



# **THE KISII NATIONAL POLYTECHNIC**

**P.O. BOX 222-40200,**

**KISII, KENYA.**

**COMPETENCY BASED CURRICULUM**

**FOR**

**CERTIFICATE IN HORTICULTURE PRODUCTION**

**LEVEL 5**

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## **COURSE OVERVIEW**

This course is designed to equip an individual with competencies for horticulture production. It further aims at equipping the individual with competencies for the storage of various horticultural produce, processing fruits, vegetables, flowers, nuts as well as herbs and spices.

The course is also designed to equip the individual with competencies to supervise the setting up and running of a horticulture production business.

This course consists of the following basic and core units of learning:

### **Basic Units of Learning**

<b>Unit Code</b>	<b>Unit Title</b>	<b>Duration in Hours</b>	<b>Credit factor</b>
KNP/HP/B001/5	Communication skills	25	2.5
KNP/ HP/B002/5	Basic mathematics	40	4.0
KNP/ HP/B003/5	Introduction to computer	45	4.5
KNP/ HP/B004/5	Entrepreneurial skills	70	7.0
KNP/ HP/B005/5	Environmental literacy	25	2.5
KNP/ HP/B006/5	Occupational safety and health practices	25	2.5
<b>Total</b>		<b>230</b>	<b>23</b>

### **Core Units of Learning**

<b>Unit Code</b>	<b>Unit Title</b>	<b>Duration in Hours</b>	<b>Credit Factor</b>
KNP/HP/C001/5	Tropical fruits production	100	10
KNP/HP/C002/5	Sub-tropical fruits production	100	10
KNP/HP/C003/5	Temperate fruits production	80	8
KNP/HP/C004/5	Vine fruits production	100	10
KNP/HP/C005/5	Mushrooms production	70	7
KNP/HP/C006/5	Herbs and spices	100	10

	production		
KNP/HP/C007/5	Horticultural nuts production	80	8
KNP/HP/C008/5	Ornamental plants production	100	10
KNP/HP/C009/5	Cut flowers production	100	10
KNP/HP/C010/5	Vegetable crops production	120	12
KNP/HP/C011/5	Industrial attachment	360	36
<b>Total</b>		<b>1310</b>	<b>131</b>

The total duration of the course for an average trainee is 1590 hours which is equivalent to forty one(41) weeks at 30 hours of learning per week plus fifteen (12) weeks Industrial Attachment

#### **Entry Requirements**

An individual entering this course should have any of the following minimum requirements:

- a) Kenya Certificate of Secondary Education (KCSE) D (plain)

**Or**

- b) Certificate in Horticulture Production Level 4

**Or**

- c) Equivalent qualifications as determined by Kenya National Qualifications Authority (KNQA)

#### **Industrial attachment**

An individual enrolled in this course will undergo twelve (12) weeks industrial attachment in a horticultural farm.

An individual enrolled in one of the core units of learning will undergo a two weeks attachment in a horticultural farm.

#### **Assessment**

The course will be assessed at two levels: internal and external.

- a) **Internal assessment** conducted continuously by the trainer (internal assessor) who is monitored by an accredited internal verifier.
- b) **External assessment** conducted by an external assessor who is monitored by an accredited external verifier.

The assessors and verifiers are accredited by TVET CDACC which also coordinates external assessment.

**Certification**

An individual will be awarded a Record of Achievement on demonstration of competence in a unit of competency. To be awarded Certificate in Horticulture production Level 5, an individual must demonstrate competence in all the units of competency. These certificate will be awarded by Kisii National Polytechnic

## **BASIC UNITS OF LEARNING**

## COMMUNICATION SKILLS

UNIT CODE: KNP/HP/B001/5

### Relationship to Occupational Standards

This unit addresses the unit of competency: Demonstrate communication skills

**Duration of Unit:** 25 hours

### Unit Description

This unit describes the competencies required to use specialized communication skills to meet specific needs of internal and external clients, conduct interviews, facilitate discussion with groups and contribute to the development of communication strategies.

### Summary of Learning Outcomes

1. Meet communication needs of clients and colleagues
2. Contribute to the development of communication strategies
3. Conduct interviews
4. Facilitate group discussions
5. Represent the organization

### Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Meet communication needs of clients and colleagues	<ul style="list-style-type: none"><li>• Communication process</li><li>• Modes of communication</li><li>• Medium of communication</li><li>• Effective communication</li><li>• Barriers to communication</li><li>• Flow of communication</li><li>• Sources of information</li><li>• Organizational policies</li><li>• Organization requirements for written and electronic communication methods</li><li>• Report writing</li></ul>	<ul style="list-style-type: none"><li>• Observation</li><li>• Oral</li></ul>

	<ul style="list-style-type: none"> <li>• Effective questioning techniques (clarifying and probing)</li> <li>• Workplace etiquette</li> <li>• Ethical work practices in handling communication</li> <li>• Active listening</li> <li>• Feedback</li> <li>• Interpretation</li> <li>• Flexibility in communication</li> </ul>	
2. Contribute to the development of communication strategies	<ul style="list-style-type: none"> <li>• Dynamics of groups</li> <li>• Styles of group leadership</li> <li>• Openness and flexibility in communication</li> <li>• Communication skills relevant to client groups</li> </ul>	<ul style="list-style-type: none"> <li>• Written</li> <li>• Observation</li> </ul>
3. Conduct interviews	<ul style="list-style-type: none"> <li>• Types of interview</li> <li>• Establishing rapport</li> <li>• Facilitating resolution of issues</li> <li>• Developing action plans</li> </ul>	<ul style="list-style-type: none"> <li>• Written</li> <li>• Observation</li> </ul>
4. Facilitate group discussions	<ul style="list-style-type: none"> <li>• Identification of communication needs</li> <li>• Dynamics of groups</li> <li>• Styles of group leadership</li> <li>• Presentation of information</li> <li>• Encouraging group members participation</li> <li>• Evaluating group communication strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Written</li> <li>• Observation</li> </ul>
5. Represent the organization	<ul style="list-style-type: none"> <li>• Presentation techniques</li> <li>• Development of a presentation</li> <li>• Multi-media utilization in presentation</li> <li>• Communication skills relevant to client groups</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written</li> </ul>



**Suggested Delivery Methods**

- Role playing
- Observation
- Viewing of related videos

**Recommended Resources**

- Desktop computers/laptops
- Internet connection
- Projectors
- Telephone

## BASIC MATHEMATICS

**UNIT CODE: KNP/ HP/B002/5**

### **Relationship to Occupational Standards:**

This unit addresses the unit of competency: Demonstrate numeracy skills

**Duration of Unit:** 40 hours

### **Unit Description**

This unit covers the competencies required to perform numerical functions. The person who is competent in this unit shall be able to: Calculate with whole numbers and familiar fractions, decimals and percentages for work; Estimate, measure, and calculate with routine metric measurements for work; Use routine maps and plans for work; Interpret, draw and construct 2D and 3D shapes for work; Interpret routine tables, graphs and charts for work; Collect data and construct routine tables and graphs for work; and Use basic functions of calculator

### **Summary of Learning Outcomes**

1. Calculate with whole numbers and familiar fractions, decimals and percentages for work
2. Estimate, measure and calculate with routine metric measurements for work
3. Use routine maps and plans for work
4. Interpret, draw and construct 2D and 3D shapes for work
5. Interpret routine tables, graphs and charts for work
6. Collect data and construct routine tables and graphs for work
7. Use basic functions of calculator

### **Learning Outcomes, Content and Suggested Assessment Methods**

Learning Outcome	Content	Suggested Assessment Methods
1. Calculate with whole numbers and familiar fractions, decimals and	<ul style="list-style-type: none"><li>▪ Interpretation of whole numbers, fractions, decimals, percentages and rates</li><li>▪ Calculations involving several</li></ul>	<ul style="list-style-type: none"><li>• Oral</li><li>• Written</li><li>• Practical test</li><li>• Observation</li></ul>

percentages for work	<p>steps</p> <ul style="list-style-type: none"> <li>▪ Calculation with whole numbers and routine or familiar fractions, decimals and percentages</li> <li>▪ Conversion between equivalent forms of fractions, decimals and percentages</li> <li>▪ Application of order of operations to solve multi-step calculations</li> <li>▪ Application of problem solving strategies</li> <li>▪ Making estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task</li> <li>▪ Use of formal and informal mathematical language and symbolism to communicate the result of a task</li> </ul>	
2. Estimate, measure and calculate with routine metric measurements for work	<ul style="list-style-type: none"> <li>▪ Selection and interpretation of measurement information in workplace tasks and texts</li> <li>▪ Identification and selection of routine measuring equipment</li> <li>▪ Estimation and making measurements using correct units</li> <li>▪ Estimation and calculation using routine measurements</li> <li>▪ Performing conversions between routinely used metric units</li> <li>▪ Using problem solving processes to undertake tasks</li> <li>▪ Recording information using mathematical language and symbols</li> </ul>	<ul style="list-style-type: none"> <li>• Oral</li> <li>• Written</li> <li>• Practical test</li> <li>• Observation</li> </ul>
3. Use routine maps and plans for work	<ul style="list-style-type: none"> <li>• Identification of features in routine maps and plans</li> </ul>	<ul style="list-style-type: none"> <li>• Oral</li> <li>• Written</li> <li>• Practical test</li> </ul>

	<ul style="list-style-type: none"> <li>• Symbols and keys used in routine maps and plans</li> <li>• Identification and interpretation of orientation of map to North</li> <li>• Demonstrate understanding of direction and location</li> <li>• Apply simple scale to estimate length of objects, or distance to location or object</li> <li>• Give and receive directions using both formal and informal language</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> </ul>
<p>4. Interpret, draw and construct 2D and 3D shapes for work</p>	<ul style="list-style-type: none"> <li>• Identify two dimensional shapes and routine three dimensional shapes in everyday objects and in different orientations</li> <li>• Explain the use and application of shapes</li> <li>• Use formal and informal mathematical language and symbols to describe and compare the features of two dimensional shapes and routine three dimensional shapes</li> <li>• Identify common angles</li> <li>• Estimate common angles in everyday objects</li> <li>• Use formal and informal mathematical language to describe and compare common angles</li> <li>• Use common geometric instruments to draw two dimensional shapes</li> </ul>	<ul style="list-style-type: none"> <li>• Oral</li> <li>• Written</li> <li>• Practical test</li> </ul> <p>Observation</p>

	<ul style="list-style-type: none"> <li>• Construct routine three dimensional objects from given nets</li> </ul>	
5. Interpret routine tables, graphs and charts for work	<ul style="list-style-type: none"> <li>• Identify routine tables, graphs and charts in predominately familiar texts and contexts</li> <li>• Identify common types of graphs and their different uses</li> <li>• Identify features of tables, graphs and charts</li> <li>• Locate specific information</li> <li>• Perform calculations to interpret information</li> <li>• Explain how statistics can inform and persuade</li> <li>• Identify misleading statistical information</li> <li>• Discuss information relevant to the workplace</li> </ul>	<ul style="list-style-type: none"> <li>• Oral</li> <li>• Written</li> <li>• Practical test</li> <li>• Observation</li> </ul>
6. Collect data and construct routine tables and graphs for work	<ul style="list-style-type: none"> <li>• Identify features of common tables and graphs</li> <li>• Identify uses of <b>different tables and graphs</b></li> <li>• Determine data and variables to be collected</li> <li>• Determine audience</li> <li>• Select a method to collect data</li> <li>• Collect data</li> <li>• Collate information in a table</li> <li>• Determine suitable scale and axes</li> <li>• Draft and draw graph to present information</li> <li>• Check that data meets the expected results and context</li> <li>• Report or discuss information</li> </ul>	<ul style="list-style-type: none"> <li>• Oral</li> <li>• Written</li> <li>• Practical test</li> <li>• Observation</li> </ul>

	using formal and informal mathematical language	
7. Use basic functions of calculator	<ul style="list-style-type: none"> <li>• Identify and use keys for <b>basic functions on a calculator</b></li> <li>• Calculate using whole numbers, money and routine decimals and percentages</li> <li>• Calculate with routine fractions and percentages</li> <li>• Apply order of operations to solve multi-step calculations</li> <li>• Interpret display and record result</li> <li>• Make estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task</li> <li>• Use formal and informal mathematical language and appropriate symbolism and conventions to communicate the result of the task</li> </ul>	<ul style="list-style-type: none"> <li>• Oral</li> <li>• Written</li> <li>• Practical test</li> <li>• Observation</li> </ul>

### **Suggested Delivery Methods**

- Group discussions
- Demonstration by trainer
- Practical work by trainee
- Exercises

### **Recommended Resources**

- Calculators
- Rulers, pencils, erasers
- Charts with presentations of data
- Graph books

- Dice

# INTRODUCTION TO COMPUTER

**UNIT CODE: KNP/ HP/B003/5**

## **Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate computer literacy

**Duration of Unit:** 45 hours

## **Unit Description**

This unit describes competencies required to use a computer and other digital devices for the purposes of communication, work performance and management at the workplace.

## **Summary of Learning Outcomes**

1. Identify computer software and hardware
2. Apply security measures to data, hardware, software in automated environment
3. Apply computer software in solving tasks
4. Apply internet and email in communication at workplace
5. Apply desktop publishing in official assignments
6. Prepare presentation packages

## **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Identify computer hardware and software	<ul style="list-style-type: none"><li>• Concepts of ICT</li><li>• Functions of ICT</li><li>• History of computers</li><li>• Components of a computer</li><li>• Classification of computers</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Oral presentation</li><li>• Observation</li></ul>
2. Apply security measures to data, hardware and software	<ul style="list-style-type: none"><li>• Data security and control</li><li>• Security threats and control measures</li><li>• Types of computer crimes</li><li>• Detection and protection against computer crimes</li><li>• Laws governing protection of ICT</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Oral presentation</li><li>• Observation</li><li>• Project</li></ul>



3. Apply computer software in solving tasks	<ul style="list-style-type: none"> <li>• Operating system</li> <li>• Word processing</li> <li>• Spread sheets</li> <li>• Data base design and manipulation</li> <li>• Data manipulation, storage and retrieval</li> </ul>	<ul style="list-style-type: none"> <li>• Oral questioning</li> <li>• Observation</li> <li>• Project</li> </ul>
4. Apply internet and email in communication at workplace	<ul style="list-style-type: none"> <li>• Computer networks</li> <li>• Network configurations</li> <li>• Uses of internet</li> <li>• Electronic mail (e-mail) concept</li> </ul>	<ul style="list-style-type: none"> <li>• Oral questioning</li> <li>• Observation</li> <li>• Oral presentation</li> <li>• Written report</li> </ul>
5. Apply desktop publishing in official assignments	<ul style="list-style-type: none"> <li>• Concept of desktop publishing</li> <li>• Opening publication window</li> <li>• Identifying different tools and tool bars</li> <li>• Determining page layout</li> <li>• Opening, saving and closing files</li> <li>• Drawing various shapes using DTP</li> <li>• Using colour pellets to enhance a document</li> <li>• Inserting text frames</li> <li>• Importing and exporting text</li> <li>• Object linking and embedding</li> <li>• Designing of various publications</li> <li>• Printing of various publications</li> </ul>	<ul style="list-style-type: none"> <li>• Oral questioning</li> <li>• Observation</li> <li>• Oral presentation</li> <li>• Written report</li> <li>• Project</li> </ul>
6. Prepare presentation packages	<ul style="list-style-type: none"> <li>• Types of presentation packages</li> <li>• Procedure of creating slides</li> <li>• Formatting slides</li> <li>• Presentation of slides</li> <li>• Procedure for editing objects</li> </ul>	<ul style="list-style-type: none"> <li>• Oral questioning</li> <li>• Observation</li> <li>• Oral presentation</li> <li>• Written report</li> <li>• Project</li> </ul>

### Suggested Delivery Methods

- Instructor led facilitation of theory
- Demonstration by trainer
- Practical work by trainee
- Viewing of related videos
- Project

- Group discussions

### **Recommended Resources**

- Desk top computers
- Laptop computers
- Other digital devices
- Printers
- Storage devices
- Internet access
- Computer software

## ENTREPRENEURIAL SKILLS

**UNIT CODE: KNP/ HP/B004/5**

### **Relationship to occupational standards**

This unit addresses the unit of competency: Demonstrate entrepreneurial skills

**Duration of unit:** 70 hours

### **Unit description**

#### **Unit description**

This unit describes the competencies critical to demonstration of entrepreneurial aptitudes. It involves, developing business innovation strategies, developing new markets, customer base, expanding employed capital and undertaking regional/county expansion while retaining motivated staff.

#### **Summary of Learning Outcomes**

1. Develop business innovation strategies
2. Develop new products/ markets
3. Expand customers and product lines
4. Motivate all staff/workers
5. Expand employed capital base
6. Undertake regional/county business expansion

#### **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Develop business Innovation strategies	<input type="checkbox"/> Innovation in business <input type="checkbox"/> Business innovation strategies <input type="checkbox"/> Creativity for business development <input type="checkbox"/> New technologies in entrepreneurship <input type="checkbox"/> Linkages with other entrepreneurs <input type="checkbox"/> Setting strategic directions <input type="checkbox"/> New ideas and approaches <input type="checkbox"/> Entrepreneurial skills development <input type="checkbox"/> Market trends <input type="checkbox"/> Monitoring and anticipating market trends	<input type="checkbox"/> Observation <input type="checkbox"/> Case studies <input type="checkbox"/> Individual/group assignments Projects <input type="checkbox"/> Written <input type="checkbox"/> Oral

	<input type="checkbox"/> Products and processes in entrepreneurship <input type="checkbox"/> Business conventions and exhibitions <input type="checkbox"/> Business growth refocus	
2. Develop new products/markets	<input type="checkbox"/> Feasibility study for new products <input type="checkbox"/> Identifying new sources of raw material and resources <input type="checkbox"/> New target markets/customers <input type="checkbox"/> Increasing products and services <input type="checkbox"/> Marketing improvement <input type="checkbox"/> Intrapreneurship and business growth	<input type="checkbox"/> Observation <input type="checkbox"/> Case studies <input type="checkbox"/> Individual/group assignments <input type="checkbox"/> Projects <input type="checkbox"/> Written <input type="checkbox"/> Oral
3. Expand customers and product lines	<input type="checkbox"/> Market demand <input type="checkbox"/> Regulatory environment <input type="checkbox"/> Creating product and services competitive advantages <input type="checkbox"/> Creating royal client base <input type="checkbox"/> Identifying and maintain new customers and markets <input type="checkbox"/> Advance product/ service promotions <input type="checkbox"/> Advance market expansion <input type="checkbox"/> Small business records management <input type="checkbox"/> Book keeping and auditing for small businesses <input type="checkbox"/> Computer application software and programmes <input type="checkbox"/> ICT in customer and product diversification	<input type="checkbox"/> Oral <input type="checkbox"/> Observation <input type="checkbox"/> Case studies <input type="checkbox"/> Individual/group assignments <input type="checkbox"/> Projects <input type="checkbox"/> Written
4. Motivate staff/workers	<input type="checkbox"/> Motivation of workers <input type="checkbox"/> Communication at workplace for motivation purpose <input type="checkbox"/> Problem solving <input type="checkbox"/> Conflict resolution at place of work <input type="checkbox"/> Good staff/workers relation <input type="checkbox"/> Team building and team work	<input type="checkbox"/> Observation <input type="checkbox"/> Case studies <input type="checkbox"/> Individual/group assignments <input type="checkbox"/> Projects <input type="checkbox"/> Written

	<input type="checkbox"/> Staff development and enhancement <input type="checkbox"/> Culture of continuous improvement	
5. Expand employed capital base	<input type="checkbox"/> Employed capital in business <input type="checkbox"/> Business share holdings <input type="checkbox"/> Types of shares <input type="checkbox"/> Shares diversification <input type="checkbox"/> Role of shareholders <input type="checkbox"/> Entrepreneurship <input type="checkbox"/> Increasing products and services	<input type="checkbox"/> Observation <input type="checkbox"/> Case studies <input type="checkbox"/> Individual/group assignments <input type="checkbox"/> Projects <input type="checkbox"/> Written <input type="checkbox"/> Oral
6. Undertake county/ regional business expansion	<input type="checkbox"/> Region/ county identification process <input type="checkbox"/> Regional/ county laws and regulation <input type="checkbox"/> Business regional/county expansion <input type="checkbox"/> Regional/ County business expansion <input type="checkbox"/> Innovation in business <input type="checkbox"/> Business expansion and diversification <input type="checkbox"/> Resources for regional/county expansion <input type="checkbox"/> Small business Strategic Plan <input type="checkbox"/> Computer software in business development <input type="checkbox"/> ICT and business growth	<input type="checkbox"/> Observation <input type="checkbox"/> Case studies <input type="checkbox"/> Individual/group assignments <input type="checkbox"/> Projects <input type="checkbox"/> Written <input type="checkbox"/> Oral

### Suggested Delivery Methods

- Instructor led facilitation of theory
- Demonstration by trainer
- Practice by trainee
- Role play
- Case study

### Recommended Resources

- Case studies for small businesses
- Business plan templates
- Laptop/ desktop computers
- Internet

- Telephone

## **ENVIRONMENTAL LITERACY**

**UNIT CODE:KNP/ HP/B005/5**

### **Relationship to Occupational Standards**

This unit addresses the unit of competency: Demonstrate environmental literacy

**Duration of Unit:** 25 hours

### **Unit Description**

This unit describes the competencies required to control environmental hazard, control environmental pollution, comply with workplace sustainable resource use, evaluate current practices in relation to resource usage, identify environmental legislations/conventions for environmental concerns, implement specific environmental programs and monitor activities on environmental protection/programs.

### **Summary of Learning Outcomes**

1. Control environmental hazard
2. Control environmental Pollution
3. Demonstrate sustainable resource use
4. Evaluate current practices in relation to resource usage
5. Identify Environmental legislations/conventions for environmental concerns
6. Implement specific environmental programs
7. Monitor activities on Environmental protection/Programs

### **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Control environmental hazard	<ul style="list-style-type: none"> <li>• Purposes and content of Environmental Management and Coordination Act 1999</li> <li>• Purposes and content of Solid Waste Act</li> <li>• Storage methods for environmentally hazardous materials</li> <li>• Disposal methods of hazardous wastes</li> <li>• Types and uses of PPE in line with</li> </ul>	<ul style="list-style-type: none"> <li>• Written questions</li> <li>• Oral questions</li> <li>• Observation of work procedures</li> </ul>

	<p>environmental regulations</p> <ul style="list-style-type: none"> <li>Occupational Safety and Health Standards (OSHS)</li> </ul>	
2. Control environmental Pollution control	<ul style="list-style-type: none"> <li>Types of pollution</li> <li>Environmental pollution control measures</li> <li>Types of solid wastes</li> <li>Procedures for solid waste management</li> <li>Different types of noise pollution</li> <li>Methods for minimizing noise pollution</li> </ul>	<ul style="list-style-type: none"> <li>Written questions</li> <li>Oral questions</li> <li>Observation of work procedures</li> <li>Role play</li> </ul>
3. Demonstrate sustainable resource use	<ul style="list-style-type: none"> <li>Types of resources</li> <li>Techniques in measuring current usage of resources</li> <li>Calculating current usage of resources</li> <li>Methods for minimizing wastage</li> <li>Waste management procedures</li> <li>Principles of 3Rs (Reduce, Reuse, Recycle)</li> <li>Methods for economizing or reducing resource consumption</li> </ul>	<ul style="list-style-type: none"> <li>Written questions</li> <li>Oral questions</li> <li>Observation of work procedures</li> <li>Role play</li> </ul>
4. Evaluate current practices in relation to resource usage	<ul style="list-style-type: none"> <li>Collection of information on environmental and resource efficiency systems and procedures,</li> <li>Measurement and recording of current resource usage</li> <li>Analysis and recording of current purchasing strategies.</li> <li>Analysis of current work processes to access information and data</li> <li>Identification of areas for improvement</li> </ul>	<ul style="list-style-type: none"> <li>Written questions</li> <li>Oral questions</li> <li>Observation of work procedures</li> <li>Role play</li> </ul>
5. Identify Environmental legislations/conventions for environmental concerns	<ul style="list-style-type: none"> <li>Environmental issues/concerns</li> <li>Environmental legislations /conventions and local ordinances</li> <li>Industrial standard /environmental practices</li> <li>International Environmental Protocols (Montreal, Kyoto)</li> </ul>	<ul style="list-style-type: none"> <li>Written questions</li> <li>Oral questions</li> <li>Observation of work procedures</li> </ul>

	<ul style="list-style-type: none"> <li>• Features of an environmental strategy</li> </ul>	
6. Implement specific environmental programs	<ul style="list-style-type: none"> <li>• Community needs and expectations</li> <li>• Resource availability</li> <li>• 5 s of good housekeeping</li> <li>• Identification of programs/Activities</li> <li>• Setting of individual roles /responsibilities</li> <li>• Resolving problems /constraints encountered</li> <li>• Consultation with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Written questions</li> <li>• Oral questions</li> <li>• Observation of work procedures</li> <li>• Role play</li> </ul>
7. Monitor activities on Environmental protection/Programs	<ul style="list-style-type: none"> <li>• Periodic monitoring and Evaluation of activities</li> <li>• Gathering feedback from stakeholders</li> <li>• Analysing data gathered</li> <li>• Documentation of recommendations and submission</li> <li>• Setting of management support systems to sustain and enhance the program</li> <li>• Monitoring and reporting of environmental incidents to concerned /proper authorities</li> </ul>	<ul style="list-style-type: none"> <li>• Oral questions</li> <li>• Written tests</li> <li>• Practical test</li> <li>• Observation</li> </ul>

### **Suggested Delivery Methods**

- Instructor led facilitation of theory
- Demonstration by trainer
- Practical work by trainee
- Viewing of related videos

### **Recommended Resources**

- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Environmental Management and Coordination Act 1999
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE)
- ISO standards
- Ccompany environmental management systems (EMS)
- Montreal Protocol



- Kyoto Protocol

## OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE: KNP/ HP/B006/5**

### **Relationship to Occupational Standards**

This unit addresses the unit of competency: Demonstrate occupational safety and health practices

**Duration of Unit:** 25 hours

### **Unit Description**

This unit describes the competencies required to comply with regulatory and organizational requirements for occupational safety and health.

### **Summary of Learning Outcomes**

1. Identify workplace hazards and risk
2. Identify and implement appropriate control measures to hazards and risks
3. Implement OSH programs, procedures and policies/guidelines

### **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Identify workplace hazards and risks	<ul style="list-style-type: none"><li>• Identification of hazards in the workplace and/or the indicators of their presence</li><li>• Evaluation and/or work environment measurements of OSH hazards/risk existing in the workplace is conducted by</li><li>• Authorized personnel or agency</li><li>• Gathering of OHS issues and/or concerns raised</li></ul>	<ul style="list-style-type: none"><li>• Oral questions</li><li>• Written tests</li><li>• Observation of trainees identify hazards and risks</li></ul>
2. Identify and implement appropriate control measure to hazards and risks	<ul style="list-style-type: none"><li>• Prevention and control measures, including use of PPE (personal protective equipment) for specific hazards are identified and implemented</li></ul>	<ul style="list-style-type: none"><li>• Oral questions</li><li>• Written tests</li><li>• Practical test</li><li>• Observation of implementation of</li></ul>

	<ul style="list-style-type: none"> <li>• Appropriate risk controls based on result of OSH hazard evaluation is recommended</li> <li>• Contingency measures, including emergency procedures during workplace incidents and emergencies are recognized and established in accordance with organization procedures</li> </ul>	control measures
3. Implement OSH programs, procedures and policies/guidelines	<ul style="list-style-type: none"> <li>• Providing information to work team about company OHS program, procedures and policies/guidelines</li> <li>• Participating in implementation of OSH procedures and policies/guidelines</li> <li>• Training of team members and advice on OSH standards and procedures</li> <li>• Implementation of procedures for maintaining OSH-related records</li> </ul>	<ul style="list-style-type: none"> <li>• Oral questions</li> <li>• Written tests</li> <li>• Practical test</li> <li>• Observation</li> </ul>

### **Suggested Delivery Methods**

- Instructor led facilitation of theory
- Demonstration by trainer
- Practical work by trainee
- Viewing of related videos

### **Recommended Resources**

- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE) e.g.
  - ✓ Mask
  - ✓ Face mask/shield
  - ✓ Safety boots
  - ✓ Safety harness
  - ✓ Arm/Hand guard, gloves

- ✓ Eye protection (goggles, shield)
- ✓ Hearing protection (ear muffs, ear plugs)
- ✓ Hair Net/cap/bonnet
- ✓ Hard hat
- ✓ Face protection (mask, shield)
- ✓ Apron/Gown/coverall/jump suit
- ✓ Anti-static suits
- ✓ High-visibility reflective vest



## **CORE UNITS OF LEARNING**

# TROPICAL FRUITS PRODUCTION

**UNIT CODE: KNP/HP/C001/5**

## **Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce tropical fruits

**Duration of Unit:** 100 Hours

## **Unit Description**

This unit specifies the competencies required to produce tropical fruits. It includes preparing tropical fruits orchard, producing tropical fruits, harvesting tropical fruits, determining productivity and quality of fruits produced, carrying out post-harvest handling of the fruits and generating production report.

## **Summary of Learning Outcomes**

1. Prepare to produce tropical fruits
2. Produce tropical fruits
3. Evaluate production of tropical fruits
4. Complete production of tropical fruits

## **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Prepare to produce tropical fruits	<ul style="list-style-type: none"><li>• Site selection and preparation</li><li>• Types of tropical fruits</li><li>• Selection of tropical fruit to produce</li><li>• Tools, equipment, supplies and materials<ul style="list-style-type: none"><li>➤ Identification</li><li>➤ Use</li><li>➤ Servicing</li><li>➤ Storage</li></ul></li><li>• Farm planning</li><li>• Soil sampling, testing and interpretation</li><li>• Soil conservation</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li><li>• Third party report</li></ul>

	<ul style="list-style-type: none"> <li>• Phyto-sanitary requirements for tropical fruits</li> <li>• Budgeting</li> </ul>	
2. Produce tropical fruits	<ul style="list-style-type: none"> <li>• Agro Ecological zonation <ul style="list-style-type: none"> <li>➤ Zone mapping</li> <li>➤ Matching fruits to AEZ</li> </ul> </li> <li>• Tropical fruits agronomic Practices: <ul style="list-style-type: none"> <li>➤ Spacing</li> <li>➤ Planting</li> <li>➤ Nutrient application</li> <li>➤ Pruning and training</li> <li>➤ irrigation</li> <li>➤ Inducing flowering</li> <li>➤ Rotations/ cropping calendar</li> <li>➤ Intercropping</li> <li>➤ Mulching</li> <li>➤ Control of pests, diseases, physiological disorders and weeds</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
3. Evaluate production of tropical fruits	<ul style="list-style-type: none"> <li>• Evaluation of fruit productivity <ul style="list-style-type: none"> <li>➤ Quality of fruits</li> <li>➤ Quantities of fruits</li> </ul> </li> <li>• Record keeping</li> <li>• Report writing</li> <li>• Computation of Returns on Investment</li> <li>• Accounting principles</li> </ul>	<ul style="list-style-type: none"> <li>• Written exercise</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Observation</li> </ul>
4. Complete production of tropical fruits	<ul style="list-style-type: none"> <li>• Harvesting/maturity index <ul style="list-style-type: none"> <li>➤ Fruit skin colour change as indicator of maturity</li> <li>➤ Falling mature fruits</li> <li>➤ Fullness of fruits</li> <li>➤ Fruit textures</li> </ul> </li> <li>• Post-harvest handling <ul style="list-style-type: none"> <li>➤ Sorting and grading</li> <li>➤ Cleaning</li> <li>➤ packing</li> </ul> </li> <li>• Disposal of waste material</li> <li>• Storage of tropical fruits</li> <li>• Pre cooling of tropical fruits</li> <li>• Record keeping</li> <li>• Report writing</li> <li>• Basic marketing principles</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>



### Suggested Methods of Delivery

- Demonstration by trainer
- Practice by the trainee
- Field trips
- Direct instruction
- Group discussions
- On job training
- Role play

### Recommended Resources

<i>A tropical fruit orchard with the following:</i>	
<b>Tools</b> <ul style="list-style-type: none"><li>• Hoes</li><li>• Machetes</li><li>• Secateurs</li><li>• Shovels</li><li>• Soil augur</li><li>• Pegs</li><li>• Hammer</li><li>• Saw</li><li>• Bucket</li><li>• Secateurs</li><li>• Shears</li><li>• Dibbler</li><li>• Pegs</li></ul>	<b>Materials and supplies</b> <ul style="list-style-type: none"><li>• Manures</li><li>• Seedlings /planting materials</li><li>• Khaki paper bags</li><li>• Measuring tape</li><li>• Layout string</li><li>• Nets</li><li>• Translucent papers</li><li>• Papers</li><li>• Fencing wire</li><li>• Staking sticks</li><li>• Nails</li><li>• Herbicides</li><li>• Pesticides</li><li>• Pheromones for arthropod traps</li></ul>
<b>Farm machinery, implements and equipment</b> <ul style="list-style-type: none"><li>• Plough</li><li>• Harrows</li><li>• Ridges</li><li>• sprayers</li><li>• Pruning saw</li><li>• Wire strainer</li><li>• Pest control traps</li><li>• Irrigation equipment e.g. pipes, sprinkles, drip lines etc.</li><li>• Pipes sprinkler</li><li>• Scouting flags</li><li>• Storage tanks</li></ul>	<b>Manuals</b> <ul style="list-style-type: none"><li>• Good Agricultural Practices (GAP) guidelines</li><li>• Ministry of Agriculture Livestock and Fishes (MoALF) Fruit production manual</li></ul>

<ul style="list-style-type: none"><li>• Gutters</li><li>• Tractors</li><li>• Bud count square</li><li>• Meteorological equipment</li></ul>	
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## SUB-TROPICAL FRUITS PRODUCTION

**UNIT CODE: KNP/HP/C002/5**

### **Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce sub-tropical fruits

**Duration of Unit:** 100 Hours

### **Unit Description**

This unit specifies the competencies required to produce sub-tropical fruits. It includes preparing tropical fruits orchard, producing tropical fruits, harvesting tropical fruits, determining productivity and quality of fruits produced, carrying out post-harvest handling of the fruits and generating production report.

### **Summary of Learning Outcomes**

1. Prepare to produce sub-tropical fruits
2. Produce sub-tropical fruits
3. Evaluate production of sub-tropical fruits
4. Complete production of sub-tropical fruits

### **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Prepare to produce sub-tropical fruits	<ul style="list-style-type: none"><li>• Site selection and preparation</li><li>• Types of sub-tropical fruits</li><li>• Selection of sub-tropical fruit to produce</li><li>• Tools, equipment, supplies and materials<ul style="list-style-type: none"><li>➤ Identification</li><li>➤ Use</li><li>➤ Servicing</li><li>➤ Storage</li></ul></li><li>• Farm planning</li><li>• Soil sampling, testing and interpretation</li><li>• Soil conservation</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li><li>• Third party report</li></ul>

	<ul style="list-style-type: none"> <li>• Phyto-sanitary requirements for tropical fruits</li> <li>• Budgeting</li> </ul>	
2. Produce sub-tropical fruits	<ul style="list-style-type: none"> <li>• Agro Ecological zonation <ul style="list-style-type: none"> <li>➤ Zone mapping</li> <li>➤ Matching fruits to AEZ</li> </ul> </li> <li>• Sub-tropical fruits agronomic Practices: <ul style="list-style-type: none"> <li>➤ Spacing</li> <li>➤ Planting</li> <li>➤ Nutrient application</li> <li>➤ Pruning and training</li> <li>➤ irrigation</li> <li>➤ Inducing flowering</li> <li>➤ Rotations/ cropping calendar</li> <li>➤ Intercropping</li> <li>➤ Mulching</li> <li>➤ Control of pests, diseases, physiological disorders and weeds</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
3. Evaluate production of sub-tropical fruits	<ul style="list-style-type: none"> <li>• Evaluation of fruit productivity <ul style="list-style-type: none"> <li>➤ Quality of fruits</li> <li>➤ Quantities of fruits</li> </ul> </li> <li>• Record keeping</li> <li>• Report writing</li> <li>• Computation of Returns on Investment</li> <li>• Accounting principles</li> </ul>	<ul style="list-style-type: none"> <li>• Written exercise</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Observation</li> </ul>
4. Complete production of sub-tropical fruits	<ul style="list-style-type: none"> <li>• Harvesting/maturity index <ul style="list-style-type: none"> <li>➤ Fruit skin colour change as indicator of maturity</li> <li>➤ Falling mature fruits</li> <li>➤ Fullness of fruits</li> <li>➤ Fruit textures</li> </ul> </li> <li>• Post-harvest handling <ul style="list-style-type: none"> <li>➤ Sorting and grading</li> <li>➤ Cleaning</li> <li>➤ packing</li> </ul> </li> <li>• Disposal of waste material</li> <li>• Storage of tropical/sub-tropical fruits</li> <li>• Pre cooling of tropical/sub-tropical fruits</li> <li>• Record keeping</li> <li>• Report writing</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

	<ul style="list-style-type: none"> <li>• Basic marketing principles</li> </ul>	
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### Suggested Methods of Delivery

- Demonstration by trainer
- Practice by the trainee
- Field trips
- Direct instruction
- Group discussions
- On job training
- Role play

### Recommended Resources

<i>A sub-tropical fruit orchard with the following:</i>	
<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>	<p><b>Materials and supplies</b></p> <ul style="list-style-type: none"> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags</li> <li>• Measuring tape</li> <li>• Layout string</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Pheromones for arthropod traps</li> </ul>
<p><b>Farm machinery, implements and equipment</b></p> <ul style="list-style-type: none"> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• sprayers</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Pest control traps</li> <li>• Irrigation equipment e.g. pipes, sprinkles, drip lines etc.</li> <li>• Pipes sprinkler</li> </ul>	<p><b>Manuals</b></p> <ul style="list-style-type: none"> <li>• Good Agricultural Practices (GAP) guidelines</li> <li>• Ministry of Agriculture Livestock and Fishes (MoALF) Fruit production manual</li> </ul>

<ul style="list-style-type: none"><li>• Scouting flags</li><li>• Storage tanks</li><li>• Gutters</li><li>• Tractors</li><li>• Bud count square</li><li>• Meteorological equipment</li></ul>	
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## TEMPERATE FRUITS PRODUCTION

**UNIT CODE: KNP/HP/C003/5**

### Relationship to Occupational Standards

This unit addresses the Unit of Competency: **Produce Temperate Fruits**

**Duration of Unit:** 80 hours

### Unit Description

This unit specifies the competencies required to produce temperate fruits. It includes preparing temperate fruits orchard, producing temperate fruits, harvesting temperate fruits, determining productivity and quality of fruits produced, carrying out post-harvest handling of the fruits and generating a production report.

### Summary of Learning Outcomes

1. Prepare to produce temperate fruits
2. Produce temperate fruits
3. Evaluate production of temperate fruits
4. Complete production of template fruit

### Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to produce temperate fruits	<ul style="list-style-type: none"><li>• Site selection and preparation</li><li>• Tools, equipment, supplies and materials<ul style="list-style-type: none"><li>➤ Identification</li><li>➤ Use</li><li>➤ Servicing</li><li>➤ Storage</li></ul></li><li>• Farm planning</li><li>• Soil sampling, testing and interpretation</li><li>• Soil conservation</li><li>• Budgeting</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li><li>• Third party report</li></ul>
2. Produce temperate fruits	<ul style="list-style-type: none"><li>• Classification of fruits</li><li>• Types of temperate fruits</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li></ul>

	<ul style="list-style-type: none"> <li>• Agro-ecological zones <ul style="list-style-type: none"> <li>➤ Agro Ecological zonation</li> <li>➤ Matching fruits to AEZ</li> </ul> </li> <li>• Temperate fruits agronomic practices: <ul style="list-style-type: none"> <li>➤ Spacing</li> <li>➤ Planting</li> <li>➤ Nutrient application</li> <li>➤ Dormancy breaking</li> <li>➤ Pruning and training</li> <li>➤ irrigation</li> <li>➤ Inducing flowering</li> <li>➤ Rotations/ cropping calendar</li> <li>➤ Intercropping</li> <li>➤ Mulching</li> <li>➤ Control of pests, diseases, physiological disorders and weeds</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Oral questions</li> <li>• Third party report</li> </ul>
3. Evaluate production of temperate fruits	<ul style="list-style-type: none"> <li>• Evaluation of fruit productivity <ul style="list-style-type: none"> <li>➤ Quality of fruits</li> <li>➤ Quantities of fruits</li> </ul> </li> <li>• Computation of Returns on Investment</li> <li>• Record keeping</li> <li>• Report writing</li> <li>• Accounting principles</li> </ul>	<ul style="list-style-type: none"> <li>• Written exercise</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Observation</li> </ul>
4. Complete production of temperate fruits	<ul style="list-style-type: none"> <li>• Maturity indices and harvesting <ul style="list-style-type: none"> <li>➤ Fruit skin colour change as indicator of maturity</li> <li>➤ Falling mature fruits</li> <li>➤ Fullness of fruits</li> <li>➤ Fruit textures</li> </ul> </li> <li>• Post-harvest handling of the tropical fruits.</li> <li>• Disposal of waste material</li> <li>• Storage of Tropical fruits</li> <li>• Preservation of tropical fruits are preserved</li> <li>• Basic marketing principles</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

### Suggested Methods of Delivery

- On job training
- Demonstration by trainer



- Practice by the trainee
- Field trips
- Discussions
- Direct instruction
- Role play

**Recommended Resources**

<b>A well established temperate fruit orchard with the following:</b>	
<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>	<p><b>Materials and supplies</b></p> <ul style="list-style-type: none"> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags</li> <li>• Measuring tape</li> <li>• Layout string</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Trellising wire and poles</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Dormancy breaking chemicals</li> <li>• Pheromones for arthropod traps</li> </ul>
<p><b>Farm machinery, implements and equipment</b></p> <ul style="list-style-type: none"> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• sprayers</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Pest control traps</li> <li>• Irrigation equipment e.g. pipes, sprinkles, drip lines etc.</li> <li>• Pipes sprinkler</li> <li>• Scouting flags</li> <li>• Storage tanks</li> </ul>	<p><b>Manuals</b></p> <ul style="list-style-type: none"> <li>• GAP guidelines</li> <li>• MoALF fruit production manual</li> </ul>

<ul style="list-style-type: none"><li>• Gutters</li><li>• Tractors</li><li>• Bud count square</li><li>• Meteorological equipment</li></ul>	
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# VINE FRUITS PRODUCTION

**UNIT CODE: KNP/HP/C004/5**

## **Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce vine fruits

**Duration of Unit:** 100 hours

## **Unit Description**

This unit specifies the competencies required to produce vine fruits. It includes preparing vine fruits orchard, producing vine fruits, harvesting vine fruits, determining productivity and quality of fruits produced, carrying out post-harvest handling of the fruits and generating production report.

## **Summary of Learning Outcomes**

1. Prepare to produce vine fruits
2. Produce vine fruits
3. Evaluate production of vine fruits
4. Complete production of vine fruits

## **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Prepare to produce vine fruits	<ul style="list-style-type: none"><li>• Site selection and preparation</li><li>• Tools, equipment, supplies and materials<ul style="list-style-type: none"><li>➤ Identification</li><li>➤ Use</li><li>➤ Servicing</li><li>➤ Storage</li></ul></li><li>• Farm planning</li><li>• Collection of soil samples</li><li>• Land preparation<ul style="list-style-type: none"><li>➤ Clearing</li><li>➤ Soil conservation measures</li><li>➤ Tillage methods</li></ul></li><li>• Procedures for occupational safety and health</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Third party report</li><li>• Oral questioning</li></ul>

<p>2. Establish vine fruits orchard</p>	<ul style="list-style-type: none"> <li>• Types of fruit vines</li> <li>• Agro-ecological zones</li> <li>• agronomic practices: <ul style="list-style-type: none"> <li>➤ Spacing</li> <li>➤ Trellis/ support system</li> <li>➤ Planting</li> <li>➤ Nutrient application</li> <li>➤ Dormancy breaking</li> <li>➤ Pruning and training</li> <li>➤ irrigation</li> <li>➤ Inducing flowering</li> <li>➤ Rotations/ cropping calendar</li> <li>➤ Intercropping</li> <li>➤ Mulching</li> <li>➤ Control of pests, diseases, physiological disorders and weeds</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
<p>3. Evaluate vine fruits</p>	<ul style="list-style-type: none"> <li>• Evaluation of fruit productivity <ul style="list-style-type: none"> <li>➤ Quality of fruits</li> <li>➤ Quantities of fruits</li> </ul> </li> <li>• Computation of Return on investment</li> <li>• Record keeping</li> <li>• Report writing</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
<p>4. Complete vine fruits production</p>	<ul style="list-style-type: none"> <li>• Harvesting/maturity index <ul style="list-style-type: none"> <li>➤ Fruit skin colour change as indicator of maturity</li> <li>➤ Falling mature fruits</li> <li>➤ Fullness of fruits</li> <li>➤ Fruit textures</li> </ul> </li> <li>• Post-harvest handling <ul style="list-style-type: none"> <li>➤ Sorting and grading</li> <li>➤ Cleaning</li> <li>➤ packing</li> </ul> </li> <li>• Pre cooling of vine fruits</li> <li>• Storage of vine fruits</li> <li>• Record keeping</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> </ul>

### Suggested Methods of Delivery

- On job training
- Demonstration by trainer
- Practice by the trainee
- Discussions

- Direct instruction
- Instructor led facilitation of theory
- Role play

**Recommended Resources**

<b>A well horticultural vine fruit orchard with the following:</b>	
<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>	<p><b>Materials and supplies</b></p> <ul style="list-style-type: none"> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Trellising wire and poles</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Pheromones</li> </ul>
<p><b>Equipment</b></p> <ul style="list-style-type: none"> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• Boom sprayer</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Traps</li> <li>• Pipes sprinklers</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Gutters</li> <li>• Tractors</li> <li>• Grading shed</li> <li>• Bud count square</li> <li>• Meteorological equipment</li> </ul>	<p><b>Manuals</b></p> <ul style="list-style-type: none"> <li>• MOLF fruits production manuals</li> <li>• GAP guidelines</li> </ul>

# MUSHROOMS PRODUCTION

**UNIT CODE: KNP/HP/C005/5**

## Relationship to Occupational Standards

This unit addresses the Unit of Competency: Produce mushrooms

**Duration of Unit:** 70 hours

## Unit Description

This unit specifies the competencies required to produce mushrooms. It includes preparing mushroom production structures and substrates, spawning, managing and harvesting the mushrooms, determining productivity and quality of mushrooms produced, generating production report and carrying out post-harvest handling of mushrooms.

## Summary of Learning Outcomes

1. Prepare to produce mushroom
2. Establish mushroom house
3. Evaluate mushroom produced
4. Complete mushroom production

## Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to produce mushroom	<ul style="list-style-type: none"><li>• Types of mushrooms</li><li>• Tools, equipment, supplies and materials<ul style="list-style-type: none"><li>➤ Identification</li><li>➤ Use</li><li>➤ Servicing</li><li>➤ Storage</li></ul></li><li>• Mushroom house<ul style="list-style-type: none"><li>➤ Siting</li><li>➤ Construction</li></ul></li><li>• Sourcing cultures</li><li>• Hygienic and sanitary requirements</li><li>• Budgeting</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Third party report</li><li>• Oral questioning</li></ul>
2. Produce mushrooms	<ul style="list-style-type: none"><li>• Types of mushrooms</li><li>• Starter culture<ul style="list-style-type: none"><li>➤ Types</li><li>➤ Establishment</li><li>➤ Maintenance</li></ul></li><li>• Mushroom growing substrate</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li><li>• Third party</li></ul>

	<ul style="list-style-type: none"> <li>➤ Types</li> <li>➤ Treatment</li> <li>• Spawning</li> <li>➤ Methods</li> <li>• Mushroom growth conditions</li> <li>• Mushroom pests and diseases</li> <li>• Good Management Practices (GMP) for mushroom <ul style="list-style-type: none"> <li>➤ Determination of maturity</li> <li>➤ Harvesting techniques</li> <li>➤ Preparation of by products</li> </ul> </li> </ul>	report
3. Evaluate production of mushrooms	<ul style="list-style-type: none"> <li>• Assessment of mushroom quality</li> <li>• Calculation of quantities of mushrooms</li> <li>• Computation of return on investment</li> <li>• Accounting principles</li> <li>• Records keeping</li> </ul>	<ul style="list-style-type: none"> <li>• Oral questions</li> <li>• Written exercise</li> <li>• Observation</li> </ul>
4. Complete the production of mushrooms	<ul style="list-style-type: none"> <li>• Post-harvest handling of mushrooms <ul style="list-style-type: none"> <li>➤ Sorting</li> <li>➤ Cleaning</li> <li>➤ Cold treatment</li> <li>➤ Preservation</li> <li>➤ Storage</li> </ul> </li> <li>• Production records</li> <li>• Production reports</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

### Suggested Methods of Delivery

- On job training
- Demonstration by trainer
- Practice by the trainee
- Field trips
- Discussions
- Direct instruction

### Recommended Resources

**A well maintained mushroom production unit with the following:**

<p>Tools</p> <ul style="list-style-type: none"> <li>• Weighing scale</li> <li>• Carpentry tools</li> </ul>	<p>Materials and supplies</p> <ul style="list-style-type: none"> <li>• Rice straw,</li> <li>• Maize stover</li> <li>• Baggase</li> <li>• Saw dust</li> <li>• Saw dust</li> <li>• Corncobs</li> <li>• Broiler chicken manure</li> <li>• Methylated spirit</li> <li>• Lime</li> <li>• Fuel for heating substrate</li> <li>• Molasses</li> <li>• Sisal twine</li> <li>• Soap Urea</li> <li>• Spawns</li> <li>• Bran</li> <li>• Polythene bags</li> <li>• Cotton seed cake</li> <li>• Sun flower seed cake</li> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Molasses</li> </ul>
<p>Equipment</p> <ul style="list-style-type: none"> <li>• PPE –hand gloves, dust coat, dust masks</li> <li>• Hand spray equipment</li> <li>• Oven</li> <li>• Basin</li> <li>• Watering cans</li> <li>• Shelves</li> </ul>	<p>Reference materials</p> <ul style="list-style-type: none"> <li>• Farm plan</li> <li>• Soil sampling procedure</li> <li>• Procurement policy and procedure</li> <li>• Good Agricultural Practices manual</li> <li>• MoALF mushroom production manual</li> <li>• Accounting principles</li> <li>• Farm policy</li> </ul>

## HERBS AND SPICES PRODUCTION

**UNIT CODE: KNP/HP/C006/5**

**Relationship to Occupational Standards**



This unit addresses the Unit of Competency: Produce Herbs and Spices

**Duration of Unit:** 100 hours

**Unit Description**

This unit specifies the competencies required to produce quality and clean herbs and spices. It includes preparing herbs and spices seedbed, producing herbs and spices while observing regulatory requirements and keeping accurate production records, determining productivity and quality of herbs and spices produced, carrying out post-harvest handling of the vine fruits and generating mushroom production report.

**Summary of Learning Outcomes**

1. Prepare to produce Herbs and Spices
2. Produce herbs and spices
3. Evaluate production of Herbs and Spices
4. Complete the production of Herbs and Spices

**Learning Outcomes, Content and Suggested Assessment Methods**

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to produce Herbs and Spices	<ul style="list-style-type: none"> <li>• Types of herbs and spices</li> <li>• Site selection and preparation</li> <li>• Selection of herbs and spices to produce</li> <li>• Farm Planning</li> <li>• Tools, equipment, supplies and materials               <ul style="list-style-type: none"> <li>➤ Identification</li> <li>➤ Use</li> <li>➤ Servicing</li> <li>➤ Storage</li> </ul> </li> <li>• Soil conservation</li> <li>• Seedbed preparation</li> <li>• Soil sampling procedure</li> <li>• Phyto-sanitary requirements for herbs and spices</li> <li>• Planting materials               <ul style="list-style-type: none"> <li>➤ Types</li> <li>➤ Sources</li> <li>➤ Preparation</li> <li>➤ seed rate</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

	<ul style="list-style-type: none"> <li>• Budgeting for planting materials and inputs</li> </ul>	
2. Produce Herbs and Spices	<ul style="list-style-type: none"> <li>• Agro Ecological zonation <ul style="list-style-type: none"> <li>➤ Zone mapping</li> <li>➤ Matching herbs and spices to AEZ</li> </ul> </li> <li>• Establishment of herbs and spices <ul style="list-style-type: none"> <li>➤ Planting</li> <li>➤ spacing</li> <li>➤ Fertilizer and manure application</li> </ul> </li> <li>• Management of herbs and spices <ul style="list-style-type: none"> <li>➤ Watering</li> <li>➤ Thinning</li> <li>➤ Gapping</li> <li>➤ mulching</li> <li>➤ weeding</li> <li>➤ Fertilizer application</li> <li>➤ pruning</li> <li>➤ Control pests, diseases, physiological disorders and weeds</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
3. Evaluate production of Herbs and Spices	<ul style="list-style-type: none"> <li>• Determination of yield of herbs and spices <ul style="list-style-type: none"> <li>➤ Quality of herbs and spices produced</li> <li>➤ Quantity of herbs and spices produced</li> </ul> </li> <li>• Computation of Return on Investment</li> <li>• Record keeping</li> <li>• Report writing</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
4. Complete production of Herbs and Spices	<ul style="list-style-type: none"> <li>• Maturity indices and harvesting of herbs and spices <ul style="list-style-type: none"> <li>➤ Fullness of the produce</li> <li>➤ Produce textures</li> </ul> </li> <li>• Post-harvest handling of herbs and spices <ul style="list-style-type: none"> <li>➤ Sorting</li> <li>➤ Cleaning</li> <li>➤ Cold treatment</li> <li>➤ Preservation</li> <li>➤ Storage</li> </ul> </li> <li>• Disposal of Waste material</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

	<ul style="list-style-type: none"> <li>• Record keeping</li> </ul>	
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**Suggested Methods of Delivery**

- On job training
- Demonstration by trainer
- Field trips
- Discussions
- Direct instruction
- Practice by the trainee
- Instructor led facilitation of theory
- Role play

**Recommended Resources**

<b>A well managed herbs and spices farm with the following:</b>	
<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Shears</li> <li>• Dibbler</li> </ul>	<p><b>Materials and supplies</b></p> <ul style="list-style-type: none"> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags</li> <li>• Measuring tape</li> <li>• Layout string</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Dormancy breaking chemicals</li> <li>• Pheromones for arthropod traps</li> </ul>
<p><b>Farm machinery, implements and equipment</b></p> <ul style="list-style-type: none"> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• sprayers</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Pest control traps</li> </ul>	<p><b>Manuals</b></p> <ul style="list-style-type: none"> <li>• GAP guidelines</li> <li>• MoALF fruit production manual</li> </ul>

<ul style="list-style-type: none"><li>• Irrigation equipment e.g. pipes, sprinkles, drip lines etc.</li><li>• Pipes sprinkler</li><li>• Scouting flags</li><li>• Storage tanks</li><li>• Gutters</li><li>• Tractors</li><li>• Bud count square</li><li>• Meteorological equipment</li></ul>	
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## HORTICULTURAL NUTS PRODUCTION

**UNIT CODE: KNP/HP/C007/5**

### **Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce Nuts

**Duration of Unit:** 80 hours

### **Unit Description**

This unit specifies the competencies required to establish and maintain horticultural nut orchard. It includes production of cashew nuts, macadamia and coconuts. The activities involved include land preparation, planting, weeding, nutrient application, control of pests and diseases, harvesting and post-harvest handling of nuts.

### **Summary of Learning Outcomes**

1. Prepare to produce Nuts
2. Produce nuts
3. Evaluate production of nuts
4. Complete the production of nuts

### **Learning Outcomes, Content and Suggested Assessment Methods**

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to produce nuts	<ul style="list-style-type: none"> <li>• Site selection and preparation</li> <li>• Tools, equipment, supplies and materials                             <ul style="list-style-type: none"> <li>➤ Identification</li> <li>➤ Use</li> <li>➤ Servicing</li> <li>➤ Storage</li> </ul> </li> <li>• Farm planning</li> <li>• Soil sampling, testing and interpretation</li> <li>• Soil conservation</li> <li>• Budgeting</li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
2. Produce nuts	<ul style="list-style-type: none"> <li>• Types of horticultural nuts</li> <li>• Agro Ecological zonation                             <ul style="list-style-type: none"> <li>➤ Zone mapping</li> <li>➤ Matching nuts to AEZ</li> </ul> </li> <li>• Agronomic practices                             <ul style="list-style-type: none"> <li>➤ Spacing</li> <li>➤ Planting</li> <li>➤ Nutrient application</li> <li>➤ Dormancy breaking</li> <li>➤ Pruning and training</li> <li>➤ irrigation</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> <li>• Interviews</li> </ul>

	<ul style="list-style-type: none"> <li>➤ Inducing flowering</li> <li>➤ Rotations/ cropping calendar</li> <li>➤ Intercropping</li> <li>➤ Mulching</li> <li>➤ Control of pests, diseases, physiological disorders and weeds</li> </ul>	
3. Evaluate production of nuts	<ul style="list-style-type: none"> <li>• Determination of yield nuts <ul style="list-style-type: none"> <li>➤ Quality of nuts</li> <li>➤ Quantity of nuts</li> </ul> </li> <li>• Computation of Return on investment</li> <li>• Record keeping</li> <li>• Report writing</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
4. Complete production of nuts	<ul style="list-style-type: none"> <li>• Maturity indices and harvesting <ul style="list-style-type: none"> <li>➤ Falling of mature nuts from the tree</li> <li>➤ Fullness of nuts</li> <li>➤ Nuts' textures</li> </ul> </li> <li>• Post-harvest handling of nuts <ul style="list-style-type: none"> <li>➤ Sorting</li> <li>➤ Cleaning</li> <li>➤ Cold treatment</li> <li>➤ Preservation</li> <li>➤ Storage</li> </ul> </li> <li>• Record keeping</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

### Suggested Methods of Delivery

- On job training
- Demonstration by trainer
- Practice by the trainee
- Field trips
- Discussions
- Direct instruction
- Instructor led facilitation of theory
- Role play

### Recommended Resources

**A well managed horticultural nut farm with the following:**

<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>	<p><b>Materials and supplies</b></p> <ul style="list-style-type: none"> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags</li> <li>• Measuring tape</li> <li>• Layout string</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Trellising wire and poles</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Dormancy breaking chemicals</li> <li>• Pheromones for arthropod traps</li> </ul>
<p><b>Farm machinery, implements and equipment</b></p> <ul style="list-style-type: none"> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• Sprayers</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Pest control traps</li> <li>• Irrigation equipment e.g. pipes, sprinkles, drip lines etc.</li> <li>• Pipes sprinkler</li> <li>• Scouting flags</li> <li>• Storage tanks</li> <li>• Gutters</li> <li>• Tractors</li> <li>• Bud count square</li> <li>• Meteorological equipment</li> </ul>	<p><b>Manuals</b></p> <ul style="list-style-type: none"> <li>• GAP guidelines</li> <li>• MoALF fruit production manual</li> </ul>

# ORNAMENTAL PLANTS PRODUCTION

**UNIT CODE: KNP/HP/C008/5**

## **Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Produce ornamental plants

**Duration of Unit:** 100 hours

## **Unit Description**

This unit specifies the competencies required to produce quality and clean ornamental plants. It involves preparing the growing structures for ornamental plants, planting, carrying out husbandry practices on the ornamental plants while observing regulatory requirements and keeping production records, acclimatizing the ornamental plants and generating a production report.

## **Summary of Learning Outcomes**

1. Prepare to produce ornamental plants
2. Produce ornamental plants
3. Evaluate production of ornamental plants
4. Complete the production of ornamental plants

## **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Methods</b>
1. Prepare to ornamental plants	<ul style="list-style-type: none"><li>• Production site selection and preparation</li><li>• Tools, equipment, supplies and materials<ul style="list-style-type: none"><li>➤ Identification</li><li>➤ Use</li><li>➤ Servicing</li><li>➤ Storage</li></ul></li><li>• Farm Planning</li><li>• Soil conservation</li><li>• Seedbed preparation</li><li>• Soil sampling procedure</li><li>• Planting materials<ul style="list-style-type: none"><li>➤ types</li><li>➤ sources</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li><li>• Third party report</li></ul>



	<ul style="list-style-type: none"> <li>➤ preparation</li> <li>• Budgeting for planting materials and inputs</li> </ul>	
2. Produce ornamental plants	<ul style="list-style-type: none"> <li>• Agro Ecological zonation <ul style="list-style-type: none"> <li>➤ Zone mapping</li> <li>➤ Matching ornamental plants to AEZ</li> </ul> </li> <li>• Types of ornamental plants</li> <li>• Establishment of ornamental plants <ul style="list-style-type: none"> <li>➤ Planting</li> <li>➤ spacing</li> <li>➤ Fertilizer and manure application</li> </ul> </li> <li>• Management of ornamental plants <ul style="list-style-type: none"> <li>➤ Watering</li> <li>➤ Gapping</li> <li>➤ Mulching</li> <li>➤ Weeding</li> <li>➤ Fertilizer application</li> <li>➤ pruning</li> <li>➤ Control of pests, diseases, physiological disorders and weeds</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
3. Evaluate production of ornamental plants	<ul style="list-style-type: none"> <li>• Determination of yield ornamental plants <ul style="list-style-type: none"> <li>➤ Quality ornamental plants</li> <li>➤ Quantity of ornamental plants</li> </ul> </li> <li>• Computation of Return on investment</li> <li>• Record keeping</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
4. Complete production of ornamental plants	<ul style="list-style-type: none"> <li>• Post-harvest handling of ornamental plants <ul style="list-style-type: none"> <li>➤ Sorting</li> <li>➤ Cleaning</li> <li>➤ Cold treatment</li> <li>➤ Preservation</li> <li>➤ Storage</li> </ul> </li> <li>• Record keeping</li> <li>• Report writing</li> <li>• Production records</li> <li>• Production reports</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

**Suggested Methods of Delivery**

- On job training
- Demonstration by trainer
- Practice by the trainee
- Field trips
- Direct instruction
- Group discussions
- Instructor led facilitation of theory
- Role play

**Recommended Resources**

<b>A well established ornamental plants orchard with the following:</b>	
<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Pruning saws</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Pegs</li> </ul>	<p><b>Materials and supplies</b></p> <ul style="list-style-type: none"> <li>• Water</li> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> </ul>
<p><b>Equipment</b></p> <ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Wheelbarrow</li> <li>• Cold rooms Tractors</li> <li>• Trailer</li> <li>• Ploughs</li> <li>• Harrows</li> <li>• Tillers</li> <li>• Sprayers</li> <li>• Cold room/store</li> </ul>	<p><b>Reference materials</b></p> <ul style="list-style-type: none"> <li>• Assessment location</li> <li>• Farm plan</li> <li>• Soil sampling guidelines</li> <li>• Laid down procurement policies</li> <li>• Good Agricultural Practices manual</li> <li>• Ornamental plants production manual</li> <li>• Farm policy</li> </ul>

## CUT FLOWERS PRODUCTION

**UNIT CODE: KNP/HP/C009/5**

### Relationship to Occupational Standards

This unit addresses the Unit of Competency: Produce cut flowers

**Duration of Unit:** 100 hours

### Unit Description

This unit specifies the competencies required to produce quality and clean cut flowers. It involves preparation of the production structures, planting, carrying out husbandry practices while observing regulatory requirements and keeping accurate production records, carrying out postharvest handling of flowers and generating a production report.

### Summary of Learning Outcomes

1. Prepare to produce cut flowers
2. Produce cut flowers
3. Evaluate production of cut flowers
4. Complete the production of cut flowers

### Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to cut flowers	<ul style="list-style-type: none"><li>• Production site selection</li><li>• Tools, equipment, supplies and materials<ul style="list-style-type: none"><li>➤ Identification</li><li>➤ Use</li><li>➤ Servicing</li><li>➤ Storage</li></ul></li><li>• Farm Planning</li><li>• Soil conservation</li><li>• Preparation of growing structures</li><li>• Preparation of growing media</li><li>• Soil sampling procedure</li><li>• Planting materials<ul style="list-style-type: none"><li>➤ types</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li><li>• Third party report</li></ul>

	<ul style="list-style-type: none"> <li>➤ sources</li> <li>➤ preparation</li> <li>• Budgeting for planting materials and inputs</li> </ul>	
2. Produce cut flowers	<ul style="list-style-type: none"> <li>• Agro Ecological zonation <ul style="list-style-type: none"> <li>➤ Zone mapping</li> <li>➤ Matching cut flowers to AEZ</li> </ul> </li> <li>• Types of cut flowers</li> <li>• Establishment of cut flowers <ul style="list-style-type: none"> <li>➤ Planting</li> <li>➤ Spacing</li> <li>➤ Fertigation and chemigation system</li> </ul> </li> <li>• Management of cut flowers <ul style="list-style-type: none"> <li>➤ Watering</li> <li>➤ Gapping</li> <li>➤ Mulching</li> <li>➤ Weeding</li> <li>➤ Pruning</li> <li>➤ Control of pests, diseases, physiological disorders and weeds</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
3. Evaluate production of cut flowers	<ul style="list-style-type: none"> <li>• Determination of yield of cut flowers <ul style="list-style-type: none"> <li>➤ Quality cut flowers</li> <li>➤ Quantity of cut flowers</li> <li>➤ Record keeping</li> <li>➤ Report writing</li> </ul> </li> <li>• Computation of Return on investment</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> </ul>
4. Complete production of cut flowers	<ul style="list-style-type: none"> <li>• Post-harvest handling of cut flowers <ul style="list-style-type: none"> <li>➤ Sorting</li> <li>➤ Cleaning</li> <li>➤ Cold treatment</li> <li>➤ Preservation</li> <li>➤ Storage</li> </ul> </li> <li>• Record keeping</li> <li>• Report writing</li> <li>• Production records</li> <li>• Production report writing</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

### Suggested Methods of Delivery

- Project

- Demonstration by trainer
- Practice by the trainee
- On job training
- Discussions
- Direct instruction
- Role play

### Recommended Resources

<b>A well managed cut flower farm with the following:</b>	
<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Panga</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Secateurs</li> <li>• Shears</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>	<p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• water</li> <li>• Pesticides</li> <li>• Fertilizers</li> <li>• Stationery</li> <li>• Manures</li> <li>• planting materials</li> <li>• Khaki paper bags size 3</li> <li>• Rope</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> </ul>
<p><b>Equipment</b></p> <ul style="list-style-type: none"> <li>• Spray pumps</li> <li>• Watering cans</li> <li>• Hose pipes</li> <li>• Wheelbarrow</li> <li>• Cold rooms Tractors</li> <li>• Trailer</li> <li>• Ploughs</li> <li>• Harrows</li> <li>• Tillers</li> <li>• Sprayers</li> <li>• Cold room/store</li> </ul>	<p><b>Reference materials</b></p> <ul style="list-style-type: none"> <li>• Assessment location</li> <li>• Farm plan</li> <li>• Soils sampling guidelines</li> <li>• Laid down procurement policies</li> <li>• Good Agricultural Practices manual</li> <li>• HCDA phyto-sanitary guide</li> <li>• Cut flowers production manual</li> <li>• Farm policy</li> </ul>

## VEGETABLE CROPS PRODUCTION

**UNIT CODE: KNP/HP/C010/5**

### Relationship to Occupational Standards

This unit addresses the Unit of Competency: Produce vegetable crops

**Duration of Unit:** 120 hours

### Unit Description

This unit specifies the competencies required to produce quality and clean vegetables. It involves seedbed preparation, planting, carrying out husbandry practices on the vegetables while observing regulatory requirements and keeping production records, carrying out post-harvest handling of vegetables and generating a production report.

### Summary of Learning Outcomes

1. Prepare to produce vegetables
2. Produce vegetables
3. Evaluate production of vegetables
4. Complete the production of vegetables

### Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Prepare to produce vegetables	<ul style="list-style-type: none"><li>• Farm Planning</li><li>• Types of vegetables</li><li>• Production Site selection and preparation</li><li>• Tools, equipment, supplies and materials<ul style="list-style-type: none"><li>➢ Identification</li><li>➢ Use</li><li>➢ Servicing</li><li>➢ Storage</li></ul></li><li>• Soil conservation</li><li>• sampling procedure</li><li>• Preparation of growing structures</li><li>• Preparation of soil based growing media</li></ul>	<ul style="list-style-type: none"><li>• Written tests</li><li>• Observation</li><li>• Oral questions</li><li>• Third party report</li></ul>

	<ul style="list-style-type: none"> <li>• Planting materials <ul style="list-style-type: none"> <li>➤ types</li> <li>➤ sources</li> <li>➤ preparation</li> </ul> </li> <li>• Budgeting for planting materials and inputs</li> </ul>	
2. Produce vegetables	<ul style="list-style-type: none"> <li>• Agro Ecological zonation <ul style="list-style-type: none"> <li>➤ Zone mapping</li> <li>➤ Matching cut flowers to AEZ</li> </ul> </li> <li>• Establishment of vegetable crops <ul style="list-style-type: none"> <li>➤ Planting</li> <li>➤ spacing</li> <li>➤ Fertilizer and manure application</li> </ul> </li> <li>• Management of vegetables <ul style="list-style-type: none"> <li>➤ Watering</li> <li>➤ Gapping</li> <li>➤ Mulching</li> <li>➤ Weeding</li> <li>➤ Fertilizer application</li> <li>➤ pruning</li> <li>➤ Control of pests, diseases, physiological disorders and weeds</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Written tests</li> <li>• Observation</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
3. Evaluate production of vegetables	<ul style="list-style-type: none"> <li>• Determination of yield of vegetables <ul style="list-style-type: none"> <li>➤ Quality vegetables</li> <li>➤ Quantity of vegetables</li> </ul> </li> <li>• Record keeping</li> <li>• Report writing</li> <li>• Computation of Return on investment</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>
4. Complete production of vegetables	<ul style="list-style-type: none"> <li>• Harvesting techniques</li> <li>• Post-harvest handling of vegetables <ul style="list-style-type: none"> <li>➤ Sorting</li> <li>➤ Cleaning</li> <li>➤ Cold treatment</li> <li>➤ Preservation</li> <li>➤ Storage</li> </ul> </li> <li>• Production records</li> <li>• Production report writing</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Written tests</li> <li>• Oral questions</li> <li>• Third party report</li> </ul>

### Suggested Methods of Delivery

- Demonstration by trainer
- Practice by the trainee
- On job training
- Direct instruction
- Group discussions
- Instructor led facilitation of theory
- Role play

### Recommended Resources

<b>A well managed vegetable crop farm with the following:</b>	
<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>• Hoes</li> <li>• Machetes</li> <li>• Secateurs</li> <li>• Shovels</li> <li>• Soil augur</li> <li>• Pegs</li> <li>• Hammer</li> <li>• Saw</li> <li>• Bucket</li> <li>• Shears</li> <li>• Saw</li> <li>• Dibbler</li> <li>• Pegs</li> </ul>	<p><b>Materials and supplies</b></p> <ul style="list-style-type: none"> <li>• Manures</li> <li>• Seedlings /planting materials</li> <li>• Khaki paper bags</li> <li>• Measuring tape</li> <li>• Layout string</li> <li>• Nets</li> <li>• Translucent papers</li> <li>• Papers</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Fencing wire</li> <li>• Staking sticks</li> <li>• Nails</li> <li>• Herbicides</li> <li>• Pesticides</li> <li>• Dormancy breaking chemicals</li> <li>• Pheromones for arthropod traps</li> </ul>
<p><b>Farm machinery, implements and equipment</b></p> <ul style="list-style-type: none"> <li>• Plough</li> <li>• Harrows</li> <li>• Ridges</li> <li>• sprayers</li> <li>• Pruning saw</li> <li>• Wire strainer</li> <li>• Pest control traps</li> <li>• Irrigation equipment e.g. pipes, sprinkles, drip lines etc.</li> <li>• Pipes sprinkler</li> </ul>	<p><b>Manuals</b></p> <ul style="list-style-type: none"> <li>• GAP guidelines</li> <li>• MoALF fruit production manual</li> </ul>



<ul style="list-style-type: none"><li>• Scouting flags</li><li>• Storage tanks</li><li>• Gutters</li><li>• Tractors</li><li>• Bud count square</li><li>• Meteorological equipment</li></ul>	
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