Unit 7

Pests and Diseases Management

Learning / Facilitating Materials

Pineapple Production National Certificate I

CAADP

NEPAD

Transforming Africa

German Cooperation
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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Demonstrate understanding of the effects of pests and diseases of pineapples.

In this LO, the learner will be able to:

a) Explain the importance of pests and disease management.
b) Identify root pests and diseases.
c) Identify foliar and stem pests and diseases.
d) Identify fruit pests and diseases.
e) Demonstrate how to manage the major pests and diseases.

PC (a) Importance of pest and disease management

Pests are any organisms that cause harm to plants and reduces crops economic value.

Disease is any ill health or abnormality on the plant that is caused by pathogens that harm and reduces its economic value.

The output of the pineapple will reduce drastically if pests and diseases are not managed. Proper pest and disease management increase shelf life for fruits, reduce losses and increase quality of fruits. Improper management can lead to total crop failure and loss to the farmer.

The major pests of pineapple are: ants, mealy bug complex, nematodes, caterpillars, rodent’s, and birds. The fruits of the pineapple can be attacked by the larvae of the butterfly; Thecla basilides which reduces fruit quality.

Diseases of pineapple are: Phytophtera Heart and root rot, Black rot and white leaf spot.

PC (b) Identify root pests and diseases.

<table>
<thead>
<tr>
<th>Pests</th>
<th>Diseases</th>
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<td>Nematodes,</td>
<td>Pineapple blast</td>
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<td>Ants</td>
<td>Lemon scarp</td>
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<tr>
<td>Symphilids</td>
<td>Phytophtera root rot</td>
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<td>Termites</td>
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<td>Pineapple root weevil</td>
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<td>Weevil grubby larvae</td>
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PC (c) Identify foliar and stem pests and diseases.

<table>
<thead>
<tr>
<th>Pest</th>
<th>Diseases</th>
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<tbody>
<tr>
<td>Pineapple mealybug/beetle</td>
<td>Yellow spot</td>
</tr>
<tr>
<td>Rats</td>
<td>Heart rot</td>
</tr>
<tr>
<td>Termites</td>
<td>Septoria spot</td>
</tr>
<tr>
<td>Aphids</td>
<td>Greasy spot</td>
</tr>
<tr>
<td>Pineapple gall wasp</td>
<td></td>
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<tr>
<td>Mites</td>
<td></td>
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</table>

PC (d) Identify fruit pests and diseases.

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Pest</th>
</tr>
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<tbody>
<tr>
<td>Anthracnose</td>
<td>Fruit flies</td>
</tr>
<tr>
<td>Bacteria wilt</td>
<td>Pineapple peel miner</td>
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Fruit disorders

- Internal browning
- Radial brown stripe
- Triad rot
- Y-center rot
- Woody fruit
- Fasciations

Activity for PCs b, c and d

Learner will be introduced to roots, stems, foliar and fruit pests and diseases and assisted to identify them on the pineapple farm.

PC (e) Demonstrate how to manage the major pests and diseases

Mealy bug colonies are tended by ants, which protect them by making shelters of soil around the mealy bug. Initial control should be directed against the ants to ensure success. When the ants are controlled, the shelters collapse and control measures can then be directed towards the mealy-bug. Spraying the plants in the field after the ants have been eliminated can control the Mealy-bug.

Ants can be controlled either by drenching their nests with recommended insecticide or by applying baits. However farmers should adhere to farm sanitation regulation, plant resistant variety, and use chemical such as pesticide, fungicide and insecticides to control at the appropriate time with the recommended dosage.
insecticide or by applying baits. However farmers should adhere to farm sanitation regulation, plant resistant variety, and use chemical such as pesticide, fungicide and insecticides to control at the appropriate time with the recommended dosage.

Activity

Learner will visit an infested pineapple land and made to demonstrate appropriate pests and disease management system.

Self-assessment

1. State two (2) reasons why pests and diseases management are needed in the pineapple farm.
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2. List two (2) each of root, stem, foliar and fruit pests and diseases of pineapple.
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Self-assessment

Pests and Diseases Management
DEMONSTRATE UNDERSTANDING OF INTEGRATED PEST MANAGEMENT (I.P.M) IN PINEAPPLE PRODUCTION

In this LO, you will learn to:

a) Explain the importance of Integrated Pest Management  
b) Identify approaches to Integrated Pest Management  
c) Apply prevention method in Integrated Pest Management.  
d) Describe intervention methods in Integrated Pest Management.  
e) Apply appropriate intervention methods in Integrated Pest Management.

PC (a) Importance of Integrated Pest Management (I.P.M.)

Integrated Pest Management is a pest management philosophy that utilizes all suitable pest management techniques and methods to keep pest populations below economic injury levels.

I.P.M has the following importance:

Increase Farm Profit (increase net profit)
- Prevent or avoid crop and pest problems before economic losses occur.
- Eliminate crop input expenses by avoiding unnecessary management actions.
- Improve the efficiency of management actions by adopting better application practices.

Improve Environmental quality
- Judicious use of pesticides and fertilizers based on identified needs.
- Use selective chemicals or application methods where possible to reduce risk to non-target organisms.

Improve Public Image of Agriculture
- Far-reaching “side benefits” of reducing further regulatory and societal restrictions on the use of pesticides.

PC (b) Identify approaches to Integrated Pest Management

The major approaches used in IPM are Prevention, Suppression, and Eradication. The steps in the implementation of IPM are:

Correct pest Identification - what pests and stages are causing the damage. This is foundation for all decision making.
Understanding of pest and crop dynamics - must have enough information about the biology of the pest encountered to assess the potential risk that the pest poses and determine the best possible management strategy.

**PC (c) Apply prevention methods in I.P.M.**

Here are four general methods to manage insect: disease, weed problems, Cultural control, Biological Control, Mechanical Control and Chemical Control. Several of these tactics or methods may be carried out concurrently or implemented at different times to achieve a truly integrated management approach.

Prevention method is removing conditions that attract pests. It includes taking steps to ensure that pest populations cannot increase to unacceptable levels. This step includes mechanical (time weeding), biological (use natural enemy), chemical (pesticide) and observed farm hygiene practices to prevent pests from becoming a threat.

**PC (d) Describe Intervention methods in I.P.M**

Unfortunately, it is not always possible to totally prevent pests and diseases from damaging a crop or reducing its economic value. This means that when pests and diseases populations do begin to approach the Economic Injury Level, an intervention has to be made to protect the crop and farm profits.

Fortunately, once a decision has been made that an intervention is required, a range of intervention options are available. These include:

- Chemical (use pesticide to eradicate pest),
- Biological (use of natural enemy to suppress pest),
- Cultural (weed control, time planting),
- Physical (hand picking and physical killing of pest),
- Genetic (the use of resistant variety),

**PC (e) Apply appropriate intervention methods in I.P.M**

Activity: (PCs- b, c, and e)

Learner will be given resources to identify approaches, apply prevention and apply intervention methods in IPM on a pineapple farm.
Self-assessment

1. List the three (3) preventing method of IPM

2. List the suppression methods of insect, disease and weed control in I.P.M.

3. State two (2) importance of I.P.M

4. State two (2) methods of intervention in I.P.M

De m onstrate knowledge of phytosanitary regulations for the market

PC (a) Sanitary and phytosanitary regulations and their importance in international trade.

PC (b) Phytosanitary standards and certification.

In this L O, you will learn to:

a) Explain sanitary and phyto-sanitary regulations and their importance in International trade.

b) Explain the phyto-sanitary standards and certification.

c) State factors required to meet the standards and certification.

Sanitary and phytosanitary regulations are rules and guidelines used to control the spread of pests and diseases from country to country.

Producers must comply with phytosanitary regulations to prevent the entry and spread of plant diseases and pests into new areas. Sanitary and phytosanitary are important in pineapple production to:

• Ensure maintenance of quality
• Meet international standards and
• Increase shelf life.

The major importing countries around the world implement pests risk analysis in order to determine the risk level of an imported product and inspect products on arrival to ensure that the level of risk is not exceeded. Goods imported into the EU must meet the EU sanitary and phytosanitary requirements to protect human and animal health.

Phytosanitary standards:

Official visual examination of plants, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations.

Phytosanitary certification:
The use of phytosanitary procedures leading to the issue of a phytosanitary certificate.

Phytosanitary measure:
Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of pests.
LEARNING OUTCOME 3

Demonstrate knowledge of phytosanitary regulations for the market

In this LO, you will learn to:

a) Explain sanitary and phyto-sanitary regulations and their importance in International trade.

b) Explain the phyto-sanitary standards and certification.

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PC (b) Phytosanitary standards and certification.

Phytosanitary standards: Official visual examination of plants, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations.

Phytosanitary certification: The use of phytosanitary procedures leading to the issue of a phytosanitary certificate.

Phytosanitary measure: Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of pests.
Phytosanitary regulation: Official rule to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests.

**PC (c) Factors required to meet standards and certification.**

To pass standards and gain certification, pineapple fruits should be free from pests' infestation, chemical residues and sun burns. The requirements can be classified in the following sectors: Food and feed safety, Animal health, Plant health and Public health as described below.

**Food and feed safety:** EU rules on food safety are designed to protect human life and health while the rules on animal feed aim at protecting human and animal life and health. Importers of fruits and foodstuffs must comply with general conditions, which include:

- General principles and requirements of food law and traceability
- General rules on hygiene of fruits and foodstuffs and hygiene specifications for food of animal origin and on microbiological criteria for foodstuffs
- Rules on residues, pesticides, veterinary medicines and contaminants in and on food
- Special rules on genetically modified food and feed, bio proteins and novel foods
- Special rules on certain groups of food products (e.g. mineral waters, cocoa, Pineapple, quick-frozen food) and foodstuffs aimed at specific populations (e.g. foods for infants and young children)
- Specific marketing and labeling requirements for fruit, feed materials, compound feeding stuffs, and feeding stuffs intended for particular nutritional purposes
- General rules on materials intended to come into contact with fruits and foodstuffs
Self-assessment

1. State two (2) standards for plant and fruits health.

2. Explain the need for sanitary and phyto-sanitary regulations.

3. State two (2) importance of sanitary and phyto-sanitary regulations in pineapple.

4. State two (2) factors required to meet phyto-sanitary standards.
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