

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**SWEET POTATO PRODUCTION**

**LEVEL 4**

****

TVET CDACC

P.O. BOX 15745-00100

NAIROBI

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# FOREWORD

The provision of quality education and training is fundamental to the Government’s overall strategy for social economic development. Quality education and training will contribute to achievement of Kenya’s development blueprint, Vision 2030 and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution of Kenya 2010 and this resulted in the formulation of the Policy Framework for Reforming Education and Training. A key feature of this policy is the radical change in the design and delivery of the TVET training. This policy document requires that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that these Occupational Standards were developed for the purpose of developing a competency-based curriculum for Sweet potato Production. These Occupational Standards will also be the basis for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for Sweet Potato sector’s growth and development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING**

**MINISTRY OF EDUCATION**

# PREFACE

Kenya’s Vision 2030 aims to transform the country into a newly industrializing, “middle-income country providing a high-quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. TVET has a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET in order to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labor force.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Sweet Potato Sector Skills Advisory Committee (SSAC) have developed these Occupational Standards for Sweet potato Production. These standards will be the basis for development of competency-based curriculum for Sweet potato Production.

The occupational standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Sweet Potato SSAC, expert workers and all those who participated in the development of these Occupational Standards.

**CHAIRPERSON, TVET CDACC**

# ACKNOWLEDGMENT

These Occupational Standards were developed through combined effort of various stakeholders from private and public organizations. I am thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) for providing guidance on the development of these Standards. My gratitude goes to Sweet Potato Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards. I thank all the individuals and organizations who participated in the validation of these Standards.

I acknowledge all other institutions which in one way or another contributed to the development of these Standards.

**CHAIRPERSON**

**SWEET POTATO SECTOR SKILLS ADVISORY COMMITTEE**

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# ACRONYMS AND ABBREVIATIONS

A Control Version

AFA Agriculture and Food Authority

AGR Agriculture and Rural Development

BC Basic Competency

CBET Competency-Based Education and Training

CDACC Curriculum Development, Assessment and Certification Council

CR Core Competency

CU Curriculum

EAS East African Standards

FSMS Food Safety Management System

GAP Good Agricultural Practice

GMP Good Manufacturing Practice

HACCP Hazard Analysis Critical Control Points

ICT Information communication technology

KEBS Kenya Bureau of Standards

KEPHIS Kenya Plant Health Inspectorate

NEMA National Environment Management Authority

OSH Occupational Safety and Health

SOPs Standard Operating Procedures

SPP Sweet Potato Production

SPVD Sweet Potato Virus Diseases

TVET Technical and Vocational Education and Training

WSR Warehousing and Receipting System

# KEY TO UNIT CODE

AGR/OS/SPP/BC/01/4/A

Industry or sector

Occupational Standards

Occupational area

Type of competency

Competency number

Competency level

Control version

# OVERVIEW

Sweet Potato Production Certificate level 4 qualification consists of competencies that a person must achieve to carry out farm planning, land preparation and to produce sweet potato seed materials and roots. It also enables an individual to manage food safety and quality assurance.

The units of competency leading to Sweet Potato Production certificate level 4 qualification include the following seven basic and five core competencies:

**BASIC UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| AGR/OS/SPP/BC/01/4/A | Demonstrate communication skills |
| AGR/OS/SPP/BC/02/4/A | Demonstrate numeracy skills |
| AGR/OS/SPP/BC/03/4/A | Demonstrate digital literacy |
| AGR/OS/SPP/BC/04/4/A | Demonstrate entrepreneurial skills |
| AGR/OS/SPP/BC/05/4/A | Demonstrate employability skills |
| AGR/OS/SPP/BC/06/4/A | Demonstrate environmental literacy |
| AGR/OS/SPP/BC/07/4/A | Demonstrate Occupational safety and health practices |

**CORE UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| AGR/OS/SPP/CR/01/4/A | Carry out farm planning |
| AGR/OS/SPP/CR/02/4/A | Carry out land preparation |
| AGR/OS/SPP/CR/03/4/A | Produce sweet potato seed materials |
| AGR/OS/SPP/CR/04/4/A | Produce sweet potato roots |
| AGR/OS/SPP/CR/05/4/A | Manage food safety and quality assurance |

# BASIC UNITS OF COMPETENCY

# DEMONSTRATE COMMUNICATION SKILLS

**UNIT CODE:** AGR/OS/SPP/BC/01/4/A

**UNIT DESCRIPTION**

This unit covers the competencies required demonstrate communication skills. It involvesobtaining and conveying workplace information, completing relevant work-related documents, communicating information about workplace processes, leading workplace discussion and communicating workplace issues.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Obtain and convey workplace information | 1. Specific and relevant information is accessed from ***appropriate sources*** based on standard procedures 2. Effective questioning, active listening and speaking skills are used to gather and convey information based on communication needs 3. Appropriate ***medium*** is used to transfer information and ideas in accordance with workplace guidelines 4. Appropriate non- verbal communication is used as per the communication needs 5. Appropriate lines of communicationwith supervisors and colleagues are identified and followed based on workplace requirements 6. Location and storage of information is undertaken according to workplace procedures    1. Personal interaction is carried out clearly and concisely according to workplace requirements |
| 1. Complete relevant work-related documents | * 1. Range of forms relating to conditions of employment are completed according to workplace procedures   2. Workplace data is recorded based on workplace requirements   3. Errors in recording information are identified and acted upon in accordance with workplace policies   4. Reporting requirements are completed according to organizational guidelines |
| 1. Communicate information about workplace processes | 1. Information sources are identified according to workplace procedures 2. ***Methods of communication*** are selected based on workplace guidelines 3. Multiple operations are communicated according to workplace structure 4. Work-related questions are asked and responded based on set protocols 5. Information is selected and organized according to workplace requirements 6. Verbal and written reporting is undertaken as per workplace requirements 7. Communication is maintained according to workplace standards |
| 1. Lead workplace discussions | 1. Response to workplace issues are sought and provided as per workplace protocol 2. Constructive contributions are made based on ***workplace discussions*** 3. Workplace objectives and action plan are communicated according to workplace requirements |
| 1. Identify and communicate issues arising in the workplace | 1. Issues and problems are identified as per workplace guidelines 2. Problems and issues in the workplace are organized according to workplace operations 3. Dialogue is initiated with appropriate personnel as per workplace structure 4. Problems and issues raised are communicated as per the workplace reporting procedures |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Methods of communication mayinclude but not limited to: | * Non-verbal gestures * Verbal * Face to face * Two-way radio * Speaking to groups * Using telephone * Written * Internet |
| 1. Workplace discussion may include but not limited to: | * Coordination meetings * Toolbox discussion * Peer-to-peer discussion |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Active listening
* Interpretation
* Negotiation
* Writing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Organization requirements for written and electronic communication methods
* Effective verbal communication methods
* Report writing
* Effective questioning techniques (clarifying and probing)
* Workplace etiquette

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   1. Dealt with a range of communication/information at one time 2. Made constructive contributions in workplace issues 3. Sought workplace issues effectively 4. Responded to workplace issues promptly 5. Presented information clearly and effectively in written form 6. Used appropriate sources of information 7. Asked appropriate questions 8. Provided accurate information |
| 1. Resource Implications | 1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place 3. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | 1. Third-party reports 2. Portfolio 3. Interview 4. Written tests 5. Observation 6. Oral questioning |
| 1. Context of Assessment | Competency may be assessed   1. On the job 2. Off the job 3. During industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE NUMERACY SKILLS

**UNIT CODE:** AGR/OS/SPP/BC/02/4/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate numeracy skills. It involves identifying and using whole numbers and simple fractions, decimals and percentages for work, identifying, measuring and estimating familiar quantities for work, reading and using familiar maps, plans and diagrams for work, identifying and describing common 2D and some 3D shapes for work, constructing simple tables and graphs for work using familiar data and identifying and interpreting information in familiar tables, graphs and charts for work

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |  |
| --- | --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function. | | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range.*** |
| 1. Identify and use whole numbers and simple fractions, decimals and percentages for work | | 1. Simple fractions, decimals and percentages identified and interpreted as per standard operating procedures. 2. Understanding of place value by organising numbers from smallest to largest demonstrated as SOPs 3. Required numerical information located and decision made on appropriate method to solve a problem as per SOPs 4. Limited range of calculations performed using the four operations using SOPs 5. Links between operations described as per SOPs 6. Estimations made to check reasonableness of results of problem-solving process as SOPs 7. Numerical information recorded, and the result of the task communicated using informal and some formal language and symbolism as per workplace procedures |
| 1. Identify, measure and estimate familiar quantities for work | 1. Measurement information in workplace tasks and texts identified and interpreted as per workplace procedures. 2. Familiar units of measurement needed for tasks is identified as per measurements manuals/charts 3. Familiar and simple amounts estimated as per workplace procedures. 4. Appropriate measuring equipment selected as per SOPs 5. ***Simple measuring equipment*** graduated in familiar units to measure relevant quantities is used as per graduation manuals. 6. Calculation done using familiar units of measurement as per SOPs 7. Measurements and results checked against estimates as per job specifications. 8. Results are recorded or reported as per workplace procedures 9. Results relevant to the workplace task are communicated using informal and some formal mathematical and general language as per workplace procedures. |
| 1. Read and use familiar maps, plans and diagrams for work | 1. Items and places are in familiar maps, plans and diagrams as per SOPs 2. Common symbols and keys recognised in familiar maps, plans and diagrams as per SOPs 3. Understanding of direction and location demonstrated by describing the location of objects, or route to familiar places as per SOPs 4. Instructions to locate familiar objects or places are given and followed as per SOPs 5. Informal and some formal oral mathematical language and symbols are used as per SOPs |
| 1. Identify and describe common 2D and some 3D shapes for work | 1. ***Common 2D shapes and some common 3D shapes*** in familiar situations are identified and named as per job requirements 2. Common 2D shapes and designs are compared and classified as per SOPs 3. Informal and some formal language used to describe common two-dimensional shapes and some common three-dimensional shapes in accordance with workplace procedures. 4. Simple items used to draw or construct common 2D shapes as per workplace procedures. 5. Common 3D shapes matched to their 2D sketches or nets as per SOPs |
| 1. Construct simple tables and graphs for work using familiar data | 1. Common types of graphs are identified and named as per SOPs 2. Familiar data to be collected is determined in accordance with job specifications. 3. A method to collect data is selected in accordance with workplace procedures. 4. A small amount of simple familiar data is collected as per workplace procedures 5. One or two variables determined from the data collected as per SOPs. 6. Data ordered and collated as per standard operating procedures. 7. A table is constructed and data entered as per SOPs 8. Graphs are constructed using data from table as per job specifications 9. Results are promptly checked as per workplace procedures 10. Graph information related to work is reported or discussed using informal and some formal mathematical and general language as per workplace procedures |
| 1. Identify and interpret information in familiar tables, graphs and charts for work | 1. Simple tables are identified in familiar texts and contexts in accordance with workplace procedures 2. Title, headings, rows and columns located in familiar tables as per SOPs 3. Information and data in simple tables identified and interpreted as per workplace procedures. 4. Information is related in accordance with workplace tasks 5. Familiar graphs and charts are identified in familiar texts and contexts as per SOPs 6. Title, labels, axes, scale and key from familiar graphs and charts are located as per SOPs 7. Information and data in familiar graphs and charts are identified and interpreted as per job requirements 8. Information is related to relevant workplace tasks as per job requirements. |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Simple measuring equipment may include but not limited to: | * Rulers * Watches/clocks * Scales * Thermometers * AVO meter |
| 1. Common 2D shapes and common 3D shapes may include but not limited to: | * Round * Square * Rectangular * Triangle * Sphere * Cylinder * Cube * Polygons * Cuboids |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Measuring
* Logical thinking
* Computing
* Drawing of graphs
* Applying mathematical formulas
* Analytical

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Types of common shapes
* Differentiation between two dimensional shapes / objects
* Formulae for calculating area and volume
* Types and purpose of measuring instruments
* Units of measurement and abbreviations
* Fundamental operations (addition, subtraction, division, multiplication)
* Rounding techniques
* Types of fractions
* Different types of tables and graphs
* Meaning of graphs, such as increasing, decreasing, and constant value
* Preparation of basic data, tables & graphs

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   * 1. Simple fractions, decimals and percentages are correctly identified and interpreted   2. Performed a limited range of calculations using the 4 operations   3. Performed calculations using familiar units of measurement   4. Recognised common symbols and keys in familiar maps, plans and diagrams   5. Constructed simple tables and graphs using familiar data   6. Identified and interpret information in familiar tables, graphs and charts |
| 1. Resource Implications | 1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place 3. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   1. Written Test 2. Interview 3. Oral Questioning |
| 1. Context of Assessment | Competency may be assessed   1. On the job 2. Off the job 3. During industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE DIGITAL LITERACY

**UNIT CODE:** AGR/OS/SPP/BC/03/4/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate digital literacy in a working environment. It entails identifying computer software and hardware, applying security measures to data, hardware, software, applying computer software in solving task sand applying internet and email in communication at workplace.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Identify computer software and hardware | * 1. ***Appropriate computer software*** is identified according to manufacturer’s specification   2. ***Appropriate computer hardware*** is identified according to manufacturer’s specification |
| 1. Apply security measures to data, hardware, software | * 1. ***Data security and privacy are classified*** in accordance with the technological situation   2. ***Security and control measures*** are applied in accordance with laws governing protection of ICT   3. Computer threats and crimes are detected as per information security management guidelines.   4. Protection against computer crimes is undertaken in accordance with laws governing protection of ICT |
| 1. Apply computer software in solving tasks | * 1. Basic word processing concepts are applied in resolving workplace tasks   2. Word processing utilities are applied in accordance with workplace procedures   3. Data is manipulated on worksheet in accordance with office procedures |
| 1. Apply internet and email in communication at workplace | * 1. Electronic mail is applied in workplace communication in accordance with office procedures   2. Office internet functions are defined and executed in accordance with office procedures   3. Network configuration and uses are determined in accordance with office operations procedures |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Range** | **Variable** |
| 1. Appropriate computer software may include but not limited to: | * Operating system * MS office * Web browser * Media players |
| 1. Appropriate computer hardware may include but not limited to: | * Computer Case * Monitor * Keyboard * Mouse * Hard Disk Drive * Motherboard * Video Card |
| 1. Data security and privacy may include but not limited to: | * Confidentiality * Cloud computing * Confidentiality * Cyber terrorism * Integrity -but-curious data serving |
| 1. Security and control measures may include but not limited to: | * Countermeasures and risk reduction * Cyber threat issues * Risk management |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical
* Interpretation
* Typing
* Communication
* Computing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Input and output devices
* Central processing Unit (CPU)
* Peripherals
* Storage Media
* Software concept
* Types of concept
* Function of computer software
* Data security and privacy
* Security threats and control measures
* Computer crimes
* Detection and protection of computer crimes
* Laws governing protection of ICT
* Word processing;
* Functions and concepts of word processing.
* Documents and tables creation and manipulations
* Mail merging
* Word processing utilities
* Spread sheet;
* Meaning, formulae, function and charts, uses, layout, data manipulation and application to cell
* Networking and Internet;
* Meaning, functions and uses of networking and internet.
* Electronic mail and world wide web
* Emerging trends and issues in ICT;
* Identify and apply emerging trends and issues in ICT
* Challenges posed by emerging trends and issues

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified input, output, CPU and storage media devices of computers in accordance to computer specification   2. Identified concepts, types and functions of computer software according to operation manual   3. Identified and controlled security threats   4. Detected and protected computer crimes   5. Applied word processing in office tasks   6. Prepared work sheet and applied data to the cells in accordance to workplace procedures   7. Used Electronic Mail for office communication as per workplace procedure   8. Applied internet and World Wide Web for office tasks in accordance with office procedures   9. Applied laws governing protection of ICT |
| 1. Resource Implications | * 1. Access to relevant workplace where assessment can take place   2. Appropriately simulated environment where assessment can take place   3. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Written tests   2. Practical assignment   3. Interview   4. Oral Questioning   5. Observation |
| 1. Context of Assessment | Competency may be assessed   1. On the job 2. Off the job 3. During industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE ENTREPRENEURIAL SKILLS

**UNIT CODE:** AGR/OS/SPP/BC/04/4/A

**UNIT DESCRIPTION**

This unit covers the competencies required demonstrate entrepreneurial skills. It involvescreating and maintaining small scale business, establishing small scale business customer base, managing small scale business and growing/ expanding small scale business.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Create and maintain small scale business | 1. Generation and evaluation of business ideas is undertaken in accordance with the existing procedure 2. Competencies are matched with business opportunities in accordance with business practices. 3. Procedure for starting a small business is identified as per the legal requirements 4. SWOT/ PESTEL analysis and or industrial survey is carried out according to office procedures 5. ***Business operations*** are monitored and controlled following established procedures. 6. Quality assurance measures are implemented in accordance with the business practices. 7. Good relations are maintained with staff/workers as per the workplace policies. 8. Policies and procedures on occupational safety and health and environmental concerns are constantly observed as per the workplace policies |
| 1. Establish small scale business customer base | 1. Good customer relations are maintained in accordance with office procedures 2. New customers and markets are identified, explored and reached out to according to the marketing plan 3. Promotions/Incentives are offered to loyal customers in accordance with office procedures 4. Additional products and services are evaluated and tried in accordance with marketing strategy 5. Customer record is maintained in accordance with office procedures |
| 1. Manage small scale business | 1. Enterprise is built up and sustained in line with judicious control of cash flows. 2. Profitability of enterprise is ensured as per the internal controls. 3. Unnecessary or lower-priority expenses and purchases are avoided as per the marketing strategy 4. Basic cost-benefit analysis are undertaken in accordance with office procedures 5. Basic financial management are undertaken in accordance with office procedures 6. Basic financial accounting in undertaken in accordance with office procedures 7. Business ***internal controls*** are implemented in accordance with office procedure 8. Setting business priorities and strategies is carried out according to office procedures 9. Preparation and interpretation of basic financial statements is undertaken in accordance with set procedures 10. Preparation of business plansfor small business is undertaken in accordance with ***business strategy*** 11. Business Social Responsibility is maintained in accordance with Standard Operations Procedures (SOP) |
| 1. Grow/ expand small scale business | 1. Prepared business growth strategy for small sale business in accordance with office procedures 2. Incorporated technology in small scale business growth in accordance with technological trends 3. Emerging issues and trends are considered in accordance with business growth strategy 4. Built audience interest in product/service according to growth strategy 5. Boosted cooperate communication according to business ***communication strategy*** |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Business operations may include but not limited to: | * Purchasing * Accounting/administrative * Work production/operations/sales * Marketing |
| 1. Internal control may include but not limited to: | * Accounting systems * Financial statements/reports * Cash management * Human resource management |
| 1. Business Strategy may include but not limited to: | * Management of wastages * Environmental Conservation |
| 1. Communication strategy may include but not limited to: | * Blue print of exchange of information * Technology and exchange of information |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Marketing
* Advertising
* Basic bookkeeping
* Accounting
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Generation and evaluation of business ideas
* Legal requirements for starting a small business
* SWOT/ PESTEL analysis
* Occupational Safety and Health
* Public relations concepts
* Business plan
* Business financing
* Marketing strategies
* Business management and control
* Production/ operation process
* Product promotion strategies
* Market and feasibility studies
* Business ethics
* Building customer relations
* Business models and strategies
* Types and categories of businesses
* Business internal controls
* Relevant national and local legislation and regulations
* Basic quality control and assurance concepts
* Building relations with customer and employees
* Building competitive advantage of the enterprise
* Business growth strategies

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |  |
| --- | --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   |  | | --- | | 1. Demonstrated entrepreneurial skills 2. Demonstrate competencies to create a small-scale business 3. Demonstrated ability to conceptualize and plan a micro/small business 4. Grew customer base for the small-scale business 5. Demonstrated ability to manage/operate a micro/small-scale business 6. Demonstrated competencies to grow a micro/small-scale business | |
| 1. Resource Implications | |  | | --- | | The following resources should be provided: |  1. Assessment location 2. Case studies on micro/small-scale enterprises 3. Assessment materials |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   |  |  | | --- | --- | | 1. Written tests 2. Observation 3. Oral questioning 4. Portfolio 5. Projects |  | |
| 1. Context of Assessment | Competency may be assessed   1. On the job 2. Off the job 3. During industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE EMPLOYABILITY SKILLS

**UNIT CODE:** AGR/OS/SPP/BC/05/4/A

**UNIT DESCRIPTON**

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating critical safe work habits, demonstrating workplace learning and workplace ethics.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Conduct self-management | 1. Personal vision, mission and goals are formulated based on potential and in relation to organization objectives 2. Emotional intelligence is demonstrated as per workplace requirements. 3. Individual performance is evaluated and monitored according to the agreed targets. 4. Assertiveness is developed and maintained based on the requirements of the job. 5. Accountability and responsibility for own actions are demonstrated based on workplace instructions. 6. Self-esteem and a positive self-image are developed and maintained based on values. 7. Time management, attendance and punctuality are observed as per the organization policy. 8. Goals are managed as per the organization’s objective 9. Self-strengths and weaknesses are identified based on personal objectives |
| 1. Demonstrate critical safe work habits | 1. Stress is managed in accordance with workplace policy. 2. Punctuality and time consciousness is demonstrated in line with workplace policy. 3. Personal objectives are integrated with organization goals based on organization’s strategic plan. 4. ***Resources*** are utilized in accordance with workplace policy. 5. Work priorities are set in accordance to workplace goals and objectives. 6. Leisure time is recognized and utilized in line with personal objectives. 7. ***Drugs and substances of abuse*** are identified and avoided based on workplace policy. 8. HIV and AIDS prevention awareness is demonstrated in line with workplace policy. 9. Safety consciousness is demonstrated in the workplace based on organization safety policy. 10. ***Emerging issues*** are identified and dealt with in accordance with organization policy. |
| 1. Demonstrate workplace learning | * 1. Learning opportunities are sought and managed based on job requirement and organization policy.   2. Improvement in performance is demonstrated based on courses attended.   3. Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job   4. Time and effort is invested in learning new skills based on job requirements   5. Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy.   6. New systems are developed and maintained in accordance with the requirements of the job.   7. Awareness of personal role in workplace ***innovation*** is demonstrated based on requirements of the job. |
| 1. Demonstrate workplace ethics | 1. Policies and guidelines are observed as per the workplace requirements 2. Self-worth and professionalism is exercised in line with personal goals and organizational policies 3. Code of conduct is observed as per the workplace requirements 4. Integrity is demonstrated as per legal requirement |

**RANGE**

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| **Range** | **Variable** |
| 1. Personal objectives may include but not limited to: | * Long term * Short term * Broad * Specific |
| 1. Feedback may include but not limited to: | * Verbal * Written * Informal * Formal |
| 1. Team may include but not limited to: | * Small work group * Staff in a section/department * Inter-agency group |
| 1. Drug and substance abuse may include but not limited to: | * Alcohol * Tobacco * Miraa * Over-the-counter drugs * Cocaine * Bhang * Glue |
| 1. Emerging issues may include but not limited to: | * Terrorism * Social media * National cohesion * Open offices |
| 1. Range of media for learning may include but not limited to: | * Mentoring * peer support and networking * IT and courses |
| 1. Innovation may include but not limited to: | * New ideas * Original ideas * Different ideas * Methods/procedures * Processes * New tools |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Interpersonal
* Critical thinking
* Observation
* Organizing
* Record keeping
* Problem solving
* Decision Making
* Resource utilization

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Work values and ethics
* Company policies
* Company operations, procedures and standards
* Occupational Health and safety procedures
* Fundamental rights at work
* Personal hygiene practices
* Workplace communication
* Concept of time
* Time management
* Decision making
* Types of resources
* Work planning
* Record keeping
* Workplace problems and how to deal with them
* Assertiveness
* Team work
* HIV and AIDS
* Drug and substance abuse
* Safe work habits
* Professional growth and development
* Technology in the workplace
* Emerging issues
  + Social media
  + Terrorism
  + National cohesion

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   * 1. Conducted self-management   2. Demonstrated critical safe work habits   3. Demonstrated workplace learning   4. Demonstrated workplace ethics |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Portfolio of evidence 3. Third Party Reports 4. Written tests |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE ENVIRONMENTAL LITERACY

**UNIT CODE:** AGR/OS/SPP/BC/06/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to demonstrate environmental literacy. It involves controlling environmental hazard, controlling environmental pollution, demonstrating sustainable resource use and evaluating current practices in relation to resource usage.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Control environmental hazard | * 1. Storage methods for environmentally hazardous materials are followed according to environmental regulations and OSHS.   2. Disposal methods of hazardous wastes are followed according to environmental regulations and OSHS.   3. ***PPE*** is used according to OSHS. |
| 1. Control environmental pollution | * 1. ***Environmental pollution*** ***control measures*** are compiled following standard protocol.   2. Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999   3. Methods for minimizing noise pollution complied following environmental regulations. |
| 1. Demonstrate sustainable use of resource s | * 1. Methods for minimizing wastage are complied with.   2. ***Waste management procedures*** are employed following principles of 3Rs (Reduce, Reuse, Recycle)   3. Methods for economizing or reducing resource consumption are practiced. |
| 1. Evaluate current practices in relation to resource usage | * 1. Information on resource efficiency ***systems and procedures*** are collected and provided as per work groups/sector   2. ***Current resource usage*** is measured and recorded as per work group/sector   3. Current purchasing strategies are analyzed and recorded according to industry procedures.   4. Current work processes to access information and data is analyzed following enterprise protocol. |
| 1. 5. Identify environmental legislations/conventions for environmental concerns | 1. Environmental legislations/conventions and local ordinances are identified according to the different environmental aspects/impact 2. Industrial standard/environmental practices are described according to the different environmental concerns |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. PPE may include but are not limited to: | * Masks * Gloves * Goggles * Safety hat * Overall * Hearing protector * Safety boots |
| 1. Environmental pollution control measures may include but are not limited to: | * Methods for minimizing or stopping spread and ingestion of airborne particles * Methods for minimizing or stopping spread and inhaling gases and fumes * Methods for minimizing or stopping spread and ingestion of liquid wastes |
| 1. Waste management procedures may include but are not limited to: | * Sorting * Storing of items * Recycling of items * Disposal of items * Handling * Transport |
| 1. Current resources usage may include but are not limited to: | * Electric * Water * Fuel * Telecommunications * Supplies * Materials |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Measuring
* Recording
* Analytical
* Monitoring
* Writing
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Storage methods of environmentally hazardous materials
* Disposal methods of hazardous wastes
* Usage of PPE Environmental regulations
* OSHS
* Types of pollution
* Environmental pollution control measures
* Different solid wastes
* Solid waste management
* Different noise pollution
* Methods of minimizing noise pollution
* Solid Waste Act
* Methods of minimizing wastage
* Waste management procedures
* Economizing of resource consumption
* Principle of 3Rs
* Types of resources
* Techniques in measuring current usage of resources
* Calculating current usage of resources
* Types of workplace environmental hazards
* Environmental regulations
* Environmental regulations applying to the enterprise.
* Procedures for assessing compliance with environmental regulations.
* Collection of information on environmental and resource efficiency systems and procedures,
* Measurement and recording of current resource usage
* Analysis and recording of current purchasing strategies.
* Analysis current work processes to access information and data Analysis of data and information

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   1. Controlled environmental hazards 2. Controlled environmental pollution 3. Demonstrated sustainable resource use 4. Evaluated current practices in relation to resource usage |
| 1. Resource Implications | The following resources should be provided:   * 1. Workplace with storage facilities   2. Tools, materials and equipment relevant to the tasks (e.g., cleaning tools, cleaning materials, trash bags, etc.)   3. PPEs   4. Manuals and references   5. Legislation, policies, procedures, protocols and local ordinances relating to environmental protection   6. Case studies/scenarios relating to environmental Protection |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written tests 4. Third party reports 5. Portfolio |
| 1. Context of Assessment | Competency may be assessed   1. On the job 2. Off the job 3. During industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# DEMONSTRATE OCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** AGR/OS/SPP/BC/07/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to practice safety and health and comply with OSH requirements relevant to work. It involves observing workplace procedures for hazards and risk prevention and participating in arrangements for workplace safety and health maintenance.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range*** |
| 1. Adhere to workplace procedures for hazards and risk prevention | 1. Arrangement of work area and items in accordance with   workplace procedures requirements   1. Work standards and procedures are followed based on instructions 2. ***Prevention and control measures*** are applied based on instructions |
| 1. Participate in arrangements for workplace safety and health maintenance | 1. Orientations on ***OSH requirements and regulations*** is undertaken in line with policy. 2. Feedback on occupational health and safety are provided as per workplace instructions. 3. Workplace procedures for reporting hazards, incidents, injuries and sickness are adhered to as per workplace policy. 4. ***OSH-related training needs*** are identified and proposed as per workplace policy. |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Prevention and control measures may include but are not limited to: | * Eliminate the hazard * Isolate the hazard * Substitute the hazard with a safer alternative * Use administrative controls to reduce the risk * Use engineering controls to reduce the risk * Use personal protective equipment * Safety, Health and Work Environment Evaluation * Periodic and/or special medical examinations of workers |
| 1. Safety gears /PPE (Personal Protective Equipment’s) may include but are not limited to: | * 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 |
| 1. Incidents and emergencies may include but are not limited to: | * Chemical spills * Equipment/vehicle accidents * Explosion * Fire * Gas leak * Injury to personnel * Structural collapse * Toxic and/or flammable vapors emission. |
| 1. OSH requirements / regulations may include but are not limited to: | * Building code * Permit to Operate |
| 1. OSH-related trainings may include but are not limited to: | * Safety Orientations relevant to tasks * Safe and Correct Operation of Tools and Equipment * Health Orientations/trainings * Prevention and Control of OSH Hazards in the workplace * Chemical Handling * Safety Trainings * Prevention and Control of Work-related Injuries and Illness * Basic First-aid Trainings * Emergency Response Trainings * Trainings on use of fire-extinguisher |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Knowledge management
* Collaborating
* Interpersonal
* Troubleshooting
* Critical thinking
* Observation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* General OSH principles and legislations
* Principles of good housekeeping (5S)
* Company/workplace policies/ guidelines
* Standards and safety requirements of work process and procedures
* Standard Workplace emergency plan and procedures
* Safety and health requirements of tasks
* Workplace guidelines on providing feedback on OSH and security concerns
* OSH regulations
* Hazard control procedures
* OSH trainings relevant to work

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | 1. Assessment requires evidence that the candidate: 2. Arranged work area and items in accordance with 3. workplace procedures requirements 4. Followed work standards and procedures based on instructions 5. Applied ***Prevention and control measures*** based on instructions 6. Undertook orientations on ***OSH requirements and regulations*** in line with policy. 7. Provided feedback on occupational health and safety as per workplace instructions. 8. Adhered to workplace procedures for reporting hazards, incidents, injuries and sickness to as per workplace policy. 9. Identified and proposed ***OSH-related training needs*** as per workplace policy. |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Portfolio of evidence 3. Third Party Reports 4. Written tests |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the –job 3. During Industrial attachment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# CORE UNITS OF COMPETENCY

# CARRY OUT FARM PLANNING

**UNIT CODE:** AGR/OS/SPP/CR/01/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to carry out farm planning. It involves carrying out site selection, determining farm layout and conducting soil testing.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which make up workplace function (to be stated in active) | **PERFORMANCE CRITERIA**  These are **assessable statements** which specify the required level of performance for each of the elements (to be stated in passive voice)  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Carry out site selection | * 1. Tools, equipment and materials for farm planning are identified and assembled based on work place requirements and procedures   2. Land is surveyed to establish boundaries and ***suitable parameters*** as per Good Agricultural Practice and survey map   3. Actual location is identified based on Good Agricultural Practice and survey findings |
| 1. Determine farm layout | * 1. Land use is determined as per GAP and survey findings   2. History of the farm use is determined as per existing farm records   3. Farm layout sketch is drawn according to land use and history of farm use   4. Actual site to establish the sweet potato crop is demarcated based on scale of production |
| 1. Conduct soil testing | * 1. Soil sampling is conducted based on ***standard operating procedures for soil sampling***   2. ***Preparation and handling of soil samples*** is carried out as per soil sample handling procedures   3. Soil samples are analyzed in situ as per GAP and test kit manufacturers guidelines   4. Soil analysis results are interpreted as per GAP and test kit manufacturers guidelines   5. Recommendations on soil fertility management are determined based on soil analysis results and interpretation |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **VARIABLE** | **RANGE** |
| 1. Suitable parameters may include but are not limited to: | * Proximity to source of water * Proximity to another crop * Slope gradient * Soil type |
| 1. Preparation and handling of soil samples may include but are not limited to: | * Cleaning * Drying * Labelling * Packaging * Sample delivery/transportation |
| 1. Standard operating procedures for soil sampling may include but are not limited to: | * Reconnaissance survey * Sampling plan * Sampling methods * Sample collection techniques |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skill

* Communication
* Analytical
* Critical thinking
* Problem solving
* Innovation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Soil conservation
* Good Agricultural Practices
* Principles of Environmental Management
* Planning
* Construction of farm structures
* Simple survey
* Drainage

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified and assembled tools, equipment and materials for farm planning   2. Surveyed land to establish boundaries and suitable parameters   3. Identified actual location   4. Determined land use   5. Determined history of farm   6. Drew farm layout sketch   7. Demarcated actual site to establish the sweet potato crop   8. Conducted soil sampling   9. Conducted basic soil testing   10. Carried out preparation and handling of soil samples |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Observation   4. Third party   5. Practical test |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# CARRY OUT LAND PREPARATION

**UNIT CODE:** AGR/OS/SPP/CR/02/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to carry out land preparation. It involves clearing land, constructing soil, soil-water and water conservation structures, carrying out tillage and preparing seedbed.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which make up workplace function (to be stated in active) | **PERFORMANCE CRITERIA**  These are **assessable statements** which specify the required level of performance for each of the elements (to be stated in passive voice)  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Clear land | * 1. Tools, equipment and materials for land preparation are identified and assembled as per work place requirements   2. Land is cleared to establish a clean field for ploughing based on ***suitable parameters*** as per Good Agricultural Practices   3. Trash from the cleared land is disposed as per GAPs and EMCA 1999 guidelines |
| 1. Construct soil, soil-water and water conservation structures | * 1. Evidence of soil erosion and water loss within the farm is determined according to EMCA 1999 procedures, soil and soil-water conservation practices   2. Type of ***soil, soil-water and water conservation structures*** to be erected are determined according to field condition, GAP procedures and best water conservation practices   3. Soil, soil-water and water conservation structures are constructed based on ***soil and water conservation standards and procedures and*** provided layout design |
| 1. Carry out tillage | * 1. ***Land preparation practice*** is identified as per the GAPs   2. Tools and equipment for use during tillage are identified and assembled as per type of tillage   3. Field is ploughed as per GAPs requirements |
| 1. Prepare seedbed | * 1. ***Type of seedbed*** to be prepared is determined based on topography and available tools and implements   2. Tools, equipment and implements are identified and assembled based on type of seedbed to be prepared   3. Selected type of seedbed is prepared based on GAP and recommended spacing as per the AEZ |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **VARIABLE** | **RANGE** |
| 1. Suitable parameters may include but are not limited to: | * Vegetation   + Stumps   + Trees   + Grass |
| 1. Soil, soil-water and water conservation structures may include but are not limited to: | Soil conservation structures   * Fanya juu terraces * Cut off drains * Fanya chini terraces * Detention ditches * Grass strips * Hedge rows * Contour bunds   Soil – water conservation structures   * In-situ water harvesting systems * Ex-situ water harvesting systems * Trapozoidal bunds * Zai pits * Negarims * Mulching * Plastic membranes   Water conservation structures   * Water ponds * Small earth dams * Water pans |
| 1. Soil conservation standards and procedures may include but are not limited to: | * Ministry of Agriculture on soil and water conservation manual * FAO soil and water conservation guidelines |
| 1. Land preparation practice includes but is not limited to: | * Conservation agriculture * Minimum tillage * Conventional tillage * Zero tillage |
| 1. Type of seedbed may include but are not limited to: | * Ridges * Mounds * Flatbeds |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Technical
* Observation
* Problem solving
* Analytical
* Reporting
* Interpretation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Use and management of tools, equipment and materials
* Bush clearing
* Types of conservation measures
* Construction of soil, soil-water and water conservation structures
* Tillage methods
* Making ridges and mounds

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified and assembled tools, equipment and materials for land preparation   2. Cleared land to establish a clean field for ploughing   3. Identified types of soil, soil-water and water conservation measures   4. Constructed soil, soil-water and water conservation structures   5. Identified tillage types   6. Tilled land   7. Prepared seedbed |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Observation   4. Third party report   5. Practical test |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE SWEET POTATO SEED MATERIALS

**UNIT CODE:** AGR/OS/SPP/CR/03/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to produce sweet potato seed materials. It involves carrying out site selection, preparing seedbed and preparing planting materials. It also involves planting seed material, maintaining seed field, harvesting seed materials and handling harvested seed material.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which make up workplace function (to be stated in active) | **PERFORMANCE CRITERIA**  These are **assessable statements** which specify the required level of performance for each of the elements (to be stated in passive voice)  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Carry out site selection | * 1. Land is assessed to establish the history of the farm based on good agricultural practices and survey findings.   2. A suitable location is identified based on method of vine multiplication to be used   3. Layout of farm plots is done based on land use practice requirements, history of farm use and ***physical land conditions*** |
| 1. Prepare nursery bed | * 1. ***Tools and equipment*** for preparing nursery bed are identified and assembled as per ***type of nursery beds***   2. For rapid multiplication, beds are demarcated based on the Good Agricultural practice procedures   3. For conventional multiplication, a seedbed is prepared based on the Good Agricultural Practices manual |
| 1. Prepare planting materials | * 1. ***Suitable variety*** is identified and selected based on demand   2. Tools and equipment are identified and assembled based on the types of nursery bed   3. ***Types of planting materials*** are identified and selected as per Good Agricultural Practices and based on their quality   4. Planting materials are hardened depending on type of seed bed   5. Planting materials are ***treated*** based on their condition and type of planting material   6. Clean planting materials are cut based on the type of nursery bed identified   7. Planting materials are preserved based on GAP and cold chain management procedure |
| 1. Plant seed material | * 1. Planting materials are established based on the method of propagation identified and seed certification standards   2. Planted materials are watered based on soil moisture content   3. Fertilizer is applied based on recommendations from soil tests and fertilizer application protocols |
| 1. Maintain seed bed | * 1. The seed bed is weeded based on the recommendations in Good Agricultural Practices   2. Gapping and rogueing is conducted based on GAPs   3. Pests and diseases are identified and controlled based on the crop protection guidelines and seed certification standards   4. ***Additional maintenance activities*** of seed bed are done based on seed certification standards |
| 1. Harvest seed materials | * 1. ***Seed material quality*** is assessed before harvesting based on GAP and seed certification standards   2. Tools and equipment for harvesting and ***handling*** are identified and assembled as per GAPs   3. For rapid and conventional multiplication, vines are harvested as per the good agricultural practice guidelines for harvesting |
| 1. Handle harvested seed material | * 1. ***Conditioning*** of the vines is conducted as per the cold chain procedure   2. Harvested seed materials are cleaned as per SOPs   3. Harvested seed materials are sorted as per SOPs   4. Harvested seed materials are packaged as per SOPs   5. Harvested seed materials are stored as per GAPs |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| **VARIABLE** | **RANGE** |
| 1. Physical land conditions may include but are not limited to: | * Slope of land * Orientation of land * Existing land structures/ plants / trees * Existing land features - stones * Land Shape   + Square   + Rectangle |
| 1. Tools and equipment may include but are not limited to: | * Jembe * Measuring line * Demarcation sticks |
| 1. Types of nursery beds may include but are not limited to: | * Rapid multiplication * Tray multiplication/single node * Conventional |
| 1. Suitable variety may include but are not limited to: | * Ecological requirements * Customer preferences |
| 1. Types of planting materials may include but are not limited to: | * Vines * Roots * Seedlings |
| 1. Treated may include but are not limited to: | * Fungicides |
| 1. Additional maintenance activities may include but are not limited to: | * Maintain recommended isolation distance between sweet potato variety and related crop * Maintain purity of planted variety * Recommended visits by regulator |
| 1. Seed material quality may include but are not limited to: | * Health status * True to type |
| 1. Handling may include but are not limited to: | * Storage * Packaging * Transportation |
| 1. Conditioning may include but are not limited to: | * Cooling |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Estimation
* Observation
* Pest and disease identification and control
* Nursery management

**Required Knowledge**

The individual needs to demonstrate knowledge of

* Crop protection
* Plant morphology
* Computing

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Assessed land to establish the history of the farm   2. Identified a suitable location   3. Performed layout of farm plots   4. Identified suitable variety   5. Identified tools and equipment for preparing nursery bed   6. Demarcated beds   7. Prepared seedbed   8. Identified types of planting materials   9. Hardened planting materials   10. Treated planting materials   11. Cut clean planting materials   12. Preserved planting materials   13. Established planting materials   14. Watered planting materials   15. Applied fertilizer   16. Weeded the seed bed   17. Conducted gapping and rogueing   18. Identified and controlled pests and diseases   19. Maintained seed bed   20. Harvested seed material   21. Performed post-harvest activities |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE SWEET POTATO ROOTS

**UNIT CODE:** AGR/OS/SPP/CR/04/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to produce sweet potato roots. It involves carrying out site selection, selecting sweet potato variety, preparing land and sourcing planting materials, supplies and other inputs. It also involves planting sweet potato seed materials, managing sweet potato crop, harvesting sweet potato roots, handling harvested sweet potato roots.

**ELEMENTS AND PERFORMANCE CRITERIA**

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| **ELEMENT**  These describe the **key outcomes** which make up workplace function (to be stated in active) | **PERFORMANCE CRITERIA**  These are **assessable statements** which specify the required level of performance for each of the elements (to be stated in passive voice)  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Carry out site selection | * 1. Location of where to grow sweet potato for root production is identified based on suitable ***ecological requirements***   2. Actual site is identified based on the ***history of the field and the neighboring fields*** |
| 1. Select sweet potato variety | * 1. Appropriate sweet potato variety is identified based on ***adaptability*** and seed availability   2. R***ecommended varieties*** are selected based on suitability of performance, purpose and ***scale*** ***of operation***, market demand and client preferences |
| 1. Prepare land | * 1. Tools and equipment are identified and assembled as per the scale of production   2. Land is prepared to achieve the ***recommended tilth*** as per good agricultural practices and scale of operation.   3. Preparation of ridges and mounds is done as per GAP and dictated by prevailing ***field conditions and grower’s preference***. |
| 1. Source planting materials, supplies and other inputs | * 1. ***Quality planting materials***, supplies and inputs are identified and selected as per ecological features and GAPs   2. Selected planting materials, supplies and inputs are sourced as per workplace procurement procedures   3. ***Planting materials*** preparedbased on GAP |
| 1. Plant sweet potato seed materials | * 1. ***Appropriate time for planting*** is determined as per crop establishment requirement and crop rotational schedule   2. ***Right spacing, depth and orientation*** are identified as per GAPs   3. ***Fertilizer and manure*** is applied based on S***oil analysis recommendations*** given   4. Actual planting is carried out as per GAPs |
| 1. Manage sweet potato crop | * 1. ***Integrated soil fertility management*** applied as a sustainable management option based on soil analysis results   2. Rogueing is carried out as per GAP.   3. Gapping is done to replace missing plants in the field within the first two weeks after planting as per GAP   4. The crop is ***kept free of weeds*** within the first two months after planting according to GAP.   5. ***Earthing up*** to prevent weevil attack is carried out when cracks are noticed as per GAP   6. Sweet potato is ***intercropped with other crops*** to increase production per unit area as per GAP   7. ***Diseases and pests*** are identified and ***managed*** to maximize fresh root yield as per GAP |
| 1. Harvest sweet potato roots | * 1. Maturity indicators on the crop are identified before harvesting as per GAP   2. ***Preparation*** for harvesting is carried out according to GAP.   3. Roots are harvested either piece meal or completely using appropriate ***tools and equipment*** as per GAP |
| 1. Handle harvested sweet potato roots | * 1. Harvested roots are transported from the field as per good handling practices   2. Harvested roots are washed as per SOPs   3. Harvested roots are sorted as per SOPs   4. Harvested roots are graded as per SOPs   5. Harvested roots are cured as per SOPs   6. Harvested roots are packaged as per SOPs   7. Harvested roots are stored as per GAPs |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

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| **VARIABLE** | **RANGE** |
| 1. Ecological requirements may include but are not limited to: | * Temperature * Altitude * Rainfall * Soils * Climate change adaptation |
| 1. History of the field and the neighboring fields may include but are not limited to: | * Previous crops grown on the field * Crop rotation plan, * Previous and current crops in the neighbourhood * Distance from nearest sweet potato field |
| 1. Variety adaptability may include but are not limited to: | Variety adaptability to;   * Climatic and soil conditions * Pest and disease resistance |
| 1. Recommended varieties may include but are not limited to: | * Varieties determined by market demand   + Rural and urban markets * Skin and flesh colours * Suitability for processing |
| 1. Scale of operation may include but are not limited to: | * Subsistence * Commercial growers * Small scale * Large scale * Medium |
| 1. Recommended tilth may include but are not limited to: | * Ploughing * Harrowing * Number of operations * Depth of ploughing * Minimum tillage * Root development and enlargement |
| 1. Scale of operation may include but are not limited to: | * Smallholder farmers   + Hand tools   + Ox ploughs * Large scale farmers   + Tractor drawn implements |
| 1. Field conditions and grower’s preference may include but are not limited to: | * Flat land * Sloppy land * Swamps/poorly drained fields * Labour availability * Mole infestation * Making of ridges and mounds at the required spacing |
| 1. Quality planting materials may include but are not limited to: | * Planting materials not showing symptoms of virus diseases * Age of plants for planting materials * Free of weevils, weevil eggs, larvae or pupae. * Cuttings from vine tips * Use of insecticides to treat materials with weevils * Conservation of planting materials |
| 1. Planting materials may include but are not limited to: | * Vine cuttings * Materials sourced from plants of 2 to 3 months * Size of cuttings * Hardening of cuttings |
| 1. Appropriate time of planting may include but are not limited to: | * Sufficient soil moisture * Pest infestation * Scale of operation * Equipment and machinery * Target market |
| 1. Soil analysis recommendations may include but are not limited to: | * Soil samples taken * Soil tested or analysis done * Recommendations given on the action to be taken |
| 1. Fertilizer and manure application may include but are not limited to: | * Recommended fertilizer type * Organic * Inorganic * Fertilizer application rate * Soil analysis recommendations |
| 1. Right spacing, depth and orientation may include but are not limited to: | * Spacing of ridges and mounds * Spacing of vine cuttings * Insertion of cuttings in the soil * Depth of planting * Orientation of cuttings at planting * Planting on the mounds * Planting on the ridges * Number of vines required per acre |
| 1. Integrated soil fertility management may include but are not limited to: | * Fallow system * Crop rotation * Well decomposed farm yard manure * Compost manure * Green manures * Mulching * Reduction in soil erosion * Conservation agriculture |
| 1. Kept free of weeds may include but are not limited to: | * Time and number of weeding * Hand weeding * Use of suitable weeding tools * Mulching * Use of herbicides |
| 1. Earthing up may include but are not limited to: | * Filling of cracks * Covering exposed roots with soil |
| 1. Intercropped with other crops may include but are not limited to: | * Pure stand * Cereals * Legumes * Competition effects * Relay cropping |
| 1. Diseases and pests may include but are not limited to: | Sweet potato diseases   * Sweet potato viral diseases * Sweet potato bacterial diseases * Sweet potato fungal diseases * Erinose (hairiness) - modified   Pests   * Weevils * Aphids * Moles * Monkeys * Foliage * Root pest |
| 1. Managed may include but are not limited to: | * Chemically * Biologically * Culturally * Manually * Rogueing |
| 1. Preparation may include but are not limited to: | * Determining purpose for harvesting * Obtaining tools and other requirements * Cutting back * Determining market/disposal channel. |
| 1. Harvesting tools and equipment may include but are not limited to: | * Jembe/fork * Ox plough * Tractor drawn implements * Crates * Gunny bags |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Computer
* Maintenance
* Problem solving
* Technical
* Critical thinking
* Observation
* Interpretation
* Sample handling
* Soil sampling
* Composting
* Preparation of planting materials
* Chemical application
* Field layout
* Variety identification
* Pest identification
* Marketing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Common sweet potato crop varieties
* Importance of sweet potato
* Measurement units; length, weights, heights
* Good agricultural practices
* Land preparation/Tillage
* Farm tools
* Diseases and pests
* Soils and soil fertility
* Weed management
* Adaptability of sweet potato varieties
* Seed multiplication
* Indigenous technical knowledge
* Moisture stress
* Drainage
* Crop rotation
* Crop protection
* Post-harvest handling
* Group dynamics

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

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| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   1. Identified necessary input requirements for root production 2. Identified suitable site 3. Identified ecological requirements for growing sweet potato 4. Identified key characteristics that differentiate varieties 5. Identified common recommended varieties 6. Identified different types of sweet potatoes based on flesh / skin colour 7. Identified tools used in land preparation 8. Made seedbed for root production 9. Made ridges and mounds at the right spacing 10. Understood soil fertility 11. Selected clean planting material 12. Prepared clean planting materials 13. Applied fertilizer and manure as recommended 14. Carried out planting 15. Planting materials inserted in the soil at the right spacing, depth and orientation 16. Implemented integrated soil fertility management based on field situation 17. Carried out rogueing 18. Replaced missing plants 19. Weeded crop 20. Covered cracks by earthing up 21. Intercropped sweet potato with other crop – relay cropping 22. Identified important diseases and pests and their causes 23. Established disease symptoms 24. Took control measures to manage diseases and pests. 25. Determined maturity indicators 26. Established appropriate tools for harvesting 27. Determined piece meal or complete harvesting. 28. Took precautions for maintaining fresh root quality 29. Did post-harvest handling practices |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks 3. Land or field for demonstration |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# MANAGE FOOD SAFETY AND QUALITY ASSURANCE

**UNIT CODE:** AGR/OS/SPP/CR/05/4/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to manage food safety and quality assurance. It involves implementing pre - requisite programs, identifying and implementing HACCP concepts, observing food safety legislations and standards and implementing quality control programs.

**ELEMENTS AND PERFORMANCE CRITERIA**

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| **ELEMENT**  These describe the **key outcomes** which make up workplace function (to be stated in active) | **PERFORMANCE CRITERIA**  These are **assessable statements** which specify the required level of performance for each of the elements (to be stated in passive voice)  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Implement pre - requisite programs | * 1. Good agricultural practices are identified and implemented according to CODEX and Kenya standards   2. ***Good handling practices*** are identified and implemented according to CODEX standards and Kenya standards for warehousing and receipting system (WRS)   3. ***Standard operating procedures*** are implemented according to CODEX standards |
| 1. Identify and implement HACCP concepts | * 1. ***Hazards*** are identified based on CODEX principles   2. ***Safe food handling practices and procedures*** are identified and implemented based on CODEX principles |
| 1. Observe food safety legislations and standards | * 1. Food laws are identified and adhered to based on existing legislative framework   2. ***Food safety management institutions*** are identified based on existing legal framework   3. ***Food standards*** are identified and adhered to based on existing institutional frameworks |
| 1. Implement quality control programs | * 1. ***Quality control records*** are kept based on ***quality assurance standards***   2. Raw material quality is controlled based on quality assurance standards |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

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| **VARIABLE** | **RANGE** |
| 1. Good handling practices may include but are not limited to: | * Quality of water for cleaning * Sanitation * Personal hygiene * Containers for transport * Storage practices * Transportation practices |
| 1. Good manufacturing practicesmay include but are not limited to: | * Personal hygiene * Pest control * Prevention of cross contamination * Waste disposal * Use of PPEs * Plant and equipment cleaning * Maintenance of equipment and machinery * Maintenance of food safety records |
| 1. Standard operating procedures may include but are not limited to: | * Pre-operational procedures * Operational procedures |
| 1. Safe food handling practices and procedures may include but are not limited to: | * Hand washing * Use of thermometers * Cleaning of utensils |
| 1. Food safety management institutions may include but are not limited to: | * Kenya Bureau of standards * KEPHIS * Public Health department * AFA * Crops department |
| 1. Hazards may include but are not limited to: | * Biological * Chemical * Physical |
| 1. Food standards may include but are not limited to: | * Mandatory standards * voluntary standards * Kenya Bureau of standards * East African Standards * CODEX * ISO |
| 1. Quality control records may include but are not limited to: | * Food and equipment inventory * Cleaning records * Storage and stock control records |
| 1. Quality assurance standards may include but are not limited to: | * KEBS * EAS * ISO * Global GAP |

**REQUIRED SKILLS AND KNOWLEDGE**

This section describes the skills and knowledge required for this unit of competency.

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Analytical
* Numeracy
* Computer
* Maintenance
* Problem solving
* Technical
* Critical thinking
* Observation
* Interpretation
* Sample handling

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Food safety
* Pre-requisite programs
* HACCP
* Food standards
* Food legislation
* Quality control

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

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| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Implemented good agricultural practices   2. Implemented standard operating procedures   3. Identified and implementedsafe food handling practices and procedures   4. Identifiedfood safety hazards   5. Identified food laws   6. Identified food safety management institutions   7. Identified food standards   8. Kept quality control records   Controlled raw material quality |
| 1. Resource Implications | The following resources must be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral   2. Written   3. Third party report   4. Observation |
| 1. Context of Assessment | Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |