UNIT 3

Land & Soil Preparation

LEARNING / FACILITATING MATERIALS

PINEAPPLE PRODUCTION
NATIONAL CERTIFICATE I

COTVET

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Introduction

Welcome to the start of your career in land and soil preparation in pineapple production

A career in land and soil preparation for pineapple production has never been as popular as it is now; competition is strong and the standards are getting high. So you must aim higher, particularly if you see pineapple industry as opportunity to build up your lifelong career.

Many career options are also available within the land and soil preparation for pineapple production. This unit will also look at the, methods of land preparation, farm land demarcation and understanding of soil preparation for planting

While training, you should make an effort on improving your personal habits, skills and knowledge to get along well with the working industry. All these aspects are essential to achieving success in the world of work.

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

This learning material covers all the Learning Outcomes for land and soil preparation requirements for the Certificate I programme.

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LEARNING OUTCOME **1**

Demonstrate knowledge of the methods of land preparation

On completion of this LO, you will be able to:

a) Explain the importance of land preparation.
b) State the various methods of land preparation.
c) Demonstrate land clearing methods.
d) Determine the depth of the top soil

PC (a) The importance of land preparation.

Draw on your past experience during farm visits to explain the importance of land preparation and state two (2) methods of land preparation.

One of the first activities that a pineapple farmer has to undertake after site selection is to prepare the land. This is an important aspect of pineapple farming; without adequate land preparation, the farmer can have total crop failure at the end of the season.

Land preparation is clearing and removal of bushes on the surface of the land, this is performed differently, but the two main practices are, one or two ploughing followed by harrowing, ridging and mulching. The size of the land, costs and machines available dictate the methods to use for land preparation.

Land preparation typically involves ploughing, harrowing, and leveling the field to make it suitable for crop establishment, land preparation releases nutrients to the soil, destroying /reducing weeds and ants nest, it also improves the soil and plant contact and reduces the incidence of pests and diseases infestation.

Picture 1: Land preparation for pineapple

PC (b) Various methods of land preparation.

Prior to planting, the soil needs to be prepared usually by some form of land clearing. Land clearing methods can be divided into two major categories, depending on the amount of crop residue, clearance can be either manual (by hand) or mechanical (by machine). Chemicals (weedicides) are occasionally used to complement manual and mechanical clearing.

PC (c) Demonstrate land clearing methods.

Manual clearing is by using axes, cutlasses and hoes. This method of clearing is by far the safest method as the soil remains relatively undisturbed.

Hand clearing is however time consuming and expensive, so it is suitable only for small farms.

Mechanized land clearing requires heavy equipment, normally; tractors which have the power to push over trees and rip out roots and stumps.

Picture 2: Tractor ploughing a land

Activity:

- Learner will practice land clearing using mechanical methods.
- Learner will practice land clearing method using manual methods.

State your experience?

PC (d) Determine depth of top soil

Procedure

- Dig two different areas of top soil about 1m x 1m x1m
- Use tape measure to measure from top to bottom of the dug pit
- Observe the various layers and count them
- Record the readings of various layers

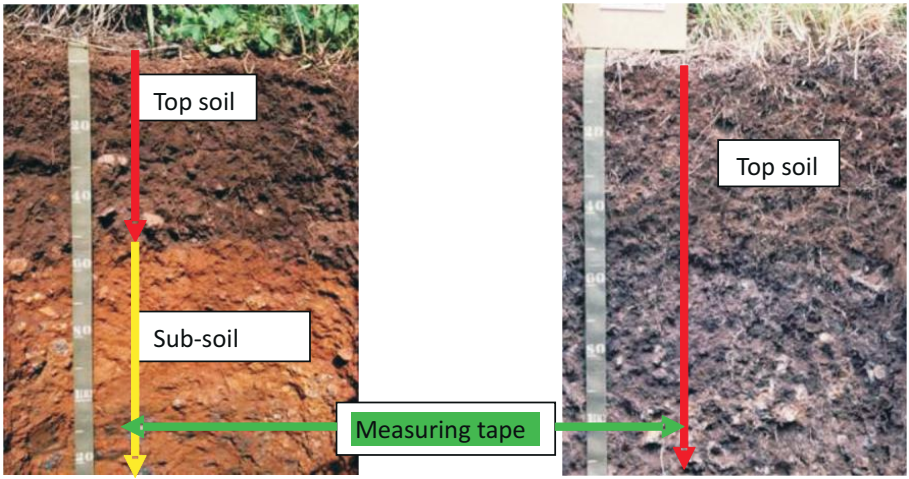


Figure: A & B Soil profile showing the depth of top soil

Comparison of two different soil profile (Fig 3A and 3B) makes figure 3B a better soil for pineapple production because of the depth of its top soil.

Top soil is important for pineapple cultivation because it is a shallow rooted crop and derives its nutrients from the topsoil.

The soil depth is an important tool in nutrient management. By examining a soil depth when the soil is dug, we can understand the soil fertility. The recommended depth of top soil for pineapple production is between 10 cm-15 cm.

Activity

Learner to use manual method of land preparation to clear 5m by 10 m of land, dig and measure the depth of the top soil.

Self-assessment

1. State two (2) importance of land preparation.

2. State two (2) methods of land clearing.

3. Discuss how good land preparation releases nutrient into the soil

4. Discuss the various land clearing methods.

Demonstrate understanding of farm land demarcation

On completion of this LO 2, you will be able to:

a) Explain the importance of land demarcation
b) Determine the land size.
c) Sketch the layout of farm land.
d) Line and peg farm land

PC (a) Importance of land demarcation.

Starting a farm is not an easy task. It involves many activities on the land of farming, how you want to farm, what you want to farm, and how big you want your farm to be. Some of the importance of proper farm land demarcation include:

- Easy accessibility
- Determine the inputs and yield
- Determine the plant population
- Know the land size of your farm boundaries
- Helps the layout
- Helps to site farm project structures
- Promotes economical use of land
- Ensures security of land

PC (b) Determine a land size.

The steps involved in determining the size of a farm land include; reconnaissance survey, sketching the farm land, taking of measurements, recording and calculating the farm size. The main tools and equipment used in farm land demarcation are ranging pole, measuring tape/Günter's chain, line, pegs, measuring tape, theodolite, level staff, cutlass, field note book and GPS (Global Positioning System)

Picture 4: Tape measure

Picture 5: Günter's chain

Picture 6: Peg

Picture 7: Measuring tape

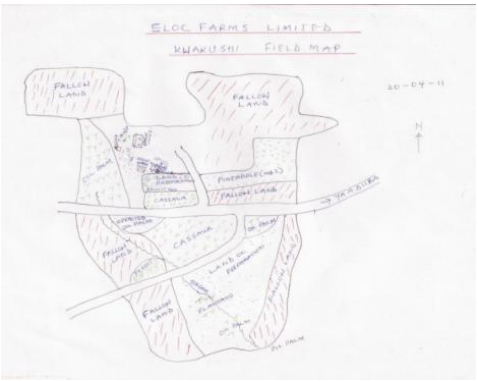
Picture 8: Measuring a land

Activity

Using appropriate tools determine the size of the school pineapple farm.

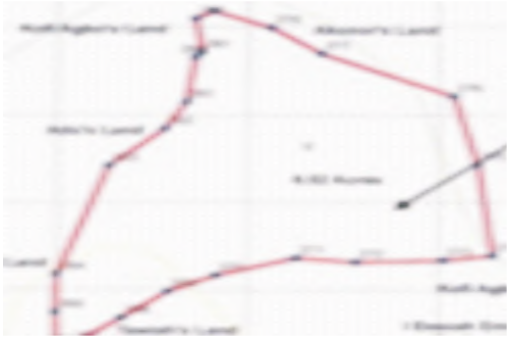
PC (c) Sketch layout of farm land.

A layout of a farm land is very important in any farm because it affects the productivity. A layout of a farm indicates cropping fields, offices, implement sheds, wash and changing rooms, pack house and access roads. An example of a farm land layout is shown in Picture 9.



Picture 9: A layout of a typical farm land

Picture 10: Develop farm land



Picture 11: Sketched farm land

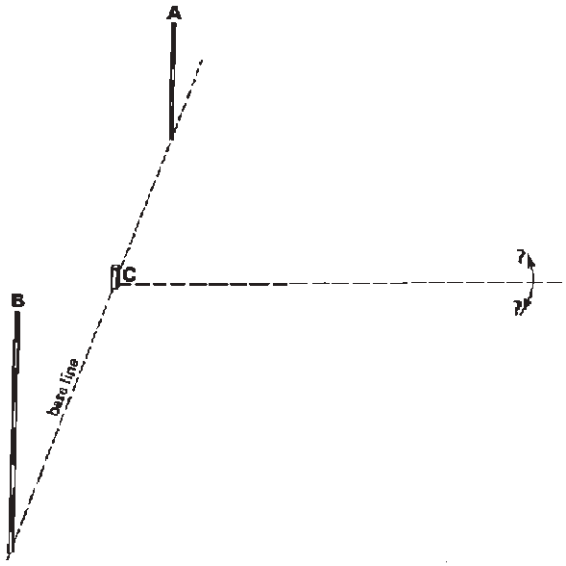
Activity

Sketch a typical farm layout within the Picture 11 below indicating the following; cropping field, access road, offices, wash and changing rooms, pack house and implement sheds

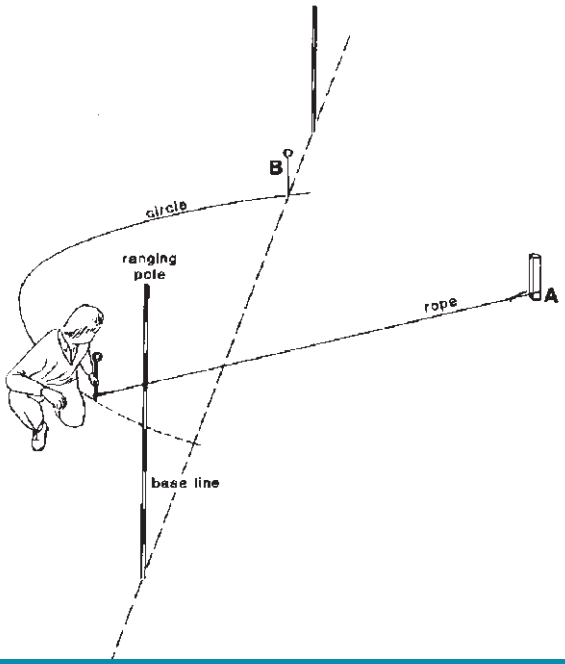
PC (d) Line and peg farm land

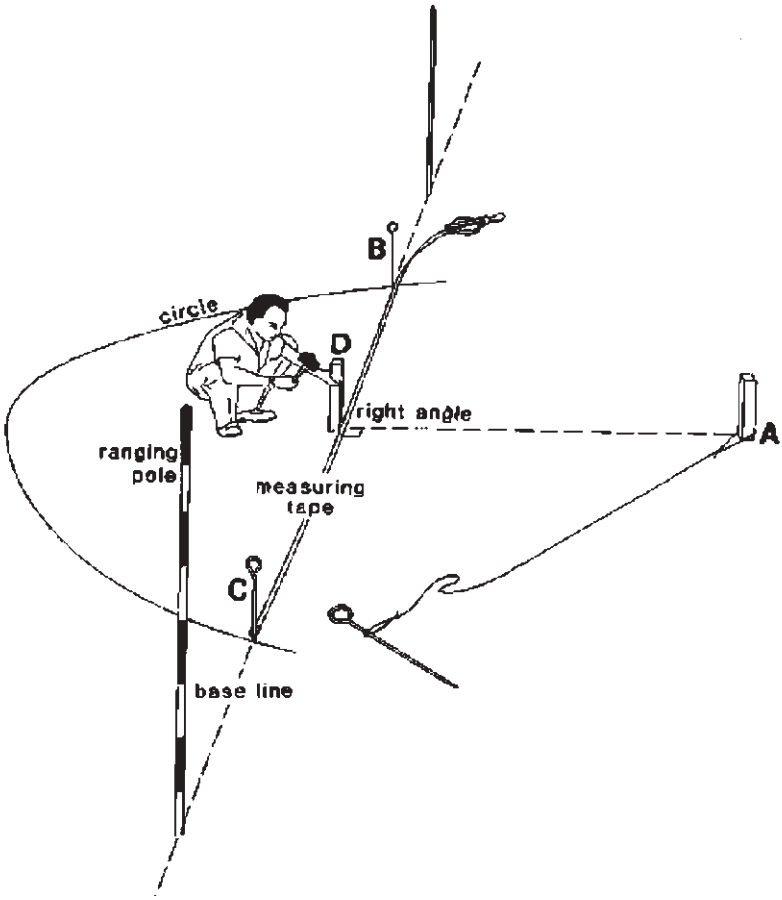
Lining and pegging of farm land ensures optimum plant population leading to higher yields. It can also help in determining the quantity of inputs to be used on the land. It makes it easy to carry out cultural practices such as weed control, fertilization, pest control and harvesting.

Step 1
The figure opposite shows the base line is defined by the poles (A) and (B) and a right angle has to be set out from peg (C). Peg (C) is on the base line.



Step 2
Peg (D) is placed exactly half way in between pegs (B) and (C). Use a measuring tape to determine the position of peg (D). Pegs (D) and (A) form the line perpendicular to the base line and the angle between the line CD and the base line is a right angle.





Picture 12: Determining baseline

Activity

Learner to line and peg as indicated below.

Materials to use

Use pegs, garden lines and tape measure for lining, pegging and mallet

The following steps are used in lining and pegging (see Picture 12)

? Select a line as your base line at the longest side of your farm land and label it A and B

? Measure a distance of 3 m along the second line, starting from the corner (point A) and mark this distance (point C).

? Now take a line which is marked with a distance of 5 m, and stretch it taut from point B towards the line with point C.

? Keeping the end points of both lines steady (points A & B) and the lines taut; move the free ends of the side line and the 5 m line until the 5 m mark and the mark at point C meet each other. This is best done with two men, one at the end of each line.

Self-assessment

1. State four (4) importance of land demarcation

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2. State five (5) steps used in determining land size

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3. List four (4) common features in a farm layout.

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4. State three (3) importance of lining and pegging of farm land

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Demonstrate understanding of soil preparation for planting

In this LO, you wil learn to :

a) Demonstrate ploughing and harrowing.
b) Prepare ridges.
c) Explain the importance of soil amendments.
d) Lay plastic mulch.

PC (a) Ploughing and harrowing

Ploughing simply means to break and turn over the soil (earth) commonly with a disc plough. Harrowing is a method for shallow cultivation of soil. It is accomplished by toothed or disk harrows and revolving hoes.

Activity

The learner woud be assisted to use the institute's tractor to plough and harrow.

PC(b) Prepare ridges

Once the ploughing and harrowing have been done, the next activity is to prepare ridges for planting. Ridging is done by bringing the top soil together in order to provide needed nutrients and support to the plant. In preparing a ridge you must consider the planting distance between each crop and the market demand for each crop but averagely the distance will be 45cm x 30 cm.

Picture13: Picture of a ridger.

Activity

The learner is to use the tractor of the institute or a hoe to prepare a ridge for a pineapple farm.

Pictuer 14 : A learner preparing ridges for pineapple

PC (c) Importance of soil amendments

Soil amendments improve the soil's physical qualities and especially its ability to provide nutrients for plants. It also helps to conserve the soil for sustainable plant growth. This can be done by mulching, composting, fertilizer and organic manure.

PC (d) Laying plastic mulch

Most commercial pineapple plantings in the fields are fumigated and fertilized prior to laying black polyethylene mulch (approximately 90 cm wide) on the planting beds. Mulch helps conserve soil moisture, promotes rooting, controls weeds, prevents fumigant evaporation, keeps the soil warm, and also increases the action of certain beneficial soil bacteria.

Mulching, however, is not beneficial in areas with high temperatures and rainfalls because it may encourage root rot and the soil temperatures are already warm enough to promote root growth.

Picture 15: Learners laying plastic mulch for pineapple production

Activity

Learner to demonstrate how to mulch using plastic on an already prepared ridge.

Self-assessment

Q1. State the importance of soil amendments in pineapple production

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Q2. State three (3) advantages of ploughing and harrowing in pineapple production

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Q3. State three (3) importance of ridging in pineapple production

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Q4. State the importance of plastic mulch in pineapple production.

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