****

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARD**

**FOR**

**LIVESTOCK FEED PRODUCER**

**LEVEL 4**

**ISCED CODE: 0811 354A**

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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 and 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 informs curriculum development to ensure the curriculum addresses its competence needs. Thus, this occupational standard may form the basis for curriculum development and assessment in the area of livestock feed formulation.

# 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 TVET Act CAP 210A 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.

This occupational standard will be the basis for the development of a competency-based education and training curriculum for livestock feed producer level 4.

# ACKNOWLEDGMENT

This occupational standard was 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 this occupational standard.

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# ABBREVIATIONS AND ACRONYMS

**CPU** Central Processing Unit

**CD** Compact Disc

**CV** Curriculum Vitae

**DVD** Digital Versatile Disc

**DVI** Digital Visual Interface

**FFM**  Feed Formulation Manual

**FPPM** Forage and Pastures Production Manual

**GAP** Good Agricultural Practices

**ICT** Information and Communications Technology

**ISCED** International Standard Classification of Education

**KEBS** Kenya Bureau of Standards

**PPE** Personal Protective Equipment

**PPM** Poultry Production Manual

**RAM** Random Access Memory

**TVET** Technical, Vocational Education and Training

**USB** Universal Serial Bus

# 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

# OVERVIEW

Livestock feed production level 4 qualification consists of competencies required by a person to produce livestock feed**.** It includes conserving farm water, processing animal feed, operating feed processing equipment and producing Livestock Forage.

Units of competency comprising Livestock feed production level 4 qualification include the following

**Common Units of Competency**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0811 341 01A | Apply principles of livestock nutrition |

**CORE UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0721 351 02A | Conserve farm water |
| 0721 351 03A | Process Animal Feed |
| 0716 351 04A | Operate Feed Processing Equipment |
| 0811 341 05A | Produce Livestock Forage |

# APPLY PRINCIPLES OF LIVESTOCK NUTRITION

## UNIT CODE: 0811 341 01A

## Unit Description

This unit equips trainees with competencies required for applying livestock nutrition that will be applied in a processing facility. It involves demonstrating knowledge of livestock digestive processes and systems, nutritional knowledge, feed types, and evaluating livestock dietary needs.

## Elements and Performance Criteria

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which make up **workplace function**. | **PERFORMANCE CRITERIA**  There 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 knowledge of livestock digestive processes and systems | * 1. Different parts of the digestive tract of ***livestock*** are identified as per animal type.   2. Process of digestion in ***livestock*** is described as it relates to their classification.   3. ***Common structural******disorders*** of the digestive system are described according to their effect on the functioning of GIT. |
| 1. Apply knowledge of nutritional principles | * 1. Nutrition is explained based on livestock physiology and metabolism.   2. Interrelation of the ***three key elements*** in the golden triangle are explained for optimizing productivity.   3. The feed conversion rates are quantified and managed to optimize nutrient utilization. |
| 1. Apply knowledge of feed types | * 1. Sources of ***feed nutrients*** are identified according to origin.   2. Roles of ***feed nutrients*** are described as they relate to function.   3. Livestock feeds are classified based on their nutritive values, moisture content and function.   4. Effects of feed **deficiencies and toxicities** are identified. |
| 1. Evaluate livestock dietary needs | * 1. **Factors influencing feed intake** in livestock are described.   2. Feed requirements for **specific livestock** are determined according to need based on ***feeding standards.***   3. ***Adequacy of nutrition*** is described based on body condition scores and weight gain***.*** |

## Range

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

|  |  |
| --- | --- |
| Variables | Range |
| * + - 1. Livestock includes but may not be limited to: | 1. Sheep 2. Cattle 3. Poultry 4. Goats 5. Pigs 6. Rabbits 7. Fish |
| * + - 1. **Common structural disorders that affect GIT** includes but may not be limited to: | * 1. Displaced abomasum   2. gizzard impaction   3. RUMEN hardware disease   4. (Traumatic reticulo-peritonitis) |
| * + - 1. **Three key elements** includes but may not be limited to: | * 1. Housing   2. Feed   3. Livestock |
| * + - 1. **Feed Nutrients component of feed includes** but may not be limited to: | 4.1 Water  4.2 Carbohydrates  4.3 Fats  4.4 Vitamins  4.5 Mineral   * 1. Proteins |
| 1. **Deficiencies and toxicities include lack of nutrients and effects of excess nutrients** includes but may not be limited to: | * 1. Mineral deficiencies   2. Carbohydrates deficiencies   3. Vitamins deficiencies   4. Hypervitaminosis   5. Mineral toxicities |
| 1. **Factors influencing feed intake includes but not limited to** | * 1. Age   2. Level of production   3. Physiological status   4. Ambient temperature |
| 1. **Feeding standards** Feeding standards are statements or quantitative descriptions of the amounts of one or more such nutrients needed by animals | * 1. KALRO feeding standards   2. National feeding standards |

**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:

* Organizing skills
* Analytical skills
* Negotiation skills
* Interpersonal skills
* Communication skills
* Evaluation skills
* Problem solving
* Critical thinking

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Animal digestive anatomy and physiology
* Animal nutrition requirements
* Feed ingredients that supply nutrients required
* Sources of quality feed ingredients
* Types of feeds and feedstuffs
* Animal nutrition
* Nutritional diseases
* Animal health
* Metabolism Types of farm animals
* Types of feed supplements and substitutes
* methods of controlling bee behavior
* Bee behavior

## 

## 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 the different parts of the digestive tract of livestock   2. Described process of digestion in livestock.   3. Described common structural disorders of the digestive system.   4. Quantified and managed feed conversion.   5. Identified effects of feed deficiencies and toxicities.   6. Determined feed requirements for specific livestock. |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant assessment environments.   2.3 Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of assessment | Competency may be observed through:   * 1. Practical   2. Third party report   3. Projects   4. Portfolio of evidence   5. Written tests   6. Oral questions |
| 1. Context(s) of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| 1. Guidance information for assessment | The unit may be assessed alone or together with other units in this sector. |

# CONSERVE FARM WATER

## UNIT CODE : 0811 341 02A

## UNIT DESCRIPTION

This unit equips trainees with knowledge and skills required to use and manage water and water catchments. The unit entails selecting sustainable water supply technologies for the farm, harvesting water in the farm and irrigating crop farm. It also involves maintaining farm irrigation system.

## ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| **ELEMENT**  These describe the **key outcomes** which makeup **work place function**. | **PERFORMANCE CRITERIA**  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. Available ***water sources*** are identified as per work requirement.   2. Water for testing is collected as per work procedures   3. Water for testing is prepared as per work requirement   4. Water treatment is as carried out as per work requirement. |
| 1. Harvest water in the farm | * 1. ***Water harvesting structure*** is identified as per work requirement   2. Design of water harvesting structure is drawn as per work requirement   3. **Personal Protective Equipment** is used as per work requirement   4. Water harvesting structure is constructed as per design   5. Functionality of the water harvesting and storage structures is tested and faults corrected as per work requirement   6. Water harvesting structure is utilized as per work requirement |
| 1. Irrigate crop farm | * 1. Water requirements for the crop to be grown is determined 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. Water is applied as per crop requirement |
| 1. Maintain irrigation system | * 1. Faults are identified as per work requirement   2. Repairs of faults are carried out as per work requirement   3. Erosion control measures are put in place as per work requirement.   4. Waste water is treated as per work instructions |

## 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** |
| **Water sources** include but not limited to: | * Wells * Rainfall * Rivers * Boreholes |
| **Water testing** include but not limited to: | * Mineral tests * PH test * Basic water test |
| **Water harvesting structures** include but not limited to: | * Farm ponds * Percolation tanks * Roof water harvesting tank * Wells * Sub surface dams * Field bunds |
| **Personal protective equipment** include but not limited to: | * Cover rolls * Gum boots * Gloves goggles * Hard huts |
| ***Tools and equipment*** include but not limited to : | * Tools for designing * Tools and equipment for construction * Tools and equipment for repair and maintenance |
| ***Irrigation systems*** include but not limited to: | * Drip irrigation * Sprinkler irrigation * Sub surface irrigation * Surface irrigation |
| ***Erosion and pollution control measures*** Include but not limited to: | 1. Walk-over techniques 2. Minimal disturbance techniques 3. Crown and cross fall drainage 4. Cross bank drainage 5. Relief culverts on roads 6. Mitre and table drains on roads 7. Armouring/gravelling of roads 8. Crossing and draining surfaces 9. Batter stabilisation 10. Contour banks and channels 11. Gabions 12. Sediment basins 13. Riparian buffer zones 14. Outlet protection structures 15. Re-vegetation |

## REQUIRED KNOWLEDGE AND SKILLS

### Required skills

The individual needs to demonstrate the following skills:

* Literacy skills
* Numeracy skills
* Problem-solving skills

### Required knowledge

The individual needs to demonstrate knowledge of:

* Environmental protection requirements,
* Organizational and site standards
* Environmental policies and
* 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 as per work instructions.   2. Selected appropriate water harvesting and storage structures as per work instructions.   3. Selected appropriate an irrigation system based on work instructions   4. Maintained farm irrigation system based on work instructions   5. Performed simples repairs in the irrigation system as per work instructions   6. Controlled erosion in the farm as per work instructions |
| 1. Resource Implications | The following resources must be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proper activities or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Practical   2. Third party report   3. Projects   4. Portfolio of evidence   5. Written tests   6. Oral questions |
| 1. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| 1. Guidance information for assessment | The unit may be assessed alone or together with other units in this sector. |

# PROCESS ANIMAL FEED

## UNIT CODE:0721 351 03A

## UNIT DESCRIPTION

This unit covers the competencies required in processing animal feed. It involves source feedstuffs, process feed ingredients, mix feed batches, package processed feeds and store processed feeds.

## ELEMENT 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. Source feedstuff | 1. ***Personal Protective Equipment (PPEs)*** are worn as per work requirement 2. A list of required ***feedstuffs*** is prepared as per **Feed Formulation Manual (FFM)** 3. Quantities of ***feed ingredients*** to be sourced are determined as per FFM 4. ***Feed ingredients*** are acquired based on the list of required feedstuffs 5. Ingredients proportions are weighed as per FFM 6. Feedstuff records are maintained as per FFM 7. Waste is managed according to environmental protection regulations |
| 1. Process Feed Ingredients | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. **Feed processing tools, equipment** and **material**s are assembled as per FFM   3. **Feedstuff treatment methods** for various feed ingredients are applied as per FFM   4. Quality control measures are adhered to as per FFM   5. Waste is managed according to environmental protection regulations |
| 1. Mix feed batches | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. ***Feed mixing tools and equipment*** are assembled as per FFM   3. Feed ingredients are assembled as per work requirement   4. Feed ingredients are weighed as per feed ration formula   5. Feed ingredients are mixed as per feed ration formula   6. Feed sample is collected for analysis as per FFM   7. Feed records are maintained as per work requirement   8. Feed waste is managed according to environmental protection regulations |
| 1. Package processed feeds | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. Packaging materials are assembled as per work requirement   3. Feed is weighed as per work requirement   4. Feed is packaged as per work requirement   5. Packaged feed is labelled as per national feed quality standards   6. Packaged feed records are maintained as per work requirement   7. Waste is managed according to environmental protection regulations |
| 1. Store processed feeds | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. ***Storage tools and equipment*** are assembled as per work requirement   3. Feed store is prepared as per work requirement   4. Processed feeds are arranged as per work requirement   5. Stored processed feed records are maintained as per work requirement   6. Stored feeds are monitored for quality as per national feed quality standards   7. Waste is managed according to environmental protection regulations |

**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. Personal Protective Equipment (PPEs) may include but are not limited to: | * + Eye protection equipment   + Hearing protection equipment   + Feet protection equipment   + Respiratory protection equipment   + Gloves   + Full body suits |
| 1. feed ingredients may include but are not limited to: | * + proteins   + carbohydrates   + fats and oils   + Vitamins;   + Minerals;   + Antibiotics;   + Chemical preservatives;   + Fermentation products   + Probiotics   + Flavors   + Sweeteners   + Any other additives |
| 1. Feed Formulation Manual (FFM) may include but are not limited to: | * + KARLO feed formulation manual   + MOA feed formulation manual |
| 1. Feed processing tools, equipment and materials may include but are not limited to: | * + Grinders   + Crushers   + Hammer mills   + Shovels |
| 1. Feedstuff treatment methods may include but are not limited to: | * + Drying   + Flaking   + Pelleting   + Grinding   + Mixing   + Crushing   + Roasting   + Cooling   + Dry rolling   + Pressure cooking   + Exploding   + Reconstitution   + Extrusion   + Gelatinization   + Popping   + Micronizing   + Crumbling |

## 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
* ICT skills
* Mixing
* Packaging
* Storing

### Required Knowledge

The individual needs to demonstrate knowledge of:

* Animal nutrition requirements
* Feed ingredients that supply nutrients required
* Sources of quality feed ingredients
* Calculation of animal feed ratios
* Computer programs
* Types of feeds and feedstuffs
* Animal nutrition
* Procurement
* Agricultural economics (cost benefit analysis)
* Animal feedstuffs processing
* Animal feedstuffs mixing techniques
* Packaging
* Standard bodies e.g. KEBS
* Feeds storage structures
* Feed storage conditions
* Characteristics of a good store
* Fee d quality materials.
* Design of feed processing premises
* Processing of feed

## EVIDENCE GUIDE

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | * 1. Determined quantities of feed to be sourced   2. Weighed the received feed ingredients   3. Stored received as per feed industry standards   4. Followed established recipes for feed processing   5. Packaged and stored the processed feed.   6. Sampled mixed feed using appropriate equipment   7. Collected samples of received feed ingredients for analysis |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant assessment environments.   3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | * 1. Practical   2. Third party report   3. Projects   4. Portfolio of evidence   5. Written tests   6. Oral questions |
| 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. |

# OPERATE FEED PROCESSING EQUIPMENT

**UNIT CODE:0716 351 04A**

**UNIT DESCRIPTION**

This unit covers the competencies required in operate feed processing equipment. it involves prepare feed processing equipment, control feed processing equipment and maintain feed processing equipment.

**ELEMENT 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. Prepare Feed Processing Equipment | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. ***Feed processing tools and equipment*** are assembled as per work requirement   3. Feed processing equipment and facility are cleaned as per work requirement   4. Waste is managed according to environmental protection regulations |
| 1. Control feed processing equipment | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. Feed ingredients are assembled as per work requirement   3. Feed processing equipment is operated as per manufacturer user manual   4. Waste is managed according to environmental protection regulations |
| 1. Maintain feed processing equipment | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. **Maintenance tools** are assembled as per work requirement   3. Feed processing equipment broken parts are repaired and replaced as per the manufacturer’s user manual   4. Feed processing equipment is serviced as per manufacturer’s manual   5. Feed processing equipment maintenance records are maintained as per work requirement   6. Waste is managed according to environmental protection regulations |

**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. ***Feed processing tools and equipment*** includes but may not be limited to: | * 1. pelletizers   2. mills   3. Dryers   4. Grinders |
| 1. **Maintenance tools** includes but may not be limited to: | * 1. greasing gun   2. spanners   3. pliers |

## 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:

* Drawing
* Communication
* Demonstration
* Interpersonal
* Calculation
* Analytical
* Observation
* Problem solving
* First aid
* Multi-tasking
* Machinery operation

### Required Knowledge

The individual needs to demonstrate knowledge of:

* Types of feed mixers and their principles of operation
* Feed mill components, controls feature and operational functions
* Attached equipment, features, operational functions and procedures
* Maintenance of feed mill
* Maintenance of feed mill facilities
* Occupational safety and health practices
* Record keeping and 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 | * 1. Cleaned feed processing equipment and facility as per work requirements.   2. Prepared the facility for feed processing   3. Operated feed processing equipment as per manufacturer user manual.   4. Repaired and replaced feed processing equipment as per manufacturer user manual   5. Feed processing equipment maintenance records are maintained as per work requirement   6. Maintained feed processing equipment maintenance record as per work requirements |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant assessment environments.   3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | * 1. Practical   2. Third party report   3. Projects   4. Portfolio of evidence   5. Written tests   6. Oral questions |
| 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 LIVESTOCK FORAGE

## UNIT CODE: 0721 351 05A

## UNIT DESCRIPTION

This unit covers the competencies required in producelivestock forage.

It involves prepare forage land, establish forage crops, manage forage crops, utilize forage crops and conserve forage crops.

## ELEMENT 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. Prepare forage land | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. **Land preparation tools and equipment** are assembled as per work requirement   3. **Forage** land is cleared from unwanted vegetation and debris as per **Good Agricultural Practices (GAPs)**   4. Forage land is tilled as per GAPs   5. Waste is managed according to environmental protection regulations |
| 1. Establish forage crops | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. Tools and equipment are assembled as per work requirement   3. **Forage propagation materials** are sourced as per Forage and Pastures Production Manual (FPPM)   4. Forage propagation materials are established as per GAPs   5. Forage establishment records are maintained as per workplace requirement   6. Waste is managed according to environmental protection regulations |
| 1. Manage forage crops | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. Tools and equipment are assembled as per work requirement   3. Forage pests and diseases are controlled as per GAPs   4. Forage weeds are controlled as per GAPs   5. Fertilizers are applied as per GAPs   6. Forage is watered as per GAPs   7. Forage management records are maintained as per workplace requirement   8. Waste is managed according to environmental protection regulations |
| 1. Utilize forage crops | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. Forage harvesting tools and equipment are assembled as per work requirement   3. Forage harvesting stage is determined as per FPPM   4. Forages are harvested as per FPPM   5. Forage production records are maintained as per workplace requirements   6. Waste is managed according to environmental protection regulations |
| 1. Conserve forage crops | * 1. Personal Protective Equipment (PPEs) are worn as per work requirement   2. **Forage conservation tools** and equipment are assembled as per work requirement   3. **Forage storage facilities** are prepared as per workplace requirement   4. Forage materials for conservation are gathered as per work requirement   5. Forage conservation methods are applied as per FPPM   6. Forage conservation records are maintained as per workplace requirement   7. Waste is managed according to environmental protection regulations |

**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. Land preparation tools and equipment includes but not limited to: | * + Jembes /hoe   + Slashers   + Mowers   + Ploughs   + Harrows |
| 1. Forage propagation materialsincludes but not limited to: | * + cuttings   + seeds   + Seeds   + Seedlings   + Splits   + Crowns   + Slips   + Cuttings   + Suckers   + Tissue culture |
| 1. Forage conservation toolsincludes but not limited to: | * + balers   + forage harvesters   + mowers   + Manual balers |
| 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   + Integrated pest management (IPM)   + Minimum, tillage |
| 1. Foragesincludes but not limited to: | * + Nandi setaria   + Star grass   + Guinea grass   + Rye grass   + Kale   + Sweet potato vine   + 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 | * 1. Assembled land preparation tools and equipment as per work requirements   2. Cleared forage land from unwanted debris and vegetation as per GAPs   3. Forage propagation materials are sourced as per Forage and Pastures Production Manual (FPPM)   4. Sourced forage propagation materials as per FPPM   5. Established Forage propagation materials as per GAPs   6. Forage pests and diseases are controlled as per GAPs   7. Controlled Forage pests and diseases as per GAPs   8. Assembled Forage harvesting tools and equipment per work requirement   9. determined Forage harvesting stage as per FPPM   10. harvested Forages are as per FPPM   11. Applied Forage conservation methods as per FPPM |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant assessment environments.   3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | * 1. Practical   2. Third party report   3. Projects   4. Portfolio of evidence   5. Written tests   6. Oral questions |
| 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. |