

UNIT

2



# Site Selection & Land Acquisition



LEARNING / FACILITATING MATERIALS

PINEAPPLE PRODUCTION  
NATIONAL CERTIFICATE I



CAADP



NEPAD  
TRANSFORMING AFRICA



german  
cooperation  
DEUTSCHE ZUSAMMENARBEIT

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# Introduction

Welcome to the start of your career in site selection and land acquisition in the pineapple industry

Site selection and land acquisition is now competitive and standards are getting high in the pineapple industry. So you too must aim higher, particularly, if you see pineapple production as opportunity to build up your lifelong career.

There have been significant changes in the pineapple industry over the years which have brought new standards, techniques, products and opportunities. Many career options are also available within the pineapple industry.

While training, you should make an effort to improving your personal habits; skills, knowledge and get along with the competition in the industry. Congratulations for making the decision to study site selection and land acquisition in the pineapple industry. You have taken the first step towards a very interesting and satisfying career.

This learning material covers all the learning outcomes for site selection and land acquisition requirements for the Certificate I programme.

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# Recognize the types of soil and topography of the land.

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

- a) Describe the characteristics of ideal soil type.
  - b) Conduct soil test to determine water holding capacity.
  - c) Determine the land gradient.
  - d) Determine the drainage of the land.
- 

## PC (a) Soil types and topography

With reference to your past experience in your town when it rains, does the soil get muddy or dries quickly?

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State four possible reasons.

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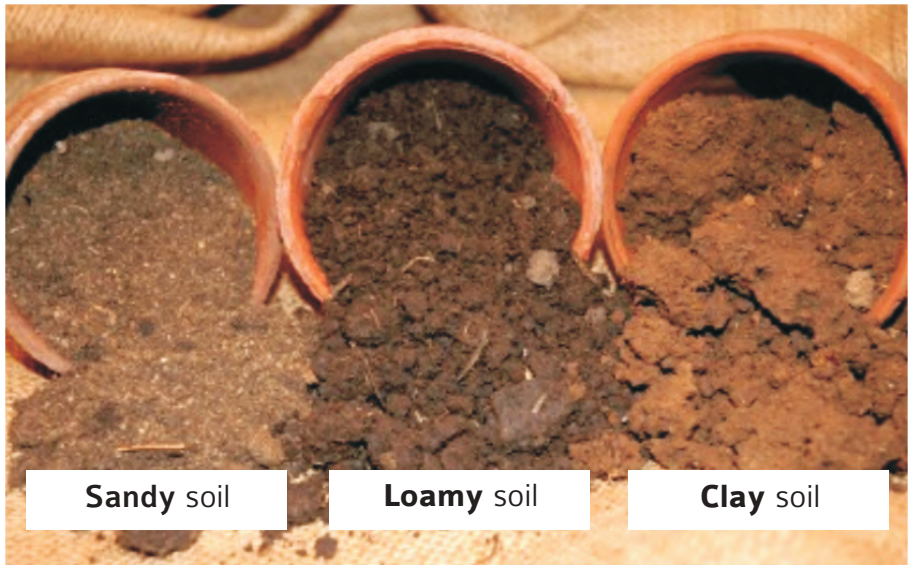
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Some of the important activities when going into pineapple production are to identify suitable soil type and topography.

Soil is a medium that support plant growth.

The types of soil are clay, sand and loam. Characteristics of soil include: The recommended soil for pineapple production should have good drainage and water holding capacity, organic matter content, aeration, porosity and infiltration.



**Picture 1** Types of soil

### **PC (b) Conduct soil test to determine water holding capacity.**

After a soil has been completely soaked by a downpour of rain, all its pore spaces are filled with water and it is regarded as being saturated. One of the main functions of soil is to store moisture and supply it to plants between rainfalls and irrigations.

Water-holding capacity is usually defined as the amount of water that the soil can hold and retain. Soils that have fine particles are able to hold more water than coarse soils while rock fragments cannot hold any water and contribute negatively to soil water-holding capacity.

#### **Activity**

Conduct the following experiment to determine the Water Holding Capacity of soil.

#### **Procedure**

##### **A. Materials**

3 cans with both ends removed and all cans of the same size

3 Filter paper or muslin cloth

3 Rubber bands

3 Racks or screens

3 Large graduated jars; the mouth of the jar must be larger than the base of the can.

Samples of sandy, loamy and clay soils

## B. Sequence of Steps

Using a rubber band, secure a piece of filter paper or muslin cloth to the base of each can.

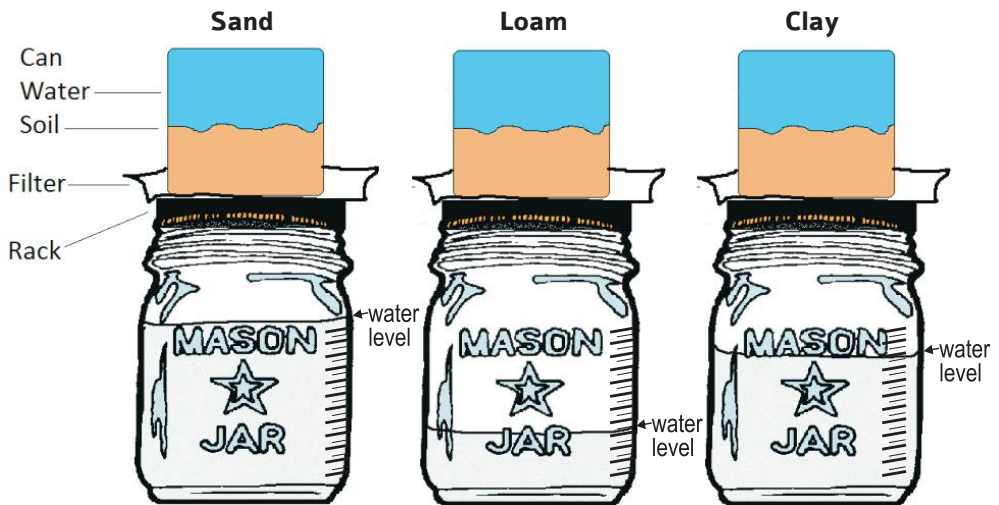
Oven-dry each sample of soil. (Try to get a sample from a field where grasses or legumes have recently been grown, a sample from a field, a sample from a garden, and so on.)

Fill each can approximately 2/3 full of its soil sample.

Place the cans on racks/screens over the mouths of the jars. See Picture 1.

Place equal amounts of water into each can.

Complete the observation questions and clean your laboratory area.



**Picture of 2** Layout of test (Water Holding Capacity of soil)



## Observation

1. Describe your observations from this experiment in respect of the three (3) types of soils.

.....

.....

.....

2. Which soil sample absorbed the most water and why?

.....

.....

3. Why would some soil samples be unable to absorb large amounts of water?

.....

.....

### PC(c) Determine the Land gradient

The slope of the land is an important landform feature which affects land use, soil erosion, agriculture and the building of roads and houses. Land slope has influence on pineapple production.

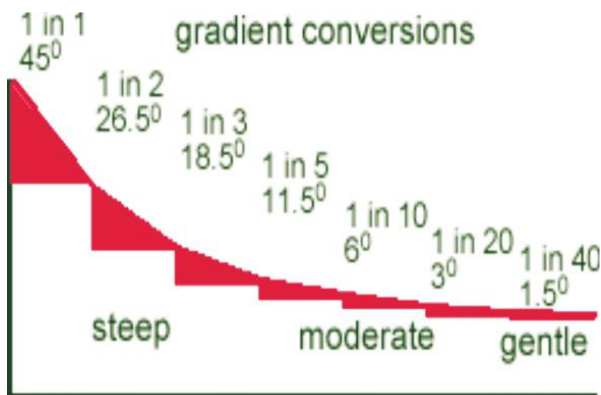


Fig 1: Gradient conversions



## Activity

Learner to determine the slope of the land gradient

### A. Procedure

Materials needed: 2 Poles of uniform height, string, level and yard stick

### B. Sequence of Steps

1. Use a line level, which are two poles of the same height with string running between the poles.
2. Identify the steep, moderate and gentle slopes and their corresponding distances.
3. Record the slope by measuring the distance from the notch where the string was placed to the top of the string.

## PC (d) Determine the drainage of the land.

The purpose of agricultural drainage is to remove excess water from the soil in order to enhance crop production. The two main methods of drainage are the ditch and the tube.



**Picture 3:** Drainage of farm



**Picture 4:** Drainage of farm

Indicate whether the farms shown in picture 3 and 4 above are drained or not.

.....

From previous knowledge on Water Holding Capacity give your reason for the answer.

.....

.....



## Self-assessment

- 1 State three (3) types of soil.

.....  
.....  
.....

- 2 State the meaning of Water Holding Capacity.

.....  
.....  
.....

3 What is the purpose of agricultural drainage?

.....  
.....

4 Why is the water holding capacity of the soil important for pineapple production?

.....  
.....

5 State the importance of determining the land gradient to the pineapple farmer.

.....  
.....

## Demonstrate the understanding of soil analysis report

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In this LO, you will learn to:

- a) Determine the previous use of a given soil.
  - b) Determine the soil pH in a given sample of soil
  - c) Interpret the soil nutrient level report
- 

### PC (a) Determine the previous use of a given soil,

Before going into the production of any crop, it is important to know the condition of the soil. A close observation of the previous crops planted on the soil can be used to determine the fertility status of the soil. The crop residue that might be left on the soil surface can be used to determine the previous crop planted.

List three methods of determining the previous use of a given land.

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

Previously cropped soils have both advantages and disadvantages. State two advantages and two disadvantages of previously cropped land

Advantages

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

Disadvantages

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

### PC (b) Determining the soil pH in a given sample of soil.

Different plants require different pH levels, so once you know your soil's pH, you can plant crop that will thrive in that soil, or you can amend the soil to expand the range of plants you can use. The pH is a measure of the soil's acidity or alkalinity

### **Activity** – Determine the soil pH

In determining the pH of a given soil, materials and equipment/tools required should be gathered together. This will save time and enable you to perform accurate tests.

**Materials to use:** baking powder, vinegar, soil sample and distilled water..

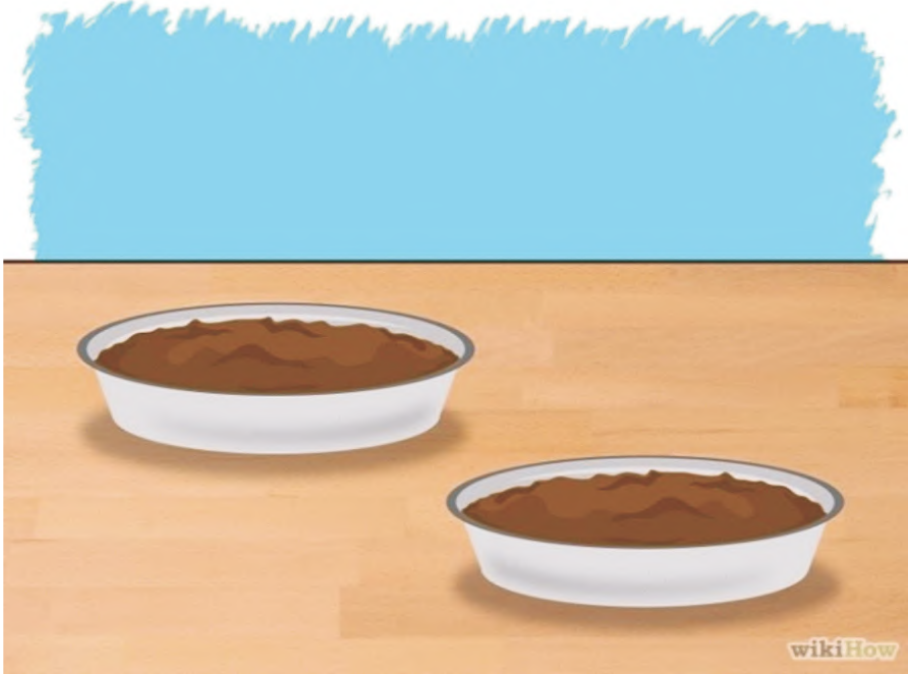
**Tools:** bowls (2)

### **Sequence/f Steps**

Conduct a soil pH test using the following steps and state which pH is ideal for pineapple production.

### **Testing Soil pH Using Vinegar and Baking Soda**

Take a cup of soil from your garden. Put a few spoonful of it into two separate containers.



**Picture 5:** Soil samples from garden

Add vinegar to one container. If it fizzes, it means your soil is alkaline. In that case, you do not need to proceed to the next step.



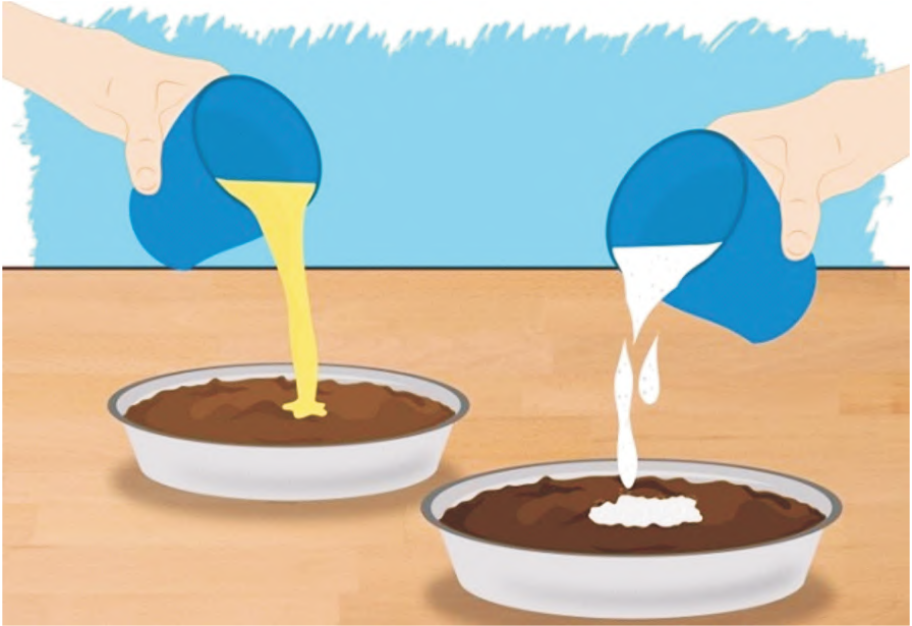
**Picture 6:** Adding vinegar

Add enough water to the other container so that it becomes very wet and muddy. Pour baking soda into this cup; if it fizzes, it means your soil is acidic.



**Picture 7:** Add water to the other container of soil

Check both soil samples again. If neither sample began fizzing, it means you probably have a neutral pH of 7. This is good, as this is the pH most plants need to grow in.



**Picture 8:** Fizzing of soil sample

**NB:** Additionally, there are simple soil pH meters and litmus paper test that can be used

### **PC (c) Interpret the soil nutrient level report.**

Soil testing is an important tool for evaluating or avoiding problems of nutrients in balance. The soil analysis report gives the levels of the various nutrients found in the soil sample.

What do the terms “very low,” “low,” “sufficient,” “high,” and “very high” mean when used in soil analysis reports? These interpretations of the analysis data are intended to help you understand the soil fertility level. The terms indicate, in general, what actions are required in managing nutrients in the next crop. They do not indicate how much nutrient should be added, or why. That is the function of the next steps in processing the analytical data and information about the cropping system.

**Table 1:** Conditions and actions indicated by levels of pH and nutrients in a standard soil test.

| <b>Factor measured</b> |   |  |   |  |   |
|------------------------|---|--|---|--|---|
| Soil test level        | soil pH   | Phosphorus   | Potassium   | Calcium  | Magnesium   |
| Very low               | Your former fertilizer programme was inadequate; you need both to add and change the fertilizer programme                                   |  |   |  |   |
| Low                    | Low pH has many adverse effects, including toxicities as well as low amounts of Ca and Mg.  | Soil P level are inadequate P fertilizer is needed   | Soil K is too low for most plants; K fertilizer is needed perhaps k is leaching ( too much water?)                          | Soil Ca is too low for most plats; liming is the low cost alternative.   | Soil Mg is too low for most plats ; mg needed either as mg sulfate or dolomite depending on the soil ph.                      |
| Sufficient             | No need for additional fertilizer.  |  |   |  |   |
| High                   | Levels are higher than desired but not likely to be a problem.  |  |   |  |   |
| Very high              | Soil pH is too high and could result in micro deficiencies, low pH , and other nutrient imbalances, the liming programme should be revised. | Soil p is too high, too much p has been added which could lead to micro nutrient deficiencies, environmental contamination could result, and the fertilizer programme should be revised. | Soil k is too high ; this could lead to nutrient imbalances, especially with mg; the fertilizer programme should be revised | Be prepared for problems such as nutrient imbalances, particularly micro nutrients problems, the fertilizer programme d should be revised. | Soil mg is too high; in some cases Ca/Mg ratios less than one can be detrimental; the fertilizer programme should be revised. |





# Self-assessment

1. What is the significance of understanding the soil test report?

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2. List the types of soils in relation to its characteristics for pineapple production.

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3. State the characteristics of a particular soil suitable for pineapple production.

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## **Demonstrate knowledge of the environmental conditions suitable for pineapple production.**

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

- a) Describe the effects of rainfall pattern on pineapple production.
  - b) Describe the effects of temperature and relative humidity on pineapple production.
  - c) Describe the nature of the soil suitable for pineapple production.
  - d) Describe the effects of pineapple production on the environment.
  - e) Explain factors to consider when selecting environment for pineapple production.
  - f) Collect and Interpret rainfall data from the nearest meteorological stations
- 

### **PC (a) Effects of rainfall pattern on pineapple production**

Although the pineapple plant is fairly resistant to drought, it requires a medium to high evenly distributed rainfall for good growth and the production of healthy fruits. It will grow with an annual rainfall as high as 2,500 mm once adequate drainage is provided.

### **PC (b) Effects of temperature and relative humidity on pineapple production.**

Temperature and relative humidity are the two main factors that affect a pineapple's properties after harvest. Storage temperature affects ethanol content, microbial growth, chilling injury index (CI), and weight loss. Low temperature, bright sunshine and total shade are harmful

### **PC (c) Nature of the soil suitable for pineapple production.**

The best soil for pineapple culture is a well-drained, sandy loam with a high content of organic matter and it should be friable for a depth of at least 2 ft (60 cm), and pH should be within a range of 4.5 to 6.5.

### **PC (d) Effects of pineapple production on the environment.**

Pineapple production impacts greatly on the environment. Some of these impacts are deforestation, depletion of soil nutrient, pollution by insecticides, herbicides and fungicides.

## PC (e) Factors to consider when selecting environment for pineapple production.

Soil (types, pH, drainage and topography), climate (rainfall, humidity, temperature, sunshine, wind)

## PC (f) Interpretation of rainfall data from nearest meteorological stations.

### Activity

Visit the District meteorological station for a period of six months to collect data on rainfall pattern and give interpretation to these data.



## Self-assessment

1. State two (2) effects of temperature on ethanol content, microbial growth, chilling injury index (CI), and weight loss on harvested pineapple.

Ethanol content:

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.....

Microbial growth:

.....  
.....

Chilling injury index (CI):

.....  
.....

Weight loss:

.....  
.....

2. What causes depletion of soil nutrients?

.....  
.....  
.....

- 3 List 5 insecticides, 4 herbicides and 2 fungicides used in pineapple production.

Insecticides

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Herbicides

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Fungicide

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## Demonstrate knowledge of land ownership structure and registration processes.

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

- a) Explain the different types of land tenure system
  - b) Explain the importance of land registration.
  - c) Explain the procedure for land registration.
- 

### PC (a) Different types of land tenure system

Land tenure refers to the way in which rights to land is obtained and distributed among people.

The land tenure system in Ghana is basically a dual one; a communal system and a title registration system. Communal land ownership is the expression used to describe the system whereby land is collectively owned by an extended family, clan or community of ancestrally related people with the control or administration of the land vested in the leader or his appointee. Land is also acquired through leasing for a fee for 25-50 years with a maximum period of 99 years, through a combination of lease and share cropping, and through pure share cropping which is subdivided into: abunu, abusa, abunan,

### PC (b) Importance of Land registration:

Land registration generally describes systems by which matters concerning ownership, possession or other rights in land can be recorded (usually with a government agency or department) to provide evidence of title, facilitate transactions and to prevent unlawful disposal.

#### Importance:

1. Prevents land litigation
2. Serves as collateral security
3. It is a legal document that allows an owner to be able to sell it out without difficulty.

## PC (c) Procedure for land registration

Below are four set standards to acquire land in Ghana:

1. Land Inspection: The investor/buyer must check the boundary corners of the land in question to verify the full extent of the land and be sure of the feasibility of the project to be used. This must be done by an expert and must be in the presence of the land owners as witnesses.
2. Land Search: This is the most important stage. Here Surveyors go onto the land to pick and demarcate the land parcel. The result is taken to the lands commission of Ghana to verify the true ownership of the land. If the name that comes up is the same as your land owners, then you can carry on the process, if not quit or seek a legal advice.
- 3 Land Documentation: The investor can proceed with the documentations; normally after a quarter or part payment has been done. The land owners then prepare the documents which must include a true and certified copy of Indenture and site plans.
4. Land Title Certification: Actually this can be done simultaneously with the projects inception since the land title certification from the Land title registry of Ghana takes quite some time, about four mouths.



### Self-assessment

1. State the procedure in the registration of land

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2. Explain the following terms used in land acquisition below:  
"Abuno", "Abusa" and "abunan,"

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3. Explain land tenure system.

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