

Look for pineapples that are heavy for their size. While larger pineapples will have a greater proportion of edible flesh, there is usually no difference in quality between a small and large size pineapple. Pineapples should be free of soft spots, bruises and darkened "eyes," all of which may indicate that the pineapple is past its prime. Pineapple stops ripening as soon as it is picked, so choose fruit with a fragrant sweet smell at the stem end. Avoid pineapple that smells musty, sour or fermented.

### PC (c) Select a variety of pineapple for a specific purpose



**Picture 4:** Md2' ('Golden Ripe', 'Extra Sweet' )

'Md2' is a hybrid developed by the Hawaiian Pineapple Research Institute. It gives a medium to large (1.3-2.5 kg) cylindrical, square-shouldered fruit, with large flat eyes, and an intense orange-yellow colour. The clear yellow pulp is sweet, compact, and fibrous. It is high in sugar (15-17°Brix) and ascorbic acid but lower in total acid than 'Smooth Cayenne'. 'MD2' is resistant to internal browning, but susceptible to fruitlet core rot, and more sensitive to Phytophthora than 'Smooth Cayenne'.

**PC (d) Develop and implement a production plan to respond to the market needs.**

In order to meet market demands at different times, there is the need to plant different planting materials at the same time, same type of planting materials at different date, use of chemicals for forcing and ripening and different sizes of planting materials at the same date.



## Self-assessment

1. State any four (4) local and two international markets you know?  
.....  
.....  
.....  
.....  
.....
2. State three (3) major countries that produce pineapple for international market.  
.....  
.....  
.....
3. State the most preferred pineapple variety for the international market.  
.....
4. Which variety of pineapple has high brix and ascorbic acid but low total acid compared to the smooth cayenne.  
.....



## Demonstrate understanding of economic importance of pineapple production

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On completion of this LO, the learner will be able to:

- a) Explain the nutritional values of pineapples.
  - b) Identify the various employment opportunities along the pineapple value chain.
  - c) Explain the economic importance of foreign exchange from pineapple to the farmer and the country.
- 

### P C. (a) Nutritional value of pineapple:

Principal Nutrient Value Percentage of RDA Energy 50 Kcal 2.5%, Carbohydrates 13.52 g 10%, Protein 0.54 g 1%, Total Fat 0.12 g <1%, Cholesterol mg 0%, Dietary Fiber 1.40 g 4%, Vitamins Folates 18 µg 4.5%, Niacin 0.500 mg 4%, Pyridoxine 0.112 mg 9%, Riboflavin 0.018 mg 1.5%, Thiamine 0.079 mg 6.5%, Vitamin A 58 IU 2%, Vitamin C 47.8 mg 80%, Vitamin E 0.02 mg <1% and Vitamin K 0.07 µg 0.5%.  
(Source: USDA National Nutrient data base)

### P C (b) Employment opportunities along the pineapple value chain.

Pineapple production has a wide range of employment opportunities in the value chain. These ranges from production to consumption (Input providers, production, marketing, transporting, and processing.)

**Input providers:** Agro-Input dealers (Chemicals, Planting Materials, Compost, Equipment,) packaging materials and mulching materials.

**Production level employment:** Local and Commercial producers.

**Market level employment:** Farm gate, wholesalers, retailers, shops and supermarkets.

**Transportation level:** Refrigerated vans, air and sea are means of transporting pineapple.

**Processing:** Pineapple are processed in various form, examples are canned fruits, Juice and jam.

## PC (c) Economic importance of foreign exchange to the farmer and the country.

Pineapple production has several economic importance for its foreign currency earnings to both the farmer and the country.

The farmer is able to earn enough profit on his production to sustain and maintain his family and further purchase modern equipment for expansion of his production business. In view of these he secures his job and employs others to the field thus reducing unemployment which is a major burden to the country.

The government derives taxes from this foreign exchange for infrastructural development, such as schools, roads, hospitals, market, etc.



## Self-assessment

Q1. Complete the table below.

Nutrient	Percentage (%)
Carbohydrate	
Protein	
Vitamin C	
Fat	
Potassium	

2. State five (5) employment opportunities you can identify under the pineapple value chain.

.....

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.....

3. List three (3) importance of foreign exchange from pineapple to the farmer.

.....

.....

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Q4. State four (4) areas where government uses foreign exchange to benefit the country..

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.....

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