

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARD**

**FOR**

**AGRICULTURE AND EXTENSION PRACTITIONER**

**LEVEL 6**

**PROGRAMME CODE: 0811 554 A**

First published 2024

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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 the 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. These reforms resulted to the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No.14 of 2012). 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, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

The reforms also 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 developing a Competency-Based Education and Training (CBET) curriculum for Agriculture and Extension practitioner level 6. These Occupational Standards will also be the basis for the assessment of an individual for competency certification.

It is my conviction that these Occupational Standards will play a great role in the development of a competent human resource for sustainable development.

**Hon. Ezekiel Machogu Ombaki, CBS**

**Cabinet Secretary**

**Ministry of Education**

**PREFACE**

Kenya 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 and Sessional Paper No. 14 of 2012 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by the industry as well as increase the global competitiveness of the Kenyan labour force.

The National Polytechnics, in conjunction with the industry experts through the Industry Advisory Board (IAB), sector regulator boards, TVETA authority, and qualification awarding institution has developed these Occupational Standards for Agriculture and Extension practitioner level 6. The occupational standards will be the basis for the development of a competency-based education and training curriculum for Agriculture and Extension practitioner level 6.

I am grateful to the Governing Council Members, TVETA, sector regulators, the industry experts, and subject experts who participated in the development of these standards.

**ACKNOWLEDGMENT**

These Occupational Standards were developed through the 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 input towards the development of these Occupational Standards.

I also thank all the individuals and organizations who participated in the validation of these Occupational Standards.

# ACRONYMS

|  |  |
| --- | --- |
| PPEs | Personal Protective Equipment |
| AAS | Atomic absorption spectrophotometer |
| UV-VIS | Ultra-violet visible spectroscopy |
| ISCED | International Standard Classification of Education |
| OSHA | Occupational Safety and Health Act |
| FAO | Food and Agriculture organization |
| TVET CDACC | TVET Curriculum development, Assessment and certification council |
| TVET | Technical and vocational education and training |
| TVETA | Technical and Vocational Education Training Authority |
| FPM | Fish production manual |
| LPM | Livestock production manual |
|  |  |

# KEY TO UNIT CODE

Sector / Industry

Sub Sector

Occupational Area

Version Control

Unit of Competence Number

ISCED level, Programme Orientation and Level of Completion

xx

x

xxx

x

x

x

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# 

# OVERVIEW

Agriculture and extension Level 6 qualification consists of competencies required by a person to enable him/her perform duties of an Agricultural and extension practitioner Level 6**.** These competencies include producing ruminant animals, producing non- ruminant animals, producing annual crops, producing perennial crop, producing horticulture crops, carry out fish farming, carrying out bee keeping, operating farm machinery and equipment, establishing farm structures, production of forage crops and carrying out extension services. Other competencies relevant to the performance of the duties of Agriculture and extension practitioner include: application of inorganic and organic chemistry principles, principles of animal anatomy and physiology, genetics concepts, soil science principles, farm management principles ,utilization of farm water and conducting research projects. In addition, communication skills, digital literacy, entrepreneurial skills and employability skills are applicable.

Thus, the units of competency comprising Agriculture and extension Level 6 qualification include the following basic, common and core competencies:

**SUMMARY OF UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **BASIC UNITS OF COMPETENCY** | |
| **UNIT CODE** | **UNIT TITLE** |
| 0611 551 1B | Apply Digital Literacy |
| 0031 541 2B | Apply Communication Skills |
| 0031 541 3B | Apply Work Ethics and Practices |
| 0413 541 4B | Apply Entrepreneurial Skills |
| **COMMON UNITS OF COMPETENCY** | |
| 0811 551 5A | Apply soil science principles |
| 0811 551 6A | Operate farm machinery |
| 0111 551 7A | Applied research |
| 0811 551 8A | Utilize water in the farm |
| 0531 551 9A | Apply inorganic and organic chemistry principles |
| 0811 551 10A | Apply farm management principles |
| 0811 551 11A | Apply Genetics principles |
| 0811 551 12A | Apply Animal anatomy and physiology |
| **CORE UNITS OF COMPETENCY** | |
| 0811 551 13A | Produce Ruminants animals |
| 0811 551 14A | Produce non-ruminant animals |
| 0811 551 15A | Produce annual crops |
| 0811 551 16A | Produce perennial crops |
| 0812 551 17A | Produce horticulture crops |
| 0831 551 18A | Carry out fish farming |
| 0811 551 19A | Carry out bee production |
| 0811 551 20A | Establish farm structure |
| 0811 551 21A | Produce forage crops |
| 0811 551 22A | Carry out extension services |

# BASIC UNITS

# APPLY DIGITAL LITERACY

**UNIT CODE: 0611 551 1A**

**UNIT DESCRIPTION:**

This unit covers the competencies required to demonstrate digital literacy. It involves operating computer devices, solving tasks using the Office suite, accessing online/offline data and information, performing online communication and collaboration, applying cybersecurity skills and performing jobs online. It also involves applying job entry techniques.

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT  These describe the key outcomes that make up workplace functions | 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. Operate computer devices | 1. **C*omputer device*** usage is determined as per workplace requirements. 2. ***Computer hardware*** is identified according to job requirements. 3. ***Computer software***is identified according to workplace requirements. 4. Computer devices are turned on or off as per the correct workplace procedure. 5. ***Mouse techniques*** are applied in solving tasks as per workplace requirements. 6. Keyboardtechniques are applied in solving tasks as per workplace requirements. 7. Computer files and folders are created and managed as per workplace requirements. 8. ***Internet connection option*s** are identified and applied in connecting computer devices to the Internet. 9. *External devices* are identified and connected to the computer devices as per the job requirement. |
| 1. Solve tasks using Office suite | 1. ***Word processing concepts***are applied in solving workplace tasks as per job requirements. 2. Worksheet data is entered and prepared in accordance with work procedures. 3. Worksheet data is built and edited in accordance with workplace procedures. 4. ***Data manipulation*** on a worksheet is undertaken in accordance with work requirements. 5. Worksheets are saved and printed in accordance with job requirements. 6. ***Electronic presentation concepts***are applied in solving workplace tasks as per job requirements. |
| 1. Manage data and information | 1. Office ***internet services*** are identified and applied in accordance with office procedures. 2. ***Internet access applications*** are determined in accordance with office operation procedures. 3. Internet search is performed as per job requirements. 4. Online digital content is downloaded in accordance with workplace requirements. 5. Digital content is identified and backed up in accordance with workplace procedures. |
| 1. Perform online communication and collaboration | 1. Netiquette principles are observed as per work requirements. 2. Electronic mail communication is executed in accordance with workplace policy. 3. Digital content copyright and licenses are identified and applied according to workplace policies and regulatory requirements. 4. ***Online* *collaboration tools*** are applied in accordance with workplace policies and regulatory requirements. |
| 1. Apply cyber security skills | 1. ***Data protection***and ***privacy***is classified in accordance with workplace policies and regulatory requirements. 2. ***Internet security threats*** are identified as per workplace policies and regulatory requirements. 3. Computer threats and crimes are detected in accordance to Information Management security guidelines 4. ***Cybersecurity control measures*** are applied in accordance with workplace policies and regulatory requirements. |
| 1. Perform online jobs | 1. ***Online job platforms*** are identified as per the job requirements. 2. Online accounts and profiles are created in accordance with the work requirements. 3. Online jobs are identified according to the bidder’s skillset. 4. Online digital identity is managed according to industry best practices. 5. Online job bidding is done as per the specific job requirements. 6. Online tasks are executed according to the job requirements. 7. Personal online payment account is managed in accordance with financial regulations. |
| 1. Apply job entry techniques | * 1. ***Job opportunities***are sought based on competencies.   2. A winning resume/CV is developed as per job advertisement.   3. An application/cover letter is developed based on the job advertisement.   4. Certificates and testimonials are organized as per resume.   5. ***Interview skills*** are demonstrated as per job advertisement. |

**RANGE**

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

| Variable | Range |
| --- | --- |
| 1. Computer devices may include but are not limited to: | * Desktops * Laptops * Smartphones * Tablets * Smartwatches |
| 1. Computer hardware may include but are not limited to: | * The System Unit E.g. Motherboard, CPU, casing, * Input Devices e.g. pointing, keying, scanning, voice/speech recognition, direct data capture devices. * Output Devices e.g. hardcopy output and softcopy output * Storage Devices e.g. main memory e.g. RAM, secondary storage (Solid state devices, Hard Drives, CDs & DVDs, Memory cards, Flash drives * Computer Ports e.g. HDMI, DVI, VGA, USB type C etc. |
| 1. Computer software may include but are not limited to: | * System software e.g. Operating System (Windows, Macintosh, Linux, Android, iOS) * Application Software e.g. Word Processors, Spreadsheets, Presentations etc. * Utility Software e.g. Antivirus programs |
| 1. External devices may include but are not limited to: | * Printers * Projectors * Smart Boards * Speakers * External storage drives * Digital/Smart TVs |
| 1. Word processing concepts may include but are not limited to: | * Creating word documents * Editing word documents * Formatting word documents * Saving word documents * Printing word documents |
| 1. Mouse techniques may include but are not limited to: | * Clicking * Double-clicking * Right-clicking * Drag and drop |
| 1. Internet connection options may include but are not limited to: | * Mobile Networks/Data Plans * Wireless Hotspots * Cabled (Ethernet/Fibber) * Dial-Up * Satellite * ISDN (Integrated Services Digital Network) |
| 1. Data manipulation may include but are not limited to: | * Use of formulae * Use of functions * Sorting * Filtering * Visual representation using charts |
| 1. Electronic presentation concepts may include but are not limited to: | * Creating slides * Editing slides * Formatting slides * Applying slide effects and transitions * Creating and playing slideshows * Saving presentations * Printing slides and handouts |
| 1. Internet services may include but are not limited to: | * Communication Services * Information Retrieval Services * File Transfer * World Wide Web Services * Web Services * Directory Services * Automatic Network Address Configuration * Newsgroup * Ecommerce |
| 1. Internet access applications/software may include but are not limited to: | * Browsers * Email Apps * ecommerce Apps |
| 1. Online collaboration tools may include but are not limited to: | * Online Storage * Online productivity applications * Online meetings, * Online learning environments, * Online calendars * Social networks |
| 1. Data protection and privacy may include but not limited to: | * Confidentiality of data/information * Integrity of data/information * Availability of data/information |
| 1. Internet security threats may include but not limited to: | * Malware attacks * Social engineering attacks * Software supply chain attacks * Advanced persistent threats (APT) * Distributed denial of service (DDoS) * Man-in-the-middle attack (Met) * Password attacks * Iota Attacks * [Phishing Attacks](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#phishing-attacks) * [Ransomware](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#ransomware) |
| 1. Security threats control measures may include but not limited to: | * Counter measures against cyber terrorism * Physical Controls * Technical/Logical Controls * Operational Controls |
| 1. Online job platforms may include but are not limited to: | * Remo task * Data annotation.tech * Cloud worker * Up work * Unifoma * Appen |
| 1. Job opportunities may include but not limited to: | * Self-employment * Service provision * product development * salaried employment |
| 1. Certificates and testimonialsmay include but not limited to: | * Academic credentials * Letters of previous employments/ services rendered * Letters of commendation * Certifications of participation * Awards |
| 1. Interview skills may include but not limited to: | * Listening skills * Grooming * Language command * Articulation of issues * Body language * Time management * Honesty * Generally knowledgeable in current affairs and technical area |

**REQUIRED KNOWLEDGE AND SKILLS**

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

Required knowledge

The individual needs to demonstrate knowledge of:

* Computer Hardware and Software Concepts
* Computer Security Concepts (Data security and privacy)
* Cyber security threats and control measures
* Understanding Computer Crimes
* Detection and protection against computer crimes
* Laws governing protection of ICT in Kenya
* Digital Identity Management
* Netiquette Principles
* Fundamentals of Copyright and Licenses
* Word processing;
* Functions and concepts of word processing;
* Documents and tables creation and manipulations;
* Document editing;
* Document formatting;
* Word processing utilities
* Spreadsheets;
* Meaning, types and importance of spreadsheets;
* Components of spreadsheets;
* Functions, formulae, and charts, uses and layout;
* Data formulation, manipulation and application to cells;
* Editing & formatting spreadsheets;
* Presentation Packages;
* Types of presentation Packages.
* Creating, formulating, running, editing, printing and presenting slides and handouts
* Networking and Internet;
* Internet connectivity.
* Browser and digital content management;
* Managing data, information, and digital content
* Electronic mail and World Wide Web
* Fundamentals of Online Working;
* Online Profile Management;
* e-Portfolio Management;
* Online Jobs Bidding;
* Online Payment Systems;
* Job entry techniques
* Job searching sites
* Interview preparation skills
* Interview handling

Required skills

The individual needs to demonstrate the following skills:

* Active listening
* Keyboard Skills
* Mouse Skills
* Analytical skills
* Creativity
* Interpretation Skills
* Communication
* Spreadsheet operations (applying fundamental operations such as addition, subtraction, division and multiplication)
* Computer Use Safety Skills
* Document Editing Skills
* Document Formatting Skills
* Document Printing Skills
* Netiquette Skills
* Internet Browsing Skills
* Problem Solving Skills
* Online Collaboration Skills
* Cybersecurity Skills
* CV writing
* grooming

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Operated computer devices as per workplace policies and regulations.   2. Solved tasks using the office suite as per workplace policies and regulations.   3. Manage data and information as per workplace policies and regulations.   4. Performed online communication and collaboration as per workplace policies and regulations.   5. Applied cybersecurity skills in accordance with workplace policies and regulations.   6. Executed online tasks according to the job requirements.   7. Searched for job opportunity based on competencies.   8. Prepared job requirement documentations based on job opportunity.   9. Demonstrated interview skills based on the job opportunity. |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant work environments where assessment can take place.   3. Resources relevant to the proposed activities or task. |
| 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral assessment   3. Portfolio of evidence   4. Interviews   5. Third party report   6. Written assessment   7. Practical assessment   8. Projects |
| 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

**APPLY COMMUNICATION SKILLS**

**UNIT CODE: 0031 541 2A**

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate communication skills. It involves applying communication channels, written, non-verbal, oral, and group communication skills.

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT  These describe the key outcomes that make up workplace function | PERFORMANCE CRITERIA  These are assessable statements that specify the required level of performance for each of the elements.  Bold and italicized terms are elaborated in the Range |
| --- | --- |
| 1. Apply communication channels | 1. Specific communication channels are identified and applied based on workplace requirements. 2. Challenges are identified and addressed as per the operational standards of the organization. 3. Communication channels are evaluated to meet workplace needs. |
| 1. Apply written communication skills | * 1. Types of written communication are identified and applied according to the workplace requirements.   2. Written communication needs are identified and implemented according to workplace procedures.   3. Written communication guidelines are analysed, evaluated, and revised based on workplace needs. |
| 1. Apply non-verbal communication skills | 1. Existing non-verbal communication techniques are identified and applied based on organization policy. 2. Non-verbal communication techniques are articulated and modeled to enhance inclusivity according to workplace requirements. |
| 1. Apply oral communication skills | 1. Types of oral communication are identified and established as per organization policy. 2. Pathways of oral communication are identified and established as per organization policy. 3. Pathways of oral communication are reviewed according to organization procedures. 4. Pathways of oral communication are maintained according to the organization standards. |
| 1. Apply group communication skills | 1. Group communication strategies are appliedbased on the workplace needs. 2. Groups are organized in accordance with workplace procedures. 3. Effective questioning, listening and non-verbal communication techniques are used as per needs. 4. Group communication challenges are identified and addressed according to the workplace needs. |

**RANGE**

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

| Variable | Range |
| --- | --- |
| 1. Communication strategies may include but are not limited to: | * Language switch * Comprehension check * Repetition * Asking confirmation * Paraphrasing * Clarification request * Translation * Restructuring * Generalization |
| 1. Effective group interaction may include but not limited to: | * Identifying and evaluating what is occurring within an interaction in a non-judgmental way. * Using active listening. * Making decision about appropriate words, behaviour. * Putting together response which is culturally appropriate. * Expressing an individual perspective. * Expressing own philosophy, ideology and background and exploring impact with relevance to communication |
| 1. Situations may include but are not limited to: | * Establishing rapport * Eliciting facts and information * Facilitating resolution of issues * Developing action plans |

**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:

* Active listening
* Interpretation
* Negotiation
* Writing
* Oral skills
* Creative thinking
* Critical thinking
* Decision making
* Analytical
* Innovation
* Conflict skills
* Leadership
* Problem solving skills
* Management
* Organizational
* Teamwork

Required Knowledge

The individual needs to demonstrate knowledge of:

* Communication process
* Dynamics of groups
* Styles of group leadership
* Key elements of communications strategy
* Principles of effective communication
* Turn-taking techniques
* Conflict resolution techniques
* Work planning
* Work organization
* Company policies
* Company operations and procedure standards
* Fundamental rights at the workplace
* Personal hygiene
* Accountability
* Workplace problems and how to deal with them

EVIDENCE GUIDE

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency. | Assessment requires evidence that the candidate:   * 1. Identified and applied specific communication channels based on workplace requirements.   2. Identified and applied specific written communication correspondence according to the workplace requirements.   3. Applied and developed non-verbal strategies to communicate in all areas of the workplace requirements.   4. Established pathways of oral communication as per workplace policy.   5. Applied group communication strategies based on workplace needs. |
| 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. 3. Resources relevant to the proposed activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral assessment   3. Portfolio of evidence   4. Interviews   5. Third party report   6. Written assessment   7. Practical assessment   8. Projects |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# APPLY WORK ETHICS AND PRACTICES

**UNIT CODE: 0031 541 3A**

**UNIT DESCRIPTION**

This unit covers competencies required to effectively apply work ethics and practices. It involves the ability to: conduct self-management, promote ethical work practices and values, promote teamwork, manage workplace conflicts, maintain professional and personal development, apply problem-solving and promote customer care.

**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 Range |
| --- | --- |
| * 1. Apply self-management skills | 1. Personal vision, mission and goals are formulated based on potential and concerning organization objectives and strategic plan 2. Self-esteem and a positive self-image are developed and maintained based on value 3. Emotional intelligence and stress management are demonstrated as per workplace requirements. 4. Assertiveness is developed and maintained based on the requirements of the job. 5. Accountability and responsibility for one's actions are demonstrated based on workplace instructions. 6. Time management, attendance and punctuality are observed as per the organization’s policy. 7. Personal goals are managed as per the organization’s objective 8. Self-strengths and weaknesses are identified based on personal objectives 9. Motivation, initiative and proactivity are utilized as per the organization policy 10. Individual performance is evaluated and monitored according to the agreed targets. |
| 1. Promote ethical work practices and values | 1. Integrity is demonstrated as per acceptable norms 2. Codes of conduct is applied as per the workplace requirements 3. Policies and guidelines are observed as per the workplace requirements 4. Professionalism is exercised in line with organizational policies |
| 1. Promote Team work | 1. ***Teams*** are formed to enhance productivity based on organization’s objectives 2. Duties are assigned to teams under the organization policy. 3. Team activities are managed and coordinated as per set objectives. 4. Team performance is evaluated based on set targets as per workplace policy. 5. ***Conflicts*** are resolved between team members in line with organization policy. 6. Gender and diversity-related issues are identified and mainstreamed in accordance with workplace policy. 7. Healthy ***relationships*** are developed and maintained in line with the workplace. 8. Adaptability and flexibility are applied in dealing with team members as per workplace policies |
| 1. Maintain professional and personal development | 1. ***Personal growth and development*** needs are identified and assessed in line with the requirements of the job. 2. ***Training and career opportunities*** are identified and utilized based on job requirements. 3. *Resources* for training are mobilized and allocated based on organizations and individual skills needs. 4. Licenses and certifications relevant to the job and career are obtained and renewed as per policy. 5. Recognitions are sought as proof of career advancement in line with professional requirements. 6. Work priorities and personal commitments are balanced and managed based on the requirements of the job and personal objectives. 7. Dynamism and on-the-job learning are embraced in line with the organization’s goals and objectives. |
| 1. Apply Problem solving skills | 1. ***Creative, innovative*** and practical solutions are developed based on the problem 2. Independence and initiative in identifying and solving problems are demonstrated based on the requirements of the job. 3. Team problems are solved as per the workplace guidelines 4. Problem-solving strategies are applied as per the workplace guidelines 5. Problems are analyzed and assumptions tested as per the context of data and circumstances |
| 1. Promote Customer Care | 1. Customers' needs are identified based on their characteristics 2. Customer ***feedback*** is allowed and facilitated in line with organization policies. 3. Customer concerns and complaints are analyzed and resolved in line with the set organizational culture. 4. Proactive customer outreach programs are implemented as per organizational policies 5. Customer retention strategies are developed and implemented in line with the organizational policy |

**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. Feedback may include but not limited to: | * Verbal * Written * Informal * Formal |
| 1. Conflicts include but are not limited to: | * Interpersonal Conflict. * Intrapersonal Conflict. * Intergroup Conflict. * Intragroup Conflict. |
| 1. Relationships may include but not limited to: | * Man/Woman * Trainer/trainee * Employee/employer * Client/service provider * Husband/wife * Boy/girl * Parent/child * Sibling relationships |
| 1. Team may include but not limited to: | * Small work group * Staff in a section/department * Inter-agency group * Virtual teams |
| 1. Personal growth may include but not limited to: | * Growth in the job * Career mobility * Gains and exposure the job gives * Net workings * Benefits that accrue to the individual as a result of noteworthy performance |
| 1. Personal objectives may include but not limited to: | * Long term * Short term * Broad * Specific |
| 1. Trainings and career opportunities may include but not limited to | * Participation in training programs * Serving as Resource Persons in conferences and workshops * Capacity building |
| 1. Resource may include may but not limited to: | * Human * Financial * Technology |
| 1. Creative and innovative may include but not limited to: | * New ideas * Original ideas * Different ideas * Methods/procedures * Processes * New tools |
| 1. Emerging issues may include but not limited to: | * Artificial Intelligence * Data confidentiality * National cohesion * Open offices |

**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:

* Active listening
* Critical thinking
* Organizational
* Negotiation
* Monitoring
* Evaluation
* Problem solving
* Decision Making
* Leadership
* Creative/innovative thinking
* Adaptability
* Conflict management
* Emotional intelligence
* Teamwork

Required Knowledge

The individual needs to demonstrate knowledge of:

* Work values and ethics
* Company policies and procedures
* Company operations, procedures and standards
* Flexibility and adaptability
* Concept of time and leisure time
* Decision making
* Work planning
* Organizing work
* Monitoring and evaluation
* Record keeping
* Gender and diversity mainstreaming
* Drug and substance abuse
* Professional growth and development
* creativity
* Innovation
* problem solving
* customer care
* Mentoring and coaching.
* Emerging 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 require evidence that the candidate:   * 1. Applied self-management skills as per organizational procedures.   2. Promoted ethical practices and values as per organizational procedures.   3. Promoted Teamwork as per workplace assignments.   4. Maintained professional and personal development as per organizational procedures.   5. Applied Problem-solving skills based on work requirements.   6. Identified customer needs based on their characteristics.   7. Gave back Customer feedback in line with organization policies. |
| 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. 3. Resources relevant to the proposed activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**APPLY ENTREPRENEURIAL SKILLS**

**UNIT CODE: 0413 541 4A**

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate an understanding of entrepreneurship. It involves demonstrating an understanding of financial literacy, applying entrepreneurial concepts identifying entrepreneurship opportunities, applying business legal aspects, developing business innovative strategies, and developing business plans.

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT  These describe the key outcomes that make up workplace function. | PERFORMANCE CRITERIA  These are assessable statements that specify the required level of performance for each of the elements.  Bold and italicized terms are elaborated in Range |
| --- | --- |
| 1. Apply Financial Literacy Skills | 1. Sources of personal and business ***funds*** are identified as per financial procedures and standards 2. Personal finances are managed as per financial procedures and standards 3. Savings are managed as per financial procedures and standards 4. Debts are managed as per financial procedures and standards 5. Investments are undertaken as per financial procedures and standards 6. Insurance services are procured as per financial procedures and standards |
| 1. Apply entrepreneurial concept | 1. Entrepreneurs and Business persons are distinguished as per principles of entrepreneurship 2. ***Types of entrepreneurs*** are identified as per principles of entrepreneurship 3. Ways of becoming an entrepreneur are identified as per principles of Entrepreneurship 4. ***Characteristics of Entrepreneurs*** are identified as per principles of Entrepreneurship 5. Salaried employment and self-employment are distinguished as per principles of entrepreneurship 6. ***Requirements for entry into self-employment*** are identified according to business procedures and standards 7. Roles of an Entrepreneur in an enterprise are determined according to business procedures and standards 8. Contributions of entrepreneurship to National development are identified as per business procedures and standards |
| 1. Identify entrepreneurial opportunities | 1. Business ideas are identified as per business procedures and standards 2. Factors to consider when evaluating business opportunity viability are explored based on business procedure and standards 3. Entrepreneurial opportunities are evaluated as per business procedures and standards 4. Business ideas and opportunities are generated as per business procedures and standards 5. Business life cycle is analysed as per business procedures and standards |
| 1. Apply business legal aspects | 1. ***Forms of business ownership*** are identified as per legal procedures and practices 2. Business Registration and Licensing processes are identified as per legal procedures and practices 3. Types of Contracts and Agreements are analysed as per legal procedures and practices 4. Employment Laws are identified as per legal procedures and practices 5. Taxation laws are identified as per legal procedures and practices |
| 1. Innovate Business strategies | 1. Business innovation strategies are determined by the organization standards 2. Creativity in business development is demonstrated in accordance with business standards 3. ***Innovative business standards*** are developed as per business principles 4. Linkages with other entrepreneurs are created as per best practice 5. ICT is incorporated in business growth and development as per best practice |
| 1. Develop Business Plan | 1. Business idea is described as per business procedures and standards 2. Business description is developed as per business plan format 3. Marketing plan is developed as per business plan format 4. Organizational/Management plan is prepared in accordance with business plan format 5. Production/operation plan is prepared in accordance with business plan format 6. Financial plan is prepared in accordance with the business plan format 7. Executive summary is prepared in accordance with business plan format 8. Business plan is presented as per best practice 9. Business ideas are incubated as per institutional policy. |

**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. Sources of personal funds may include but not limited to: | * Salary/Wages * Investments * Savings * Inheritance * Government Benefits |
| 1. Sources of business finance may include but not limited to: | * Equity Financing * Debt Financing, * Personal Savings/Investment * Retained Earnings * Grants and Subsidies * Crowdfunding * supplier Credit: * Leasing and Asset Financing: |
| 1. Types of entrepreneurs may include but not limited to: | * Innovators * Imitators * Craft * Opportunistic * Speculators |
| 1. Characteristics of Entrepreneurs may include but not limited to: | * Creative * Innovative * Planner * Risk taker * Networker * Confident * Flexible * Persistent * Patient * Independent * Future oriented * Goal oriented |
| 1. Requirements for entry into self-employment may include but not limited to | * Technical skills * Management skills * Entrepreneurial skills * Resources * Infrastructure |
| 1. Forms of businesses ownership may include but not limited to: | * Sole proprietorship * Partnership * Limited companies * Cooperatives |
| 1. Innovative business standards may include but not limited to: | * New products * New methods of production * New markets * New sources of supplies * Change in industrialization |

**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
* Management
* Problem-solving
* Root-cause analysis
* Communication

Required Knowledge

The individual needs to demonstrate knowledge of:

* Decision making
* Business communication
* Change management
* Competition
* Risk
* Net working
* Time management
* Leadership
* Factors affecting entrepreneurship development
* Principles of Entrepreneurship
* Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
* Conflict resolution
* Health, safety and environment (HSE) principles and requirements
* Customer care standards
* Basic financial management
* Business strategic planning
* Impact of change on individuals, groups and industries
* Government and regulatory processes
* Local and international market trends
* Product promotion standards
* Market and feasibility studies
* Government and regulatory processes
* Local and international business environment
* Relevant developments in other industries
* Regional/ County business expansion standards

**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 Sources of personal and business finance as per financial procedures and standards 2. Managed Personal finances as per financial procedures and standards 3. Made Investment decisions as per financial procedures and standards 4. GeneratedBusiness ideas and opportunities based on business procedure and standards 5. Analysed business life cycle based on business procedure and standards 6. Determined business innovative standards as per business principles 7. Developed and presented a business plan as per regulatory framework. |
| 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 may be assessed through:   1. Written tests 2. Oral questions 3. Third party report 4. Interviews 5. Portfolio |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**COMMON UNITS**

# APPLY SOIL SCIENCE PRINCIPLES

**UNIT CODE: 0811 551 5A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to apply soil science principles. It includes competencies for performing soil sampling, analysis and improving soil fertility.

**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. Perform soil sampling | 1. ***Personal protective equipment*** is won as per work requirement 2. ***Soil sampling tools*** and ***soil testing equipment*** are assembled as per work requirement 3. Soil samples are obtained as per work procedure 4. Composite soil samples are prepared and recorded for analysis as per ***sampling procedures*** |
| 1. Perform soil analysis | * 1. Personal protective equipment are won as per work requirement   2. Soil analysis equipment and materials are assembled according to work requirement   3. Soil samples are processed based on test requirement   4. ***Soil properties*** are analysed in accordance to work requirement   5. Soil analysis report is prepared as per work procedure |
| 1. Improve soil fertility | * 1. Personal protective equipment is worn as per work requirement   2. Tools, equipment and materials are assembled according to work requirement   3. ***Fertilizers*** are prepared as per soil analysis report   4. ***Soil amendments*** are applied as per soil analysis report   5. ***Soil conservation measures*** are applied as per work requirement |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Soil sampling toolsincludes but not limited to: | * Hoes * Machetes * Secateurs * Shovels * Soil augur * Panga * Hammer * Saw * Bucket * Shears * Dibbler * Pegs |
| 1. Soil testing equipment includes but not limited to: | * Digestion block * Kjeldahl apparatus * UV-VIS Spectrophotometer * Atomic absorption spectrophotometer (AAS) * Flame photometer * pH meter * EC meter * TDS meter * Fume chamber * Measuring cylinders * Assorted glassware for routine laboratory procedures * Mechanical stirrer * Electric shaker * Eureka cans * Meteorological equipment |
| 1. Personal protective equipment includes but not limited to: | * Gloves * Safety goggles * Safety boots * Overalls * Dust coat * Earmuffs * Face masks |
| 1. Sampling procedures includes but not limited to: | * Field layout * Sample collection * Compositing * Packaging * Processing * Storage |
| 1. Soil propertiesincludes but not limited to: | * Soil texture * Soil aggregation * Soil consistency * Soil colour * Soil moisture * Soil air * Soil bulk density * Water holding capacity * Soil pH * Soil EC * Cation exchange capacity * Percent base saturation * Salt index * Microbial activity * CN ratio * Nutrients concentration |
| 1. Fertilizersinclude but not limited to: | * Organic fertilizers * Inorganic fertilizers |
| 1. Soilamendmentsinclude but not limited to: | * Fertilizers * Agricultural lime * Gypsum |
| 1. Soilconservationmeasuresinclude but not limited to: | * Cover cropping * Mulching * Strip cropping * Building of terraces * Minimum tillage * Contour ploughing |

**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
* Nutrients deficiency scouting
* Equipment calibration
* Technical Report writing
* Soil sampling
* Soil testing
* Plant tissue analysis
* Fertilizer recommendation
* Computation of lime requirement
* Observation
* Digital literacy

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Essential plant nutrients
* Soil-plant relationship
* Types of fertilizers and their nutrition content
* Fertilizer formulation and use
* Sources of soil acidity
* Management of soil acidity
* Types of tools and equipment used in soil sampling and soil testing
* Soil sampling and testing
* Soil degradation
* Soil conservation
* Standard operating procedures
* Accounting principles
* Waste Management
* Occupational Safety and Health Procedures

**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. Observed safety measures by using Personal Protective Equipment (PPE) and correct tools 2. Assemble soil sampling tools and soil testing equipment 3. Collected soil samples as per soil sampling procedures 4. Processed soil samples for laboratory analysis in accordance to work procedures 5. Analysed soil physical, chemical and biological properties in accordance to work procedures 6. Computed fertilizer application rates as per crop nutrient requirement 7. Computed lime requirement as per soil analysis report and agronomic requirement 8. Applied soil amendments as per soil analysis report 9. Applied soil conservation measures as per field conditions |
| 1. Resource Implications (required for assessment) | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place 2. Access to relevant workplace assessment environment 3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Written tests   3. Practical report   4. Oral questioning   5. interviews |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

# OPERATE FARM MACHINERY

# UNIT CODE: 0811 551 6A

**UNIT DESCRIPTION**

This unit specifies the competencies required by Agriculture and Extension practitioner to operate farm machinery**.** It involves operate hand tools and equipment, operate tillage machinery, operate planting machinery, operate crop protection machinery, operate harvesting machinery and operate agro-processing machinery.

**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. Operate hand tools and equipment | * 1. ***Hand tools*** and ***equipment*** are assembled as per work requirement   2. Hand tools and equipment are utilized as per work procedure   3. Hand tools and equipment are serviced as per work procedure   4. Hand tools and equipment are stored as per work procedure |
| 1. Operate tillage machinery | * 1. ***Personal protective equipment*** is worn as per safety procedures   2. ***Tillage machinery*** is operated as per work procedures   3. Tillage machinery is maintained as per work procedure   4. Tillage machinery is stored as per work procedure |
| 1. Operate planting machinery | * 1. Personal protective equipment is worn as per safety procedure   2. ***Planting machinery*** is calibrated as per work requirement   3. Planting machinery is operated as per work procedure   4. Planting machinery is maintained as per work procedure   5. Planting machinery is stored as per work procedure |
| 1. Operate crop protection machinery | * 1. ***Crop protection machinery*** calibrated as per work requirement   2. Crop protection machinery is operated as per work requirement   3. Crop protection machinery is maintained as per work procedure   4. Crop protection machinery is stored as per work requirement |
| 1. Operate harvesting machinery | * 1. Harvesting machinery is operated as per work procedures   2. Harvesting machinery is maintained as per work requirement   3. Harvesting machinery is stored as per work requirement |
| 1. Operate agro-processing machinery | * 1. ***Agro-processing machinery*** is operated as per work requirement   2. Agro-processing machinery is maintained and repaired as per work requirement   3. Agro-processing machinery is stored as per work requirement |

**RANGE**

|  |  |
| --- | --- |
| **Variable** | **Range** |
| * + - 1. PPEs include but not limited to: | * Eye protection equipment * Hearing protection equipment * Feet protection equipment * Respiratory protection equipment * Gloves * Full body suits |
| * + - 1. Hand tools and equipment include but not limited to: | * Garden tools and equipment * Workshop tools and equipment * Carpentry tools and equipment * Masonry tools and equipment * Livestock handling tools and equipment |
| * + - 1. Tillage machineryinclude but not limited to: | * Ploughs * Harrows * Tillers * Rotavators * Subsoilers |
| * + - 1. Planting machineryinclude but not limited to: | * Seed drills * Planters * Ridgers * Fertilizer distributors * Manure spreaders |
| * + - 1. Crop protection machineryinclude but not limited to: | * Sprayers * Dusters |
| * + - 1. Harvesting machineryinclude but not limited to: | * Balers * Mowers * Combined harvesters * Potato harvester * Threshers |
| * + - 1. Processing machineryinclude but not limited to: | * Mills * Grinders * Shellers * Dryers * Elevators conveyors |

**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:

* Identification
* Drawing
* Communication
* Demonstration
* Interpersonal
* Calculation
* Analytical
* Observation
* Problem solving
* First aid
* Innovation
  + - Creativity

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* + - Types and sources of farm power
    - Tractor engine
    - Tractor systems and their principles of operation
    - Power transmission in a tractor
    - Tractor components, controls and features and operational functions
    - Tractor steering systems and features
    - Attached equipment, features and operational functions and procedures
    - Operating principles and operating of farm machinery
    - Maintenance of tractors
    - Maintenance of farm tools, equipment and machinery

**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 | The evidence required to demonstrate competency in this unit must be relevant to workplace operations and satisfy holistically all of the requirements of the performance criteria and required skills and knowledge and include evidence of the following   * 1. Utilized hand tools and equipment   2. Serviced Hand tools and equipment   3. Operated Tillage machinery   4. Calibrated Planting machinery calibrated as per work requirement   5. Operated Planting machinery as per work procedure   6. calibrated Crop protection machinery as per work requirement   7. Operated Crop protection machinery as per work requirement   8. Operated Harvesting machinery as per work procedures   9. Wore Personal protective equipment per safety procedures   10. Operated Agro-processing machinery is as per work requirement |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:  3.1Observation   * 1. Written tests   2. Oral questioning   3. Interviewing |
| 1. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job roles is recommended. Attitude is assessed operation of farm power and machinery. |

# APPLIED RESEARCH

**UNIT CODE: 0111 551 7A**

**UNIT DESCRIPTION**

This unit specifies the competencies required by Agriculture and Extension practitioner to conduct scientific research**.** It involves preparing scientific research proposal, applying scientific research methods and analyzing scientific research finding.

**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 |
| 1. Prepare scientific research proposal | 1. Scientific research problem is identified based on existing research gap 2. Research objectives are developed according to research problem 3. Research questions are designed based on research objectives 4. Scientific research proposal is developed as per standard research procedures |
| 1. Apply scientific research methods | 1. ***Scientific study design*** is determined in accordance with research problem and research data 2. Sample size is determined based on the research methodology 3. ***Sampling techniques*** are determined in accordance with scope and research methodology 4. Ethical considerations are determined based on research methods utilized 5. Research materials are identified based on scope and research methodology 6. Data is collected in accordance with research methodology |
| 1. Analyze scientific research finding | 1. ***Data analysis methods*** are identified as per job requirement. 2. Data analysis is performed as per work procedure 3. Research report is prepared as per work procedure. |

**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. Scientific study design includes but not limited    to: | * Qualitative designs * Quantitative designs |
| 1. Sampling techniques include but not limited to: | * Probability   + Non-probability |
| 1. Data analytical methods include but not limited to: | * ANOVA * Measures of central tendency * Measures of dispersal |

**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
* Communication
* Computer
* Creativity
* Interpersonal
* Critical thinking
* Data collection
* Decision making
* Dissemination
* Observation
* Problem solving
* Report writing
* Statistical

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Introduction to research
* Problem identification
* Types of research
* Purposes of research
* Basic terms in research
* Problem identification
* Literature review
* Research design
* Data collection and analysis
* Research materials
* Statistics
* Mathematics
* Research proposal
* Research report

**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 scientific research problem based on existing research gap 2. Developed scientific research proposal as per work requirement. 3. DeterminedScientific study design in accordance with research problem and research data 4. Collected data in accordance with research methodology 5. Applied data analysis techniques as per work requirement Compiled Research report as per work requirement |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place 2. Access to relevant workplace assessment environment 3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   1. Practical Assessment 2. Project-Based Assessment 3. Portfolio of Evidence 4. Third Party Reports 5. Written Assessment |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# UTILIZE WATER IN THE FARM

**UNIT CODE : 0811 551 8A**

**UNIT DESCRIPTION**

This unit specifies the competencies required by Agriculture and Extension practitioner to utilize water in the farm. It involves select sustainable water supply, Harvest water in the farm, irrigate crop farm and continuously improve utilization of water.

**ELEMENTSANDPERFORMANCECRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCECRITERIA**  These are **assessable s**tatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Select sustainable water supply | * 1. ***Water sources*** are identified as per work requirement.   2. ***Water testing*** is carried out as per work procedures   3. Water treatment is as carried out as per work procedure. |
| 1. Harvest water in the farm | * 1. ***Water harvesting structure*** identification is carried out as per work requirement   2. water harvesting structure design is drawn as per work requirement   3. ***Personal Protective* *Equipment*** is worn as per work requirement   4. Water harvesting structure is constructed as per design   5. water harvesting structure functionality is tested as per work requirement   6. water harvesting structure faults are corrected as per work requirement   7. Water harvesting structure is utilized as per work requirement |
| 1. Irrigate crop farm | * 1. crop water requirement grown is established as per work requirement   2. ***Irrigation system*** is selected as per work requirement   3. Irrigation system is designed as per work requirement   4. ***Tools and equipment*** are assembled and are used as per work.   5. Irrigation system is installed as per work requirement   6. Irrigation system is maintained as per work requirement |
| 1. Improve utilization of water | * 1. Repairs of faults are carried out as per work requirement   2. ***Erosion and pollution control measures*** are put in place as per work requirement.   3. Regulations governing water use and managementare complied with as per work requirement.   4. Improved technologies that use less water are adopted in the farm as per work requirement |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| * + - 1. Tools and equipment include but not limited to : | * Tools for designing * Tools and equipment for construction * Tools and equipment for repair and maintenance |
| * + - 1. Components of irrigation system include but not limited to: | * Pipes * Emitters * Pump * Tanks * Nozzles * Valves * Control unit * Wiring |
| * + - 1. Erosion and pollution control measures Include but not limited to: | * Walk-over techniques * Minimal disturbance techniques * Crown and cross fall drainage * Cross bank drainage * Relief culverts on roads * Mitre and table drains on roads * Armouring/gravelling of roads * Crossing and draining surfaces * Batter stabilisation * Contour banks and channels * Gabions * Sediment basins * Riparian buffer zones * Outlet protection structures * Re-vegetation |

**REQUIRED KNOWLEDGE AND SKILLS**

**Required skills**

The individual needs to demonstrate the following skills:

* **Literacy skills to**: Locate, read, interpret and convey information in written, diagrammatic and/or verbal form
* **Numeracy skills to** measure calculate and estimate material quantities and time required to complete a task
* **Problem-solving skills:** Identify problems and equipment faults and demonstrate appropriate response procedures.

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Environmental protection requirements, including the safe disposal of products and waste material
* Organizational and site standards, requirements, policies and procedures relevant to environmental care
* Environmental policies and practices, risks and hazard identification relevant to water protection
* Established communication channels and protocols
* Problem identification and common faults-finding techniques
* Types of tools and equipment and procedures for their safe use and maintenance
* Mathematical procedures for measuring and estimating, including calculating quantities and time to complete tasks

**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. Selected sustainable water supply technologies for the farm   2. Designed water harvesting and storage structures   3. Supervised construction of water harvesting and storage structure.   4. Designed an irrigation system   5. Maintained irrigation system   6. Used tools and equipment appropriately   7. Drew designs appropriately   8. Calculated elevations correctly   9. Measured distances correctly.   10. Observed environmental and economic implications in designing |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Written tests   3. Oral questioning   4. Interviewing |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace   4.2 Simulated work environment. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job roles is recommended. Attitude is assessed alongside application of water smart technologies. |

# 

# APPLY INORGANIC AND ORGANIC CHEMISTRY PRINCIPLES

**UNIT CODE: 0531 551 9A**

**UNIT DESCRIPTION**

This unit specifies the competencies required by agriculture and extension practitioner to apply inorganic and organic chemistry. It involves applying physical chemistry principles, inorganic and organic chemistry concepts.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCECRITERIA**  These are **assessable s**tatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| * + - 1. Apply physical chemistry principles | 1. Acid and bases properties are applied as per acid-base theory. 2. Salts properties are applied as per salt solubility rules 3. Ionic and chemical equilibrium properties are applied as per physical chemistry theory. 4. Reaction kinetics properties are applied as per physical chemistry theory. 5. Gas properties are applied as per kinetic theory of gases. |
| 1. Apply inorganic chemistry concepts | * 1. Knowledge of element is applied as per the periodic table.   2. ***Chemical bonds*** are determined according to Valence Shell Electron Pair Repulsion (VSEPR) theory.   3. Inorganic salts are tested as per solubility rules |
| 1. Apply organic chemistry concepts | * 1. ***Organic compounds classes*** are used according to International Union of Pure and Applied Chemistry (IUPAC) rules.   2. ***Physical properties*** of organic compounds are applied as per IUPAC rules.   3. ***Chemical properties*** organic compounds are applied as per IUPAC rules.   4. Synthesized compounds are purified as per organic laboratory manual   5. Purified compounds are used as per organic laboratory manual |

**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. Chemical bonds may include but are not limited to: | * Ionic bonds * Covalent bonds * Metallic bonds * Hydrogen bonds |
| 2. Organic compounds classes may include but are not limited to: | * Carbohydrates * Proteins * Lipids * Hydrocarbons |
| 3.Physical properties may include but are not limited to: | * Colour * Hardness * Mass * Solubility * Density * Melting point |
| 4.Chemical properties may include but are not limited to: | * pH * Chemical stability * Radioactivity * Flammability * Heat of combustion |

**REQUIRED KNOWLEDGE AND SKILLS**

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

Required knowledge

The individual needs to demonstrate knowledge of:

* Periodic table
* Hydrocarbons
* Chemical reaction
* Laboratory safety
* Laboratory apparatus
* Laboratory rules and regulation

**Required skills**

The individual needs to demonstrate the following skills:

* Observation
* Analytical
* Critical thinking
* Writing
* Active listening
* Problem solving

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Applied acid and bases properties as per acid-base theory.   2. Applied salts properties as per salt solubility rules   3. Applied Ionic and chemical equilibrium properties as per physical chemistry theory.   4. Applied reaction kinetics properties as per physical chemistry theory.   5. Applied gas properties as per kinetic theory of gases.   6. Tested inorganic salts as per solubility rules   7. Applied physical properties of organic compounds as per IUPAC rules.   8. Applied chemical properties organic compounds as per IUPAC rules.   9. Used purified compounds as per organic laboratory manual |
| 1. Resource implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place 2. Access to relevant work environment 3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical 2. Oral questioning 3. Portfolio of evidence 4. Third party report 5. Written tests |
| 1. Context of assessment | Competency may be assessed:   1. Workplace   4.2 Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# 

# APPLY FARM MANAGEMENT PRINCIPLES

**UNIT CODE : 0811 551 10A**

**UNIT DESCRIPTION**

This unit specifies competencies required to apply farm management principles**.** It involves Applying Farm Planning techniques, controlling farm operations, manage farm resources and Organize farm operations

**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. Apply farm Planning techniques | 1. Agriculture enterprise goals and objectives established as per workplace procedures 2. ***Agriculture farm organization plans*** are established as per work requirement   1.3 agriculture farm goals ***resources*** are identified as per workplace requirements |
| 1. Control farm operations | 1. Employees Motivation is performed as per operational plan 2. ***Leadership styles*** are applied as per workplace requirements 3. Farm plan evaluation and adjustments are conducted as per type of plan 4. Employees Capacity building is performed as per workplace procedures 5. ***Performance appraisals*** are conducted as per workplace procedures 6. ***Resource adjustments*** is performed as per workplace procedures |
| 1. Manage farm resources | 1. Corporate social responsibilities and cultural opportunities Assessment is conducted as per workplace procedures 2. Farm enterprise Costs and pricing is carried out as per cost-budget analysis 3. Quality control and customer service is conducted as per workplace procedures 4. Farm resource allocation is conducted as per workplace procedures |
| 1. Organize farm operations | 1. Resources distribution is performed as per workplace procedures Achieve established goals as per workplace procedures 2. Livestock farm enterprise is budgeted as per workplace procedures 3. ***Staffing of workers*** in the livestock farm is executed as per workplace procedures |

**RANGE OF VARIABLES**

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. Organization plans may include but not limited to: | * Strategic plan * Tactical plan * Operational plan   + Working plan |
| 1. Resources may include but not limited to: | * + Human   + Financial   + Agricultural machines   + Agricultural inputs |
| 1. Leadership styles may include but not limited to: | * + Authoritarian Leadership   + Democratic Leadership   + Transformational Leadership   + Laissez-Faire Leadership |
| 1. Performance appraisals may include but not limited to: | * + Straight ranking appraisals   + Grading   + 1 by objective appraisals   + Behavior-based appraisal   + Performance appraisal |
| 1. Resource adjustments may include but not limited to: | * + Budget   + Staff |
| 1. Staffing of workers may include but not limited to: | * + Advertisement of vacant   + Shortlisting   + Interview   + Recruitment   + Training   + Motivation |

**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 knowledge:

* Strategic planning
* Monitoring and evaluation
* Business management function
* Human resources management
* Sales and Marketing
* Basic accounting
* Critical thinking
* Leadership skills

**Required s knowledge**

The individual needs to demonstrate the following skills:

* Basic numeracy
* Record Keeping
* Report writing
* Basic accounting

**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 assessment of corporate social responsibilities and cultural opportunities as per work place procedure   2. Conducted quality control and customer service as per work place procedure   3. Conducted Performance appraisals as per work place procedure   4. Performed Resource adjustmentsas per work place procedure |
| 1. Resource   implication | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Method of   assessment | Competency in this unit may be assessed through:   * 1. Written tests   2. Oral questioning   3. Third party reports |
| 1. Context of   assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# APPLY GENETICS CONCEPTS

**UNIT CODE: 0811 551 11A**

**UNIT DESCRIPTION**

This unit covers describes knowledge, skills and attitudes required to apply genetic concepts. It involves applying Mendelian and chromosomal theories in theory in agricultural production it also involves illustrating genetic mutations in agricultural production.

**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. Apply chromosomal theory | * 1. Chromosome structure is identified and illustrated based on genetic principles   2. DNA structure is identified and illustrated based on genetic principles   3. Role of DNA is illustrated based on genetic principles   4. ***Cell division stages*** are identified and illustrated based on genetic principles |
| 1. Apply Mendelian theory | * 1. Concept of variation is applied in breeding based on genetic principles   2. Monohybrid inheritance is identified and illustrated based on genetic principles   3. Dihybrid inheritance is identified and illustrated based on genetic principles   4. Complete dominance is identified and illustrated based on genetic principles   5. Co-dominance is identified and illustrated based on genetic principles   6. Incomplete dominance is identified and illustrated based on genetic principles   7. Phenotypes and genotypes are illustrated based on genetic principles   8. Phenotypic and genotypic frequencies are illustrated based on genetic principles |
| 1. Apply genetic mutation | 1. ***Causes of mutations*** are identified based on genetic principles 2. ***Types of mutation*** are identified and illustrated based 3. ***Mutational disorders*** are identified and illustrated based on genetic principles |

**RANGE OF VARIABLES**

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. Cell division stages may include but not limited to: | * + Interphase   + Prophase   + Metaphase   + Anaphase   + Telophase |
| 1. Causes of mutations may include but not limited to: | * Radioactive rays * Chemicals * Infectious agents |
| 1. Types of mutation may include but not limited to: | * Chromosomal mutation * Gene mutation |
| 1. Mutational disorders may include but not limited to: | * Hypotrichosis * Beta-man * Osteoporosis * Pulmonary hypoplasia |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate the following skills:

* Inheritance and variation
* Chromosome structures
* Structure of DNA
* Role of DNA
* Causes of mutation
* Cell division
* Types of mutation
* Mutational disorders

**Required skills**

The individual needs to demonstrate knowledge of:

* Critical thinking
* Logical thinking
* Problem Solving
* Drawing
* Interpretation
* Application
* Communication

**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:  Concept of variation is applied in animal breeding based on genetic principles  1.1 Identified and illustrated Monohybrid inheritance  1.2Identified and illustrated Dihybrid inheritance  1.3 Identified and illustrated Complete dominance  1.4 Identified and illustrated Co-dominance  1.5 Identified and illustrated Incomplete dominance  1.6 Identified and illustrated Chromosome structure  1.7 Identified and illustrated DNA structure  1.8 Role of DNA is illustrated based on genetic principles  1.9 Identified and illustrated Cell division  1.10Identified Causes of mutations  1.11Types of mutation are identified and illustrated  1.12 Identified and illustrated Mutational disorders |
| 1. Resource   implication | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Method of   assessment | Competency in this unit may be assessed through:   * 1. Practical   2. Written tests   3. Questionnaires   4. Oral questioning |
| 1. Context of   assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# APPLY ANIMAL ANATOMY AND PHYSIOLOGY

**UNIT CODE : 0811 551 12A**

**UNIT DESCRIPTION**

This unit describes knowledge, skills and attitudes required to apply animal anatomy and physiology. It involves carrying out animal classification, applying morphology and physiology in animal production

**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. Classify farm animals | 1.1 ***Mammals*** are classified based on taxonomic principles of classification  1.2 ***Aves*** are classified based on taxonomic principles of classification   * 1. ***Pisces*** are classified based on taxonomic principles of classification   2. ***Reptiles*** are classified based on taxonomic principles of classification   3. ***Amphibians*** are classified based on taxonomic principles of classification   4. ***Arthropods*** are classified based on taxonomic principles of classification |
| 1. Apply morphology in animal production | 2.1 External features of animals are identified and illustrated based on animal classification  2.2 ***Animal anatomical structures***are identified and illustrated based on animal classification  2.3 Relationship between animal structures is illustrated based on physiological functions |
| 1. Apply animal physiological functions | 3.1  ***Animal organ systems*** are identified and illustrated based on animal morphology  3.2 ***Animal physiological processes*** are identified and illustrated based on animal morphology  3.3 Adaptations of ***Animal body organs*** are identified and illustrated based on animal morphology |

**RANGE OF VARIABLES**

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. Mammals may include but not limited to: | * Cattle * Rabbits * Sheep * Goats * Donkeys * Camel |
| 1. Aves may include but not limited to: | * Chicken * Ducks * Guinea fowl * Geese * Turkey |
| 1. Pisces may include but not limited to: | * Tilapia * Nile perch * Cat fish * Mudfish * Salmon fish |
| 1. Reptiles may include but not limited to: | * Crocodile * Turtles * Lizards * Tortoise * Snake |
| 1. Amphibians may include but not limited to: | * Frogs * Toad * Newts * Salamander |
| 1. Arthropods may include but not limited to: | * + Tick   + Spider   + Obsters,   + Crabs   + Mites   + Centipedes   + Millipedes |
| 1. Animal anatomical structures may include but not limited to: | * + Vertebral column   + Skull   + Rib   + Forelimb   + Hind limb   + Pectoral girdle   + Pelvic girdle |
| 1. Animal organ systems may include but not limited to: | * + Circulatory system   + Digestive system   + Reproductive system   + Respiratory system   + Excretory system   + Nervous system   + Lymphatic system   + Cardiovascular system   + Musculoskeletal system |
| 1. Animal physiological processes may include but not limited to: | * + Respiration   + Thermoregulation   + Osmoregulation |
| 1. Animal body organs may include but not limited to: | * + Heart   + Lungs   + Kidney   + Skin   + Liver   + Pancreas |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate the following knowledge:

* Animal anatomy and morphology
* Animal physiological functions
* Animal classification

**Required Skills**

The individual needs to demonstrate the following skills:

* Drawing
* Decision Making
* Critical thinking
* Communication
* Organizational
* Assertiveness
* Responsibility

**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. Classified animals   2. Identified and illustrated animal anatomy   3. Identified and illustrated animal organ systems   4. Identified and illustrated animal physiological processes   5. Illustrated how body organs are adapted to perform physiological processes |
| 1. Resource   implication | 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   3. Material relevant to the proposed assessment activities or tasks |
| 1. Method of   assessment | Competency in this unit may be assessed through:   * 1. Projects   2. Written tests   3. Questionnaires   4. Oral questioning |
| 1. Context of   assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**CORE UNITS**

# PRODUCE RUMINANT ANIMALS

**UNIT CODE: 0811 551 13A**

**UNIT DESCRIPTION**

This unit specifies competencies required to produce ruminant animals. It entails breeding ruminant animals, feeding ruminant animals, managing ruminant animal parasites and diseases , carrying out ruminant animals routine management practices and managing ruminant products .

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCECRITERIA**  These are **assessable s**tatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Breed Ruminant animal | * 1. ***Breeding tools*** and ***equipment*** are assembled as per work requirement   2. Breeding stock is selectedas per work procedure   3. Service of breeding Stock is carried outas per work procedure   4. Breeding record is prepared as per work procedure |
| 1. Feed Ruminant animals | * 1. Ruminant ***animal feeds*** are identified as per animal nutritional requirement   2. Ruminantfeed ration is formulated as per animal feeding standard manual   3. Feed quantity is determined as per animal nutritional requirement   4. Feeding record is prepared as per work procedure |
| 1. Manage Ruminant parasites | * 1. Parasite prevention and control schedule is developed as per work requirement   2. ***PPEs*** are worn as per work requirement   3. Materials and equipment for parasite control are assembled as per work requirement   4. ***Parasites control method*** is applied based on type of parasite being controlled   5. Parasite control record is prepared as per work procedure   6. Parasite control wastes are managed as per work procedure |
| 1. Manage ruminant diseases | * 1. Disease prevention and control schedule is developed as per work requirement   2. PPEs are worn as per work requirement   3. Materials and equipment for disease control are assembled as per work requirement   4. **Disease** ***control method*** is applied as per work requirement   5. Health record is prepared as per work procedure   6. Disease control wastes are managed as per work procedure |
| 1. Carry out ruminant routine management practices | * 1. ***Routine management practice*** schedule is prepared as per work requirement   2. PPE***s*** are worn as per work requirement   3. Materials and equipment are assembled as per work requirement   4. Ruminantroutine management procedure is performed as per work requirement   5. ***Routine management practice record*** are prepared as per work requirement |
| 1. Market ruminant products | * 1. ***Ruminant products*** areprocessed as per product requirement   2. Ruminant products are preserved as per product requirement   3. Ruminants products are distributed as per product requirement   4. Records are prepared as per work procedures |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Breeding tools and equipment include but not limited to | * Animal pregnancy testing kit * Hormone testing kit * Semen collection kit * Ovulation prediction monitors |
| 1. Animal feeds include but not limited to | * Concentrates * Forage * Pastures |
| 1. PPEs include but not limited to | * Gloves * Overalls * Gumboots * Head gear * Face mask |
| 1. Parasites control method | * Deworming * Spraying * Dipping |
| 1. Disease control method | * Vaccination * Quarantine * Vector control * Adequate production |
| 1. Routine management practice | * Identification * Milking * Dehorning * Disbudding * Hoof trimming * Docking * Removal of extra teats * Shearing * Castration |
| 1. Routine management practice record | * Breeding records * Production records * Feeding records * Health records |
| 1. Ruminant products include but not limited to: | * Milk * Meat * Mutton * Wool * Skins * Hides |

**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:

* Handling tools and equipment
* Animal handling
* Communication skills
* Digital skills
* Occupational health and safety

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Genetics
* Anatomy and physiology
* Basic patholog**y**

**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. Selected breeding stock as per work procedure 2. Identified ruminant animal feeds as per animal nutritional requirement 3. Formulated ruminant feed ration as per animal feeding standard manual 4. Determined feed quantity as per animal nutritional requirement 5. Applied parasites control method based on type of parasite being controlled 6. Applied disease control method as per work requirement 7. Performed ruminant routine management procedure as per work requirement 8. Ruminant products are preserved as per product requirement 9. Records are prepared as per work procedures |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Written tests   2. Practical tests   3. Observation   4. Oral questioning   5. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job roles is recommended. |

# 

# PRODUCE NON-RUMINANT ANIMALS

**UNIT CODE: 0811 551 14A**

**UNIT DESCRIPTION**

This unit specifies competencies required to produce non-ruminant animals . It comprises of breeding and feeding Non ruminant animals, managing parasites and diseases, carrying out routine management practices in Non ruminant animals and marketing Non ruminant animal products.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCECRITERIA**  These are **assessable s**tatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Breed Non ruminant animal | * 1. ***Breeding tools*** and ***equipment*** are assembled as per work requirement   2. Breeding stock is selectedas per work procedure   3. Service of breeding Stock is carried outas per work procedure   4. Breeding record is prepared as per work procedure |
| 1. Feed Non ruminant animals | * 1. Ruminant ***animal feeds*** are identified as per animal nutritional requirement   2. Ruminantfeed ration is formulated as per animal feeding standard manual   3. Feed quantity is determined as per animal nutritional requirement   4. Feeding record is prepared as per work procedure |
| 1. Manage Non ruminant parasites | * 1. Parasite prevention and control schedule is developed as per work requirement   2. ***PPEs*** are worn as per work requirement   3. Materials and equipment for parasite control are assembled as per work requirement   4. ***Parasites control method*** is applied based on type of parasite being controlled   5. Parasite control record is prepared as per work procedure   6. Parasite control wastes are managed as per work procedure |
| 1. Manage Non ruminant diseases | * 1. Disease prevention and control schedule is developed as per work requirement   2. PPEs are worn as per work requirement   3. Materials and equipment for disease control are assembled as per work requirement   4. **Disease** ***control method*** is applied as per work requirement   5. Health record is prepared as per work procedure   6. Disease control wastes are managed as per work procedure |
| 1. Carry out Non ruminant routine management practices | * 1. ***Routine management practice*** schedule is prepared as per work requirement   2. PPE***s*** are worn as per work requirement   3. Materials and equipment are assembled as per work requirement   4. Non ruminantroutine management procedure is performed as per work requirement   5. ***Routine management practice record*** are prepared as per work requirement |
| 1. Market Non ruminant products | * 1. Non-ruminant products areprocessed as per product requirement   2. Non-ruminant products are preserved as per product requirement   3. Non-ruminant products are distributed as per product requirement   4. Records are prepared as per work 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.

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Breeding tools and equipment include but not limited to | * Animal pregnancy testing kit * Hormone testing kit * Semen collect * ion kit * Ovulation prediction monitors |
| 1. Animal feeds include but not limited to | * Concentrates * Forage * Pastures |
| 1. PPEs include but not limited to | * Gloves * Overalls * Gumboots * Head gear * Face mask |
| 1. Parasites control method | * Deworming * Spraying * fumigation |
| 1. Disease control method | * Vaccination * Quarantine * Vector control |
| 1. Routine management practice | * Identification * Castration * Teeth clipping * Debeaking * Tail clipping * Sexing * Iron injection |
| 1. Routine management practice record | * Breeding records * Production records * Feeding records * Health records |

**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:

* Handling tools and equipment
* Animal handling
* Communication skills
* Digital skills
* Occupational health and safety
* Problem solving
* Marketing skills
* Financial management skills

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Genetics
* Anatomy and physiology
* Basic patholog**y**

**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. Selected breeding stock as per work procedure 2. Identified Non-ruminant animal feeds as per animal nutritional requirement 3. Formulated Non-ruminant feed ration as per animal feeding standard manual 4. Determined feed quantity as per animal nutritional requirement 5. Applied parasites control method based on type of parasite being controlled 6. Applied disease control method as per work requirement 7. Performed Non-ruminant routine management procedure as per work requirement 8. Non-ruminant products are preserved as per product requirement 9. Records are prepared as per work procedures |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Written tests   2. Practical tests   3. Observation   4. Oral questioning   5. Portfolio of evidence   6. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job roles is recommended. |

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# PRODUCE ANNUAL CROPS

**UNIT CODE:**  **0811 551 15A**

**UNIT DESCRIPTION**

This unit specifies competencies required to produce annual crops. It involves preparing land, establishing and managing selected annual crops. It also involves harvesting and storage as well as processing and marketing of the selected annual crops

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCECRITERIA**  These are **assessable s**tatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Prepare planting materials | * 1. ***Personal protective equipment*** is donned as per work requirement   2. Tools and equipment are assembled as per work requirement   3. ***Planting materials*** are obtained as per crop requirement |
| 1. Prepare crop seedbed | * 1. Personal protective equipmentis donned as per work requirement   2. ***Land preparation tools*** and ***equipmen***t are assembled as per work requirement   3. Land is cleared as per agronomic requirements   4. ***Tillage operations*** are carried out as per agronomic requirements   5. ***Soil conservation measures*** are applied as per work procedure   6. Recordsare prepared as per work procedure |
| 1. Plant Annual crops | * 1. Personal protective equipment is donned as per work requirement   2. ***Farm inputs*** are assembled as per work requirement   3. Annual crop is established as per crop requirements   4. Recordsare prepared as per work procedure |
| 1. Manage Annual crops | * 1. Personal protective equipmentis donned as per work requirement   2. Farm inputsare assembled as per work requirement   3. ***Field management practice*** is carried out as per crop agronomic requirements   4. Recordsare prepared as per work procedure |
| 1. Harvest Annual crops | * 1. Personal protectiveequipmentis donned as per work requirement   2. ***Harvesting tools*** and ***equipmen***t are assembled as per work requirement   3. Maturity indices are applied in determining crop maturity as per market demand   4. ***Harvesting method*** is applied as per crop requirement   5. Recordsare prepared as per work procedure |
| 1. Process annual crop products | * 1. Personal protective equipmentis donned as per work requirement   2. ***Processing tools, equipment*** and ***machines*** are assembled as per work requirement   3. Processing of annual crop is carried out as per work procedure   4. Products are marketed as per workplace procedure   5. ***Records*** are prepared as per work procedure |

**RANGE**

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

|  |  |
| --- | --- |
| 1. Personal protective equipment includes but not limited to: | * Overall or over coat * Gumboots * Gloves * Head gear * Face mask |
| 1. Landpreparationtools and equipmentincludes but not limited to: | * + **Tools** * Land clearing tools/equipment/machinery * Axes * Panga * Rake * Slasher * Tillage tools/equipment/machinery * Fork jembe * Harrows * Hoe * Tractor   + **Equipment** * Mower * Rotavator * Wheelbarrow * Ridgers * Moulboard plough * Disc plough * Disc harrow |
| 1. Planting materialsincludes but not limited to: | * Seeds and seedlings * Splits * Crowns * Slips, cuttings and sucker |
| 1. Tillage operations include but not limited to; | * Primary cultivation * Secondary cultivation * Tertiary operations |
| 1. Soil conservation measuresinclude but not limited to***;*** | * Contour planting * Terraces * Gabbions * Mulching * Cover cropping * Minimum tillage * Crop rotation * Intercropping |
| 1. Farm inputs includes but not limited to; | * Fertilizers * Seeds * Vegetative propagation materials * manures |
| 1. Field management practicesinclude but are not limited to: | * Watering * Mulching * Gapping * Thinning * Crop protection from weeds, pests and diseases * Training * Fertilizer application * Pruning |
| 1. Harvesting tools and equipment include but not limited to; | * Sickle * Axe * Harrow * Chopper |
| 1. Harvesting methodsinclude but not limited to; | * Hand picking * Use of tools * Use of machinery |
| 1. Annual crops include but not limited to: | * wheat * Rice * Maize * Millet * Sorghum * Beans * Soya * Beans * Pigeon peas * Sunflower * Cotton * Tobacco * Sweet potatoes * Cassava |
| 1. Recordsinclude but not limited to; | * Inventory records * Financial records * Yield and production records * Payroll and labour records * Farm input utilization record |
| 1. Processing tools and equipmentinclude but not limited to; | * Blender * Motar and pestle * Weighing scale * Knives/cutting materials * Weighing cup * Bowl choppers * bandsaws * slicers * Marinating vacuum tumblers * Peelers |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required skills**

The individual needs to demonstrate the following skills:

* + - * Tilling
      * Tools and equipment classification
      * Measuring
      * Leveling
      * Gaping
      * Pruning
      * Spraying
      * Pests , diseases and nutrients deficiency scouting
      * Equipment calibration
      * Technical Report writing
      * Produce handling
      * Soil conservation
      * Observation
      * Negotiation
      * Digital literacy

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Sources of quality water
* Agro- Ecological Zonation
* Farm establishment and management
* Types of annual crops and physiology of different annual crops
* Types of tools and equipment used in production of annual crops
* Soil fertility and soil conservation
* Phyto-sanitary requirements
* Good Agricultural Practices
* Sources of quality planting materials for annual crops
* Husbandry practices in annual crops production
* Maturity indices in annual crops
* Harvesting and Post Harvesting Handling of annual crops
* Accounting principles, farm records and reports
* Waste Management
* Occupational Safety and Health Procedures

**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. Donned Personal Protective Equipment (PPE ) as per work requirement   2. ***Planting materials*** was obtained as per crop requirement   3. Carried out ***tillage operations*** as per agronomic requirements   4. ***Soil conservation measures*** was applied as per work procedure   5. Annual crop was established as per crop requirements   6. ***Field management practice*** was carried out as per crop agronomic requirements   7. ***Harvesting tools*** and ***equipmen***t was assembled as per work requirement   8. Maturity index was applied in determining crop maturity as per market demand   9. ***Harvesting method*** was applied as per crop requirement   10. ***Processing tools, equipment*** and ***machines*** was assembled as per work requirement   11. 6.3 Processing of annual crop was carried out as per work procedure   12. 6.4 Product was marketed as per workplace procedure   13. ***Record*** was prepared as per work procedure |
| 1. Resource Implications (required for assessment ) | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Practical assessment   3. Written tests   4. Oral questioning   5. Demonstration   6. Questionnaires   7. Projects   8. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE PERENNIAL CROPS

**UNIT CODE:**  **0811 551 16A**

**UNIT DESCRIPTION**

This unit specifies competencies required to produce perennial crops. It involves preparing land, establishing and managing selected perennial crops. It also involves harvesting and storage as well as processing and marketing of the selected perennial crops

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCECRITERIA**  These are **assessable s**tatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Prepare planting materials | * 1. ***Personal protective equipment*** is donned as per work requirement   2. Tools and equipment are assembled as per work requirement   3. ***Planting materials*** are obtained as per crop requirement |
| 1. Prepare crop seedbed | * 1. Personal protective equipmentis donned as per work requirement   2. ***Land preparation tools*** and ***equipmen***t are assembled as per work requirement   3. Land is cleared as per agronomic requirements   4. ***Tillage operations*** are carried out as per agronomic requirements   5. ***Soil conservation measures*** are applied as per work procedure   6. Recordsare prepared as per work procedure |
| 1. Plant Perennial crops | * 1. Personal protective equipment is donned as per work requirement   2. ***Farm inputs*** are assembled as per work requirement   3. Perennial crop is established as per crop requirements   4. Recordsare prepared as per work procedure |
| 1. Manage Perennial crops | * 1. Personal protective equipmentis donned as per work requirement   2. Farm inputsare assembled as per work requirement   3. ***Field management practice*** is carried out as per crop agronomic requirements   4. Recordsare prepared as per work procedure |
| 1. Harvest Perennial crops | * 1. Personal protectiveequipmentis donned as per work requirement   2. ***Harvesting tools*** and ***equipmen***t are assembled as per work requirement   3. Maturity indices are applied in determining crop maturity as per market demand   4. ***Harvesting method*** is applied as per crop requirement   5. Recordsare prepared as per work procedure |
| 1. Process perennial crop products | * 1. Personal protective equipmentis donned as per work requirement   2. ***Processing tools, equipment*** and ***machines*** are assembled as per work requirement   3. Processing of perennial crop is carried out as per work procedure   4. Products are marketed as per workplace procedure   5. ***Records*** are prepared as per work procedure |

**RANGE**

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

|  |  |
| --- | --- |
| 1. Personal protective equipment includes but not limited to: | * Overall or over coat * Gumboots * Gloves * Head gear * Face mask |
| 1. Landpreparation toolsand equipmentincludes but not limited to: | **Tools**   * Land clearing tools/equipment/machinery * Axes * Panga * Rake * Slasher * Tillage tools/equipment/machinery * Fork jembe * Harrows * Hoe * Tractor   **Equipment**   * Mower * Rotavator * Wheelbarrow * Ridgers * Moulboard plough * Disc plough * Disc harrow |
| 1. Plantingmaterialsincludes but not limited to: | * + Seeds and seedlings   + Splits   + Crowns   + Slips, cuttings and sucker |
| 1. Tillageoperations include but not limited to; | * + Primary cultivation   + Secondary cultivation   + Tertiary operations |
| 1. Soilconservationmeasuresinclude but not limited to***;*** | * + Contour planting   + Terraces   + Gabbions   + Mulching   + Cover cropping   + Minimum tillage   + Crop rotation   + Intercropping |
| 1. Farm inputs includes but not limited to***;*** | * + Fertilizers   + Seeds   + Vegetative propagation materials   + Manures |
| 1. Fieldmanagementpracticesinclude but are not limited to: | * + Watering   + Mulching   + Gapping   + Thinning   + Crop protection from weeds, pests and diseases   + Training   + Fertilizer application   + Pruning |
| 1. Harvesting tools and equipment include but not limited to; | * + Sickle   + Axe   + Harrow   + Chopper |
| 1. Harvesting methodsinclude but not limited to; | * + Hand picking   + Use of tools   + Use of machinery |
| 1. Perennial crops include but not limited to: | * + Sugarcane   + Coconut   + Coffee   + Palm tree   + Sisal   + Tea   + Macadamia |
| 1. Records include but not limited to; | * + Inventory records   + Financial records   + Yield and production records   + Payroll and labour records   + Farm input utilization record |
| 1. Processingtoolsand equipmentinclude but not limited to; | * + Blender   + Motar and pestle   + Weighing scale   + Knives/cutting materials   + Weighing cup   + Bowl choppers   + bandsaws   + slicers   + Marinating vacuum tumblers   + Peelers |
| 1. Processingmachinesinclude but not limited to; | * Hulling * Millers * Grinding machine * Dryers * Blenders |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required skills**

The individual needs to demonstrate the following skills:

* Tilling
* Tools and equipment classification
* Measuring
* Leveling
* Gaping
* Pruning
* Spraying
* Pests, diseases and nutrients deficiency scouting
* Equipment calibration
* Technical Report writing
* Produce handling
* Soil conservation
* Observation
* Negotiation
* Digital literacy

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Sources of quality water
* Agro- Ecological Zonation
* Farm establishment and management
* Types of annual crops and physiology of different annual crops
* Types of tools and equipment used in production of annual crops
* Soil fertility and soil conservation
* Phyto-sanitary requirements
* Good Agricultural Practices
* Sources of quality planting materials for annual crops
* Husbandry practices in annual crops production
* Maturity indices in annual crops
* Harvesting and Post Harvesting Handling of annual crops
* Accounting principles, farm records and reports
* Waste Management
* Occupational Safety and Health Procedures

**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. Donned Personal Protective Equipment (PPE ) as per work requirement   2. Planting materials was obtained as per crop requirement   3. Carried outtillage operations as per agronomic requirements   4. Soil conservation measureswas applied as per work procedure   5. Annual crop was established as per crop requirements   6. Field management practice was carried out as per crop agronomic requirements   7. Harvesting tools and equipment was assembled as per work requirement   8. Maturity index was applied in determining crop maturity as per market demand   9. Harvesting method was applied as per crop requirement   10. Processing tools, equipmentand machines was assembled as per work requirement   11. Processing of annual crop was carried out as per work procedure   12. Product was marketed as per workplace procedure   13. Recordwas prepared as per work procedure |
| 1. Resource Implications (required for assessment ) | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Practical assement   3. Written tests   4. Oral questioning   5. Demonstration   6. Questionnaires   7. Projects   8. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PRODUCE HORTICULTURAL CROPS

**UNIT CODE:**  **0812 551 17A**

**UNIT DESCRIPTION**

This unit specifies competencies required to produce horticultural crops. It involves preparing land, establishing and managing selected horticultural crops. It also involves harvesting and storage as well as processing and marketing of the selected horticultural crops

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCECRITERIA**  These are **assessable s**tatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| 1. Prepare planting materials | * 1. ***Personal protective equipment*** is donned as per work requirement   2. Tools and equipment are assembled as per work requirement   3. ***Planting materials*** are obtained as per crop requirement |
| 1. Prepare horticulture crop seedbed | * 1. Personal protective equipmentis donned as per work requirement   2. ***Land preparation tools*** and ***equipmen***t are assembled as per work requirement   3. Land is cleared as per agronomic requirements   4. ***Tillage operations*** are carried out as per agronomic requirements   5. ***Soil conservation measures*** are applied as per work procedure   6. Recordsare prepared as per work procedure |
| 1. Plant Horticultural crops | * 1. Personal protective equipment is donned as per work requirement   2. ***Farm inputs*** are assembled as per work requirement   3. Horticultural crop is established as per crop requirements   4. Recordsare prepared as per work procedure |
| 1. Manage Horticultural crops | * 1. Personal protective equipmentis donned as per work requirement   2. Farm inputsare assembled as per work requirement   3. ***Field management practice*** is carried out as per crop agronomic requirements   4. Recordsare prepared as per work procedure |
| 1. Harvest Horticultural crops | * 1. Personal protectiveequipmentis donned as per work requirement   2. ***Harvesting tools*** and ***equipment*** are assembled as per work requirement   3. Maturity indices are applied in determining crop maturity as per market demand   4. ***Harvesting method*** is applied as per horticultural crop requirement   5. Recordsare prepared as per work procedure |
| 1. Process Horticultural crop products | * 1. Personal protective equipmentis donned as per work requirement   2. ***Processing tools, equipment*** and ***machines*** are assembled as per work requirement   3. Processing of Horticultural crop is carried out as per work procedure   4. Products are marketed as per workplace procedure   5. ***Records*** are prepared as per work procedure |

**RANGE**

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

|  |  |
| --- | --- |
| 1. Personalprotectiveequipment includes but not limited to: | * Overall or over coat * Gumboots * Gloves * Head gear * Face mask |
| 1. Landpreparationtoolsand equipmentincludes but not limited to: | **Tools**   * Land clearing tools/equipment/machinery * Axes * Panga * Rake * Slasher * Tillage tools/equipment/machinery * Fork jembe * Harrows * Hoe * Tractor   **Equipment**   * Mower * Rotavator * Wheelbarrow * Ridgers * Moulboard plough * Disc plough * Disc harrow |
| 1. Plantingmaterialsincludes but not limited to: | * + Seeds   + Vegetative materials   + Cuttings   + Vines   + Cuttings   + Splits   + Setts |
| 1. Tillageoperations include but not limited to; | * Primary cultivation * Secondary cultivation * Tertiary operations |
| 1. Soilconservationmeasuresinclude but not limited to***;*** | * Contour planting * Terraces * Gabbions * Mulching * Cover cropping * Minimum tillage * Crop rotation * Intercropping |
| 1. Farm inputs includes but not limited to; | * Fertilizers * Seeds * Vegetative propagation materials * manures |
| 1. Field management practicesinclude but are not limited to*:* | * Watering * Mulching * Gapping * Thinning * Crop protection from weeds, pests and diseases * Training * Fertilizer application * Pruning |
| 1. Harvesting tools and equipment include but not limited to; | * Sickle * Axe * Harrow * Chopper |
| 1. Harvesting methodsinclude but not limited to; | * Hand picking * Use of tools * Use of machinery |
| 1. Horticulturalcrops include but not limited to: | * Vegetables: * Brassicas – cabbage, kales, cauliflower, Brussel sprouts etc. * Solanaceae – tomato, pepper, brinjals etc. * Root and bulb crops – carrots, onions, raddish, beetroot etc. * Cucurbits – cucumber, pumpkin, melon etc. * Salad crops – celery, lettuce, parsley etc. * Legumes – French beans, green peas etc. * Herbs and spices – coriander, chives, dill, ginger etc. * Pomology (fruits) * Citrus * Avocado * Mango * Banana * Passion fruits * Pawpaw * Guavas * Floriculture * Carnations * Roses * Chrysanthemums * Hibiscus * Landscaping * Bedding plants and flowers * Shrubs and trees * Turfs |
| 1. Recordsinclude but not limited to; | * Inventory records * Financial records * Yield and production records * Payroll and labour records * Farm input utilization record |
| 1. Processingtoolsand equipmentinclude but not limited to; | * Blender * Motar and pestle * Weighing scale * Knives/cutting materials * Weighing cup * Bowl choppers * bandsaws * slicers * Marinating vacuum tumblers * Peelers * Picklers |
| 1. Processingmachinesinclude but not limited to; | * Grinding machine * Dryers * Blenders * Blanchers * Freezers * Dryers * Pasteurizing machine * Fermenters |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required skills**

The individual needs to demonstrate the following skills:

* Tilling
* Tools and equipment classification
* Measuring
* Leveling
* Gaping
* Pruning
* Spraying
* Pests , diseases and nutrients deficiency scouting
* Equipment calibration
* Technical Report writing
* Produce handling
* Soil conservation
* Observation
* Negotiation
* Digital literacy

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Sources of quality water
* Agro- Ecological Zonation
* Farm establishment and management
* Types of annual crops and physiology of different annual crops
* Types of tools and equipment used in production of annual crops
* Soil fertility and soil conservation
* Phyto-sanitary requirements
* Good Agricultural Practices
* Sources of quality planting materials for annual crops
* Husbandry practices in annual crops production
* Maturity indices in annual crops
* Harvesting and Post Harvesting Handling of annual crops
* Accounting principles, farm records and reports
* Waste Management
* Occupational Safety and Health Procedures

**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. Donned Personal Protective Equipment (PPE) as per work requirement   2. Planting materials was obtained as per crop requirement   3. Carried outtillage operations as per agronomic requirements   4. Soil conservation measureswas applied as per work procedure   5. Annual crop was established as per crop requirements   6. Field management practice was carried out as per crop agronomic requirements   7. Harvesting tools and equipment was assembled as per work requirement   8. Maturity index was applied in determining crop maturity as per market demand   9. Harvesting method was applied as per crop requirement   10. Processing tools, equipmentand machines was assembled as per work requirement   11. Processing of horticultural crop was carried out as per work procedure   12. Product was marketed as per workplace procedure   13. Recordwas prepared as per work procedure |
| 1. Resource Implications (required for assessment ) | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Practical assessment   3. Written tests   4. Oral questioning   5. Demonstration   6. Questionnaires   7. Projects   8. Third party report |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# CARRY OUT FISH FARMING

**UNIT CODE: 0831 551 18A**

**UNIT DESCRIPTION**

This unit specifies competencies required to carry out fish farming. This involves constructing fish farming structures, feed fish, managing fish hatcheries and managing fish cages. It also involves harvesting of fish, processing harvested fish as well as managing re- circulatory aquaculture systems

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCECRITERIA**  These are **assessable s**tatements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the range.*** |
| * + - 1. Construct fish farming structures | * 1. ***PPE’s*** are worn as per task requirements   2. Fish farm site is selected as per farm plan   3. ***Tools, equipment*** and ***materials*** are assembled as per work requirement   4. Fish holding unit is constructed and installed according to FPM   5. Fish farm water filtration system is installed based on design features   6. ***Auxiliary farm structures*** are constructed or installed based on the farm design specifications   7. ***Predator control devices*** are installed as per FPM |
| * + - 1. Perform fish farm management practices | * 1. ***Water quality parameters*** are monitored as per FPM   2. ***Fishpond*** ***maintenance practice*** is carried out as per work requirement   3. ***Fish predators*** and ***parasites*** are controlled as per FPM   4. ***Fish diseases*** are controlled as per work procedures   5. Fish are fed as per work requirement   6. ***Fish farm wastes*** are managed as per environmental protection guidelines   7. ***Records*** are kept as per work procedures |
| * + - 1. Manage fish hatcheries | * 1. ***Hatchery management tools, equipment*** and ***materials*** are assembled as per task requirements   2. Hatchery Pre-stocking activities are performed as per FPM   3. Brood stock is fed according to FPM.   4. Water quality is monitored as per FPM   5. Brood health is managed as per work requirement.   6. Hatchery records are kept as per work procedure |
| * + - 1. Harvest and process fish | * 1. Tools, equipment and materials for processing are assembled as per work procedures   2. Harvesting of fish is carried out as per FPM   3. Harvested fish is sorted according to FPM   4. Preservation methods are performed as per FPM   5. Fish processing methods are performed as per FPM   6. Fish products and by-products are marketed as per workplace procedure   7. **Records** are kept as per work 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. Fish farmsitepreparationactivities may include but not limited to: | * Site selection * Site clearance * Measurement and pegging |
| 1. Auxiliaryfarmstructures may include but not limited to: | * Farm stores * Roads * Fences * Offices * Laboratories * washrooms |
| 1. Waterqualityparametersmay include but not limited to: | * Water temperature * Water PH * Dissolved oxygen * Ammonia * Nitrates * nitrites * Salinity * Turbidity * Salinity * Total suspended solids * Heavy metals * Hydrogen sulphide |
| 1. Pondrepairandmaintenancemay include but not limited to: | * Sealing leakage * Declogging * Water flow rate regulation |
| 1. Fishdiseasecausesmay include but not limited to: | * Environmental/water quality causes * Hereditary/genetic causes * Microbial/pathogenic causes * Nutritional causes * Physical injury |
| 1. Sanitationandhygienemay include but not limited to: | * Regular hand washing * Sanitization * Disinfection * Use of foot bath |
| 1. Fishfeeds may include but not limited to | * Live or natural feeds * Concentrate feeds |
| 1. Bio-security measuresmay include but are not limited to: | * Sanitation and hygiene practices * Sourcing of feeds, fingerlings, brood stock * Self-closing doors * Use of air conditioning instead of natural ventilation. * Use of artificial lights. * Visitor Movement control |
| 1. Preservation methodsmay include but are not limited to: | * Chilling * Freezing * Salting * Drying * Salting * Smoking |
| 1. Fishprocessingmethodsmay include but not limited to: | * Salting * Drying * Salting * Smoking * Filleting * Frying |
| 1. HatcheryPre-stockingactivitiesmay include but not limited to: | * Cleaning * Declogging * Removal of sludge * Fixing water leakages * liming * Filling with water * Controlling water flow rate |
| 1. Husbandrypracticesmay include but not limited to: | * Feeding * Aeration * Water flow rate control * Water quality monitoring * Predator control * Sludge removal * Declogging of drainage system * Cleaning of filters * Harvesting * Growth monitoring * Fingerling/fry grading * Marketing of hatchery products * Fish health monitoring * Fish propagation * Fish stocking * Fingerling packaging and transport |
| 1. FishsafetyandBiosecuritymeasures may include but not limited to: | * Fencing * Proper Sourcing of feeds, fingerlings, brood stock * Predator control * Visitor Movement control * Quarantine and isolation |
| 1. Recirculating Aquaculture System (RAS) may include but not limited to: | * Bio-filters * Mechanical filters * Fish culture unit(s) * Water reservoir * Water drainage system * Water aeration sytem |
| 1. RAS management activitiesmay include but not limited to: | * Cleaning of the unit * De-clogging * Water flow rate control * Water aeration or oxygenation * Fish feeding * Water quality monitoring * Predator control * Sludge removal * Declogging of drainage system * Cleaning of filters * Harvesting * Growth monitoring * Fingerling/fry grading * Marketing of hatchery products * Fish health monitoring * Fish propagation * Fish stocking * Fingerling packaging and transport |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Arithmetic
* Net working
* Fish biology
* Water chemistry

**Required skills**

The individual needs to demonstrate the following skills:

* Fish handling
* Procurement
* water quality equipment Calibration
* Net repair and maintenance
* Record keeping
* Fish stocking
* Fish harvesting
* Fish packaging and transportation
* Fish health monitoring
* Water flow rate control
* Fish feeding
* Fish growth monitoring
* Fish marketing
* Communication
* Problem solving
* Time management
* Digital
* Critical thinking

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Adhere to safe work procedures.   2. Set up fish culture unit   3. Humane fish handling.   4. Package and transport fish   5. Maintain water flow rate   6. Produce fish feeds   7. Aerate fish holding unit   8. Feed fish.   9. Stock fish   10. Fertilize earthen pond   11. Lime earthen pond   12. Manage fish health.   13. Harvest fish   14. Handle harvested fish.   15. Market fish products and by products   16. Keeps records |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Practical assessment 2. Oral assessment 3. Portfolio of evidence 4. Project 5. Case study 6. Third party report (recognition of prior learning) 7. Written tests |
| 1. Context of assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# 

# CARRY OUT BEE KEEPING

**UNIT CODE: 0811 551 19A**

**UNIT DESCRIPTION**

This unit specifies competencies required to establish an apiary, manage bee colony and managing bee pests and diseases. It also involves harvesting bee products and processing of harvested bee products.

|  |  |
| --- | --- |
| **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. Establish bee apiary | * 1. Apiary site is identified as per work requirement and farm plan   2. ***Materials, tools*** and ***equipment*** for clearing the apiary site are assembled as per workplace procedures   3. Apiary site is prepared as per the work procedures   4. ***Bee hives*** are constructed as per work procedure   5. Bee hives are erected in the apiary as per work requirement   6. Bee hives are stocked as per work procedures |
| * + - 1. Manage bee colony | * 1. ***Personal protective equipment*** is worn as per work requirement   2. Bees are fed based on availability of nectar and water   3. Bee hives are inspected periodically as per work procedures   4. Queen bee is managed as per work procedures   5. Honeybee colony is divided as per work procedures |
| * + - 1. Manage bee pests and disease | * 1. Protective gear is worn as per the work requirement   2. Beehive is inspected for pests and diseases as per work procedures   3. Materials and equipment for pest and disease control are assembled as per work requirement   4. Pest and disease control methodis applied based on type of pest and disease being controlled   5. Pest and disease control record is prepared as per work procedure |
| * + - 1. Harvest bee products | * 1. Colonies to be harvested are identified as per work procedures.   2. ***Personal protective equipment*** is worn as per work requirement   3. Honey is harvested as per the work procedures   4. Bee propolis is harvested as per work procedures   5. Bee pollen is trapped and collected as per work procedures   6. Bee broods are harvested as per work procedures |
| * + - 1. Manage bee products | * 1. Bee products are processed as per work requirement   2. Bee products are packaged as per work requirement   3. Bee products are labelled and branded as per work procedures   4. Bee products are marketed as per farm procedures |

**RANGE OF VARIABLES**

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 Bee products includes but not limited to | * Honey * Propolis * Bee venom * Creamed honey * Manuka honey * Comb honey * Honeycomb * Beeswax * Bee pollen * Royal jelly |
| 2 tools and equipment | * Smokers * Hive tools * Conical honey strainer * Wax press   + Solar wax melter |
| 3 personal protective equipment includes | * Bee suit   + Gloves   + Gumboots |
| 3.Bee disease includes but not limited to | * Bee viruses * Nosemosis * Varroa mites * American Foulbrood (AFB) * European Foulbrood (EFB) * Amebiosis * Chalkbrood * Stonebrood * Small Hive Beetle (SHB) |
| 4.Bee pests includes but not limited to | * Carpenter bee * Honey bee * Bumblebee * Ants * Mite * Lesser wax moth * Bee louse   + Greater wax moth |

**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
* Evaluation
* Management
* Problem solving
* Time management
* Data collection
* Numeracy
* Observation
* Negotiation
* Digital literacy
* Equipment calibration

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Beehive construction
* Apiary site selection
* Beehive stocking
* Swarming of bee
* Bee multiplication
* Bee nutrition
* Parasite and disease management in bees
* Bee products
* Bee production records
* Animal Produce handling

**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:  1.1 Constructed beehives based on resources available  1.2 Managed apiaries based on GAPs  1.4 Harvested bee products based on market demand  1.5 Managed bee diseases based on GAPs  1.6 Controlled bee parasites and predators based on GAPs |
| 2. Resource Implications. | The following resources should be provided:  2.1 Access to relevant workplace where assessment can take place  2.2 Appropriately simulated environment where assessment can take place  2.3 Materials relevant to the proposed assessment activity or tasks |
| 3. Methods of Assessment. | Competency may be assessed through:  3.1 Practical  3.2 Project  3.3 Portfolio of evidence  3.4 Third Party Report  3.5 Written Tests  3.6 Oral Questioning |
| 4. Context of Assessment. | Competency may be assessed:   1. Workplace   4.2 Simulated work environment |
| 5. Guidance information for assessment. | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# ESTABLISH FARM STRUCTURES

**UNIT CODE: 0811 551 20A**

**UNIT DESCRIPTION**

This unit specifies competencies required to set up farm structures. It involves developing of farm plan, designing farm structures and constructing farm structures. It also involves maintenance of used farm structures.

**ELEMENTS AND PERFORMANCE CRITERIA**

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| **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.*** |
| Develop farm plan | * 1. ***Farm conditions*** are analysed based on work requirement   2. Space requirements and relationships between farm components are determined as per work requirement   3. Farm plan layout is drawn based on efficiency, expansion capability, farmer’s preference and environmental impacts. |
| Design farm structure | * 1. Drawing instruments are used as per work procedure   2. Scales are used as per structure design drawing   3. Areas and volumes are determined as per work requirement   4. Plan of farm structure is drawn as per work requirement |
| Construct farm structure | * 1. Personal protective equipment (PPEs) are used as per work procedures   2. Site for construction is prepared as per the design   3. Tools and equipment are assembled as per work requirement   4. Measurements are taken as per work requirement   5. Markings are carried out as per work requirement   6. Construction materials are selected based on design.   7. Construction procedure is carried out as per work requirement |
| Maintain farm structure | * 1. Personal protective equipment (PPEs) is used as per work requirement   2. Performance of constructed structure is assessed as per work requirement   3. Quality of structure is assessed as per work requirement.   4. Repairs are carried out as per need and design |

**RANGE**

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

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| **Variable** | **Range** |
| * + - 1. 1. Farm structures/ constructed structuresincludes but not limited to: | * Nursery beds * green house * screen house * tunnels * Sheds * Fence * Apiaries * Storage rooms * Calf pens * Poultry houses * Wooden pegs * Measuring tape * Hammer * Sisal twine * Masonry tools * Carpentry tools * Plumbing tools * Hoe * Jembe * Panga * Slashers * Rakes * Mowers * Wheel barrows * Personal Protective Equipment (PPE |
| * Materials includes but not limited to | * Power * Green house construction materials * Tunnel construction materials * Shed construction materials * Screen house construction materials * Nursery beds construction materials * Fencing materials * Water * Metals * Woods * Nails * Hammer * Stones * Ballast * Iron sheets * Nails * Cement |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required skills**

* + Planning
  + Innovation and creativity
  + Accounting skills
* Estimation
* Masonry
* Carpentry
* Plumbing
* Joinery
* Measuring
* Drawing
* Basic structural design interpretation skills
* Basic numeracy
* Craftsmanship
* Tilling skills

**Required knowledge**

The individual needs to demonstrate knowledge of:

* + Factors to consider in selecting construction site
  + Farm Structure plan development
  + Preparation of construction site
  + Interpretation of an architectural plan
  + Preparation of bill of quantities
  + Budgeting
  + Types of tools and equipment required in farm structures construction
  + Materials for constructing Farm structures
  + Sources of funds
  + Nursery Irrigation systems
  + Construction of farm structures
  + Record keeping
  + Costing
  + Report writing
  + environmental Impact Assessment

**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. Analysed Farm conditions based on work requirement   2. Drawn Farm plan layout based on efficiency, expansion capability, farmer’s preference and environmental impacts   3. Drawn Plan of farm structure as per work requirement   4. Prepared site for construction as per the design   5. Selected Construction materials based on design.   6. Carried out Construction procedure as per work requirement   7. Carried out repairs as per need and design |
| 2. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 3. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Written tests   3. Oral questioning   4. Interviewing |
| 4. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job roles is recommended. Attitude is assessed alongside construction of farm structures |

# PRODUCE FORAGE CROPS

**UNIT CODE: 0811 551 21A**

**UNIT DESCRIPTION**

This unit specifies competencies required to produce and conserve forage. It entails; preparation of land for forage growing, establishment and management of forage crops, utilization of forage.

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| **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. Prepare planting materials | * 1. ***Personal protective equipment*** is donned as per work requirement   2. ***Tools*** and ***equipment*** are assembled as per work requirement   3. ***Planting materials*** are obtained as per crop requirement   4. ***Treatment*** of planting materials is carried out as per crop requirement |
| 1. Prepare crop seedbed | * 1. ***Personal protective equipment*** is donned as per work requirement   2. ***Tools*** and ***equipmen***t are assembled as per work requirement   3. Land is cleared as per agronomic requirements   4. ***Tillage operations*** are carried out as per agronomic requirements   5. ***Soil conservation measures*** are applied as per work procedure   6. ***Records*** are prepared as per work procedure |
| 1. Plant forage crops | * 1. ***Personal protective equipment*** is donned as per work requirement   2. ***Farm inputs*** are assembled as per work requirement   3. Forage crop is established as per crop requirements   4. ***Records*** are prepared as per work procedure |
| 1. Manage forage crops | * 1. ***Personal protective equipment*** is donned as per work requirement   2. ***Farm inputs*** are assembled as per work requirement   3. ***Field management practices*** are carried out as per crop agronomic requirements   4. ***Records*** are prepared as per work procedure |
| 1. Harvest forage crops | * 1. ***Personal protective equipment*** is donned as per work requirement   2. ***Tools*** and ***equipmen***t are assembled as per work requirement   3. Maturity indices are applied in determining crop maturity as per market demand   4. ***Harvesting method*** is applied as per crop requirement   5. ***Records*** are prepared as per work procedure |
| 1. Utilize forage   Crop | * 1. ***Personal protective equipment*** is donned as per work requirement   2. ***Tools, equipment and machines*** are assembled as per work requirement   3. Forage crop is conserved as per work requirement   4. ***Record*** is prepared as per work procedure |

**RANGE**

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

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| 1. Phytosanitary requirements includes but not limited to: | * Use of manures and fertilizers on forage produce * Rules on marketing and labelling of produce * Rules on materials intended to come into contact with forages |
| 1. Planting materialsincludes but not limited to: | * Seeds * seedlings * splits * crowns * slips * Cuttings * Suckers * Tissue culture |
| 1. Field management practicesinclude but are not limited to: | * Watering * Mulching * Gapping * Thinning * Crop protection from weeds, pests and diseases * Training * Fertilizer application * Pruning |
| 1. Good Agricultural Practices (GAP)includes but not limited to: | * Field hygiene * Selection of clean planting materials * Safe use of agro-chemicals and maximum Residual Levels of agro-chemicals used * Environmental sustainability |
| 1. Foragesincludes but not limited to: | * Nandi setaria * Star grass * Guinea grass * Rye grass * Kale * Sweet potato vines * Lucerne * Desmodium * Clovers * Napier grass * Bana grass. * sesbania * alfalfa * Rhodes * leucaena * oats |

**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:**

* Tilling
* Measuring
* Leveling
* Gaping
* Spraying
* Pests , diseases and nutrients deficiency scouting
* Equipment calibration
* Technical Report writing
* Produce handling
* Soil sampling
* Observation
* Negotiation
* Digital literacy

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Sources of quality water
* Agro- Ecological Zonation
* Forage establishment and management
* Types of forages
* Physiology of different forage crops
* Types of tools and equipment used in production of forages
* Soil sampling and testing
* Soil conservation
* Phyto-sanitary requirements
* Good Agricultural Practices
* Sources of quality planting materials for forages
* Husbandry practices in forage production
* Maturity indices in forage crops
* Harvesting and Post Harvesting Handling of forages
* Accounting principles
* Production records and reports
* Waste Management
* Occupational Safety and Health Procedures
* General management of forage production farm

**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. Prepared planting land to a level suitable to the planting material   2. Observed safety measures by using Personal Protective Equipment (PPE) and correct tools   3. Established forages suitable for the Agro Ecological zone, market demand   4. Managed weeds, pests, and diseases in selected forages. Followed required process of producing selected forages   5. Efficiently used inputs   6. Utilized and conserved forage efficiently |
| 1. Resource Implications (required for assessment ) | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Written tests   3. Oral questioning |
| 1. Context of Assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 1. Guidance information for assessment | What can be assessed in holistic assessment (with other units relevant to the industry sector, workplace and job roles) is recommended. Attitude is assessed alongside production of forages. |

# CARRY OUT EXTENSION SERVICES

**UNIT CODE: 0811 551 22A**

**UNIT DESCRIPTION**

This unit specifies competencies required in understanding agricultural extension and rural sociology. It involves Carrying out training needs assessment (TNA), developing extension training plan, conducting extension training and evaluating extension training.

**ELEMENTS AND PERFORMANCE CRITERIA**

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| --- | --- |
| **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. Carry out training needs assessment (TNA) | * 1. Training Needs Assessment tool is developed as per selected area of training   2. Data is collected based on design   3. Collected data is analyzed based on design   4. Report is developed based on analyzed TNA data |
| 1. Develop extension training plan | * 1. Extension objectives are determined as per TNA report.   2. Training venue is determined as per TNA report.   3. ***Mode of delivery*** is determined based on TNA report.   4. ***Training materials*** are prepared based on mode of training.   5. Resource persons are identified as per mode of delivery.   6. Sensitization of training is carried out as per plan |
| 1. Conduct extension training | * 1. Venue is setup as per extension plan.   2. Registration is carried out as per workplace procedures.   3. Information and technology is disseminated based on extension method.   4. Records of training are prepared as per FAO agricultural extension manual. |
| 1. Evaluate extension training. | * 1. Aspects to be evaluated are determined as per set objectives.   2. ***Method of evaluation*** is determined as per work plan.   3. Evaluation is conducted as per extension program.   4. Evaluation results are analysed as per work plan.   5. ***Evaluation report*** is developed as per extension program. |

**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.

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| --- | --- |
| Variable | Range |
| 1. Modeofdeliveryinclude but not limited to | * Demonstrations * Field days * Group meetings * Lectures * Farm visits * Office visits |
| 1. Training materials include but not limited to | * Posters * Handouts * Pamphlets |
| 1. Method of evaluation include but not limited to | * Formal * Informal * Internal * External * Summative |
| 1. Reports include but not limited to | * Monthly * Annual * Periodic * special |

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:

* Group mobilization.
* Resource mobilization
* Communication skills
* Negotiation
* Mediation
* Leadership

Required knowledge.

The individual needs to demonstrate knowledge of:

* Preparation of agricultural extension materials
* Technical knowledge on report writing

**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:  Demonstrated:   1. Developed Training Needs Assessment tool (TNA) as per selected area of training. 2. Collected Data based on design. 3. Developed report based on analysed TNA data. 4. Prepared Training materials based on mode of training. 5. Carried out sensitization of training as per plan. 6. Disseminated information and technology based on extension method. 7. Developed Evaluation report as per extension program. |
| 1. Resource   Implication | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant workplace assessment environment   3. Resources relevant to the proposed assessment activity or tasks |
| 3. Method of  Assessment | Competency in this unit may be assessed through:   1. Written tests 2. Role play 3. Simulation 4. Oral questioning |
| 4. Context of  assessment | Competency may be assessed:   1. Workplace 2. Simulated work environment |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |