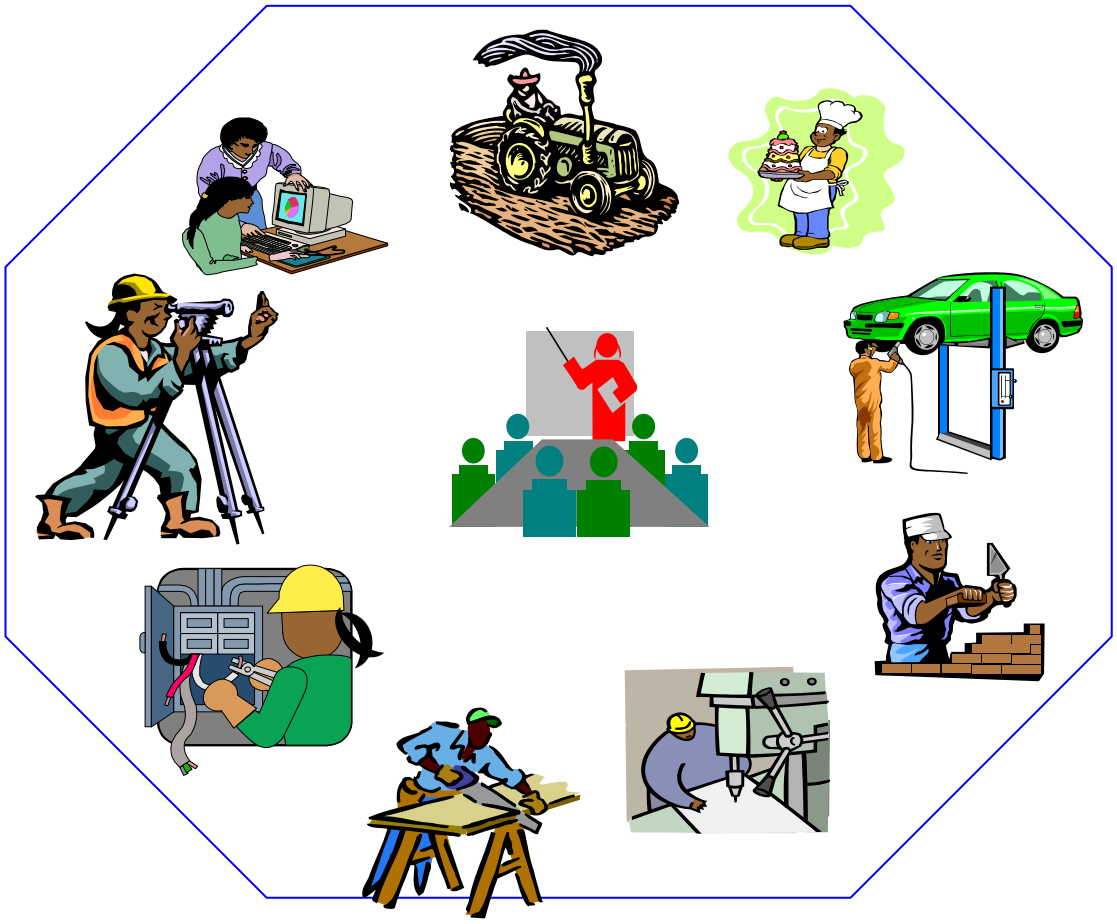
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA OCCUPATIONAL STANDARD

AGRICULTURAL MACHNERY AND EQUIPMENT OPERATION

NTQF Level I, II, III and IV



Ministry of Labour and skill
March 2022

Introduction

Ethiopia has embarked on a process of reforming its TVET-System. Within the policies and strategies of the Ethiopian Government, technology transformation – by using international standards and international best practices as the basis, and, adopting, adapting and verifying them in the Ethiopian context – is a pivotal element. TVET is given an important role with regard to technology transfer. The new paradigm in the outcome-based TVET system is the orientation at the current and anticipated future demand of the economy and the labor market.

The Ethiopia Occupational Standards (EOS) is the core element of the Ethiopian National TVET-Strategy and an important factor within the context of the National TVET-Qualification Framework (NTQF). They are national Ethiopian standards, which define the occupational requirements and expected outcome related to a specific occupation without taking TVET delivery into account.

This document details the mandatory format, sequencing, wording and layout for the Ethiopia Occupational Standard which comprised of Units of Competence.

A Unit Title describes a distinct work activity. It is documented in a standard format that comprises:

- Occupational title and NTQF level
- Unit title
- Unit code
- Unit descriptor
- Elements and Performance Criteria
- Variables and Range
- Evidence guide

Together all the parts of a Unit Title guide the assessor in determining whether the candidate is competent.

The ensuing sections of this EOS document comprise a description of the occupation with all the key components of a Unit Title

- Chart with an overview of all Units of Competence for the respective level including the Unit Codes and the Unit Titles
- Contents of each Unit Title(competence standard)
- Occupational map providing the technical and vocational education and training (TVET) providers with information and important requirements to consider when designing training programs for this standard and for the individual, a career path.

Modification History

2.1 Occupational Title:

This occupational Standard is set for Agricultural Machinery and Equipment Operation Level I, II, III and IV. This occupational Standard is version2 and revised in March 2022.

2.2. Description of the Occupation

2.2.1 Level Description

Level I

In the previous version (version 1); level I didn't specified for a single occupation and had been entitled as 'Farm Mechanization 'which was customized as 'Agricultural Machinery and Equipment Operation ' for the current revised version. Based on the NTQF and the guide lines of the new TVET policy formulated; the exiting occupation is reviewed by accepting, removing, shifting and modifying the name as well as its body. Moreover, the revisitation process again takes into consideration the benchmark from Australia and Philippine to be full and address its intended objective.

Level II

Breadth, depth and complexity of competences would cover selecting, adapting and transferring skills and knowledge to new environments and providing technical advice and some leadership in resolution of specified problems. This would be applied across a range of roles in a variety of contexts with some complexity in the extent and choice of options available.

Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgment is required in the selection of equipment, services or contingency measures and within known time constraints.

Applications may involve some responsibility for others. Participation in teams including group or team co-ordination may be involved.

Level III

Breadth, depth and complexity of knowledge and competencies would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance are involved when organizing activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature.

Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organization of, others.

2.2.2 Occupant Performance Profile

Agricultural Machinery and Equipment Operation level

Occupational standard for this level covers description of the competences (knowledge, skills and attitudes) to perform work activities to standard required at work places expressed as occupant performance profile listed on the chart

Occupant Performance Profile

Agricultural Machinery and Equipment Operation level II

Occupational standard for this level covers description of the competences (knowledge, skills and attitudes) to perform work activities to standard required at work places expressed as occupant performance profile listed on the chart

Occupant Performance Profile

Agricultural Machinery and Equipment Operation III

Occupational standard for this level covers description of the competences (knowledge, skills and attitudes) to perform work activities to standard required at work places expressed as occupant performance profile listed on the chart:

Occupant Performance Profile

Level IV

Agricultural Machinery and Equipment Operation IV

Occupational standard for this level covers description of the competences (knowledge, skills and attitudes) to perform work activities to standard required at work places expressed as occupant performance profile listed on the chart:

2.2.3. *Unit Code:*

There are agreed conventions for the unit codes used for unit of competences organized for any specific occupational standard. Codes are given by considering international and national benchmarks.

Example:

Unit Title: Develop animal feed plan and conduct ration formulation

Unit Code: **AGR AMO4 01 1222**

Unit Coding is described here under:

Character	**What it stands for:**
AGR	First three characters signify the priority/major industry/sector acronym. **AGR** represents Agriculture
AMO4	Four characters in the second group signify the acronym of the occupational title expressed as a work function and qualification level written in numerical

	form shows the unit belongs. **AMO4** represents Agricultural Machinery and Equipment Operation and number **4** represents that the occupational standard serves for Level IV
01	Third group with two numbers signify the numerical order of the specific unit in the level occupational standard
1222	Fourth group of four characters signify the month and year of OS development. E.g. December **2020**

2.2.3 Version Change

This occupational standard is developed in the title of **"Agricultural Machinery and Equipment Operation "**for level I, II, III and IV. The title of the occupational standard for this version is maintained the existing title names: Basic Farm Machinery and Equipment Operation L-I, ,Farm Machinery and Equipment Operation L-II, Farm Machinery and Equipment Operation L-III and Farm Machinery and Equipment Operation L-IV to which the relevant sector for the occupation- Agriculture sector belongs.

The version number for future revision will either be changed or not, depending on the extent of the change. Thus, those who are responsible to undertake competence assessment and provide training should check for the version number and review date of the document to confirm the latest version number before developing assessment tools and commence training respectively. Users are also advised to contact the agency for any doubts they have on the document or may refer to the website.

The development date is the time the document is prepared and validated by relevant industry experts and approved by relevant sector leading the industry. It indicates the effective date to use the document for training and assessment purposes and termination of use of the previous version for any purposes.

The endorsed occupational standards and their components may remain current up to five years from the date of development. This version is developed in **March 2022.**

Previous Occupational Standard	**Modified Occupational standard**
Name and Level: Basic Farm Machinery and Equipment Operation : Level I	Name and Level: Agricultural Machinery and Equipment Operation : Level I
Farm Machinery and Equipment Operation : Level II	Name and Level: Agricultural Machinery and Equipment Operation : Level II
Farm Machinery and Equipment Operation Level III	Name and Level: Agricultural Machinery and Equipment Operation : Level III
Farm Machinery and Equipment Operation : Level IV	Name and Level: Agricultural Machinery and Equipment Operation : Level IV
Version: one	Version: two
Date of Development: July 2014	Date of Development: March 2022

UNIT OF COMPETENCE CHART

Occupational Standard: Agricultural Machinery and Equipment Operation Level I

Occupational Code: AGR AMO

NTQF Level I

AGR AMO1 01 0322 Use Basic workshop Tools and measuring devices	**AGR AMO1 02 0322** Perform Crop Production	**AGR AMO1 03 0322** Perform Agricultural Crop Harvesting
AGR AMO1 04 0322 Operate Manual Agricultural equipment	**AGR AMO1 05 0322** Operate Animal Husbandry Machinery and Equipment	**AGR AMO1 06 0322** Undertake basic Maintenance of Machinery and Equipment
AGR AMO1 07 0322 Inspect, repair and Replace Tyres	**AGR AMO2 07 0322** Operate and Use Post Harvest Technologies	**AGR AMO1 09 0322** Apply First Aid
AGR AMO1 10 0322 Apply Agricultural Extension Communication	**AGR AMO1 11 0322** Implement Agribusiness Marketing	**AGR AMO1 12 0322** Apply Basics of Human Nutrition Practices
AGR AMO1 13 0322 Apply 5S Procedures		

UNIT OF COMPETENCE CHART

Occupational Standard: Agricultural Machinery and Equipment Operation

Occupational Code: AGR AMO

NTQF Level II

AGR AMO2 01 0322 Test, Service and Charge Batteries	**AGR AMO2 02 0322** Operate Agricultural Tractor	**AGR AMO2 03 0322** Operate walking Tractors
AGR AMO2 04 0322 Undertake Land Preparation operation	**AGR AMO2 05 0322** Conduct Backhoe/ Front-end Loader Operations	**AGR AMO2 06 0322** Operate irrigation pumps and equipment
AGR AMO2 07 0322 Operate animal product processing Machinery	**AGR AMO2 08 0322** Inspect and Adjust Machinery Controlling System	**AGR AMO2 09 0322** Apply Agricultural Extension service for rural development
AGR AMO2 10 0322 Prevent and Eliminate MUDA		

NTQF Level III

AGR AMO3 01 0322 Operate Broadcasting Machinery and Equipment	**AGR AMO3 02 0322** Operate Row Crop Planting and Seeding Machinery and Equipment	**AGR AMO3 03 0322** Operate Mobile Irrigation Machinery and Equipment
AGR AMO3 04 0322 Operate Chemical spraying Machinery and Equipment	**AGR AMO3 05 0322** Operate Grain Cleaning Machinery and Equipment	**AGR AMO3 06 0322** Operate Grain Combine Harvester
AGR AMO3 07 0322 Operate Grab loader and Haulage machinery	**AGR AMO3 08 0322** Operate Cotton picker	**AGR AMO3 09 0322** Operate Cane Harvester
AGR AMO3 10 0322 Operate Animal Feed Processing Machinery and Equipment	**AGR AMO3 11 0322** Apply Digital Technology in Agriculture	

NTQF Level IV

AGR AMO4 01 0322 Operate Small-scale Horticultural product Processing Equipment	**AGR AMO4 02 0322** Operate Precision Agriculture Technology	**AGR AMO4 03 0322** Perform New Land Development Operation
AGR AMO4 04 0322 Manage Machinery Custom Hiring and Rental Services	**AGR AMO4 05 0322** Manage Agricultural Machinery and Equipment	**AGR AMO4 06 0322** Plan and Implement Machinery Operational Plan
AGR AMO4 07 0322 Develop Value Chain Analysis		

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Use Basic Workshop Tools and Measuring Devices**
Unit Code	**AGR AMO1 01 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to identify, use and maintain Workshop Tools and measuring devices; Conduct measurement and analyse results

Elements	Performance Criteria
1. Identify Workshop Tools and Measuring Devices	1.1 OHS requirements including regulatory requirements are identified and reported. 1.2 ***Personal protective equipment*** needs are identified 1.3 ***Hand tools, power tools*** and ***measuring devices*** are identified 1.4 ***Safe working procedures*** adhered and followed 1.5 Unsafe or faulty tools are identified and marked for use according to designated procedures before, during and after use. 1.6 ***Workplace information*** requirements and procedures are accessed and strictly followed.
2. Use hand and power tools	2.1 ***Hand and power tools*** are selected appropriate to the task requirements. 2.2 All safety requirements are adhered to before, during and after use. 2.3 Hand tools are used to produce desired outcomes to job specifications which may include finish, tension, size or shape. 2.4 Power tools are used for a determined sequence of ***operations*** 2.5 Hand and Power tools are stored safely in appropriate location according to standard workshop procedures and manufacturers' recommendations.
3. Conduct measurements and analyse results	3.1 Methods and Work instructions/information are strictly applied. 3.2 Technical and/or calibration requirements and warning are sourced for measuring equipment and support equipment is identified and prepared. 3.3 Measurement results are compared with manufacturer/ component supplier specifications to indicate compliance or non-compliance. 3.4 Report is processed in accordance with workplace procedures
4. Maintain tools and measuring device	4.1 Information required for maintenance is accessed from manufacturer/component supplier specifications and correctly interpreted 4.2 ***Operational maintenance*** of tools and measuring device are carried out. 4.3 Checks are completed without causing damage to component or

	system 4.4 Workplace documents are processed and ***communicated*** in accordance with workplace procedures

Variable	**Range**
Personal protective equipment	May include but not limited to: • Protective covers, • Eye glass • Goggles • Gloves • Safety shoe • Face shield • Apron/overall • Facemask
Hand tools	May include but not limited to: • Hacksaws • Spanners • Hammers • Punches • Screwdrivers • Sockets • Wrenches • Scrapers • Chisels • File • Tap and die
Power tools	May include but not limited to: • Electric or pneumatic/hydraulic tools • Grinders, • Grease gun • Sanders, planers, routers and drills
Measuring Devices	May include but not limited to: • Vernier calliper • Micrometre • Pressure gauge • Measuring tape • Thickness gauge • Split levels • Steel rulers • Tape measures • Balance • Graduated cylinders

Safe working procedures	May include but not limited to: • Vehicular movement • Toxic substances • Electrical safety • Machinery movement and operation • Manual and mechanical lifting and shifting • Working in proximity to others and site visitors
Operations	May include but not limited to: • Clamping • Cutting • Alignment • Adjustment to produce desired outcomes.
Operational maintenance	May include but not limited to: • Hand sharpening, cleaning, lubricating, tightening, calibrating • Simple tool repairs and adjustments using engineering principles, tools, equipment and procedures to statutory and regulatory requirements
Communicating	May include but not limited to: • Verbal and visual • Site specific instructions, • Written instructions, • Plans or instructions related to job/task, • Telephones and pagers
Workplace information	May include but not limited to: • Cleaning the work area • Verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets diagrams or sketches • Safe work procedures related to the use and maintenance of measuring equipment • Regulatory/legislative requirements pertaining to the automotive industry, including Environment Protection Regulations (Diesel Fuels), • Organisation work specifications and requirements • Instructions issued by authorised enterprise or external persons

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge, attitude and skills competence to: • Identify and select different hand tools, power tools and measuring devices in a general operational workshop context • Apply different hand tools, power tools and measuring devices in a

	general operational workshop context • Identify common fault and defects in hand tools, power tools and measuring devices • Perform routine maintenance requirements for a range of hand tools and power tools • Perform adjustments/alignments to a range of power tools • Perform tool sharpening techniques for a range of hand and power tools • Describe hazards and control measures associated
Required Knowledge and Attitudes	Demonstrate knowledge of: • Application of different hand tools in a general context • Common faults and/or defects in hand tolls and power tools • Procedures for marking unsafe or faulty tools for repair • Routine maintenance requirements for a range of hand tools and power tools • Application of different power tools • Clamping/securing methods • Adjustments/alignments to a range of power tools • Procedures for marking unsafe or faulty power tools for repair • Tool sharpening techniques for a range of hand tools and power tools • Storage location and procedures for a range of hand and power tools • Hazards and control measures associated with using hand tools and power tools • Safe work practices and procedures • Common automotive measurement terminology • Types of non-specialist measuring equipment and their applications • Measurement procedures • Measuring equipment maintenance procedures • Enterprise quality procedures • Work organisation and planning processes
Required Skill	Demonstrate skills to: • Reading and following information on standard operating procedures • Selecting hand tools and /or power tools appropriate to the task • Use personal protective equipment • Using hand tools, power tools and measuring devices safely • Identifying and use hand tool, power tool and measuring device defects and marking for repair • Maintaining/sharpening hand tools and /or power tools using appropriate techniques • Using clamping/securing devices • Storing hand tools in accordance with manufacturers'/standard

	operating procedures • Sharpening tools/tool bits within the scope of this unit • Storing power tools according to manufacturers'/ standard operating procedures • Use mathematical ideas and techniques to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks • Use workplace technology related to the use and maintenance of measuring equipment, computerised technology and communication devices and the reporting/documenting of results
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Perform Crop Production**
Unit Code	**AGR AMO1 02 0322**
Unit Descriptor	This unit covers the knowledge, skills and attitude required to identify crop types, identify and determine basic Properties of Soil Prepare materials, tools and equipment for crop production, undertake agricultural Crop production work, clean up, store materials, equipment, and record and document.

Element	Performance Criteria
1. Identify crop types	1.1 ***Crop types*** and characteristics are identified 1.2 ***Methods of crop productions*** are identified and understood according to agronomical practices 1.3 Identify suitable agro climatic zone for crops 1.4 Identify ***good agriculture practice(GAP)***
2. Identify and Determine Basic Properties of Soil	**2.1** Prepare for ***soil sampling*** techniques and sample collection methods are identified according to site plans requirements **2.2** Areas of homogeneous soil types are identified for sampling **2.3** Area for soil sample collection is identified from workplace records or according to enterprise work procedures **2.4** The ***physical characteristics*** of the soil are identified according to investigative requirements and best practice guidelines **2.5** Soil profile is determined, where appropriate according the guidelines.
3. Prepare materials, inputs, tools and equipment for crop production	3.1. The required ***inputs,*** materials, ***tools equipment and machinery*** are identified. 3.2. Materials, tools and equipment are checked with insufficient or faulty 3.3. Correct manual handling and techniques for loading and unloading **materials are** used to minimize damage to the load, person and the vehicle. 3.4. Suitable ***Personal Protective Equipment (PPE)*** are selected and checked. 3.5. ***OHS hazards*** are identified and reported
4. Undertake agricultural Crop production work	4.1. Crop production work is undertaken in a safe and environmentally appropriate manner. 4.2. Conduct ***agronomic practices*** 4.3. Interactions with farmers and customers are carried out in a positive and supportive manner.

	4.4. Workplace procedures in relation to workplace practices, handling and disposal of materials are observed.
5. Handle, Clean up and store materials and equipment	5.1. ***Waste material*** produced and generated during crop production work is handled and stored in a designated area 5.2. Tools, equipment and machinery are checked for wear/damage, and prepared for transporting/storage 5.3. Materials, equipment and machinery are cleaned and stored in safe work site while completing cropping activities.
6.Record and document	6.1. Problems or difficulties in completing work to required standards or timelines are reported. 6.2 Materials, equipment and machinery condition after work are recorded and reported 6.3 Work activities and outputs are reported in standard format

Variable	**Range**
Agricultural crops	May include but not limited to : • Cereal crop • Grain legumes • Industrial crop (cotton, sugar cane) • Oilseeds – ground nuts, sesame, flax, sunflower, safflower • Castor beans, horse bean, soya bean, haricot bean and peas • Horticultural crops: ➢ Leaf plants. Lettuce, cabbage, spinach, cauliflower ➢ Fruit plants - pepper, tomato, green beans, ➢ Root plants- potato, sugar beets, sweet potato, carrot, red beet ➢ Crawling plants - pumpkin, water melon, egg plants, cucumber zukuni ➢ Shallot, onion, garlic, ➢ Orange, lemon, grape fruits, mandarin, banana ➢ Papaya, Avocado, Casmir, guava, apple, mango, peach ,pear, pineapple, Passion fruit, grape vines • Spice and stimulants Coffee, tea, ginger, and all other spice plants grown
Methods of crop productions	May include • Preparation of Soil. • Sowing of Seeds • Application of Manure and Fertilizers • Irrigation system • Crop Protection • Harvesting • Storage

Tools and equipment	May include but not limited to: • Hand tools, • Knapsack • Machetes • Sickles • Sack truck • Fencing tools, • Augers, • Measuring tools, • Secateurs, • Spades, • Forks, • Hoes, • Packing equipment, • Box • Water can • Spades, • Augers, • Soil sample storing • Recording materials, • Field test kits • PH meter • Litmus paper • Tape measure, • Polythene bags • Knives, • Meter tape • Ladders, • Drip irrigation, • Sprinklers,
Inputs	May include but not limited to: • Seeds/planting materials • Fertilizer • Pesticides • Bio fertilizer • Compost • Lime Planting materials • Cutting • Buds • Bulbs • Corms • Seed

Agronomic Practice	My include, but not limited to: • Site selection • Land clearing and preparation, • Seeding/planting/Sowing • Input application • Weeding • Hoeing • Watering/Irrigating • Pest management • Maintaining, • Loading and unloading, • Harvesting/picking, • Sorting, and packing
Personal Protective Equipment (PPE)	May include, but not limited to: Steel capped boots/shoes, overalls, gloves, sun hat, safety goggles, face mask and ear protectors.
OHS hazards	May include but not limited to: • Solar radiation, dust, noise, • Air- and soil-borne microorganisms, • Chemicals and hazardous substances, • Sharp hand tools and equipment, • Manual handling, • Holes, and slippery and uneven surfaces
soil sampling	May include, but not limited to: • Collecting, • Preparing, • Packaging and labelling soil samples for off-site testing and/or on-site testing and analysis.
Physical characteristics of soil	May include but not limited to: • Colour, • Texture, • Structure, • Depth of root zone and • Depth of water table.
Soil profile	May include but not limited to: • Soil profile is defined as the vertical section of the soil from the ground surface downwards to where the soil meets the underlying rock.
Waste material	May apply to: • Plant debris, litter and broken components, • Plastic, metal, or paper-based materials. • Straws,

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills to: • Prepare materials, tools and equipment for cropping work • Undertake field crop work • Apply safe work practices in repair and maintenance of structures. • Field preparation for crop establishment • Identify good agronomic practice • Handle materials and equipment safely and • Carry out cleaning up on completion of work. • Collect, analyses and organize information, locate, interpret e and apply with further clarification • Plan and organize own activities in a logical sequence and in a timely manner. • Use mathematical ideas and skills and estimation relevant to cropping • understand sampling techniques • Collect soil samples for testing • Identify soil profile and physical property • Perform soil tests and determine basic properties of soil by observation and using soil test kits • Sample, test soil samples and report in the required format on the soil characteristics identified • Communicate with work team members, • Recording techniques have been successfully and appropriately carried out
Required Knowledge and Attitudes	Demonstrate knowledge of: • Safe work practices principles • Identify Materials, tools and equipment for crop production work • Crop production materials and equipment • Cleaning work on completion • Information handling • Logical sequence of work activities in a timely manner • Mathematical ideas and estimation • Understand soil sampling techniques • Physical soil testing methods that may be used to identify and determine basic properties of soil intended to crop production purpose • Understand and identify soil profile • The capacity of soils to provide water to plants. • The importance of organic matter in soil in relation to the intended crop production use. • Soil-plant relationships

	• Understand planting/transplanting/sowing, potting, weeding, hoeing, picking, packing, • Loading, unloading and transporting techniques
Required Skills	Demonstrate Skills to: • Prepare materials, tools and equipment for cropping work • Undertake agricultural cropping work as directed • Clean up and handle materials and equipment on completion of work. • Communicate ideas and information about the job, tasks and problems • Working with others and in teams • Apply technology in the use of farm tools and equipment • Measure distance, depth and spacing, calculate area, volume • Collect soil samples • Perform basic physical soil tests • Identify soil profile • Communicate of ideas and information through reporting results of soil tests to supervisor or others orally or in writing • Collect, and organize information through recording from laboratory results • Use of mathematical ideas and techniques through the use of accepted soil tests • Apply problem-solving skills through identifying and resolving problems with the sampling process • Use technology to access and apply soil sampling techniques specifications, undertake soil basic properties identification activities communicate report and keep records. • Use of technology through the use of standard soil testing equipment • Undertake crop production management works
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Perform Agricultural Crop Harvesting**
Unit Code	**AGR AMO1 03 0322**
Unit Descriptor	This unit covers the knowledge, skills and attitude required to Prepare for agricultural crop harvesting ,Prepare machinery and equipment for crop harvesting and Complete harvesting operation

Elements	Performance Criteria
1. Prepare for agricultural crop harvesting operations.	1.1 Instructions about ***agricultural crop*** harvesting activities are interpreted and clarified with the supervisor. 1.2 Occupational Health and Safety (OHS) hazards are identified, risks assessed and reported to the supervisor. 1.3 Suitable Personal Protective Equipment (PPE) is selected, used and maintained. 1.4 ***Machinery***, ***equipment and tools*** are selected and prepared for the task being undertaken. 1.5 Field crops maturity status is identified and confirmed 1.6 Suitable **weather conditions** for harvesting are considered according to farm work procedure.
2. Prepare machinery and equipment for crop harvesting	2.1 Machinery for crop harvesting operations are identified 2.2 Pre-operation requirements are checked for crop harvesting machinery 2.3 Instructions concerning location, harvesting schedule and special operating instructions or work procedures are performed. 2.4 Farm tools, equipment and machinery are maintained and adjusted. 2.5 Availability of required labour and equipment are scheduled (place and time) 2.6 Crop harvesting procedures and performance expectations prepared and confirmed
3. Complete harvesting operation	3.1 Crop harvest order and procedures as scheduled in harvesting plan are implemented 3.2 Harvesting machinery and equipment are cleaned according to enterprise procedures and the manufacturer's specifications. 3.3 All containers, leftover fluids waste and harvest debris is disposed

	of safely and appropriately. 3.4 All required workplace records are completed accurately and promptly in accordance with ***enterprise requirements***.

Variable	**Range**
Agricultural crops	May include but not limited to : • Cereal crops • Legume crops • Oil crops • Stimulant crops • Horticultural crops • Industrial crops • Root and spice crops
weather conditions	May include but not limited to • Temperature, • Humidity, • Rain, • Wind • Sunny condition(storm, cloudy…)
Machinery	May include but not limited to: • Combine harvesters, • Threshing machines, • Shellers • Seed cleaning/grading machinery, • Reaper harvester • Brush cutter • Ballers
Equipment and tools	May include but not limited to: • Hand tooling, • Specialised equipment knives, • bags, • Ladders maturity testing • Equipment, • Tyre removal equipment, • Various repair material, • Repair tool set • Trailers, trucks
Personal Protective Equipment (PPE)	May include but not limited to : • Boots, overalls, gloves, goggles, respirator or face mask, face guard, hearing protection, sunscreen lotion and hard hat. • Personal protective equipment is to include that prescribed under legislation/regulations/codes of practice and workplace policies

	and practices
Enterprise requirements	May include but not limited to: • Waste management • Pollution • Noise • Dust • Clean-up management • Protective clothing and equipment • Use of tooling and equipment • Workplace environment and safety • handling of material • Use of firefighting equipment • Enterprise first aid • Hazard control and hazardous materials and substances

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Prepare precondition for harvesting machinery and equipment • Suitable weather condition and crop maturity level identified and confirmed • Crop harvest order and procedures as scheduled in harvesting plan are implemented • Harvesting machinery and equipment are cleaned • Record and document information as requested
Required Knowledge and Attitudes	Demonstrate knowledge of: • Harvesting machinery and equipment basic function known. • Types of crops and their characteristics • Crop product quality requirements consideration • Read a range of workplace information • Environmental impacts and procedures for crop harvesting • The effect of adverse climatic conditions (e.g., rain, hail, extreme wind, or very high ultraviolet radiation), which may prevent or impede crop harvesting operations. • Plan the time taken to complete the tasks necessary to fulfil the operation
Required Skills	Demonstrate skills to: • Identify hazards and follow safety directions • Participate in teams

	• Monitored crop quality throughout harvest • Maturity status and weather condition identified • Identify harvesting machine types • Communicate ideas and information to work team members, supervisors, contractors and clients
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Operate Manual Agricultural Equipment**
Unit Code	**AGR FMO1 04 0322**
Unit Descriptor	This unit covers the knowledge, attitude and skill required to prepare, operate, maintain and store manual equipment.

Elements	Performance Criteria
1. Prepare manual equipment for operation	1.1 Components and working principles of manual equipment are identified and understood. 1.2 ***OHS requirements*** and hazards associated with the use of equipment are identified. 1.3 ***Safe operating procedures*** are observed and noted during the use of tools/ equipment in accordance with workplace guidelines. 1.4 ***Personal Protective Equipment (PPE)*** is selected and used. 1.5 ***Environmental requirements*** and Workplace ***information sources*** are accessed and procedures are strictly adhered. 1.6 Pre-operational checks are performed. 1.7 Chemical labels and symbols are recognised and hazards are identified. 1.8 Equipment is calibrated and adjusted according to job specification 1.9 Appropriate ***fitting and accessory*** for desired operation is selected.
2. Operate manual equipment	2.1 The implements/equipment are adjusted and calibrated according to work requirements 2.2 ***Manual equipment*** operations are performed according work requirements 2.3 Spraying operations are carried out according requirement 2.4 Feed the right amount of input for the designed capacity of equipment. 2.5 Seed breakage or insufficient work result are monitored and corrected.
3. Maintain and store manual equipment	3.1 Faulty equipment is maintained and replaced 3.2 Manual operated equipment is cleaned after use according to manufacturer instruction. 3.3 Waste and disposable materials are removed and disposed after operation in appropriate location. 3.4 Worn out parts and components are maintained. 3.5 Manual equipment is stored in a safe place. 3.6 Instructions for transport, handling and storage of chemicals are recognised and observed 3.7 Instructions for use, maintenance and storage of personal

	Protective equipment and application equipment are implemented. 3.10. Records are completed in accordance with work plan Procedures

Variable	Range
Manual equipment	May include but not limited to: • Knapsack sprayer (battery operated, hand cranked etc.) • Hand operated Sheller/thresher • Manual groundnut decorticator • Improved ploughs • Animal drawn carts • cultivators/weeder • Animal feed choppers
OHS requirements	May include but not limited to • Personal protective equipment and clothing • Workplace environment and safety, safety equipment • Enterprise first aid and first aid equipment • Hazard and risk control and hazardous materials and substances electrical safety • Elimination of hazardous materials and substances • Manual handling, including shifting, lifting and carrying • Emergency procedures • Use of tooling and equipment • Handling of material • Use of fire fighting Equipment
Safe operating procedures	May include but not limited to: • Operational risk assessment and treatments associated with vehicular movement, toxic substances, machinery movement and operation, manual and mechanical lifting and shifting, • Working in proximity to others and site visitors • Emergency shutdown and stopping of Equipment, extinguishing fires, enterprise first aid requirements and site evacuation
Personal Protective Equipment (PPE)	May include but not limited to: • Include that prescribed under legislation/regulations/codes of practice and workplace policies and practices
Information sources	May include but not limited to : • Verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, Material Safety Data Sheets (MSDS), diagrams and sketches • Regulatory/legislative requirements pertaining to automotive and chemical industry • Organisation work specifications and requirements

	• Instructions issued by authorised enterprise or external persons • International standards • Verbal and graphical instructions and fault reporting and may include site specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Fitting and accessory	May include but not limited to: • Spray nozzles • Sieves • Belt and pulley • Pressure tubes
Environmental requirements	May include: • Waste management • Pollution • Noise • Dust • Clean-up management
Emergency procedures	May include but not limited to: • Emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Operate manual equipment as per enterprise requirement • Safety rules for rotating and reciprocating parts of the equipment • Interpret chemical safety rules • Follow safety instructions including handling and storage • Use personal protective equipment • Calibrate and adjust equipment according to job specification • Select appropriate fitting and accessory for desired operation
Required Knowledge	Demonstrate knowledge of: • Basic occupational health and safety rules required to work near and around chemicals • Basic operating principles and functions of manual equipment • Use of operational manual • Chemicals being used for the control of pests and weeds • Environmental impacts of chemical use • Major parts, attachments and components of manual equipment • OHS, environmental and pesticides legislation and enterprise procedures
Required Skills	Demonstrate skills to: • Interpret labels and instructions • Follow workplace instructions and directions from the chemical label or Material Safety Data Sheets (msdss)

	• Communicate information about spillages, accidents or deficiencies in procedures and practice • Use appropriate Personal Protective Equipment (PPE) • Recognise caution or hazard signs and symbols • Interpret tasks or information from labels, manuals or written instructions • Use numeracy skills to complete basic calculations • Calibrate and adjust • Operate manual equipment • Maintain equipment • Record information accurately
Resources Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Operate Animal Husbandry Machinery and Equipment**
Unit Code	**AGR AMO1 05 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to prepare, Operate, use, clean, and store basic machinery and equipment for livestock (cattle, poultry, bee, fish…)

Elements	Performance Criteria
1. Prepare and identify for Work	1.1 Safety rules are followed and applied according to the policy of the working area/industry. 1.2 Identification is done in accordance with OHS requirements. 1.3 Personal protective equipment is applied. 1.4 Routine pre-operational checks of ***machinery and equipment*** are carried out and adjustments made according to manufacturer's specifications and/or enterprise policies and procedures. 1.5 Faulty or unsafe machinery and equipment are identified and segregated for repair or replacement according to enterprise requirements.
2. Identify technologies for animal husbandry machinery and equipment	2.1 Animal products used by human beings are identified. 2.2 Animal product storage equipment's is identified and selected 2.3 Animal product processing machinery and equipment are identified and selected 2.4 Industry terminology related to work procedures, equipment and animal management is used in work activities. 2.5 ***Daily routines*** are completed in accordance with occupational health and safety (OHS) requirements and environmentally sensitive work practices
3. Operate and use livestock husbandry machinery and equipment	3.1 Machinery and equipment are checked for contamination according to written guidelines and legislative requirements. 3.2 Appropriate machinery and equipment are used according to the manufacturers guidelines 3.3 Basic machinery and equipment are used for efficient and economic handling of animal products 3.4 Machinery and support equipment are made safe for checking, supported safely with free moving parts pinned or supported as required. 3.5 legislation or operating procedures are identified and inspected for contamination according to organizational procedures

4. Clean machinery and equipment	4.1 Machinery and equipment with free moving parts pinned is made safe for cleaning 4.2 Appropriate equipment is selected for cleaning. 4.3 Guards are checked and replaced safely 4.4 Areas on other equipment that likely to accumulate contaminants are identified, inspected and cleaned.
5. Safe storage of Machinery and equipment	5.1 Waste materials are disposed of according to enterprise operating procedures and relevant legislative requirements. 5.2 Equipment are stored safely in clean environment and storage area 5.3 Malfunctioned and damaged equipment are separated in storage area 5.4 Records of cleaning are recorded on appropriate forms according to enterprise policy and procedures.

Variable	**Range**
Machinery and equipment	May include but not limited to: • Milking machine • Hatchery and setter • Fish and poultry feeding equipment • Brooders • Incubator • Beehive
Daily routines may include:	May include but not limited to: • Cleaning animal housing and facilities • Feeding and watering animals • Collecting, collating and recording data • General animal husbandry tasks • Maintaining and storing records • Maintaining equipment.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: Indentify animal products storage, processing, handling machineries and equipments Select and use basic livestock products storage and processing machinery and equipments • List animal products used by human beings • List diary, poultry and beekeeping and production machinery and equipment.

	• Maintain products hygiene in accordance of industrial standard • report any issues that pose an infection risk • dispose of waste and infected material • Maintain accurate records using relevant organisational electronic and/or manual systems.
Required Knowledge and Attitudes	Demonstrate knowledge of: • machinery and equipment operating features • major components of animal product storage and processing machinery and equipment • inspection points and procedures required by legislation • Occupational Health and Safety (OHS), environment and management legislative and enterprise requirements
Required Skills	May include but not limited to: • identify adopt safe work environment • inspect animal, diary, poultry and bees machinery and equipment • operate, use and clean basic livestock machinery and equipment • use numeracy skills to estimate, calculate and record routine workplace measures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Undertake basic Maintenance of Machinery and Equipment**
Unit Code	**AGR AMO1 06 0322**
Unit Descriptor	This unit of competency covers the knowledge, attitudes and skills required for basic routine maintenance, perform routine and scheduled maintenance, complete basic routine and scheduled maintenance.

Elements	Performance Criteria
1. Prepare for basic routine maintenance	1.1 ***Tools*** and ***supplies*** required to carry out basic routine maintenances are identified and selected according to manufacturer's specifications. 1.2 Suitable ***personal protective equipment*** *is* selected, used and maintained according to ***OHS requirements***. 1.3 Faulty or unsafe machinery and equipment are identified and segregated for repair or replacement according to enterprise requirements. 1.4 ***OHS hazards*** in the workplace are identified and safety concerns reported.
2. Perform routine and scheduled maintenance	2.1 Common Greasing, lubrication points are identified 2.2 Basic scheduled servicing of machinery / equipment is carried out according to manufacturer's specifications and enterprise requirements. 2.3 Perform ***routine maintenance*** according to operational manual. 2.4 ***Routine Pre and On Operational checks*** of ***machinery*** and ***equipment*** are carried out and adjustments made according to manufacturer's specifications. 2.5 Basic techniques are applied and mechanical faults are identified and rectified according to manufacturer's specifications. 2.6 More serious or complex faults are reported for referral according to enterprise requirements.
3. Complete basic routine and scheduled maintenance	3.1 Tools are cleaned, returned to operating order and stored according to manufacturer's specifications and enterprise requirements. 3.2 Environmental procedures are followed and waste from maintenance activities is collected, treated and disposed or recycled according to enterprise requirements. 3.3 Work area is cleaned and maintained according to OHS and enterprise requirements. 3.4 Malfunctions, faults, wear or damage to tools are reported to the supervisor according to enterprise requirements. 3.5 Machinery /equipment service activities are recorded and reported

	according to enterprise requirements.

Variable	Range
Tools	May include but not limited to: • Greasing gun and lubricating devices • washing tools, • maintenance tools (toolset of different sizes and types)
Supplies	May include but not limited to: • lubricants, spare parts, cleaning materials
Routine pre-operational checks	May include but not limited to: • Oils and coolant levels • Tyre pressure • Torn/worn and broken parts • Loose parts(guards, bolts, nuts, screws, clamps, belts and chains) • Lubrication/greasing of exposed parts
Machinery	May include but not limited to: • Tractors/wheeled, tracked/ • Combine harvesters and threshing, shelling, machines • Self-propelled sprayers(boom sprayers) • Self-propelled manure spreaders • Cane harvester • Pumps • Generators • Mowers • Rotary hoes • Mechanical pruners
Equipment	May include but not limited to: • Trailers/carts • Tillage and planting implements • Tractor attachment implements • Spraying equipment • Fertilizer spreaders
Enterprise policies and procedures	May include but not limited to: • Quality policies and procedures, including Relevant Ethiopian standards • OHS, sustainability, environment, equal opportunity and anti-discrimination • Manufacturer specifications and industry codes of practice • Safe work procedures • Reporting and recording procedures
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Sharp cutting tooling and instruments, • stumps and logs in the soil or covered by debris • Torn or improper use personal protective equipments

	• Worn out repair tools • Servicing while engine is running • Working under machines not secured • Unprotected moveable parts • Electricity and water, • Toxic substances, • Damaged packing material or containers, • Broken or damaged equipment, • Flammable materials and fire hazards, • lifting practices, • spillages, waste and debris especially on floors
Routine maintenance	My include but not limited to:- • Greasing, • Lubrication, • checking, • adjusting • tighten parts
Personal protective equipment	May include but not limited to: • include that prescribed under legislation/regulations/codes of practice and workplace policies and practices
OHS requirements	May include but not limited to:- • Legislations, regulations/codes of practice and enterprise safety policies and procedures. • Protective clothing and equipment • Use of tooling and equipment • Workplace environment and safety • Handling of material • Use of fire fighting equipment • Enterprise first aid • Hazard control and hazardous materials and substances

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to:. • Identify tools and required supplies • Identify Faulty or unsafe machinery and equipment • carry-out basic routine and scheduled machinery and equipment service • report and tag more serious faults • keep records of serviced machinery and equipment • malfunctions, faults, wear or damage to tools are reported to the supervisor according to enterprise requirements.
Required Knowledge and Attitudes	Demonstrate knowledge of: • Types, characteristics and functions of machinery and equipment • machinery and equipment checking and operating procedures

	• functions of tools used in maintenance of machinery and equipment • types and uses of lubricants and other commonly used servicing materials • Operational principles of machinery including mechanical and electrical systems • Functions of components of common mechanical and hydraulic systems • OHS legislative requirements • Codes of practice with regard to the use and control of hazardous substances and/or working in confined spaces • Environmental codes of practice with regard to maintenance activities and disposal of fuels and oils
Required Skills	Demonstrate skills to: • Demonstrate safe and environmentally responsible workplace practices • Read and interpret manufacturers specifications, work and maintenance plans, safety decals and material safety data sheets (msdss) • Carry out basic servicing of machinery • Carry out basic mechanical fault finding • Refer complex mechanical faults to appropriate technician • Follow procedures to dispose of waste • Recognise caution or hazard signs and symbols • Measure and calculate volumes, consumption and lubrication requirements • Use literacy skills to read and follow a range of basic instructions • Use oral communication skills/language competence to communicate effectively with others
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Inspect, repair and Replace Tyres**
Unit Code	**AGR AMO1 07 0322**
Unit Descriptor	This unit of competency covers the knowledge, attitudes and skills required to prepare, repair and replace tyre, conduct inspection, carry out removal, refit and check tyre for use or storage

Elements	Performance Criteria
1. Prepare to inspect, repair and replace tyre	1.1 Nature and scope of work requirements are identified and confirmed 1.2 ***OHS requirements***, including regulatory requirements and Personal Protective Equipment needs are observed throughout the work. 1.3 Procedures and information such as workshop manuals and specifications is prepared. 1.4 ***Tooling, equipment and materials*** required are ***sourced***. 1.5 Technical requirements are sourced for repair and fitting of tyres and tubes and support equipment is identified and prepared.
2. Conduct inspection	2.1 Inspection works are implemented in accordance with workplace procedures. 2.2 Inspection of road wheel assemblies, mounting points and fittings for damage and wear 2.3 Inspection results are compared with manufacturer/ component supplier specifications. 2.4 Results are documented with evidence and supporting information and recommendation(s) made. 2.5 Report is done in accordance with workplace procedures.
3. Carry out removal**,** repair and refit	3.1 ***Safe operating procedures*** are observed and noted during the use of tools/ equipment. 3.2 Removal, repair and refit are implemented. 3.3 Types & methods of service and repair are implemented. 3.4 Findings and recommendations are completed in accordance with enterprise procedures. 3.5 **Emergency *procedures*** are identified and followed as per organization's guideline.
4. Check Tyre for use or storage	4.1 Repair schedule documentation is completed. 4.2 Final inspection is made to ensure safety features are in place. 4.3 Final inspection is made to ensure work is to workplace expectations. 4.4 Tyre is cleaned for use or storage to workplace expectations. 4.5 Job card is processed in accordance with workplace procedures.

Variable	Range
OHS requirements	May include but not limited to: • Protective clothing and equipment • Use of tooling and equipment • Workplace environment and safety • Handling of material • Enterprise first aid • Hazard control and hazardous materials and substances
Tooling, equipment and materials	May include but not limited to: • Hand tools • Power tools • Jacks • Wheel block • Safety stand • Tyre remover • Tyre changer machine • Vulcaniser • Hoists and • Pressure gauge • Tyre balancer • Air compressor • Pry bar/lever • Tip top
Sources of information	May include but not limited to: • Verbal or written and graphical instructions, • Safe work procedures related to the removal, repair and fitting of heavy tyres and tubes • Regulatory/legislative requirements pertaining to the automotive industry, including Ethiopian design rules • Engineer's design specifications and instructions • Organisation work specifications and requirements • Instructions issued by authorised enterprise or external persons • Ethiopian standards
Safe operating procedures	May include but are not limited to: The conduct of operating risk assessment and treatments associated with: • Vehicular movements, • Control air pressure • Toxic substances, • Electrical safety, • Equipment movement and operation, • Manual and mechanical lifting and shifting, • Working in proximity to others and site visitors

Emergency procedures	May include but are not limited to: • emergency shutdown and stopping of equipment, • extinguishing fires, • enterprise first aid requirements and site evacuation
Environmental requirements	May include but are not limited to: • waste management, • noise, dust and clean-up management

Evidence Guide	
Critical Aspects of Competence	Must demonstrate skills and knowledge to: • Applying safety procedures and requirements • Selecting methods and techniques appropriate for each work required • Accurately interpreting inspection results • Conducting the removal, repair and refit of tyres and tubes in accordance with workplace procedures • Completing removal, repair and refit of wheels, tyres and tubes and associated components within workplace timeframes.
Required knowledge and attitudes	Demonstrate knowledge of: • OHS and environmental regulations/requirements, equipment, material and personal safety requirements • Operating principles of tyre and tube repair equipment and their relationship to each other • Accident prevention during working on tyre and tube repair equipment • Types and layout of service/repair manuals • Inspection procedures • Repair procedures • Enterprise quality procedures • Work organisation and planning processes
Required Skills	Demonstrate skills to: • Interpret and apply manufacturer/component supplier procedures, workplace policies and procedures • Apply oral communication skills sufficient to convey information and concepts to customers • Apply planning and organising skills to own work activities, including making good use of time and resources, • Establish safe and effective work processes to resolve problems and downtime, • Systematically develop solutions to avoid or minimise reworking and avoid wastage • Apply workplace technology for removal, repair and fitting of heavy tyres and tubes, including the use of measuring equipment, specialist tooling • Reporting/documenting of results
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and

	OHS practices.
Methods of Assessment	Competency may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Operate and Use Post Harvest Technologies**
Unit Code	**AGR AMO1 08 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to prepare for use and operate post-harvest machinery and equipment, complete post-harvest technologies and equipment operation.

Elements	**Performance Criteria**
1. Prepare post-harvest machinery and equipment for use	1.1 Types, working mechanisms and components of ***post-harvest technologies*** are identified 1.2 Post-harvest technologies appropriate to job requirements are selected against a work requirement 1.3 Source of power is identified and prepared for the selected post-harvest technology according to appropriate job activities. 1.4 ***Routine pre-operational checks*** of Post-harvest technologies are carried out according to manufacturer's specifications. 1.5 Equipment is securely calibrated for operation to manufacturer's specifications. 1.6 Check safe guards are in place 1.7 ***Faulty parts*** are identified, safety tagged, and reported to supervisor according to enterprise requirements. 1.8 ***Occupational Health and Safety (OHS) hazards*** are identified, risks assessed and risk controls are implemented.
2. Operate post-harvest machinery and equipment	2.1 ***Personal Protective Equipment (PPE)*** is selected and used according to procedures. 2.2 Transportation to worksite are performed in accordance of enterprise regulation and procedure 2.3 Post-harvest technologies are operated in a safe and controlled manner, and monitored for performance and efficiency. 2.4 Emergency stop procedures are confirmed and followed

	2.5 Environmental implications associated with machinery operation are identified, assessed and taken into account.
3. complete post-harvest technologies and equipment operation	3.1 Machinery and equipment shut-down procedures are carried out to manufacturer's specifications and enterprise requirements. 3.2 Post-harvest technologies operational records are maintained and reported according to enterprise requirements. 3.3 Machinery and equipment are cleaned, secured and stored according to manufacturer's specifications and enterprise requirements. 3.4 Post-harvest technologies damage, malfunctions or irregular performance are recorded and/or reported according to enterprise requirements.
4. Perform post-harvest handling	4.1 ***Post-harvest handling*** technologies are identified 4.2 Product quality checking is identified and applied 4.3 Appropriate product transportation and storage is selected and applied 4.4 Basic routine maintenance is carried out according to manufacturer's instruction and procedure. 4.5 Report any faults, improper operation and safety issue on time according to enterprise reporting procedure.

Variable	**Range**
Post-harvest technologies	May include but not limited to: • Storage solutions (Hermetic Bag, Metal Silo…) • Grain Sheller and thresher • Dehuller(sorghum, barley, rice) • Driers (Solar and others) • Decorticators • Peeling machine • Fruit presser • Root crop cutters/graters. • Mills and mixers
Routine pre-operational checks	May include but not limited to: • Oils and water level if operated by engine • Couplings • Loose bolts and nuts • Wear and tear of body and components • Broken/loose parts • Belt tension
Faulty parts	May include but not limited to: • Leakage • Damages • Wear and tear • Mis- alignment
Occupational Health	May include but not limited to:

Safety (OHS) hazards	• Sharp cutting tooling and instruments • Improper use of personal protective equipment's • Worn out repair tools • Servicing while engine is running • Unprotected moveable parts • Damaged packing material or containers • Broken or damaged equipment • Flammable materials and fire hazards • Stumps and logs in the containers and moving parts operating beyond own ability or negligence
OHS requirements	May include but not limited to: • Personal protective equipment and clothing • Workplace environment and safety, safety equipment • Enterprise first aid and first aid equipment • Hazard and risk control and moving parts • Elimination of hazardous materials and substances • Manual handling, including shifting, lifting and carrying • Distancing • Emergency procedures • Handling of material • Use of fire fighting equipment
Personal Protective Equipment (PPE)	May include but not limited to: • Safety glove • Safety helmet • Ear muff • Respiratory mask • overall
Post-harvest handling	May include but not limited to: • Packaging • Transporting • Storage equipment • Quality control • Moisture Tester • Shelf life

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Carry out pre-operational checks and maintenance and report defects if necessary • inspect the post-harvest equipment / parts to identify the faults following standard procedures • Test the performance of post-harvest equipments following standards procedures and take necessary action as per the job requirements

	• Secure attachments according to manufacturer's directions • apply Product quality checking • Operate machinery in a safe and controlled manner • Machinery and equipment shut-down procedures according to manufacturer specification.
Required Knowledge and Attitudes	Demonstrate knowledge of: • Types of post-harvest machinery and equipment • Characteristics and components of post-harvest technologies • Manufacturers specifications for servicing of machinery and equipment • Procedures for cleaning, securing and storing machinery, equipment and materials • Crop treatment for shelf life and packaging • Transportation and storage of crop technology • Potential risks and hazards associated with the operation of machinery and equipment • Environmental impacts and minimisation measures associated with the operation of machinery and equipment • OHS and environmental legislation, regulations and Codes of Practice
Required Skills	Demonstrate skills to: • Identify hazards and implement safe operating procedures • Complete pre-operational checks • Recognise and report defects • Safe and economic use of tools, equipment, and instruments. • Operate machinery and equipment to industry standards • Demonstrate safe and environmentally responsible workplace practices • Read and interpret manufacturer's specifications, work and maintenance plans, and material safety data sheets (msdss) • Interpret and apply instructions, communicate with work team and supervisor, record and report equipment faults, workplace hazards, and accidents
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Apply First Aid**
Unit Code	**AGR AMO1 09 0322**
Unit Descriptor	This unit of competency describes the skills and knowledge required to provide first aid response, life support, management of casualty(s), the incident and other first aiders, until the arrival of medical or other assistance. These skills and knowledge may be applied in a range of situations, including community and workplace settings.

Elements	Performance Criteria
1. Assess the situation	1.1 ***Hazards*** are identified, assessed and minimized in the situation that may pose a risk of injury or illness to self and others. 1.2 Immediate ***risk*** is minimized to self and casualty's health and safety by controlling any hazard in accordance with occupational health and safety requirements. 1.3 Casualty is assessed and injuries, illnesses and conditions are identified.
2. Apply first aid procedures	2.1 Information is calmly provided to reassure casualty, adopting a communication style to match the casualty's level of consciousness. 2.2 Available ***resources and equipment*** are used to make the casualty as comfortable as possible. 2.3 The casualty is responded to in a culturally aware, sensitive and respectful manner. 2.4 The nature of casualty's injury/condition and relevant first aid procedures are determined and explained to provide comfort. 2.5 Consent is sought from casualty prior to applying first aid management. 2.6 ***First aid management*** is provided in accordance with ***established first aid principles*** and Ethiopian resuscitation council (arc) guidelines and/or state/territory regulations, legislation and policies and industry requirements. 2.7 First aid assistance is sought from others in a timely manner and as appropriate. 2.8 First aid equipment is correctly operated as required for first aid management according to manufacturer/supplier's instructions and local policies and/or procedures. 2.9 Safe manual handling techniques are used as required. 2.10 ***Casualty's condition*** is monitored and responded in accordance with effective first aid principles and procedures. 2.11 Casualty management is finalized according to casualty's needs and first aid principles.
3. Communicate details of the incident	3.1 Ambulance support and/or appropriate medical assistance are/is requested according to relevant circumstances using relevant ***communication media and equipment***.

	3.2 Assessment of casualty's condition and management activities is accurately conveyed to ambulance services /other emergency services/relieving personnel. 3.3 Reports are prepared as appropriate in a timely manner, presenting all relevant facts according to established procedures. 3.4 Details of casualty's physical condition, changes in conditions, management are accurately recorded and responded to management in line with established procedures. 3.5 Confidentiality of records and information/***documentation*** is maintained in line with privacy principles and statutory and/or organisation policies.
4. Evaluate own performance	4.1 Feedback is sought from ***appropriate clinical expert***. 4.2 The possible psychological impacts are recognized on rescuers of involvement in critical incidents. 4.3 Debriefing/evaluation as appropriate is made participatory in to improve future response and address individual needs.

Variable	**Range**
Hazards	May include but not limited: • A source or situation with the potential for harm in terms of human injury or ill-health, damage to property, the environment, or a combination of these • physical hazards • biological hazards • chemical hazards • hazards associated with manual handling
Risk	May include but not limited: • risks from equipment, machinery and substances • risks from first aid equipment • environmental risks • exposure to blood and other body substances • risk of further injury to the casualty • risks associated with the proximity of other workers and bystanders • risks from vehicles
Resources and equipment	May include but not limited: • AED • first aid kit • auto-injector • puffer/inhaler • resuscitation mask or barrier • spacer device
First aid management	The setting in which first aid is provided, including: • workplace policies and procedures • industry/site specific regulations, codes, etc • OHS requirements • location and nature of the incident • situational risks associated with, for example, electrical and

	biological hazards, weather, motor vehicle accidents • location of emergency services personnel • The use and availability of first aid equipment and resources • Infection control • Legal and social responsibilities of first aider
Established first aid principles	May include but not limited: • Preserve life • Prevent illness, injury and condition(s) becoming worse • Promote recovery • Protect the unconscious casualty
Casualty's condition	May include but not limited: • Abdominal injuries • Airway obstruction • Allergic reactions • Altered and loss of consciousness • Bleeding • Burns - thermal, chemical, friction, electrical • Chest pain/cardiac arrest • Injuries: cold and crush injuries; eye and ear injuries; head, neck and spinal injuries; minor skin injuries; needle stick injuries; soft tissue injuries including sprains, strains, dislocations • Near drowning • Envenomation - snake, spider, insect and marine bites • Environmental conditions such as hypothermia, hyperthermia, dehydration, heat stroke • Fractures • Medical conditions, including cardiac conditions, epilepsy, diabetes, asthma and other respiratory conditions • No signs of life • Poisoning and toxic substances (including chemical contamination) • Respiratory distress/arrest • Seizures • Shock • Stroke • Substance misuse - common drugs and alcohol, including illicit drugs.
Communication media and equipment	May include but not limited: • telephones, including landline, mobile and satellite phones • HF/VHF radio • flags • flares • two way radio • email • electronic equipment • hand signals
Documentation	May include but not limited: • injury report forms • workplace documents as per organisation requirements • person administering

	• dose • vital signs May include recording: • time • location • description of injury • first aid management • fluid intake/output, including fluid loss via: • blood • vomit • faeces • urine • administration of medication including: • time • date
Appropriate clinical expert	May include but not limited: • ambulance officer/paramedic • other medical/health worker
Contextualisation to address specific requirements	May include but not limited: • focus on first aid management of specific types of injury • first aid provision under specific constraints or circumstances (e.g. in confined spaces, in maritime work environment or in work environment involving identified risks/hazards)
Vital signs	May include but not limited: • consciousness • breathing and circulation

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • competence should be demonstrated working individually and, where appropriate, as part of a first aid team • consistency of performance should be demonstrated over the required range of situations relevant to the workplace or community setting • currency of first aid knowledge and skills is to be demonstrated in line with regulations, legislation and policies, Ethiopian Red Cross(ERC) and industry guidelines
Required Knowledge and Attitudes	Demonstrate knowledge of; • ERC Guidelines relating to provision of first aid as outlined • Working knowledge of: • basic principles and concepts underlying the practice of first aid • procedures for dealing with major and minor injury and illness • priorities of management in first aid when dealing with life threatening conditions • basic occupational health and safety requirements in the provision of first aid • infection control principles and procedures, including use of standard precautions • chain of survival • first Aiders' skills and limitations

	• Understanding of the use of an Automated External Defibrillator (AED), including when to use and when not to • First aid management of: ➢ abdominal injuries ➢ allergic reactions ➢ altered and loss of consciousness ➢ bleeding ➢ burns - thermal, chemical, friction, electrical ➢ cardiac arrest ➢ casualty with no signs of life ➢ chest pain ➢ choking/airway obstruction ➢ injuries: cold and crush injuries; eye and ear injuries; head, neck and spinal injuries; minor skin injuries; needle stick injuries; soft tissue injuries including sprains, strains, dislocations ➢ envenomation - snake, spider, insect and marine bites ➢ environmental impact such as hypothermia, hyperthermia, dehydration, heat stroke ➢ fractures • medical conditions, including cardiac conditions, epilepsy, diabetes, asthma and other respiratory conditions: ➢ near drowning ➢ poisoning and toxic substances (including chemical contamination) ➢ respiratory distress ➢ seizures ➢ shock ➢ stroke ➢ substance misuse - common drugs and alcohol, including illicit drugs ➢ Awareness of stress management techniques and available support • Social/legal issues: ➢ duty of care ➢ need to be culturally aware, sensitive and respectful ➢ importance of debriefing ➢ confidentiality ➢ own skills and limitations
Required Skills	Demonstrate skills of: • conduct an initial casualty assessment • plan an appropriate first aid response in line with established first aid principles, policies and procedures, ERC Guidelines regulations, legislation and policies and industry requirements and respond appropriately to contingencies in line with own skills • demonstrate correct procedures for performing CPR using a manikin, including standard precautions • apply first aid principles • infection control, including use of standard precautions • follow OHS guidelines • safe manual handling

	• consideration of the welfare of the casualty • ability to call an ambulance • site management to prevent further injury • provide assistance with self-medication as per subject's own medication regime and in line with state/territory legislation, regulations and policies and any available medical/pharmaceutical instructions • administer medication in line with state/territory regulations, legislation and policies • prepare a written incident report or provide information to enable preparation of an incident report • communicate effectively and assertively in an incident • make prompt and appropriate decisions relating to managing an incident in the workplace • call an ambulance and/or medical assistance according to relevant circumstances and report casualty's condition • use literacy and numeracy skills as required to read, interpret and apply guidelines and protocols • evaluate own response and identify appropriate improvements where required
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard : **Agricultural Machinery and Equipment Operation Level I**	
Unit Title	**Apply Agricultural Extension Service**
Unit Code	**AGR AMO1 10 0322**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to understand the Concept and evolution of agricultural Extension, apply extension methods and Approaches, apply Agricultural extension Communication and facilitation for technology promotion, Conduct training and record and document data
Element	**Performance Criteria**
1. Understand the Concept and evolution of Agricultural Extension	1.1 The ***concept of Agricultural extension*** is understood to gain relevant knowledge 1.2 The ***evolution and progress of agricultural extension*** is expressed to understand the concept of Agricultural Extension 1.3 The ***role of extension*** in agricultural development is understood to deliver effective extension services 1.4 The ***importance of Agricultural extension*** is determined to have appropriate knowledge, 1.5 ***Extension planning*** is understood to determine extension activities
2. Apply Extension methods and Approaches	2.1. ***Extension methods*** are understood to provide Extension services based on organizational standard, extension systems, extension strategy and extension guide lines 2.2. ***Extension approaches*** are understood for implementation of extension services 2.3. The ***importance of extension methods and approaches*** are understood for Agricultural extension service delivery 2.4. Appropriate extension methods and approaches are applied to transfer agricultural technologies, based on organizational standard, extension systems, extension strategy and extension guide lines,
3. Apply Agricultural Extension Communication and Facilitation for technology promotion	3.1. The concept***, principle*** and ***type of communication*** is understood to have good extension communication knowledge & skill 3.2. ***Communication barriers*** are identified, understood and solved to undertake effective communication 3.3. ***Elements of extension communication*** are defined and used to create positive environment for communication 3.4. ***Audio visual techniques*** are understood to provide Agricultural Extension and communication delivery services 3.5. ***Roles*** and ***characteristics of extension communicator*** are recommended to improve the communicator's performance 3.6. The ***basic concept of facilitation*** is understood to improve facilitation skills 3.7. The ***roles and responsibilities of a facilitator*** is applied to progress facilitation skills 3.8. Conflict resolution skill is understood to enhance homogeneity 3.9. The ***skills of a facilitator*** are applied for communication &

	technology promotion
4. Conduct Training	4.1. ***Need assessment*** is conducted to provide appropriate training 4.2. ***Preparation*** is carried-out to facilitate the training process ***4.3.*** Implementation is conducted to capacitate trainees based on organizational training guide line ***4.4. Evaluation is carried-out*** to understand the outcome
5. Record and Document Data	5.1 ***Data collecting formats*** are developed 5.2 Appropriate data are collected and organized 5.3 Collected and organized data are documented and ***reported***

Variable	Range
Concept of Agricultural Extension	May include but not limited to: • Definition of agricultural extension • Purpose of agricultural extension
Evolution and progress of agricultural extension	May include but not limited to: • National Agricultural Extension systems • Related reading materials • Professionals • Electronic mail • Briefing notes • Journal articles • Code of conduct
Role of extension	May include but not limited to: • Situation analysis • Awareness creation • Training • Facilitation • Demonstrations • Field day exchange visit • Establish farmers group • Link farmers with relevant stakeholders • Monitoring and evaluation • Experience sharing • Assist and provide extension services for farmers • Organize farmer to farmer learning
Importance of Agricultural extension	May include but not limited to; • Identify problem • Find solution • Bring behavioural change • Transfer of technology • Assist farmers to help themselves
Extension planning	May include but not limited to: • Conduct survey • Identification of activities • Data collection • Development of formats
Extension methods	May include but not limited to: • Individual • Group • Mass

Extension approaches	May include but not limited to: • Participatory • Pluralistic • Farmers field school • Pastoral field school • Mobile extension • Model village • Cluster approaches • Scaling/up/out/down
Importance of extension methods and approaches	May include but not limited to: • Information and technology dissemination • Deliver extension message effectively • Increase knowledge of farmers • Bring attitude change • Formation of opinion • Encourage farmers to raise issues • To get/provide possible alternative solutions
Type of communication	May include but not limited: • Intra personal communication • Inter personal communication • Organizational communication
Principles of communication	May include but not limited to: • Awareness creation • Designed message with respect to objectives and respective audience • Message content should suite to the target audience
Communication barriers	May include but not limited to: • The use of jargons words/terms • Cultural differences • Lack of attention, interest, distractions • Differences in perception and viewpoint • Physical disabilities • Physical barriers to non-verbal communication • Language differences and the difficulty in understanding unfamiliar accents • Expectations and prejudices • Emotional barriers and taboos
Elements of extension communication	May include but not limited to: • Source • Sender • Message • Channel • Receiver

Audio visual techniques	May include but not limited to: • Audio visual aids • Assembling • Character • Advantages • Uses
Characteristics of extension communicator	May include but not limited to: • Confident • Friendly/ welcoming • Observant • Appreciative • Respectful • Organized • Good judgment • Consistent • Honest
Role of extension communicator	May include but not limited to: • Create motivation and feeling • Be aware of problem of the local people • Priority of direct needs • Create self-belief in rural people • Emphasis on self-depend aces • Change in social attitude • Rebuilding of the village • Full uses of local resources
Basic concept of facilitation	May include but not limited to: • Definition of facilitation • Purpose of facilitation • Evolution and progress of facilitation
Role and responsibility of facilitator	May include but not limited to: • Does not evaluate group ideas • Helps the group focus its energies on a task • Suggests methods and procedures • Protects all members of the group from attack • Helps find win/win solutions • Makes sure that everyone has the opportunity to participate • Periodically summarizes the group consensus on issues to validate and clarify the progress of the discussion • Encouraging of every one's knowledge

Conflict resolution skill	May include but not limited to: • Recognize • Resolve conflicting needs • Relieve stress • Recognize and manage emotions • Improve nonverbal communication skills • Use humor and play to deal with challenges
Skill of facilitator	May include but not limited to: • Active Listening • Summarizing • Synthesis • Conflict resolution
Need assessment	May include but not limited to: • Identification of areas • Selection of respondents • Preparation of tools • Conduct the assessment • Organize data
Preparation	May include but not limited to: • Identify trainees and trainers • Organize logistics • Select Venue • Selecting and organize training materials • Select and Organize training aids • Prepare schedule and others
Evaluation	May include but not limited to: • Preparation of evaluating formats • Identify sample • Conduct evaluation • Organize result • Report
Data collecting formats	May include but not limited to: • Recording formats • Writing formats
Reporting	May include but not limited: • Organizing • Writing • Submitting/transfer

Evidence Guide	
Critical Aspects of Competence	Demonstrates knowledge and skill to : • Identify and interpret the role of Agricultural Extension • Apply Extension method and Approaches

	• Develop Extension planning • Perform Conflict resolution • collect, record, organize and document data
Required Knowledge and Attitudes	Demonstrates knowledge and attitude of : • Agricultural extension • Conflict resolution • Extension method and Approaches • Agricultural Extension Communication and Facilitation • collecting, recording, organizing and documenting of data
Required Skills	Demonstrates skills to: • Resolve conflict • Develop Extension planning • Apply extension method and Approaches • Facilitate Agricultural Extension Communication
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and Occupational health and safety (OHS) practices.
Methods of Assessment	Competence may be assessed through: • Written Test, Interview, quiz, practical assignment • Observation, Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Implement Agribusiness Marketing**
Unit Code	**AGR AMO1 11 0322**
Unit Descriptor	This unit covers the knowledge, skills and attitude required to Understand concept of agricultural marketing Understand concepts of agribusiness Identify marketing targets for Agricultural products Implement marketing strategy . Establish contract farming, and Apply Agricultural marketing services.

Element	Performance Criteria
1. Understand concept of agricultural marketing	1.1 ***.Concept of agricultural marketing*** is understood for Agricultural marketing 1.2 Importance of agricultural marketing is understood to provide agricultural marketing services 1.3 ***.Roles of* agricultural market**-oriented service is identified and understood 1.4 ***.Principles of agricultural marketing*** and strategies are identified and understood 1.5 ***Marketing mix*** is understood to implement agricultural marketing activities 1.6 ***Types of marketing*** are understood and identified to implement the appropriate marketing services
2. Understand concepts of agribusiness	2.1***. Concept of agribusiness*** is understood for Agricultural marketing 2.2 Importance of agribusiness is understood to provide agribusiness services 2.3 ***Roles of agribusiness***-oriented service is identified and understood 2.4 ***Principles of agribusiness*** and strategies are identified and understood 2.5. **Characteristic of Agribusines**s are understood to implement Agribusiness 2.6. **Dimension** and s**tructures** of Agribusiness are understood and distinguished
3. Identify marketing targets for Agricultural products	3.1 .***Marketing targets*** are identified for Agricultural products and services 3.2 ***Approaches* of *agricultural market*** are understood for agricultural market product and service. 3.3 ***Segment descriptors*** are used to display the targets of agricultural market 3.4 ***Strategic of agricultural marketing options*** are identified to develop agricultural ***marketing plan*** 3.5 Business plans are prepared to perform cost and benefit analysis
Implement marketing strategy	4.1 .Agricultural marketing functions strategy is designed to perform agriculture business. 4.2 ***Action plan*** is developed to implement Agricultural marketing strategies**.** 4.3 .Require resource are identified and coordinated to implement agricultural marketing 4.4 Marketing mix is implemented according to the strategy Agricultural.
Establish contract farming	5.1 Concept of ***contract farming*** is understood to enhance market oriented production 5.2 ***Types of contract farming*** are identified to select the appropriate approach 5.3 ***Models of Contract*** farming are understood and identified 5.4. Steps and procedures of contract farming establishments are identified 5.5 Contract farming ***requirements*** are identified and applied based on the organizational standard

	5.6 Contract farming systems are established
6. Apply Agricultural marketing services	6.1 Agricultural products are identified to delivered provided marketing services 6.2 Need assessment is conducted to identify ***marketing conditions*** 6.3 ***Market strategies*** are developed to implement the Agricultural marketing services 6. 4Customer feedbacks are collected and organized to improve Agricultural marketing services 6.5 Data is organized and documented to report the appropriate body.

Variable	**Range**
Concept agricultural marketing	May include, but not limited to: • Needs • Product • Demand • Value • Transaction • Satisfaction and Quality • Exchange • Market
Roles marketing	May include but not limited to: • Determine price • Consumer choice • Increase efficiency • Improve scarcity
Principles agricultural marketing	May include but not limited to: • Product • Price • promotion • Place • People • Process
Marketing mix	• May include, but not limited to: • Price • Promotion • Place • Product

Types of marketing	May include, but not limited to • Perfect competitive • Monopoly • Oligopoly • Monopolistic
Concept of Agribusiness	May include, but are not limited to: • Agricultural impute supply • Farmer producer • Process of wholesaler • Distribution and retailer
Characteristic of Agribusiness	May include but not limited to: • Existence around production areas • Variety and size of Ag organization • Scale and type of competition • Conservativeness of Ag: • Decision making: • Community oriented business
Dimension	May include, but not limited to: • Agricultural sector and their interdependence • farm either private or government • Market oriented. • Dynamic sector and continuously meets current demands of consumers • Provides forward and backward linkages
Structures	May include but not limited to: • Input sector: • Farm/production sector: • Product sector:
Marketing targets	May include but not limited to: • Demographic • Geographic • Psychographic • Behaviours pattern
Marketing conditions	May include but not limited to: • Government • International transaction • Speculation and expectation • Supply and demand

AgriculturalMarket strategies	• May include, but not limited to: • Analyse agricultural market • Analyse competition • Define market mix • Determine position • Marketing budget • Execution plan understand potential customers
Approaches for agricultural market	• May include, but not limited to: • Functional • Institution • Commodity • Behavioural
Segment descriptors	• May include, but not limited to: • Demographic • Behavioural • Geographic • Psychographic
Marketing plans	• May include, but not limited to • Function of marketing • Market program • Achieve the market objectives
Action plan	• May include, but not limited to: • Resource • Budget • Times • Output
Contract farming	May include, but not limited to • Agreement between buyer and seller • Farmer and processing making firms for production • Supplies of agricultural product
Types of contract farming	May include, but not limited to • Market specifying • Recourse providing • Production management
Models of Contract	May include, but not limited to • Full model contract farming • Specific
Requirements	• Traceability • Site history and management • Propagation material • Soil/substrate management

	• Fertilizer use • Irrigation • Crop protection

Evidence Guide	
Critical Aspects of Competence	Must demonstrate skills and knowledge to: • Understand Concept of agribusiness to apply agribusiness marketing • Identify Principles of agribusiness and strategies to implement Agribusiness marketing • Determine Agricultural Marketing targets for provide products and services • Develop Action plan to implement Agricultural marketing strategies. • Prepare Business plans to perform cost and benefit analysis • Apply marketing conditions to conducted Need assessment for products and service • Understand concept of contract farming to enhance market oriented production • Apply appropriate models to established contract farming • Contract farming requirements are identified and applied based on the organizational guide line • Established Contract farming systems based on the organizational standard

Required Knowledge and Attitude	Demonstrate knowledge of : • Principles of agricultural marketing to implement marketing strategy • Concept of agribusiness to apply agribusiness marketing • the roles of agribusiness to perform agricultural marketing. • Principles of agribusiness and strategies to implement Agribusiness marketing • Agricultural Marketing targets that provide products and services • Required resource to implement agricultural marketing • concept of contract farming to enhance market oriented production • appropriate models to established contract farming • Contract farming systems based on the organizational standard
Required Skills	Demonstrate Skills to : • Determine ***marketing options*** to design marketing plan • Implement Agricultural marketing strategies develop action plan • Identified Agricultural Marketing targets for provide products and services • Select ***Approaches*** of agricultural market to implement product and service. • ***Use segment descriptors*** to display the targets of agricultural market • Develop Action plan to implement Agricultural marketing strategies. • Prepare Business plans to perform cost and benefit analysis • Apply marketing conditions to conducted Need assessment for products and service • Organize customer feedbacks to improve Agricultural marketing services • Apply appropriate models to established contract farming • Contract farming requirement***s*** to applied based on the organizational guide line • Established Contract farming systems based on the organizational standard
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level I	
Unit Title	**Apply Basics of Human Nutrition Practices**
Unit Code	**AGR AMO1 12 0322**
Unit Descriptor	This unit covers the knowledge, skill and attitude required to categorize agricultural foods items, recognize malnutrition in the community, identify the role of agriculture in nutrition and contribute to the awareness creation of the community in utilization of agricultural products.

Element	Performance Criteria
1. Identify Categories of agricultural foods items	1.1. Basic ***terminologies and concepts*** in nutrition are identified and explained 1.2. ***Food groups, nutrient and their sources*** of balanced diet are identified and explained 1.3. ***Origin*** and composition of food stuffs are identified and described 1.4. ***Energy dense*** and ***nutrient dense*** food sources are identified and explained
2. Recognize malnutrition in the community	2.1. Physical signs of malnutrition are identified and explained 2.2. Forms, causes and consequences of ***malnutrition*** in different groups of community are identified 2.3. Measures to overcome malnutrition, importance of maintenance of adequate and balanced diet are promoted 2.4. Contribution is made in elders, family heads and women awareness creation programs
3. Identify the role of agriculture in nutrition	3.1. The role of agriculture as source of variety foods is recognized and promoted 3.2. The contribution of agriculture sector in nutrition sensitive intervention is described 3.3. ***Nutrition sensitive agricultural practices*** are identified and communicated as per the nutrition program guideline
4. Demonstrate diversified Agricultural food production and consumption techniques	4.1. Importance of diet diversification is identified and discussed with family holds and community according to the program guideline 4.2. Techniques of diversified food production are identified and demonstrated to farmers and family members 4.3. ***Techniques of enhancing*** the nutrient content of family foods are assessed and implemented according to the program guideline and cultural requirements of the rural community

	4.4. Utensils are identified and cooking techniques demonstrated for specific agricultural products 4.5. PPE are selected and used in accordance to OHS requirement and code of ethics 4.6. Balanced and nutrient dense diet preparation is demonstrated using food stuff ingredients
5.Perform proper handling and storage of agricultural food products	5.1. Importance of ***hygiene*** for nutrition is explained 5.2. ***Storage facilities*** are identified and family holds supported in construction. 5.3. Agricultural products are ***safely handled and stored*** 5.4. Methods and techniques of safely handling and storing agricultural products are demonstrated in accordance products requirement
6.Document and report food production, consumption and difficulties	6.1. Diversified food production and consumption activities are documented 6.2. Difficulties happened in the processes are reported to the respective authorities.

Variable	**Range**
Terminologies and concepts	May include, but not limited to: • Food • Diet • Nutrient • Balanced Diet • Nutritious food • Hidden hunger • Malnutrition • Stunting • Underweight • Overweight • Nutrition • Diversification • Body growth • Body Development • Food fortification • Bioavailability • Food taboos • Window of opportunity • Fortification • Food security • Nutrition security • Small holder farmer

	• Cretinism

Food groups	May include, but not limited to: • Vegetables food group • Fruits food group • Legumes and nuts food group • Animal source food group • Fats oils and sweets food group • Staples food group
Nutrient and their sources	May include, but not limited to: • Carbohydrates • Lipids/Fats • Proteins • Minerals • Vitamins
Food origin	May include, but not limited to: • Animal • Plant
Energy dense	May include, but not limited to: • Calories • Nutrient
Nutrient dense	May include, but not limited to: • Vitamins • Minerals • Fibbers
Malnutrition	May include, but not limited to: • Under nutrition may be: ➢ stunting ➢ wasting ➢ underweight • Over nutrition may be: ➢ obesity ➢ overweight
Nutrition sensitive agricultural practices	May include, but not limited to: • Nutrition sensitive agricultural intervention • Diversification in: ➢ Production of fruits, vegetable, nutritious roots, cereals, pulse, and mushroom ➢ Animal source foods (Dairy, poultry, shoat, fish)
Techniques of enhancing	May include, but not limited to: • Fortification, • Germination, • Fermentation, • Roasting and Cooking
Hygiene	May include, but not limited to: • Food hygiene • Personal hygiene

	• Environmental hygiene
Storage facilities	May include, but not limited to: • Bins • Refrigerator • Shelf • Rack and Barn
Safely handling and storing	May include, but not limited to: • Sanitation • Ventilation

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Use utensils and prepare balanced nutrition • Distinguish and demonstrate energy dense and nutrients- dense foods and preparation techniques • Demonstrate food storing and preserving techniques • Explain the need for variety and diversification of foods • Explain agricultural food types, and sources • Describe forms, causes and consequences of excess or deficient intake of certain food types • Maintain personal hygiene to minimize risk to food product safety
Required Knowledge and Attitude	Demonstrate knowledge of: • Terminologies and concepts of nutrition • OHS requirements • Food groups and nutrient composition and diet requirement • Adequate and balanced diets • Agricultural food types, and sources • Need for variety and diversification of family diet with a variety of agricultural food products • Basic principles of producing quality/ nutritious agricultural products • Effect of food production and /or preparation on nutrient content of a variety of energy- dense and nutrients- dense foods • Child and maternal nutrition • Forms, causes and consequences of malnutrition • Basic food safety principles and requirements • Hygiene and food safety procedures • food safety recording requirements • Common hazards and sources of contamination in area of work • Legal and regulatory requirements pertaining to food production, storage, handling and packaging relevant to area of

	work • Personal hygiene practices and clothing requirements relevant to area of work.

Required Skills	Demonstrate skills to: • Categorize agricultural food items into major food groups based on their nutrient contents • Identify local varieties of animal and plant products, • Demonstrate production and /or preparation of nutrient rich diets • Communicate appropriate information with regard to diversified foods for pregnant women and children • Demonstrate various methods of integrated nutritious agricultural products production • Identify the consequences of excess or deficient intake of certain food types • Demonstrate how to enhance nutrient content using different food groups • Handle food .products to prevent damage, spoilage and waste • Identify hazards, contaminants and risks or control points • Document and report food safety hazards and risks to appropriate personnel • Store food products in appropriate areas at correct temperatures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard:	Agricultural Machinery and Equipment Operation Level I
Unit Title	**Apply 5S Procedures**
Unit Code	**AGR AMO1 13 0322**
Unit Descriptor	This unit covers the knowledge, skills and attitude required to apply 5S techniques to his/her workplace. It covers responsibility for the day-to-day operations of the workplace and ensuring that continuous improvements of Kaizen elements are initiated and institutionalized.

Elements	Performance Criteria
1. Prepare for work.	1.1. Work instructions are used to determine job requirements, including method, material and equipment. 1.2. Job specifications are read and interpreted following working manual. 1.3. ***OHS requirements***, including dust and fume collection, breathing apparatus and eye and ear personal protection needs are observed throughout the work. 1.4. ***Tools and equipment*** are prepared and used to implement 5S. 1.5. ***Safety equipment and tools*** are identified and checked for safe and effective operation. 1.6. Kaizen Board (Visual Management Board) is prepared and used in harmony with different workplace contexts.
2. Sort items.	2.1. Plan is prepared to implement sorting activities. 2.2. Cleaning activities are performed. 2.3. All ***items*** in the workplace are identified following ***the appropriate procedures***. 2.4. Necessary and ***unnecessary items*** are listed using the ***appropriate format***. 2.5. ***Red tag*** strategy is used for unnecessary items. 2.6. Unnecessary items are evaluated and placed in an appropriate place other than the workplace. 2.7. ***Necessary items*** are recorded and quantified using appropriate format. 2.8. Performance results are reported using appropriate formats. 2.9. Necessary items are regularly checked in the workplace.
3. Set all items in order.	3.1. Plan is prepared to implement set in order activities. 3.2. General cleaning activities are performed. 3.3. Location/Layout, storage and indication methods for items are decided. 3.4. Necessary tools and equipment are prepared and used for setting in order activities. 3.5. Items are placed in their assigned locations. 3.6. After use, the items are immediately returned to their assigned locations. 3.7. Performance results are reported using appropriate formats. 3.8. Each item is regularly checked in its assigned location and order.
4. Perform shine activities.	4.1 Plan is prepared to implement shine activities. 4.2 Necessary tools and equipment are prepared and used for shinning

	activities. 4.3 ***Shine activity*** is implemented using appropriate procedures. 4.4 Performance results are reported using appropriate formats. 4.5 Regular shining activities are conducted.
5. Standardize 5S.	5.1. Plan is prepared and used to standardize 5S activities. 5.2. ***Tools and techniques to standardize 5S*** are prepared and implemented based on ***relevant procedures***. 5.3. Checklists are followed for standardize activities and ***reported*** to ***relevant personnel***. 5.4. The workplace is kept to the specified standard. 5.5. Problems are avoided by standardizing activities.
6. Sustain 5S.	6.1. Plan is prepared and followed to sustain 5S activities. 6.2. Tools and techniques to sustain 5S are discussed, prepared and implemented based on relevant procedures. 6.3. Workplace is inspected regularly for compliance to specified standard and sustainability of 5S techniques. 6.4. Workplace is cleaned up after completion of job and before commencing next job or end of shift. 6.5. Situations are identified where compliance to standards is unlikely and actions specified in procedures are taken. 6.6. Improvements are recommended to lift the level of compliance in the workplace. 6.7. Checklists are followed to sustain activities and report to relevant personnel. 6.8. Problems are avoided by sustaining activities.

Variable	**Range**
OHS requirements	May include, but not limited to: • Legislation/Regulations/Codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. • Personal protective equipment is to include that prescribed under legislation/regulations/codes of practice and workplace policies and practices. • Safe operating procedures are to include, but are not limited to the conduct of operational risk assessment and treatments associated with workplace organization. • Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation.
Tools and equipment	May include, but not limited to: • Paint • Hook

	• Sticker • Signboard • Nails • Shelves • Chip wood • Sponge • Broom • Pencil • Shadow board/Tools board

Safety equipment and tools	May include, but not limited to: • Dust masks/goggles • Glove • Working cloth • First aid and safety shoes
Items	May include, but not limited to: • Tools • Jigs/Fixtures • Materials/components • Machine and equipment • Manuals • Documents • Personal items (e.g. Bags, lunch boxes and posters) • Safety equipment and personal protective equipment • Other items which happen to be in the work area
The appropriate procedures	May include, but not limited to: • Steps for implementing 5S (sort, set in order and shine) activities. • Written, verbal and computer based or in some other format.
Unnecessary items	Are not needed for current production or administrative operation and include but not limited to: • Defective or excess quantities of small parts and inventory • Out dated or broken jigs and dies • Worn-out bits • Out dated or broken tools and inspection gear • Old rags and other cleaning supplies • Electrical equipment with broken cords • Out dated posters, signs, notices and memos • Some locations where unneeded items tend to accumulate • In rooms or areas not designated for any particular purpose • In corners next to entrances or exists • Along interior and exterior walls • Next to partitions and behind pillars • Under the eaves of warehouses • Under desks and shelves and in desk and cabinet drawers • Near the bottom of tall stacks of items • On unused management and production schedule boards • In tools boxes that are not clearly sorted
Appropriate format	May include, but not limited to: • All items, necessary and unnecessary items.
Red tag	A format prepared with a red color paper or card which is filled and attached temporarily on the unnecessary items until decision is made. The red tag catch people's attention because red is a color that stands out. So to fill and attach red tag on items, asks the following three questions: • Is this item needed? • If it is needed, is it needed in this quantity?

	• If it is needed, does it need to be located here?

Necessary items	Are required in the workplace for current production or administrative operation in the amount needed.

Shine activity	May include, but not limited to:
	• Inspection
	• Cleaning
	• Minor maintenance May include, but not limited to:
	  ➢ Tightening bolts
	  ➢ Lubrication and Replacing missing parts

Tools and techniques to standardize 5S	May include, but not limited to:
	• 5S Job Cycle Charts
	• Visual 5S
	• The Five Minute 5S
	• Standardization level checklist
	• 5S checklist
	• The five Whys and one How approach(5W1H)
	• Suspension
	• Incorporation and Use Elimination
	• 5S slogans
	• 5S posters
	• 5S photo exhibits and storyboards
	• 5S newsletter
	• 5S maps
	• 5S pocket manuals
	• 5S department/benchmarking tours
	• 5S months
	• 5S audit
	• Awarding system
	• Big cleaning day
	• Patrolling system May include, but not limited to:
	  ➢ Top management Patrol
	  ➢ 5S Committee members and Promotion office Patrol
	  ➢ Mutual patrol
	  ➢ Self-patrol
	• Checklist and Camera patrols

Relevant procedures	May include, but not limited to: • Assign 5S responsibilities • Integrate 5S duties into regular work duties • Check on 5S maintenance level • OHS measures such as signage, symbols / coding and labelling of workplace and equipment • Creating conditions to sustain your plans • Roles in implementation
Reporting	May include, but not limited to: • Verbal responses

	• Data entry into enterprise database • Brief written reports using enterprise report formats
Relevant personnel	May include, but not limited to: • Supervisors, managers and quality managers • Administrative, laboratory and production personnel • Internal/external contractors, customers and suppliers

Evidence Guide	
Critical Aspects of Competence	Demonstrates skills and knowledge to: • Discuss how to organize KPT. • Describe the pillars of 5S. • Discuss the relationship between Kaizen elements. • Implement 5S in own workplace by following appropriate procedures and techniques.
Required Knowledge and Attitudes	Demonstrates knowledge of: • Kaizen principle, pillars and concept • Key characteristic of Kaizen • Elements of Kaizen • Wastes/MUDA • Basics of KPT • Aims, benefits and principles of KPT • Stages of KPT • Structure and role of the components of Junior KPT • Concept and parts of Kaizen board • Concept and benefits of 5S • The pillars of 5S • Three stages of5S application • Benefits and procedure of sorting activities • The concept and application of Red Tag strategy • Relevant Occupational Health and Safety (OHS) and environment requirements • Benefits and procedure of set in order activities • Set in order methods/techniques • Benefits and procedure of shine activities • Inspection methods • Planning and reporting methods • Method of Communication • Benefits of standardizing and sustaining 5S • Tools and techniques to sustain 5S • Ways to improve Kaizen elements • Benefits of improving kaizen elements • Relationship between Kaizen elements
Required Skills	Demonstrates skills of: • Participating actively in KPT

	• Technical drawing • Communication skills • Planning and reporting own tasks in implementation of 5S • Following procedures to implement 5S in own workplace • Using sorting formats to identify necessary and unnecessary items • Improving workplace layout following work procedures • Preparing labels, slogans, etc. • Reading and interpreting documents • Observing situations • Gathering evidence by using different means • Recording activities and results using prescribed formats • Working with others • Solving problems by applying 5S • Preparing and using kaizen board • Preparing and using tools and equipment to implement and sustain 5S • Improving Kaizen elements by applying 5S • Standardizing and sustaining procedures and techniques to avoid problems • Procedures to standardizing 5S activities • Analysing and preparing shop layout of the workplace • Standardizing and sustaining checklists
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

NTQF Level II

Occupational Standard: Agricultural Machinery and Equipment Operation Level II	
Unit Title	**Test, Service and Charge Batteries**
Unit Code	**AGR AMO2 01 0322**
Unit Descriptor	This unit covers the competence to inspect service and maintain storage battery systems in on-site agricultural machineries and equipment. Work requires individuals to demonstrate judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.

Elements	Performance Criteria
1. Prepare to undertake battery inspection	1.1. ***OHS and environmental requirements*** are identified and confirmed. 1.2. ***Personal protection equipment*** needs are used throughout the work. 1.3. ***Safe operating procedures*** and ***information*** are sourced. 1.4. Tools and equipment's are identified and prepared and sourced.
2. Conduct inspection	2.1. Methods for the conduct of inspection are implemented in accordance with workplace procedures and manufacturer/component supplier specifications. 2.2. Inspection results are compared with manufacturer/ component supplier specifications. 2.3 Results are documented with evidence and supporting information and recommendations made. 2.5. Report is made in accordance with workplace procedures.
3. Carry out service and maintenance	3.1 Technical and tool requirements for servicing and maintenance are identified and support. 3.2 Methods for the conduct of service and/or maintenance are implemented. 3.3 Battery pole or terminal Cleaning and refilling are performed. 3.4 Battery electrolyte replaced and top up is performed. 3.5 Battery charging and boosting operation are performed. 3.6 Battery clamp adjustments made during service and/or maintenance. 3.7 Battery test results are compared. 3.8 Report is made in accordance with workplace procedures.
4. Clean up work area and maintain Equipment	4.1 ***Materials*** that can be reused are collected and stored. 4.2 Waste and scrap are removed following workplace procedures. 4.3 Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures. 4.4 Unserviceable equipment is tagged and faults identified in accordance with workplace requirements.

Variable	Range
Environmental requirements	May include but not limited to: • Waste management, • Dust • Clean-up management • Regulations, • international standards, • internal company quality policy • standards and enterprise operations and procedures
OHS	May include but not limited to: • Protective clothing • Equipment, use of tooling and equipment, • Workplace environment and • Safety, handling of material, • Use of fire fighting equipment, • Enterprise first aid, hazard control and hazardous materials and substances
Safe operating procedures	May include but not limited to: • Working with Toxic substances, Electrical safety, • Equipment movement • Mechanical lifting and shifting • Working in proximity to others and site visitors • Emergency shutdown • Stopping of equipment • extinguishing fires • Enterprise first aid requirements • site evacuation
Information	May include but not limited to: • Verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, Material Safety Data Sheets (MSDS), diagrams and sketches • Safe work procedures related to inspection, servicing and maintenance of battery storage systems • Regulatory/legislative requirements pertaining to automotive industry, including International Design Rules • Engineer's design specifications and instructions • Organisation work specifications and requirements • Instructions issued by authorised enterprise or external persons • International standards • verbal and graphical instructions and fault reporting and may include site specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Materials	Materials may include but not limited to:

	• Cleaning agents • Electrolyte • Distilled water • Carbon rod/lead • Containers
Tooling and Equipment	May include but not limited to: • Hand tools • Peak load tester • Multimeter • Hydrometer

Evidence Guide	
Critical Aspects of Competence	Must demonstrate skills and knowledge competence in: • Applying safety procedures and requirements • Servicing and maintaining battery storage systems in accordance with manufacturer/component supplier and site requirements • Applying battery boosting and battery charging • Completing inspection in accordance with manufacturer/component supplier requirements • Completing work within workplace timeframes • recording and documenting
Required knowledge and attitude	Demonstrates knowledge of: • OHS and environmental regulations/requirements, equipment, material • Personal safety requirements • Working procedure with battery testing Equipment • Operating principles and layout of battery storage systems • Type and methods of battery charging, boosting. • Inspection procedures • Service and/or maintenance procedures • Enterprise quality procedure • Work organization and planning processes
Required Skills	Demonstrates skills to: • Apply manufacturer/component supplier procedures, workplace policies and procedures • Applying battery boosting and battery charging. • Interacting with other persons both on a one-to-one basis and in groups • Communicating effectively with others involved in or affected by the work • Perform inspection, servicing and repairing works • Establish safe and effective work processes to resolve problems and downtime • Systematically develop solutions to avoid or minimise reworking

	and avoid wastage • Use workplace technology related to inspection, servicing and maintenance of battery storage systems • reporting/documenting of results
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level II	
Unit Title	**Operate Agricultural Tractor**
Unit Code	**AGR AMO2 02 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to identify systems, components and controls of tractor; prepare tractor for operation; drive tractor; select, remove and fit attachment; operate tractor with attached implement and trailer and complete tractor operation.

Elements	**Performance Criteria**
1. Identify systems, components and controls of tractor	1.1 Workplace ***information sources*** regarding ***tractor*** driving and operations are accessed and sourced. 1.2 Tractor types, distinguishing characteristics and operation requirements are identified. 1.3 ***Systems and components*** and their functions are identified. 1.4 Operational requirements of ***Tractor controls and functions***, indicators, levers, and pedals are identified and applied as per ***manufacturer's operator's manuals***.
2. Prepare tractor for operation	2.1 ***Occupational Health and Safety (OHS***) hazards are identified and safety concerns are reported and personal protective equipment needs are used. 2.2 ***Compliance documentation relevant*** to conducting tractor operations is accessed, interpreted and applied.

	2.3 Routine checks of tractors are conducted prior to use according to manufacturer's specifications and enterprise requirements. 2.4 Tractor controls and functions are checked for serviceability and any faults rectified or reported. 2.5 Work instructions and ***safety requirements*** are obtained, confirmed and applied to the allotted task. 2.6 Signage requirements are identified, obtained and implemented from the project traffic management plan.
3. Drive tractor	3.1 Risks to self, others and the environment are recognised and avoided according to enterprise requirements. 3.2 Suitable ***personal protective equipment*** is used, maintained and stored according to enterprise requirements. 3.3 Driving posture that permits effective control and operation of the tractor is adopted. 3.4 Pre-start, start-up, park and shutdown procedures are carried out according to manufacturer's operator's manual 3.5 Gauges and warning lights are checked after the engine starts. 3.6 Tractor is moved off with no significant imbalance and noticeable roll in the opposite direction. 3.7 Correct use of clutch is demonstrated. 3.8 Safe and competent steering skills are demonstrated. 3.9 Smooth efficient gear changing and gear selection are demonstrated. 3.10 Safe and accurate tractor controls during reversing manoeuvrers are demonstrated. 3.11 Tractor is operated according to low risk operating procedures in a controlled manner and monitored for performance and efficiency. 3.12 Tractor is driven safely between worksites, observing relevant codes and traffic management requirements. 3.13 Tractor is safely parked according to enterprise requirements. 3.14 Environmental impacts associated with tractor operation are recognised and minimised according to directions.

4. Select, remove and fit attachment	4.1 Matching attachment for appropriate power requirement 4.2 ***Methods*** of ***hitching*** implements are identified. 4.3 ***Attachment*** for the task is selected by considering factors specified in operator's manual. 4.4 ***Trailed implement*** is hitched and removed by following manufacturer's procedure. 4.5 ***Mounted implement*** is hitched and removed by following manufacturer's procedure. 4.6 Attach and detach PTO shaft to the tractor following manufacturer's procedures. 4.7 Equipment is securely attached and calibrated for operation to manufacturer's specifications. 4.8 . Attachment is adjusted, calibrated and used in accordance with recommendations and design limits.
5. Operate tractor with attached implement	5.1 Risks to self, others and the environment are recognised and avoided according to enterprise requirements. 5.2 Suitable Personal Protective Equipment is used, maintained and stored according to enterprise requirements. 5.3 Tractor is operated according to low risk operating procedures in a controlled manner and monitored for performance and efficiency. 5.4 Driving speed and clearance of attachment are strictly followed from the ground as specified in operators manual 5.5 Potential risk when turning, driving at speed and rough terrain are identified. 5.6 Adjustment of three-point linkage is observed and strictly followed as specified in operators manual while driving in and off farm and making turning on operation 5.7 Environmental impacts associated with tractor operation are recognised and minimised according to directions.
6. Operate tractor with trailer	6.1 Risks to self, others and the environment are recognised and avoided according to enterprise requirements. 6.2 Suitable personal protective equipment is used, maintained and stored according to enterprise requirements. 6.3 Trailer is hitched to tractor and hydraulic/pneumatic/electrical

	couplings are connected. 6.4 Tractor is operated according to low risk operating procedures in a controlled manner and monitored for performance and efficiency. 6.5 Tractor trailer is reversed to the specified position for tipping. 6.6 Code of practice for driving agricultural machinery on public road is adhered. 6.7 Common methods of securing a load are demonstrated. 6.8 Environmental impacts associated with tractor operation are recognised and minimised according to directions
7. Complete tractor operation	7.1 Shut-down procedures are conducted according to manufacturer's specifications. 7.2 Wheels are checked/trailer parking brake applied (if applicable) 7.3 PTO shaft, hydraulics/pneumatic pipes and electrics are disconnected and stored correctly. 7.4 Post inspection is conducted in accordance with manufacturer's instruction. 7.5 Malfunctions, faults, irregular performance or damage to tractor are detailed and reported according to enterprise requirements. 7.6 Tractor operational reports are maintained according to enterprise requirements. 7.7 Tractor is cleaned, secured and stored according to enterprise and OHS requirements 7.8 Attachments is lowered, cleaned and stored in designated location.

Variable	**Range**
Information sources	May include but not limited to : • Verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, Material Safety Data Sheets (MSDS), diagrams and sketches • Safe work procedures related to inspection, servicing and maintenance of battery storage systems • Regulatory/legislative requirements pertaining to farm machinery industry, including International design rules • Engineer's design specifications and instructions • Organization work specifications and requirements • Instructions issued by authorized enterprise or external persons

	• International and National standards • Verbal and graphical instructions and fault reporting and may include site specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Tractor	May include but not limited to : • Two wheel drive tractor • Four wheel drive tractor • Track/crawler tractor • Utility tractor/general purpose tractor
Systems and components	May include but not limited to: • Engine and its components • Lubrication system • Cooling system • Fuel system • Electrical system • Steering system • Hydraulic system • Transmission system • Brake system and components
Tractor controls and functions	May include but not limited to: • Hand controls • Foot controls • Combination controls
Manufacturer's operator's manual	May include but not limited to: • Use and operation manual for tractor • Use and operation manual for attachments • Use and operation manual for trailer
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Sharp cutting tooling and instruments, • Torn or improper use personal protective equipment • Worn out repair tools • Servicing while engine is running • Working under machines not secured • Unprotected moveable parts • Electricity and water, • Toxic substances, • Damaged packing material or containers, • Broken or damaged equipment, • Flammable materials and fire hazards, • lifting practices, • Stumps and logs in the soil or covered by debris • Spillages, waste and debris especially on floors • Uneven/ unstable terrain, trees, • Overhead and underground power lines, • Bridges, buildings, excavations, traffic, embankments,

	• Cuttings, structures and hazardous materials
Relevant compliance documentation	May include but not limited to: • Legislative, organisation and site requirements and procedures • Manufacturer's guidelines and specifications • Codes of practice • Employment and workplace relations legislation
Safety requirements	May include but not limited to: • Protective clothing and equipment, use of tools and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, use of First Aid equipment, hazard control and hazardous materials and substances • Safe operating procedures to recognise hazards and prevent risks associated with underground and overhead power lines, other machines, personnel, restricted access barriers, traffic control, working at heights, working in proximity to others, worksite visitors and the public • Emergency procedures, including: emergency shutdown and stopping, extinguishing fires, organisational First Aid requirements and evacuation
Personal Protective Equipment	May include but not limited to: • Safety shoes • Gloves • Overall • Dust mask • Spectacles • Ear plugs • Helmet
Methods of hitching	May include but not limited to: • Drawbar • Three point hitch
Attachment	May include but not limited to: • A front blade, slasher, mower, auger • Drag broom, power broom, loading platform • Rotary hoe, spraying equipment and disc plough • Disc harrow, mould board plough, reversible plough • Power harrow, chisel plough, subsoiler
Trailed implement	May include but not limited to: • Trailed harrows • Trailed cultivators • Trailed planters and seed drills
Mounted implement	May include but not limited to: • Mounted ploughs • Mounted cultivators • Mounted planters and drills

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Distinguish tractor types, components, controls and systems • Carry out pre-operational checks • Select appropriate gear and change gears smoothly • Correct use of pedals • Operate tractor forward and in reverse in a safe and controlled manner • Attach and detach implements according to manufacturer's manual • Drive tractor with trailer in reverse to parking area • Refer and use operator's manual as required • Park tractor and apply safe stopping procedures • Record maintenance and operation details
Required Knowledge and Attitudes	Demonstrate knowledge of: • Tractor types, characteristics, technical capabilities and limitations • Systems and components of tractors • Tractor components, controls and features and operational functions • Tractor steering systems • Distinguishing characteristics of individual tractors including rated power • Attached equipment, features and operational functions and procedures • Operating principles and operating methods • Effects of adverse weather, soil condition and difficult terrain conditions on tractor operation • Duty of care to self, others and the environment • Use and control of hazardous substances • Relevant legislation with regard to machinery operation and licensing requirements • Environmental codes of practice with regard to machinery operation • Ohs legislative requirements, codes of practice, hazard identification and risk assessment
Required Skills	Demonstrate skills of: • Steer, manoeuvre and position tractor in a smooth and controlled manner • Utilise the various components and controls of tractors • Set and secure equipment for operation • Safely and effectively operate tractors in adverse weather and difficult terrain conditions • Attach and detach implements

	• Operate tractor with attached implement and trailer • Demonstrate safe and environmentally responsible workplace practices • Interpret manufacturers specifications, work and maintenance plans, and material safety data sheets (msdss) • Effectively communicate faults and hazards, interpret and apply task instructions, report and maintain operational records • calculate and measure distance, volumes and weights
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level II	
Unit Title	**Operate Walking Tractor**
Unit Code	**AGR AMO2 03 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to identify systems, components and controls of walking tractor; prepare for operation; attach and detach attachments and undertake agricultural work.

Elements	Performance Criteria
1. Identify systems, components and controls of walking tractor	1.1 Workplace ***information sources*** regarding walking tractor driving and operations are accessed and sourced. 1.2 ***Systems*** and ***components*** and their functions are identified. 1.3 Operational requirements of Tractor controls and functions are identified and applied as per ***manufacturer's operator's manuals***.
2. Prepare walking tractor for operation	2.1 ***Occupational Health and Safety (OHS***) hazards are identified and safety concerns are reported and personal protective equipment needs are used. 2.2 Suitable Personal Protective Equipment is used, maintained and stored according to enterprise requirements. 2.3 ***Compliance documentation relevant*** to conducting tractor operations is accessed, interpreted and applied. 2.4 Routine checks of tractors are conducted prior to use according to manufacturer's specifications and enterprise requirements. 2.5 Tractor controls and functions are checked for serviceability and any faults rectified or reported. 2.6 Work instructions and ***safety requirements*** are obtained, confirmed and applied to the allotted task.
3. Operate walking tractor	3.1 Risks to self, others and the environment are recognised and avoided according to enterprise requirements. 3.2 Suitable ***personal protective equipment*** is used, maintained and stored according to enterprise requirements. 3.3 Pre-start, start-up, park and shutdown procedures are carried out according to manufacturer's operator's manual 3.4 Correct use of clutch is demonstrated. 3.5 Smooth efficient gear changing and gear selection are

	demonstrated. 3.6 Walking Tractor is operated according to low risk operating procedures in a controlled manner and monitored for performance and efficiency. 3.7 Tractor is safely parked according to enterprise requirements and manufacturer guidelines. 3.8 Environmental impacts associated with tractor operation are recognised and minimised according to directions.
4. Select, remove and fit attachment	4.1 ***Methods of fitting attachment*** are identified. 4.2 ***Attachment*** for the task is selected by considering factors specified in operator's manual. 4.3 Equipment is securely attached and calibrated for operation to manufacturer's specifications. 4.4 Attachment is adjusted and calibrated in accordance with recommendations and design limits. 4.5 Attachment is removed following manufacturers procedure.
5 Undertake agricultural work using walking tractor	5.1 Risks to self, others and the environment are recognised and avoided according to enterprise requirements. 5.2 Selected attachment is fitted the required ***agricultural work*** 5.3 The required adjustments are carried out to meet the desired job performance requirement 5.4 Driving speed and clearance of attachment are strictly followed from the ground as specified in operators manual 5.5 Potential risk when turning, driving at speed and rough terrain are identified. 5.6 Code of practice for driving agricultural machinery on public road is adhered. 5.7 Common methods of securing a load are demonstrated. 5.8 Environmental impacts associated with tractor operation are recognised and minimised according to directions.
6 Complete walking tractor operation	6.1 Shut-down procedures are conducted according to manufacturer's specifications.

	6.2 Wheels are chocked/trailer parking brake applied (if applicable) 6.3 Post inspection is conducted in accordance with manufacturer's instruction. 6.4 Malfunctions, faults, irregular performance or damage to tractor are detailed and reported according to enterprise requirements. 6.5 Tractor operational reports are maintained according to enterprise requirements. 6.6 Tractor is cleaned, secured and stored according to enterprise and OHS requirements 6.7 Attachment is cleaned and stored in designated location.

Variable	**Range**
Information sources	May include but not limited to : • Verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, Material Safety Data Sheets (MSDS), diagrams and sketches • Safe work procedures related to inspection, servicing and maintenance of battery storage systems • Regulatory/legislative requirements pertaining to farm machinery industry, including International design rules • Engineer's design specifications and instructions • Organization work specifications and requirements • Instructions issued by authorized enterprise or external persons • International and National standards • Verbal and graphical instructions and fault reporting and may include site specific instructions, written instructions, plans or instructions related to job/task, telephones and pagers
Manufacturer's operator's manual	May include but not limited to: • Use and operation manual for walking tractor • Use and operation manual for attachments
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Sharp cutting tooling and instruments, • Torn or improper use personal protective equipment • Worn out repair tools • Servicing while engine is running • Working under machines not secured • Unprotected moveable parts • Electricity and water, • Toxic substances, • Damaged packing material or containers,

	• Broken or damaged equipment, • Flammable materials and fire hazards, • Lifting practices, • Stumps and logs in the soil or covered by debris • Spillages, waste and debris especially on floors • Uneven/ unstable terrain, trees, • Overhead and underground power lines, • Bridges, buildings, excavations, traffic, embankments, • Cuttings, structures and hazardous materials
Relevant compliance documentation	May include but not limited to: • Legislative, organisation and site requirements and procedures • Manufacturer's guidelines and specifications • Codes of practice • Employment and workplace relations legislation
Safety requirements	May include but not limited to: • Protective clothing and equipment, use of tools and equipment, workplace environment and safety, handling of materials, use of fire fighting equipment, use of First Aid equipment, hazard control and hazardous materials and substances • Safe operating procedures to recognise hazards and prevent risks associated with underground and overhead power lines, other machines, personnel, restricted access barriers, traffic control, working at heights, working in proximity to others, worksite visitors and the public • Emergency procedures, including: emergency shutdown and stopping, extinguishing fires, organisational First Aid requirements and evacuation
Personal Protective Equipment	May include but not limited to: • Safety shoes • Gloves • Overall • Dust mask • Spectacles • Ear plugs

	• Helmet
Methods of fitting attachment	May include but not limited to: • Direct bolt fixing • Belt coupling • Gear coupling
Attachment	May include but not limited to: • Mouldboard plough • Disc plough • Rotary tiller • Planter • Sheller and Thresher, • Reaper • Centrifugal pump • Generator • Trailer • Grain Mill
Agricultural work	May include but not limited to: • Land preparation • Planting and seeding system • Irrigation work • Harvesting system • Transportation

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Carry out pre-operational checks and maintenance • Select appropriate gear and change gears smoothly • Operate tractor forward and in reverse in a safe and controlled manner • Attach and detach attachments according to manufacturer's manual • Selection, attachment and adjustments of belts • Crank starting • Refer and use operator’s manual as required • Record maintenance and operation details
Required Knowledge and Attitudes	Demonstrate knowledge of: • Systems and components, controls and features and operational functions of walking tractors • Distinguishing characteristics of individual walking tractors including rated power • Attached equipment, features and operational functions and procedures • Identify different agricultural attachment and equipment used with

	walking tractor • Operating principles and operating methods • Effects of adverse weather, soil condition and difficult terrain conditions on tractor operation • Duty of care to self, others and the environment • Use and control of hazardous substances • Relevant legislation with regard to machinery operation and licensing requirements • Environmental codes of practice with regard to machinery operation • Ohs legislative requirements, codes of practice, hazard identification and risk assessment
Required Skills	Demonstrate skills of: • Park tractor and apply safe stop procedures • Steer, manoeuvre and position tractor in a smooth and controlled manner • Utilise the various components and controls of tractors • Set and secure equipment for operation • Safely and effectively operate tractors in adverse weather and difficult terrain conditions • Attach and detach implements • Operate tractor with attached implement and trailer • Demonstrate safe and environmentally responsible workplace practices • Interpret manufacturers specifications, work and maintenance plans, and Material Safety Data Sheets (msdss) • Effectively communicate faults and hazards, interpret and apply task instructions, report and maintain operational records • Calculate and measure distance, volumes and weights
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level II	
Unit Title	**Undertake Land Preparation Operation**
Unit Code	**AGR AMO2 04 0322**
Unit Descriptor	This unit of competence covers the knowledge, skills and attitudes required to prepare for land preparation operation, Prepare the land preparation machinery and equipment, carry out primary and secondary tillage operations and complete land preparation operations.

Elements	Performance Criteria
1. Prepare the land preparation machinery and equipment	1.1 Classifications of ***soil tillage systems*** are identified. 1.2 The method, requirements and sequence of ***tillage operations*** for the employed crop production system are identified and interpreted from the production plan. 1.3 Basic characteristics, operating mechanisms and types of ***tillage implements*** used in land preparation are identified. 1.4 ***Occupational Health and Safety (OHS) hazards*** in land preparation are identified; risks assessed and suitable controls implemented. 1.5 Suitable ***Personal Protective Equipment*** is selected, used and maintained. 1.6 ***Environmental implications*** of preparing the land is identified, likely outcomes assessed and, if necessary, responsible action is taken. 1.7 Compatible tractor and equipment required for ***cultivation*** are selected according to the land preparation plan and organisation guidelines. 1.8 Tractor and equipment are checked, serviced, adjusted for the conditions and worn parts replaced to ensure reliability during cultivation. 1.9 Selected implement is attached to tractor and hitch system is adjusted to meet job requirements.
2. Carry out primary tillage operations	2.1 OHS hazards are identified, risks assessed and suitable controls implemented. 2.2 Previous crop or land clearing debris/stocks and cane stools are removed and incorporated using appropriate tillage equipment 2.3 ***Field ploughing pattern*** is selected, marked out and followed to maximize efficiency and work quality. 2.4 Ploughing operation is undertaken as per the tillage plan and completed for each paddock. 2.5 Tractor and equipment are operated in a safe, effective and efficient manner and at speeds to suit the conditions.

	2.6 The quality of tillage is maintained by continually checking and adjusting the tractor and equipment.
3. Carry out secondary tillage operations	3.1 OHS hazards are identified, risks assessed and suitable controls implemented 3.2 Appropriate equipment and field working pattern is selected and followed to maximize efficiency and work quality. 3.3 Secondary tillage operation is undertaken as per the cultivation plan and completed for each paddock. 3.4 Tractor and equipment are operated in a safe, effective and efficient manner and at speeds to suit the conditions. 3.5 The quality of cultivation is maximised by continually checking and adjusting the tractor and equipment as necessary. 3.6 Pre-planting treatments are applied as required by the planting plan.
4. Complete land preparation operations	4.1 Tractor and equipment are cleaned and stored according to manufacturer specifications, organisational procedures and regulations. 4.2 Post operation inspection are carried out as per enterprise guideline 4.3 All containers, leftover fluids, waste and debris are disposed of safely and appropriately from the cleaning and maintenance work. 4.4 All required records and documentation are completed accurately and promptly according to organisational requirements.

Variable	**Range**
Soil tillage systems	May include but not limited to: • Conventional tillage system • Reduced tillage system • Conservation tillage system
Tillage operations	May include but not limited to: • Primary tillage • Secondary tillage • Crop management tillage operations
Tillage implements	May include but not limited to: • ploughs • disc harrows/uprooter • Sub-soiler • Harrows • Planner/seeder • Field cultivators • Inter row cultivators • Ridgers • Rollers

Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Sharp cutting tooling and instruments, • Torn or improper use personal protective equipments • Worn out repair tools • Broken or damaged equipment, • Servicing while engine is running • Working under machines not secured • Unprotected moveable parts • Electricity and water, • Toxic substances, • Damaged packing material or containers, • Flammable materials and fire hazards, • lifting practices, • Stumps and logs in the soil or covered by debris • Crash with tractors/trucks • Uneven terrain, • Canals, ditches, embankments
Personal Protective Equipment	May include but not limited to: • Safety shoes • Overall • Hand gloves • Spectacles • Ear plugs • Dust masks
Environmental implications	may include: • Waste management • Pollution • Noise • Dust • Clean-up management
Cultivation	May include but not limited to: • Slashing, trash chopping • Ripping or subsoiling • Ploughing • Harrowing, ridging • Soil treatment
Field ploughing pattern	May include but not limited to: • Casting • Gathering • Working back and forth • Round

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Interpret production plans • Identify basic operating mechanisms and types of tillage implements used in land preparation • Adjust plough and carry out operation by following efficient operation pattern • Perform land preparation with satisfactory work quality

	• Service, operate, adjust tillage equipment safely • Complete pre- and post-operational checks on tools, tractor and implement
Required Knowledge and Attitudes	Demonstrate knowledge of: • Soil tillage systems, tillage operations and implement types • Methods of cultivating a range of soil types • Environmental issues of preparing soil for planting, such as drainage and irrigation systems, soil amelioration and waste disposal procedures • Tillage operation season • Optimum soil moisture for carrying out land preparation operation • A range of pre-planting treatments, their purpose and method of application • Operation and maintenance of tillage equipment procedures • Ohs guidelines, procedures and principles, including manual handling and exposure to hazardous substances
Required Skills	Demonstrate skills to: • Interpret production/planting plans, produce standards, quality specifications and work procedure documents • Measure materials and site plan specifications • Operate, adjust tillage equipment safely • Complete pre- and post-operational checks on tools, tractors and equipment • Perform routine safety, service and maintenance procedures on tools, tillage and equipment • Laying out fields for ploughing operation • Undertake land preparation operation with required quality and job specification • Read and interpret manufacturer specifications, work and maintenance plans, and material safety data sheets (msds) • Interpret and apply task instructions • Record and report faults, workplace hazards and accidents • Use numeracy skills to estimate, calculate and record routine workplace measures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level II	
Unit Title	**Conduct Backhoe/ Front-end Loader Operations**
Unit Code	**AGR AMO2 05 0322**
Unit Descriptor	This unit of competency covers the knowledge, attitude and skills required to Prepare for Work Operate backhoe/ loader; Carryout Lift, carry and place materials; Carry out machine maintenance; Check, Clean and store Backhoe/Loader.

Elements	Performance Criteria
1. Prepare for Work	1.1 ***Compliance documentation*** relevant to conduct ***backhoe/loader* tasks** is accessed, interpreted and applied. 1.2 ***Work instructions*** and Safety requirements is obtained, confirmed and applied to the allotted task. 1.3 Conduct machine pre-operational checks 1.4 Start-up, park and shutdown procedures are carried out as per site specific requirement 1.5 Machine controls and functions are checked for serviceability and faults are reported. 1.6 Signage requirements are identified, obtained and implemented from the project traffic management plan. 1.7 Site drawing and plans are read and interpreted. 1.8 Appropriate ***attachments*** are selected and fitted according to work requirements, soil and rock types and soil condition 1.9 ***Environmental protection requirements*** are identified confirmed and applied from the project environmental management plan to the allotted task.
2. Operate backhoe/ loader	2.1 Site hazards associated with backhoe/loader operations are identified and safe operating techniques used to minimise risk. 2.2 Work activity is evaluated and most productive operating technique is determined. 2.3 Loading technique is selected and modified to appropriately meet changing work conditions which may include variable grades, and work with varying materials, haulage units and materials handling facilities. 2.4 Safe towing practices are demonstrated in accordance with the authorised equipment and connection capabilities. 2.5 Backhoe is operated according to work instructions. 2.6 Backhoe/loader is moved safely between worksites, observing relevant codes and traffic management requirements.
3. Carryout Lift, carry and place materials	3.1 ***Communication practices*** associated with transportation and lifting of ***materials*** are conducted. 3.2 Slings and lifting gear are selected and attached in accordance with

	safe working load requirements. 3.3 Machinery is positioned and located to ensure stability to effectively shift materials according to job specifications. 3.4 Slinging, lifting, carrying and placing of materials are carried out to work specifications 3.5 Load is moved in accordance with conventional hand and audible signals.
4. Check, Clean and store Backhoe/Loader	4.1 Work area is cleared and disposed of or materials are recycled in accordance with project environmental management plan. 4.2 Plant, tools and equipment are cleaned, checked, maintained and stored. 4.3 Removed attachments are cleaned and stored in designated location.

Variable	**Range**
Compliance documentation	May include but not limited to : • legislative, organisation and site requirements and procedures • manufacturer's guidelines and specifications • Ethiopian standards • codes of practice • Employment and workplace relations legislation • Equal Employment Opportunity and Disability Discrimination legislation
Backhoe/loader tasks	May include but not limited to : • Mixing materials • Stripping/spreading topsoils and materials • Trench excavation, backfilling, lifting and carrying materials • Loading dump trucks, wagons, hoppers • Chutes and cutting/boxing • Scrub clearing, ripping, compacting • Cutting, batters and benches, rock breaking • Demolition and any activities associated with the attachments listed
Work instructions	May include but not limited to: • Plans, specifications, • Quality requirements • Operational details • Dimensions, • Tolerances, • Standards of work • Drawings, specifications • Project documentation
Attachments	May include but not limited to : • Extending devices • Tilt bucket, buckets • Compaction wheel, ripper • Plate compactor, rock breaker • Auger, broom, mower/slasher • Forklift,

	• Free/rock grab
Environmental protection requirements	May include but not limited to: • Organisational/project environmental management plan • Waste management • Water quality protection • Soil erosion, vibration • Movement discomfort • Dust and clean-up management
Communications practices	May include but not limited to: • Verbal instructions and fault reporting and may include two way radio, hand signals, mobile phone, site specific instructions, written instructions or instructions related to job/task • On site meeting processes may include notification/ scheduling (time, place, purpose), task discussions and local coordination of procedural and operational issues
Materials	May include but not limited to: • clays • Silts • Stone • Gravel • Mud • Rock • Sand • Topsoil • Blended materials • Organic materials • Construction site materials/waste and • Bituminous mixes • Rock types
Maintenance	May include but not limited to: • Cleaning, authorised servicing and the monitoring, recording and reporting of faults; It may also include the conduct of : • Authorised minor replacements and the provision of assistance to maintenance personnel during maintenance and repair activities

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Follow procedures and instructions for conducting backhoe/loader operations • Carryout Lift, carry and place materials • Apply procedures and techniques for the safe, effective and efficient completion of backhoe/ loader operations. • Understand and interpret site drawings and plan to select work method
Required Knowledge and Attitudes	Demonstrate knowledge of: • Backhoe/loader types, characteristics, technical capabilities and limitations • Basic principles of soil technology for civil works • Site and equipment safety requirements • Techniques for calculating safe working loads

	• Backhoe/loader techniques related to essential tasks • Processes for interpreting drawings and sketches • Operational, maintenance and basic diagnostic procedures • Site isolation and traffic control responsibilities and authorities • Materials safety data sheet and materials handling methods • Project quality requirements • Methods of changing machine attachments • Safe operating techniques in all terrain • Basic earthworks calculations • Civil construction activity sequences of earthworks and drainage • Levelling techniques
Required Skills	Demonstrate skills of: • apply legislative, organisation and site requirements and procedures • Apply site and equipment safety requirements • Apply techniques for calculating safe working loads • Apply backhoe/loader techniques related to essential tasks • Interpret drawings, site plans and sketches • Apply operational, maintenance and basic diagnostic procedures • Apply site isolation and traffic control responsibilities and authorities • Interpret materials safety data sheet and materials handling methods • Apply project quality requirements • Use civil construction terminology • Apply methods of changing machine attachments • Apply safe operating techniques in all terrain • Carry out basic earthworks calculations • Apply levelling techniques • Interpret jsa's/safe work method statement
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Farm Machinery and Equipment Operation Level II	
Unit Title	**Operate irrigation pumps and equipment**
Unit Code	**AGR AMO2 06 0322**
Unit Descriptor	This unit of competency involves the knowledge, attitude and skills required to prepare, operate and finish irrigation pumping operation.

Elements	Performance Criteria
1. Prepare for irrigation work	1.1 Irrigation field is made ready to be irrigated 1.2 Pumping system lines, outlets are identified and confirmed for operation 1.3 crop water requirement and irrigation scheduling information is accessed 1.4 Type of ***irrigation method*** is determined 1.5 Pipe, fittings valves and water meter are prepared 1.6 Source and location of irrigable water is identified 1.7 Potential ***Occupational Health and Safety (OHS) hazards*** are identified and reported in accordance to workplace procedures.
2. Prepare irrigation pump and equipment	2.1 Performance characteristics, components and working capacity of irrigation pump is identified 2.2 Appropriate ***Personnel Protective Equipment*** is selected and used in accordance to work requirements. 2.3 ***Pump type***, size and associated accessories appropriate to job requirement are selected 2.4 Pump is secured on site, and positioned to receive and deliver water supply in accordance with organisational procedures and requirements 2.5 ***Routine pre-operational checks*** and equipment cleaning tasks are conducted as per organization procedures. 2.6 Damaged or worn components are replaced and/or reported. 2.7 Potential environmental implications are identified and reported in accordance to workplace requirements.
3. Operate pump	3.1 pump with power source and accessories are assembled 3.2 Pump primed and get ready for operation 3.3 Operation and function of pump and driving power unit is checked 3.4 Pump controlling equipment are checked and confirmed 3.5 Pump is started for operation in accordance with organisational procedures, manufacturers' specifications and enterprise

	procedures. 3.6 Pumps are operated and observed to ensure that pressure and flow of water meets operational requirements and that safety to personnel is maintained 3.7 Operational valves and valve assemblies are checked for leaks 3.8 Pump performance and efficiency is monitored and maintained to ensure maximum efficiency of operations 3.9 Pump operations are carried out avoiding injury to personnel and damage to equipment and facilities 3.10 Mechanical malfunctions on operations are reported, in accordance with organisational procedures 3.11 Potential risks to self, others and the environment are assessed and minimised 3.12 Emergency Shutdown procedures are implemented according to operational manual
4. Finish pump operation	4.1 Pump operations are completed in accordance with organisational procedures 4.2 Shut down procedures are followed in accordance to manufacturer's instruction. 4.3 Pump accessories are collected, reinstated and stored, in accordance with organisational procedures 4.4 Operational records are documented and completed as per workplace manuals. 4.5 Periodic operator level servicing and maintenance measures are carried out in accordance to manufacturer's instruction and workplace guideline. 4.6 Flanges, gaskets and seals are checked and maintained to meet operational requirement 4.7 Pump filter systems are checked and cleaned to remove any blockage and impurities 4.8 Malfunctions, faults, irregular performance or damage are identified and reported in accordance to workplace guideline.

Variable	Range
Irrigation method	May include but not limited to: • Surface irrigation method (basin, border, furrow) • Drip irrigation system • Overhead irrigation system • Sub-surface irrigation system
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Foreign materials • Debris and unnecessary material into the machine • Torn or improper use personal protective equipments • Worn out repair tools • Servicing while engine is running • Working under machines not secured • Unprotected moveable parts • Electricity and water, • Toxic substances, • Damaged/loose parts, • Flammable materials and fire hazards, • Waste and debris especially on floors
Personnel Protective Equipment	May include but not limited to: • Plastic boots • Overall
pump type	May include but not limited to: • portable pump • Electrical pump • Diesel/ gasoline engine pump • Centrifugal • Axial • Solar pump • Submersible water pump
Routine pre-operational checks	May include but not limited to: • Oils, fuel and water levels • Electrical system and control gauges • Loose parts and connections • Belts tension • Logged nozzles and worn tubes and lines • Coupling security • Lubrication of movable parts • Torn and broken parts • Spacing and calibration of equipment
principles of hydraulics	May include but not limited to • Discharge and flow rates

	• Friction loss • Head pressure calculations • Jet reaction • Required branch and nozzle pressures • Pump performance curves

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Identify types, performance characteristics, components and working capacity of irrigation pumps • Operating a pump including using gauges and controls, positioning and priming • Assemble pump with power source and accessories • Monitoring performance of pump • Perform pump servicing and routine maintenance
Required Knowledge and Attitudes	Demonstrate knowledge of: • Demonstrate the procedures of pre-operational checks • Procedures for making operator level servicing • Shutdown and emergency stop procedures • Pump types, characteristics and accessories • Pump selection procedures • Basic diagnostic procedures • Components and controls features and functions • Irrigation methods • Discharge and flow rates • Power source for pump • Principles of hydraulics, and pressure, priming and operating pumps. • Delivery and suction head, total head, pump operating pressure • Crop water requirement, • Work, Health and Safety (WHS)/Occupational Health and Safety (OHS) organisational requirements including risk mitigation
Required Skills	Demonstrate skills of: • Read and interpret Pump performance curve • Pump coupling, positioning and securing • Identify hazards and pumps safe work procedures • Conduct pre-operational checks • Operate pump in a safe, efficient and controlled manner • Apply routine maintenance • Perform operator maintenance tasks • Attach and uncouple hoses, lines
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test

	• Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level II	
Unit Title	**Operate Animal Product Processing Machinery**
Unit Code	**AGR AMO2 07 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to prepare, Operate, use, clean, basic machinery and equipment used in animal Product processing plant and storage

Elements	Performance Criteria
1. Identify type and functional requirement of operating milk processing machinery & equipments	1.1 Safety rules are followed and applied according to the policy of the working area/industry. 1.2 Identification is done in accordance with OHS requirements. 1.3 Personal protective equipment is applied. 1.4 Routine pre-operational checks of ***machinery and equipment*** and raw materials are carried out and adjustments made according to manufacturer's specifications and/or enterprise policies and procedures. 1.5 Product safety and hygiene are applied 1.6 Faulty or unsafe machinery and equipment are identified and segregated for repair or replacement according to enterprise requirements.
2. Operate Diary machine	2.1 Animal product storage equipment's is identified and selected 2.2 Animal product processing machinery and equipment are identified and selected 2.3 Industry terminology related to work procedures, equipment and animal management is used in work activities. 2.4 ***Daily routines*** are completed in accordance with occupational health and safety (OHS) requirements and environmentally sensitive work practices
3. Operate Fish and poultry processing machinery and equipment	3.1 ***slaughtering machine*** operation is performed according manufacturers instruction 3.2 fish skin removing, descaling and deboning machinery and equipment are operated 3.3 ***poultry meat processing equipment*** is operated according to manufacturer's specification 3.4 Fish and poultry processing machine are operated in safe condition in accordance to enterprise requirement
4. Operate honey processing	4.1 Honey extractor machinery and equipment is operated according manufactures instruction

equipment	4.2 Wax moulding is performed according to company requirements 4.3 Packaging is performed according to company instruction and working procedure
5. Finish advanced animal product processing machinery	5.1 Machinery and equipment are checked for contamination according to written guidelines and legislative requirements. 5.2 Appropriate machinery and equipment are used according to the manufacturers guidelines 5.3 Basic machinery and equipment are used for efficient and economic handling of animal products ***5.4*** Machinery and support equipment are made safe for checking, supported safely with free moving parts pinned or supported as required. ***5.5*** legislation or operating procedures are identified and inspected for contamination according to organizational procedures
6. Clean machinery and equipment	4.1 Machinery and equipment with free moving parts pinned is made safe for cleaning 4.2 Appropriate equipment is selected for cleaning. 4.3 Guards are checked and replaced safely 4.4 Areas on other equipment that likely to accumulate contaminants are identified, inspected and cleaned.
7. Safe storage of Machinery and equipment	7.1 Waste materials are disposed of according to enterprise operating procedures and relevant legislative requirements. 7.2 Equipment are stored safely in clean environment and storage area 7.3 Malfunctioned and damaged equipment are separated in storage area 7.4 Records of cleaning are recorded on appropriate forms according to enterprise policy and procedures.

Variable	**Range**
Plant	May include but not limited to : • Plant comprises integrated plant and machinery to handle raw milk into pasteurized milk, yogurt, butter and geese products with end packaging.
Machinery and equipment	May include but not limited to: ➢ Milk chilling tanks ➢ Pasteurizer ➢ lactometer ➢ Cream separator ➢ Churning machine ➢ Butter churner • Honey processing equipment • Fish processing equipment

	• Chicken processing equipment etc • scolder and plucker
Daily routines may include:	May include but not limited to: • Cleaning animal housing and facilities • Feeding and watering animals • Collecting, collating and recording data • General animal husbandry tasks • Maintaining and storing records • Maintaining equipment.

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Indentify animal products storage, processing, handling machineries and equipments • Select and use basic livestock products storage and processing machinery and equipments • List animal products used by human beings • List diary, poultry and beekeeping and production machinery and equipment. • Maintain products hygiene in accordance of industrial standard • report any issues that pose an infection risk • dispose of waste and infected material • Maintain accurate records using relevant organisational electronic and/or manual systems.
Required Knowledge and Attitudes	Demonstrate knowledge of: • Machinery and equipment operating features • Major components of animal product storage and processing machinery and equipment • Inspection points and procedures required by legislation • Occupational health and safety (ohs), environment and management legislative and enterprise requirements
Required Skills	May include but not limited to: • Identify adopt safe work environment • Inspect animal, diary, poultry and bees machinery and equipment • Operate, use and clean basic livestock machinery and equipment • Use numeracy skills to estimate, calculate and record routine workplace measures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Farm Machinery and Equipment Operation Level II	
Unit Title	**Inspect and Adjust Machinery Controlling System**
Unit Code	**AGR AMO2 08 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to prepare for inspection and servicing of steering, brake and clutch systems.

Elements	Performance Criteria
1. Prepare for inspection and servicing	1.1 Nature and scope of work requirements are identified and confirmed. 1.2 Workplace ***information*** sources are accessed and procedures strictly adhered. 1.3 ***OHS requirements*** including regulatory requirements and ***Personal Protective Equipment*** needs are observed throughout the work. 1.4 Procedures and information such as workshop manuals and specifications and tooling required are sourced. 1.5 ***Methods*** appropriate to the circumstances are selected and prepared in accordance with standard operating procedures. 1.6 Resources required for inspecting and servicing steering systems, brake and clutch controls are sourced and support equipment is identified and prepared. 1.7 Warnings are observed in relation to working with wheeled and tracked vehicles.
2. Inspect control systems	2.1 Inspection of suspension and ***steering system components*** are conducted and implemented by applying manufacturer recommended ***steering system inspection method.*** 2.2 Inspection of clutch and brake controls are conducted in accordance with operational manual 2.3 Adjustments including wheel bearing adjustments and brake/clutch pedal travel are made. 2.4 Results are compared with manufacturer/component supplier specifications to indicate compliance or non-compliance. 2.5 Results are documented with evidence and supporting information and recommendation(s) made. 2.6 Report is forwarded to persons for action in accordance with workplace procedures.
3. Complete inspection and adjustment work	3.1 Final inspection is made to ensure protective guards, safety features and cowlings are in place. 3.2 Machine/equipment is cleaned for use or storage to workplace expectations. 3.3 Job card is processed in accordance with workplace procedures.

Variable	Range
Information	May include but not limited to: • Verbal or written and graphical instructions, signage, work schedules/plans/specifications, work bulletins, memos, material safety data sheets, diagrams or sketches • Safe work procedures related to the inspection and servicing of wheeled and tracked type steering systems and associated components • Regulatory/legislative requirements pertaining to the automotive industry, • Organisation work specifications and requirements • Instructions issued by authorised enterprise or external persons
OHS requirements	May include but not limited to: • Protective clothing and equipment • Use of tooling and equipment • Workplace environment and safety • Handling of material • Use of fire fighting equipment • Enterprise first aid • Hazard control and • Hazardous materials and substances
Personal Protective Equipment	May include but not limited to: • Glove • Overall • Safety shoes • Helmet • Eye glass • Face musk
Methods	May include but not limited to: • Visual and aural • Functional assessments, including damage, • Corrosion • Wear • Electrical
Steering systems	May include but not limited to: • Wheeled and tracked vehicles • Light and heavy vehicles • Motorcycles and outdoor power equipment
Inspection of clutch and brake controls	May include but not limited to: • Pedals Free play • Air leakage • Hydraulic leakage
Steering System components	May include but not limited to: • Wheel bearings, • Ball joints • King pin • Steering linkage • Steering boxes and

	• Steering columns • Shaft • Electronic controlled systems • Two and four wheel steer and full hydraulic steering • articulated vehicles and tracked type systems
steering system Inspection method	May include but not limited to: • Checking leaks in steering box/hoses • Checking steering linkage arms and rods for cracks • Checking looseness and missing bolts and nuts • Excessive player of steering wheel
Tools and equipment	May include but not limited to: • Hand tooling • Meters • Gauges • Hydraulic testing equipment and devices
Materials	May include but not limited to: • Lubricants • Cleaning materials • Brush
Safe operating procedures	May include but not limited to: • The conduct of operational risk assessment and treatments associated with vehicular movement • Hazardous substances, electrical safety • Machinery movement and operation • manual lifting and shifting • working in proximity to others and site visitors
Emergency procedures	May include but not limited to: • Emergency shutdown and stopping of equipment • Operating safely in the event of fires • Enterprise first aid requirements and site evacuation
Communicated	May include but not limited to: • Verbal and visual instructions and fault reporting • Site specific instructions • Written instructions • Plans or instructions related to job/task • Telephones and pagers

Evidence guide	
Critical aspects of competence	Must demonstrate knowledge and skills competence to: • Completing preparatory activity in a systematic manner • Observing safety procedures and requirements • Selecting methods and techniques appropriate to the circumstances • Conducting service of a range of steering systems in accordance with the workplace and manufacturer/component supplier requirements • Accurately interpreting inspection results • Adjust brake and clutch pedal travel
Required knowledge and	Demonstrate knowledge of: • Ohs and environmental regulations/requirements, equipment,

attitudes	material and personal safety requirements • Dangers of working with wheeled and/or tracked vehicles • Operating principles of mechanical and hydraulic steering systems and their relationship to each other • Operating principles of brake and clutch system • Types of service and repair manuals • Inspection procedures • Service procedures • Enterprise quality procedures • Work organisation and planning processes
Required skills	Demonstrate skills of: • Applying interpretive skills sufficient to locate, interpret and apply manufacturer/component supplier procedures, workplace policies and procedures • Applying analytical skills required for identification and analysis of technical information • Planning and organising skills to own work activities, including making good use of time and resources, sorting out priorities and monitoring one's own performance • Inspect service, and adjust steering system components • Inspect service and adjust brake and clutch controls • Establish safe and effective work processes which anticipate and/or resolve problems and downtime • Use mathematical ideas and techniques to correctly calculate time, assess tolerances, apply accurate measurements • Use workplace technology related to the inspection and servicing of steering systems and associated components. • Reporting/documenting of results
Resource implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and ohs practices.
Methods of assessment	Competence may be assessed through: • Interview / written test • Observation / demonstration with oral questioning
Context of assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard : Agricultural Machinery and Equipment Operation Level II	
Unit Title	**Apply Agricultural Extension service for Rural development**
Unit Code	**AGR AMO2 09 0322**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to promote the use of digital technology agricultural extension, understand adult learning, Integrated gender agricultural extension and Recognize Indigenous Knowledge

Element	Performance Criteria
1. Promote the use of digital technology in Agricultural Extension	1.1 The ***use of Digital technology in Agricultural extension*** is introduced to familiarize its importance 1.2 ***Skills in using digital technology*** is built to strengthen agricultural extension services 1.3 The ***role of digital technologies in agricultural extension*** services is understood to enhance agricultural development.
2. Understand Adult Learning	2.1 The ***concept of adult learning*** is understood to bring behavioural changes 2.2 ***Principles of Adult learning*** is determined for the implementation of extension services 2.3 The ***importance of Adult learning*** in Agricultural Extension is understood to enhance agricultural extension services 2.4 ***Adult learning methods*** are understood to enhance the knowledge and skills of extension beneficiaries 2.5 ***The role of adult learning*** is understood to allow farmers develop knowledge and skills
3. Integrate Gender in Agricultural Extension	3.1 The ***concept of gender*** is understood to provide inclusive agricultural extension services 3.2 Gender awareness and sensitization is created to increase the contribution of gender in agricultural development 3.3 The ***role of gender in agriculture*** is determined to enhance agricultural development. ***3.4 Gender mainstreaming*** is implemented for effective outcome of extension services
4. Recognize Indigenous Knowledge	4.1. The ***concept of indigenous knowledge*** is understood to strengthen the service of agricultural extension 4.2. ***Characters of indigenous knowledge*** are understood to promote local experience 4.3. ***Exchange of indigenous knowledge*** is promoted to enhance

		community development
	4.4.	The ***importance of indigenous knowledge*** is understood to facilitate its contribution to the development processes.
	4.5.	The ***controversial issues of the debate on indigenous knowledge*** are further studied to propose the urgent need, to document, learn, preserve, and exchange indigenous knowledge

Variable	Range
Use of Digital technology in Agricultural extension	May include but not limited to: • Define Digital Technology • Evolution and progress of digital technologies • Digital technology for Agricultural Extension • Tools for digital technology • Utilization of digital technologies
Skills in using digital technology	May include but not limited to: • Demonstrate digital technologies • Practice digital technologies • Apply digital technologies • Maintain and manage digital technologies
Role of digital technologies in agricultural extension	May include but not limited to: • Provide diverse knowledge to beneficiaries • Supply Efficient information products • Provide technology-related advice • provide location-specific market information • enhance technology adoption in agriculture
Concept of adult learning	May include but not limited to: • Adult learning theories • Characteristics • Adult learning approaches • Purpose of Adult learn • Adult learning practices
Principles of Adult learning	May include but not limited to: • Self-directed • Experiential • Problem-centered • Motivated to learn • Learner oriented • Practice Oriented • looks for help and mentorship • Open for modern ways of learning • Choose how to learn
Importance of Adult learning	May include but not limited to; • Increase effective participation in decision making • Improves individuals' technology utilization • Enhances working efficiency, • Keep up with the growing economic competition • Self-improvement • Financial growth and benefit

Adult learning methods	May include but not limited to: • Visual Aids • Audio • Print Media • Tactile • Interactive
The role of adult learning	May include but not limited to: • Behavioral change • Enhance to acquire new skills and knowledge • Access disadvantaged groups • Promote Participatory decision making
Concept of gender	May include but not limited to: • Definition of Gender • Historical development of Gender • Importance of Gender • Gender awareness and sensitization
Role of gender in agriculture	May include but not limited to: • Women's contribution in Agricultural Production • Women's participations in rural labor market • Women's participation in Agricultural Extension • Gender difference in rural labor markets • Impact of gender role in Agricultural Extension services
Gender mainstreaming	May include but not limited to: • Understanding of gender equality • Mainstreaming strategy • Steps of gender mainstreaming
Concept of indigenous knowledge	May include but not limited to: • Definition of Indigenous knowledge • Historical development of indigenous knowledge • Importance of indigenous knowledge for development processes
Characters of indigenous knowledge	May include but not limited to: • Experiences • its compatibility with indigenous environment and culture • insufficient knowledge of rural people • combination of culture, belief and religion
Exchange of indigenous knowledge	May include but not limited to: • Recognition and identification • Validation of indigenous knowledge • Recording and document indigenous knowledge • Storage in retrievable repositories • Dissemination of indigenous knowledge • Utilization of indigenous knowledge

Importance of indigenous knowledge	May include but not limited to: • Problem solving strategies • Important component of global knowledge • Resource in the development processes • Understanding of local conditions • Increase responsiveness of client • Enhance cross cultural understanding
Controversial issues of the debate on indigenous knowledge	May include but not limited to: • Discrimination, • Exploitation, • Dispossession • Miss-Used And • Miss- Appropriation • Violation Of The Right Of Indigenous People

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge attitude and skill to: • Use of Digital technology in Agricultural extension • Applies the role of digital technologies in agricultural extension • Implements Adult learning methods • Implements Gender mainstreaming • Facilitates the Exchange of indigenous knowledge • Understands the controversial issues of the debate on indigenous knowledge
Required Knowledge and Attitudes	Demonstrates knowledge of - • Understands concept of adult learning • Recognize the Principles of Adult learning • Appreciates the importance of Adult learning • Understands the concept of gender • Understands the concept of indigenous knowledge • Understand the Characters of indigenous knowledge • Appreciates the importance of indigenous knowledge • Understands the controversial issues of the debate on indigenous knowledge
Required Skills	Demonstrates skills: • Demonstrates the use of Digital technology in Agricultural extension • Applies the role of digital technologies in agricultural extension • Implements the Adult learning methods • Understands and implements the role of adult learning • Understands and implement the role of gender in agriculture • Implements Gender mainstreaming • Facilitates the Exchange of indigenous knowledge

Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and Occupational health and safety (OHS) practices.
Methods of Assessment	Competence may be assessed through: • Written Test, Interview, Quiz, Practical assignment • Observation and Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level II	
Unit Title	**Prevent and Eliminate MUDA**
Unit Code	**AGR AMO2 10 0322**
Unit Descriptor	This unit covers the knowledge, skills and attitude required by a worker to prevent and eliminate MUDA/wastes in his/her workplace by applying scientific problem-solving techniques and tools to enhance quality, productivity and other kaizen elements on continual basis. It covers responsibility for the day-to-day operation of the work and ensures Kaizen Elements are continuously improved and institutionalized.

Element	Performance Criteria
1. Prepare for work.	1.1. Work instructions are used to determine job requirements, including method, material and equipment. 1.2. Job specifications are read and interpreted following working manual. 1.3. ***OHS requirements***, including dust and fume collection, breathing apparatus and eye and ear personal protection needs are observed throughout the work. 1.4. Appropriate material is selected for work. 1.5. ***Safety equipment and tools*** are identified and checked for safe and effective operation.
2. Identify MUDA and problem	2.1 Plan of MUDA and problem identification is prepared and implemented. 2.2 Causes and effects of MUDA are discussed. 2.3 All possible problems related to the process /Kaizen elements are listed using ***statistical tools and techniques***. 2.4 All possible problems related to kaizen elements are identified 2.5 are used to draw and analyze current and listed on Visual Management Board/Kaizen Board. 2.6 ***Tools and techniques*** situation of the work place. 2.7 Wastes/MUDA are identified and measured based on ***relevant procedures***. 2.8 Identified and measured wastes are reported to relevant personnel.
3. Analyze causes of a problem.	3.1 All possible causes of a problem are listed. 3.2 Cause relationships are analyzed using***4M1E***. 3.3 Causes of the problems are identified. 3.4 The root cause which is most directly related to the problem is selected. 3.5 All possible ways are listed using ***creative idea generation*** to eliminate the most critical root cause. 3.6 The suggested solutions are carefully tested and evaluated for potential complications. 3.7 Detailed summaries of the action plan are prepared to implement the suggested solution.

4. Eliminate MUDA and Assess effectiveness of the solution.	4.1. Plan of MUDA elimination is prepared and implemented by ***medium KPT*** members. 4.2. Necessary attitude and the ***ten basic principles*** for improvement are adopted to eliminate waste/MUDA. 4.3. Tools and techniques are used to eliminate wastes/MUDA based on the procedures and OHS. 4.4. Wastes/MUDA are reduced and eliminated in accordance with OHS and organizational requirements. 4.5. ***Tangible and intangible results*** are identified. 4.6. Tangible results are compared with targets using ***various types of diagrams***. 4.7. Improvements gained by elimination of waste/MUDA are reported to relevant bodies.
5. Prevent occurrence of wastes and sustain operation.	5.1. Plan of MUDA prevention is prepared and implemented. 5.2. Standards required for machines, operations, defining normal and abnormal conditions, clerical procedures and procurement are discussed and prepared. 5.3. Occurrences of wastes/MUDA are prevented by using ***visual and auditory control methods***. 5.4. Waste-free workplace is created using ***5W and 1H***sheet. 5.5. The completion of required operation is done in accordance with standard procedures and practices. 5.6. The updating of standard procedures and practices is facilitated. 5.7. The capability of the work team that aligns with the requirements of the procedure is ensured and trained on the new ***Standard Operating Procedures (SOPs)***.

Variable	Range
OHS requirements	May include, but not limited to: • Are to be in accordance with legislation/ regulations/codes of practice and enterprise safety policies and procedures. This may include protective clothing and equipment, use of tooling and equipment, workplace environment and safety, handling of material, use of fire fighting equipment, enterprise first aid, hazard control and hazardous materials and substances. • PPE are to include that prescribed under legislation/regulations/codes of practice and workplace policies and practices. • Safe operating procedures are to include, but are not limited to the conduct of operational risk assessment and treatments associated with workplace organization. • Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and site evacuation.
Safety equipment and tools	May include, but not limited to: • Dust masks/goggles • Glove • Working cloth • First aid and • Safety shoes
Statistical tools and techniques	May include, but not limited to: • 7 QC tools May include, but not limited to: ➢ Stratification ➢ Pareto Diagram ➢ Cause and Effect Diagram ➢ Check Sheet ➢ Control Chart/Graph ➢ Histogram and Scatter Diagram • QC techniques May include, but not limited to: ➢ Brain storming ➢ Why analysis ➢ What if analysis ➢ 5W1H
Tools and techniques	May include, but not limited to: • Plant Layout • Process flow • Other Analysis tools • Do time study by work element • Measure Travel distance

	• Take a photo of workplace • Measure Total steps • Make list of items/products, who produces them and who uses them & those in warehouses, storages etc. • Focal points to Check and find out existing problems • 5S • Layout improvement • Brainstorming • And on • U-line • In-lining • Unification • Multi-process handling &Multi-skilled operators • A.B. control (Two point control) • Cell production line • TPM (Total Productive Maintenance)

Relevant procedures	May include, but not limited to: • Make waste visible • Be conscious of the waste • Be accountable for the waste and measure the waste.
4M1E	May include, but not limited to: • Man • Machine • Method Material and Environment
Creative idea generation	May include, but not limited to: • Brainstorming • Exploring and examining ideas in varied ways • Elaborating and extrapolating • Conceptualizing
Medium KPT	May include, but not limited to: • 5S • 4M (Machine, Method, Material and Man) • 4p (Policy, Procedures, People and Plant) • PDCA cycle Basics of IE tools and techniques
The ten basic principles for improvement	May include, but not limited to: • Throw out all of your fixed ideas about how to do things. • Think of how the new method will work- not how it won. • Don't accept excuses. Totally deny the status quo. • Don't seek perfection. A 5o percent implementation rate is fine as long as it's done on the spot. • Correct mistakes the moment they are found. • Don't spend a lot of money on improvements. • Problems give you a chance to use your brain. • Ask "why?" At least five times until you find the ultimate cause. • Ten people's ideas are better than one person's. • Improvement knows no limits.
Tangible and intangible results	May include, but not limited to: • Tangible result may include quantifiable data • Intangible result may include qualitative data
various types of diagrams.	May include, but not limited to: • Line graph • Bar graph • Pie-chart • Scatter diagrams • Affinity diagrams

Visual and auditory control methods	May include, but not limited to: • Red Tagging • Sign boards • Outlining • And ones • Kanban, etc.
5W and 1H	May include, but not limited to: • Who • What • Where • When • Why and • How
Standard Operating Procedures (SOPs).	May include, but not limited to: • The customer demands • The most efficient work routine (steps) • The cycle times required to complete work elements • All process quality checks required to minimize defects/errors • The exact amount of work in process required

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Discuss why wastes occur in the workplace • Discuss causes and effects of wastes/MUDA in the workplace • Analyze the current situation of the workplace by using appropriate tools and techniques • Identify, measure, eliminate and prevent occurrence of wastes by using appropriate tools and techniques • Use 5W and 1H sheet to prevent • Detect non-conforming products/services in the work area • Apply effective problem-solving approaches/strategies. • Implement and monitor improved practices and procedures • Apply statistical quality control tools and techniques.

Required Knowledge and Attitude	Demonstrate knowledge of: • Targets of customers and manufacturer/service provider • Traditional and kaizen thinking of price setting • Kaizen thinking in relation to targets of manufacturer/service provider and customer • value • The three categories of operations • the 3“MU” • wastes occur in the workplace • The 7 types of MUDA • QC story/PDCA cycle/ • QC story/ Problem solving steps • QCC techniques • 7 QC tools • The Benefits of identifying and eliminating waste • Causes and effects of 7 MUDA • Procedures to identify MUDA • Necessary attitude and the ten basic principles for improvement • Procedures to eliminate MUDA • Prevention of wastes • Methods of waste prevention • Definition and purpose of standardization • Standards required for machines, operations, defining normal and abnormal conditions, clerical procedures and procurement • Methods of visual and auditory control • TPM concept and its pillars. • Relevant OHS and environment requirements • Method and Lines of communication • Methods of making/recommending improvements. • Reporting procedures • Workplace procedures associated with the candidate's regular technical duties • organizational structure of the enterprise
Required Skills	Demonstrate skills to: • Draw & analyze current situation of the work place • Use measurement apparatus (stop watch, tape, etc.) • Calculate volume and area • Apply statistical analysis tools • Use and follow checklists to identify, measure and eliminate wastes/MUDA • Identify and measure wastes/MUDA in accordance with OHS and procedures • Use tools and techniques to eliminate wastes/MUDA in accordance with OHS procedure.

	• Apply 5W and 1H sheet • Update and use standard procedures for completion of required operation • Apply Visual Management Board/Kaizen Board. • Detect non-conforming products or services in the work area • Work with others • Read and interpret documents • Observe situations • Solve problems • Communicate information • Gather evidence by using different means • Report activities and results using report formats • Implement and monitor improved practices and procedures
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

NTQF Level III

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Operate Broadcasting Machinery and Equipment**
Unit Code	**AGR AMO3 01 0322**
Unit Descriptor	This unit of competence covers the knowledge, skills and attitudes required to prepare machinery and equipment, operate and complete broadcast spreading operation.

Elements	Performance Criteria
1. Prepare tractor and equipment for use	1.1 Type, operating principles and components of broadcast/ spreaders is identified. 1.2 Tools and ***equipment*** required for making adjustments and calibrations are prepared. 1.3 Appropriate ***Personnel Protective Equipment*** is selected and used in accordance to work requirements. 1.4 ***Routine pre-operational checks*** and equipment cleaning tasks are conducted as per organization procedures. 1.5 Damaged or worn components are replaced and/or reported. 1.6 Potential ***Occupational Health and Safety (OHS) hazards*** are identified and reported in accordance to workplace procedures. 1.7 Ancillary equipment is attached and checked for correct operation in accordance to manufacturer's instruction. 1.8 Equipment is calibrated according to manufacturer's instruction to meet desired application rate. 1.9 ***Factors*** affecting spreader delivery rate and pattern are identified. 1.10 Potential environmental implications are identified and reported in accordance to workplace requirements.
2. Operate tractor attached Broadcast spreader	2.1 Appropriate ground speed is determined that will allow to meet the desired application rate. 2.2 Areas where chemicals or seed rate to be applied are measured and travel path of adjacent passes are marked with visible poles for the calibrated spread width. 2.3 Tractor and equipment are operated in a safe, efficient and controlled manner. 2.4 Machinery is operated in accordance with task requirements, conditions and manufacturers operating guidelines. 2.5 The spreader is frequently checked for its distribution width and pattern density to make immediate correction as required. 2.6 Machinery performance and efficiency are monitored and adjustments made as required. 2.7 Potential risks to self, others and the environment are assessed and minimised

3. Complete broadcast spreading activity	3.1 Shut down procedures are followed in accordance to manufacturer's instruction. 3.2 Spreader is cleaned out to prevent rust and corrosion. 3.3 Operational records are documented and completed as per workplace manuals. 3.4 Malfunctions, faults, irregular performance or damage are identified and reported in accordance to workplace guideline.

Variable	Range
Equipment	May include but not limited to: • Measuring scale • Measuring tape • Stop watch • Collection bucket • Calculator
Personnel Protective Equipment	May include but not limited to: • Safety shoes • Overall • Dust mask • Spectacles • Ear plugs
Routine pre-operational checks	May include but not limited to: • Oils, fuel and water levels • Electrical system and control gauges • Tyre pressure • Calibration unit adjustment • Loose boats and nuts • Belts and chains tension • Coupling security • Lubrication of movable parts • Hopper lids • Torn and broken parts • Spacing and calibration of equipment
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Sharp cutting tooling and instruments, • Torn or improper use personal protective equipment • Worn out repair tools • Servicing while engine is running • Working under machines not secured • Unprotected moveable parts • Electricity and water, • Toxic substances, • Damaged packing material or containers, • Broken or damaged equipment, • Flammable materials and fire hazards, • Lifting practices, • Stumps and logs in the soil or covered by debris • Spillages, waste and debris especially on floors • Crash with tractors/trucks
Factors	May include but not limited to: • Humidity • Ground speed • Shape and size of granule • Spreader angle/height • Wind • Roughness of surface

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • conduct pre operational tasks • Operate tractor with the spreader in a safe, efficient and controlled manner • Calibrate the spreader to the desired application rate • Operate the spreader efficiently by maintaining speed and spreading pattern

Required Knowledge and Attitudes	Demonstrate knowledge of:
	• manufacturer's requirements and/or workplace requirements for:
	  • Pre-operational checks
	  • Calibrating procedures
	  • Broadcast spreader operation techniques
	  • Operator level servicing
	  • Shutdown and emergency procedures
	  • Basic diagnostic techniques
	  • Equipment characteristics, technical capabilities and limitations
	  • Components and controls features and functions

Required Skills	Demonstrate skills of: • identify hazards and implement safe work procedures • Conduct pre-operational checks • Operate machinery in a safe, efficient and controlled manner • Apply safe stoping • Calibrating broadcast spreader • Perform operator maintenance tasks • Attach and uncouple associated equipment • Use literacy skills to read, interpret and follow organisational policies and procedures, follow sequenced written instructions, record accurately and legible information collected and select and apply procedures for a range of tasks • Use oral communication skills/language competence to fulfil the job role as specified by the organisation. • Use numeracy skills to estimate, calculate and record routine workplace measures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Operate Row Crop Planting and Seeding Machinery and Equipment**
Unit Code	**AGR AMO3 02 0322**
Unit Descriptor	This unit of competence covers the knowledge, attitude and skills to prepare machinery and equipment, operate and complete row-crop planting and seed drilling operation.

Elements	Performance Criteria
1. Prepare machinery and equipment for use	1.1 ***Types***, working principles and components of row planting and seed drilling equipment are identified. 1.2 Appropriate ***Personnel Protective Equipment*** is selected, used and maintained. 1.3 Tools and ***equipment*** required for making adjustments and calibrations are prepared. 1.4 Routine ***pre-operational checks*** and housekeeping tasks are conducted. 1.5 Damaged or worn components are replaced and/or reported. 1.6 ***Occupational Health and Safety (OHS) hazards*** for working with machinery are identified, risks assessed and risk controls implemented. 1.7 ***Ancillary equipment*** is attached and checked for correct operation in accordance to manufacturer's instruction. 1.8 Row planter is calibrated according to work requirment to meet desired seed and row spacing. 1.9 Seed drill /planter is calibrated according to manufacturer's instruction to meet the desired application rate. 1.10 Row markers are set for the selected tractor size and desired row spacing, 1.11 Potential environmental implications are identified and reported in accordance to workplace requirements.
2. Operate machinery and equipment	2.1 Tractor and equipment are operated in a safe, efficient and controlled manner. 2.2 Machinery is operated in accordance with task requirements, conditions and manufacturer's operating guidelines. 2.3 Machinery performance and efficiency are monitored and adjustments made as required. 2.4 Uniform/ accurate seed and/or fertilizer placement, depth of planting and blockage is checked during planting operation

	2.5 Moisture and level of seeds in hoppers, gears, sprockets, seed dropping hoses, belts and chains tensions are regularly monitored and actions taken promptly 2.6 Optimum soil moisture condition are checked for planting 2.7 Row spacing and units assembly are monitored and remedial action is taken according to manufacturer's guideline enterprise requirement. 2.8 Proper use of row markers is demonstrated 2.9 Potential environmental risks of operating sowing equipment are assessed and minimised.
3. Complete row-planting/seeding work	3.1 Shut down procedures are followed according to manufacturer's instruction. 3.2 Operational records are completed according to enterprise requirements. 3.3 Hoppers are cleaned out to prevent clogging, blockage rust and corrosion. 3.4 Routine operator servicing is carried out according to operator's manual. 3.5 Malfunctions, faults, irregular performance or damage are identified and reported.

Variable	Range
Types	May include but not limited to: • Mechanical row planter • Pneumatic row planter • Mechanical Drills • Air drills
Personnel Protective Equipment	May include but not limited to: • Safety shoes • Overall • Ear Plug • Glove • Face mask • Eyeglass
Equipment	May include but not limited to: • Measuring scale • Measuring tape • Stop watch • Collection bucket • Calculator
Pre-operational checks	May include but not limited to: • Oils, fuel and water levels • Electrical system and control gauges • Tyre pressure • Loose boats and nuts • Belts and chains tensions • Coupling security • Lubrication of movable parts • Hopper lids • Torn and broken parts • Spacing and calibration of equipment
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Sharp cutting tooling and instruments, • Torn or improper use personal protective equipments • Worn out repair tools • Servicing while engine is running/working under machines • Unprotected moveable parts • Electricity and water, • Toxic substances, • Damaged packing material or containers, • Broken or damaged equipment, • Flammable materials and fire hazards, • Lifting practices, • Stumps and logs in the soil or covered by debris • Spillages, waste and debris especially on floors • Crash with tractors/trucks
Ancillary equipment	May include but not limited to: • PTO shaft • Hose • Guards

	• Chains

Evidence guide	
Critical aspects of competence	Demonstrate knowledge and skills to: • Identify types, working principles and components of row planting and seed drilling equipment • Conduct pre and post operational checks • Calibrate seed driller and planter • Operate planting and seeding machinery and equipment in a safe, efficient and controlled manner • Perform minor maintenance and fault finding • Record work activities
Required knowledge and attitudes	Demonstrate knowledge of: • Pre-operational checks procedures • Seed drill and planter calibration procedure • Machinery operation techniques • Operator level servicing procedures • Shutdown procedures • Emergency procedures • Precision agriculture and controlled traffic • Basic diagnostic technical procedures • Equipment characteristics, technical capabilities and limitations • Components and controls features and functions • Ohs legislation and requirements for operators • Risks to environment from operating sowing equipment for row crops
Required skills	Demonstrate skills of: • Identify hazards and implement safe work procedures • Conduct pre-operational checks • Operate machinery in a safe, efficient and controlled manner • Calibrate seed drill and planter • Follow planting requirements • Clean and store equipment according to company requirement • Perform operator maintenance tasks • Attach and uncouple associated equipment • Use literacy skills to read, interpret and follow organisational policies and procedures • Use communication skills/language competence to fulfil the job role as specified by the organisation • Use numeracy skills to estimate, calculate and record routine workplace measures
Resource implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and ohs practices.

Methods of assessment	Competence may be assessed through: • Interview / written test • Observation / demonstration with oral questioning
Context of assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Operate Mobile Irrigation Machinery and Equipment**
Unit Code	**AGR AMO3 03 0322**
Unit Descriptor	This unit covers the knowledge, skills and attitudes to prepare for cultivation prepare cultivating equipment, carryout primary tillage and seedbed preparation operations and complete land preparation operation.

Elements	Performance Criteria
1. Prepare machinery and equipment for use	1.1 Working principle, components and ***types of mobile irrigation system*** is identified. 1.2 Appropriate Personnel Protective Equipment is selected and used. 1.3 Routine pre-operational checks and housekeeping tasks are conducted. 1.4 Routine pre-operational checks and housekeeping tasks are conducted. 1.5 Damaged or worn components are replaced and/or reported. 1.6 Potential ***Occupational Health and Safety (OHS) hazards*** is identified and reported. 1.7 Sprinkler nozzles are checked for clogging and functionality. 1.8 The irrigation system layout for pump station, mainlines and hydrants locations are identified. 1.9 Irrigation hoses, pipes and fittings are prepared. 1.10 Potential environmental implications are identified and reported. 1.11 Ancillary equipment is attached and checked for correct operation.
2. Operate mobile irrigation machinery and equipment	2.1 Irrigation equipment is positioned and secured in the desired location 2.1 Irrigation water is discharged under pressure from the water distribution system. 2.2 The pump pressure is checked to meet the system requirement of mobile irrigation system. 2.3 ***Machinery and equipment*** are operated in a safe, efficient and controlled manner. 2.4 The nozzle size and travel speed are adjusted to suit the soil infiltration rate and crop water requirements. 2.5 Irrigation machinery is operated in accordance with task

	requirements, conditions and manufacturers operating guidelines. 2.6 Machinery performance and efficiency are monitored and adjustments made as required. 2.7 Potential risks to self, others and the environment are assessed and minimized.
3. Complete work	3.1 Shut down procedures are followed. 3.2 Operational records are completed. 3.3 Routine operator servicing is carried out. 3.4 Malfunctions, faults, irregular performance or damage are identified and reported. 3.5 Headwork, mainline, hydrants connection lines and the distribution system is checked to identify any leakages or other losses from the system. 3.6 Sprinklers are inspected for blockages

Variable	**Range**
Types of mobile irrigation system	May include but not limited to: • Centre pivot • Automatic Rotating Lawn • Linear • Cable tow traveller • Hose drag traveller
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Worn out repair tools • unprotected moveable parts • broken or damaged equipment, • lifting practices, • Stumps and logs in the soil or covered by debris • crash with tractors/trucks

Evidence guide	
Critical aspects of competence	Demonstrate knowledge and skills to: • Conduct pre and post operational checks • Operate mobile irrigation machinery and equipment in a safe, efficient and controlled manner • Monitor operational performance of mobile irrigation system • Inspect clogged and blocked parts of mobile irrigation system • Perform minor maintenance and fault finding • Record work activities

Required knowledge and attitudes	Demonstrate knowledge of: • An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria. • Hazards and risks associated with mobile irrigation machinery and equipment operations • Mobile irrigation machinery and equipment components, controls, features, technical capabilities and limitations • Pre-operational checks • Machinery operation techniques • Operator level servicing • Planned and emergency shutdown procedures • Health and safety in the workplace procedures applicable to mobile irrigation machinery and equipment operation • Environmental impacts associated with operating machinery and equipment used for mobile irrigation • Pre-operational checks and machinery operation techniques • Operator level servicing and shutdown procedures • Emergency procedures and basic diagnostic techniques • Equipment characteristics, technical capabilities and limitations • Components and controls, features and functions
Required skills	Demonstrate skills of: • Conduct pre-operational checks • Operate machinery in a safe, efficient and controlled manner • Perform operator maintenance tasks • Attach and uncouple associated equipment • Use literacy skills to read, interpret and follow organisational policies and procedures, follow sequenced written instructions, record accurately and legible information collected and select and apply procedures for a range of tasks • Use oral communication skills/language competence to fulfil the job role as specified by the organisation, including questioning techniques, active listening, clarifying information and consulting with supervisors as required • Use numeracy skills to estimate, calculate and record routine workplace measures • Use interpersonal skills to work with and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities
Resource implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and ohs practices.
Methods of assessment	Competence may be assessed through: ➢ Interview / written test

	➢ Observation / demonstration with oral questioning
Context of assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Operate Chemical Spraying Machinery And Equipment**
Unit Code	**AGR AMO3 04 0322**
Unit Descriptor	This unit of competence covers the knowledge, skills and right attitudes required to prepare for chemical spraying operation, Prepare machinery and Equipment for use, Prepare chemical mixes, Perform Chemical spraying Operation and complete Spraying Operation.

Elements	Performance Criteria
1. prepare for chemical spraying operation	1.1 Prepare a basic application plan according to workplace procedures 1.2 Types of spraying equipment, components, and working principles are identified 1.3 Field size is identified for chemical and fertilizer application according to company procedure 1.4 ***OHS***, risks and controls procedures for chemical application operation are selected 1.5 Tools and ***equipment*** required for calibrations are prepared 1.6 Identify rate of chemical requirement according company working procedure 1.7 Identify, select, fit and use ***personal protective equipment*** (PPE) according to chemical label and workplace safety procedures 1.8 Select appropriate mixing equipment and a suitable location for mixing and filling into the tanker according to workplace procedures 1.9 Chemicals are mixed according to the required standard
2. Perform Chemical spraying Operation	2.1 Pre operation machinery and equipment are cheeked 2.2 **Machinery and equipment** are operated in a safe, efficient and controlled manner by employing ***safe operating procedure*** 2.3 Machinery performance and efficiency are monitored and adjustments made as required. 2.4 Meteorological conditions are considered during application. 2.5 ***Environmental requirements*** are observed and precautions implemented according to workplace and environmental protection regulation or guidelines 2.6 Potential risks to self, others, product integrity and the environment are assessed and minimized. 2.7 Emergency procedures are identified and followed as per organization's guideline.

	2.8 Apply chemical while minimizing off target damage according to label directions, MSDS and application plan
3.Complete Spraying Operation	3.1 Shut down procedures are followed. 3.2 Clean and decontaminate application equipment according to operator manual instructions, MSDS and legislative and regulatory requirements 3.3 Dispose of chemicals and used containers for chemical mixing according to manufacturer instructions and legislative and regulatory requirements 3.4 Nozzles, valves controllers and spraying components are cleaned to prevent clog and damage 3.5 Complete chemical treatment records and report incidents according to workplace procedures and legislative and regulatory requirements 3.6 Components are cleaned/ flushed in accordance with manufacturer's specifications and chemical label requirements. 3.7 Routine operator servicing is carried out. 3.8 Malfunctions, faults, **emergency procedures** and irregular performance or damage are identified and reported.

Variable	**Range**
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Torn or improper use personal protective equipment's • Worn out repair tools • Chemical contact, burn or swallowing • Working under machines not secured • Unprotected moveable parts • Toxic substances, • Damaged packing material or containers, • Broken or damaged equipment, • Flammable materials and fire hazards, • Wrong spraying direction in relation to the wind, • Stumps and logs in the soil or covered by debris • Crash with tractors/trucks
Equipment	May include but not limited to: • Graduated Jar • Stop watch • Calculator
Spray components	May include but not limited to: • Nozzle • Valve • Pump • Filter

	• Boom • Spray Tank • Mixing tank
Personal Protective Equipment	May include but not limited to: • Respirator • Chemical overall • Rubber Gloves • Safety shoe • Transparent Eye goggle • Plastic boot
Routine pre-operational checks	May include but not limited to: • Oils and water level • Tyre pressure • Couplings • Loose bolts, nuts and tightness of clamps • Wear and tear of body and components • Nozzle size , drop volume, and clogging • Hose tear and wear • Spray volume in the tank • Pump pressure, • Leakage of chemicals, oils and fuel • Corrosion on pumps and agitator systems
Safe operating procedures	May include but are not limited to: • Operational risk assessment and treatments associated with vehicular movement, toxic substances, chemical safety, machinery movement and operation, manual and mechanical lifting and shifting, • Working in proximity to others • Emergency shutdown and stopping of equipment, • Enterprise first aid requirements
Machinery and equipment	May include but are not limited to: • Boom sprayer • Trailed Sprayer • Specialised liquid chemical application machinery • Equipment used for crop protection and pest management
Environmental requirements	May include but not limited to: • Waste management(disposal) • Pollution • Water source contamination • Wind drift • Clean-up management

Emergency procedures	May include but not limited to: • Emergency shutdown and stopping of equipment • Extinguishing fires • Enterprise first aid requirements and site evacuation

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Identify hazards and implement safe workplace practices and procedures • Carry out chemical application machinery and equipment pre-operational checks according to operation and maintenance manual • Calibrated and set up application equipment components • Conduct pre and post operational checks • Recognised and documented defects in chemical application machinery and equipment and operational capacity • Record work activities
Required Knowledge and Attitudes	Demonstrate knowledge of: • Hazards and risks associated with chemical application machinery and equipment operations • Chemical application machinery and equipment components, controls, features, technical capabilities and limitations • Manufacturer requirements and workplace requirements for: • Pre-operational checks • Machinery operation techniques • Operator level servicing • Planned and emergency shut down procedures • Features and functions of chemical application equipment components, including: liquid spray; nozzles, tanks, agitation systems, pumps, filters, pressure regulation valves • Granular applicators/dusters; hoppers, flow control valves • Effects of meteorological conditions on chemical application • Legislative and regulatory requirements applicable to chemical application • Workplace procedures applicable to health and safety in the workplace for chemical application machinery and equipment operation • Environmental impacts associated with operating chemical application machinery and equipment including spray drift • Manufacturers specifications and/or workplace requirements for: ➢ Pre-operational checks ➢ Machinery operation techniques ➢ Operator level servicing ➢ Shutdown emergency procedures

	• Features and function of application equipment components: ➢ Liquid spray - nozzles, tanks, agitation systems, pumps, filters, pressure regulation valves etc ➢ Granular applicators/dusters - hoppers, flow control valves etc • Effect of meteorological conditions on chemical application • Equipment characteristics, technical capabilities and limitations • Basic diagnostic techniques procedures • Equipment characteristics, technical capabilities and limitations • Components and controls features and functions identification • Environmental impacts including spray drift
Required Skills	Demonstrate skills of: • Conduct pre-operational checks • Calibration/set up of application components • Operate machinery in a safe, efficient and controlled manner • Perform operator maintenance tasks • Attach and uncouple associated equipment • Use literacy skills to read, interpret and follow organisational policies and procedures, follow sequenced written instructions, record accurately and legible information collected and select and apply procedures for a range of tasks • Use oral communication skills/language competence to fulfil the job role as specified by the organisation. • Use numeracy skills to estimate, calculate and record routine workplace measures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Operate Grain Cleaning Machinery and Equipment**
Unit Code	**AGR AMO3 05 0322**
Unit Descriptor	This unit covers the knowledge, skills and right attitudes to select and prepare cleaning machine for use, operate cleaning machine and complete cleaning operations.

Elements	Performance Criteria
1. Select and prepare cleaning machine for use	1.1 ***Types of grain cleaning machineries*** and their c***omponents*** are identified. 1.2 Select and prepare grain cleaning machinery and equipment to job requirements and confirm against work plan. 1.3 Complete routine pre-operational checks of the machine to manufacturer's specifications and enterprise requirements 1.4 Recognise workplace health and safety hazards in the workplace and assess and minimise risks
2. Operate cleaning machine	2.1 ***adjustments*** on different working units are carried out depending on types of grain to be cleaned 2.2 Appropriate sieve is selected and used 2.3 Operate grain cleaning machine in a safe and controlled manner and monitor for performance and efficiency 2.4 Anticipate risks to self, others and the environment and implement minimisation strategies accordingly 2.5 Select, use, maintain and store suitable personal protective equipment (PPE) 2.6 Report environmental implications associated with machinery operation
3. Complete and report on the seed cleaning operation	3.1 shut-down procedures to manufacturer's specifications and enterprise requirements was followed 3.2 Grain cleaning machinery and equipment operational data recorded 3.3 Clean, secure and store grain cleaning machinery and equipment 3.4 Report malfunctions, faults and observation of irregular performance of grain cleaning machinery and equipment

Variable	Range
Types of grain cleaning machineries	May include but not limited to: • Stationary Seed cleaner • Mobile seed cleaner

	• Indent cylinder • Gravity table
Components	May include but not limited to: • Pre cleaning unit • Grading unit • Cleaning unit • Separating unit • Bagging unit
adjustments	May include but not limited to • Appropriate sieve sizes selection, • Fan speed • Motor speed
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • Sharp cutting tooling and instruments, • Torn or improper use personal protective equipment • Worn out repair tools • Broken or damaged equipment, • Servicing while engine is running • Working under machines not secured • Unprotected moveable parts • Electricity and water, • Toxic substances, • Damaged packing material or containers, • Flammable materials and fire hazards, • Lifting practices, • Stumps and logs in the soil or covered by debris • Crash with tractors/trucks • Uneven terrain, • Canals, ditches, embankments
Personal Protective Equipment	May include but not limited to: • Safety shoes • Overall • Hand gloves • Spectacles • Ear plugs • Dust masks

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Assemble and operate cleaner • Evaluate the performance of the cleaner • Complete and report on cleaning operation • Define the processing requirements of a grain cleaning and

	processing job • Disassemble and clean cleaner • select and place screens and prepare machinery for use
Required Knowledge and Attitudes	Demonstrate knowledge of: • Principles and practices for operating cleaner • Ball trays and their purpose • Documentation associated with grain cleaning • Machinery safety • Possible contamination points • Required maintenance and usual wear points • Screen types and sizes • The adjustment and effect of airflow and motor speed within each cleaning chambers • The different types of screen available for the task • Types of impurities and the machine's ability to handle impurities • Different grain grading
Required Skills	Demonstrate skills to: • Operate, adjust and calibrate grain cleaner safely • Complete pre- and post-operational checks on cleaning components and power source • Perform routine safety, service and maintenance procedures according to manufacturer's instruction • Read and interpret manufacturer operation manual • Record and report faults, workplace hazards and accidents • Use numeracy skills to estimate, calculate and record routine workplace measures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Operate Grain Combine Harvester**
Unit Code	**AGR AMO3 06 0322**
Unit Descriptor	This unit of competence covers the knowledge, skills and attitudes to identify systems, components and controls of combine harvester, Prepare Combine for harvesting operation, operate Combine for crop Harvest and complete harvesting operations.

Elements	Performance Criteria
1. Identify systems, components and controls of combine harvester	1.1 ***Occupational Health and Safety (OHS***) hazards are identified and safety concerns are reported and personal protective equipment needs are used. 1.2 ***Compliance documentation*** relevant to conducting combine harvesting operations is accessed, interpreted and applied. 1.3 Main components and operating principles of ***functional units*** of ***combine harvester*** are identified 1.4 Engine, transmission, steering mechanisms and hydraulic systems are identified. 1.5 Routine checks of combine harvester are conducted prior to use according to manufacturer's specifications and enterprise requirements. 1.6 Pre-start, start-up, park and shutdown procedures are carried out according to manufacturer's operator's manual. 1.7 Combine harvester controls and functions are checked for serviceability and any faults rectified or reported. 1.8 Risks to self, others and the environment are recognised and avoided according to enterprise requirements. 1.9 Driving posture that permits effective control and operation of the combine harvester is adopted. 1.10 Gauges and warning lights are checked after the engine starts 1.11 Requirements for the work to be undertaken to understand the harvesting calendar is applied. 1.12 Fire extinguishers are checked and placed in an accessible location,
2. Prepare Combine for harvesting	2.1 Combine harvester is driven safely to forward and reverse

operation	direction in a controlled manner. 2.2 Smooth efficient gear changing and gear selection are demonstrated. 2.3 Harvesting equipment is moved between sites and on public roads in compliance with legislation including hygiene requirements. 2.4 The environmental impacts of harvesting the crop are identified and action is taken were required. 2.5 The hygiene standards for the crop and the paddock are identified from the harvest strategy and/or the crop storage plan. 2.6 Combine harvester and other ***equipment*** are cleaned of pests and other contaminants to maintain hygiene standards as required by the harvest strategy. 2.7 The appropriate type ***header*** is fitted that suits the crop to be harvested and all the required adjustments are carried out. 2.8 The harvester is adjusted for harvesting conditions and appropriate parts are replaced to ensure reliability during harvesting 2.9 All containers, leftover fluids, waste and debris from the maintenance and servicing work are disposed of safely and in line with environmental guidelines.
3. Operate Combine for crop Harvest	3.1 The harvest strategy is followed and completed for each paddock. 3.2 Harvesting machinery and ancillary equipment are operated in a safe manner and at speeds to suit crop conditions. 3.3 Cleanliness and purity of the ***harvested crop*** are maximised by maintaining the hygiene of all surfaces that come into contact with the crop. 3.4 The quality of product is optimised by continually checking and, where necessary, 3.5 Adjusting the harvester and ancillary equipment, including their height and other settings.
4. Complete harvesting operations	4.1 Harvester and attachments and other ancillary equipment are cleaned and stored to minimise damage and to maximise hygiene according to manufacturer's specifications, organisational procedures and regulations. 4.2 Insecticides are applied as required by the organisation and the harvest strategy. 4.3 All containers, leftover fluids, waste and debris from the maintenance and servicing work are disposed of safely and according to environmental requirements. 4.4 All required records and documentation are completed accurately and promptly in accordance with enterprise requirements.

Variable	Range
Operator controls	May include but not limited to: • Gear shifting lever • Clutch pedal • Brake pedal • Hydraulic control unit • Crank handle • Threshing system on/off • Grain unloading lever • Concave adjustment lever
Functional units of combine harvester	May include but not limited to: • Cutting unit • Conveying and feeding • Threshing unit • Separation/Cleaning • Handling/Grain storage
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • header, blades • Torn or improper use personal protective equipment • Worn out repair tools • unprotected moveable parts • electricity and water, • toxic substances, • damaged packing material or containers, • broken or damaged equipment, • flammable materials and fire hazards, • Stumps and logs in the soil or covered by debris • crash with tractors/trucks • overheating
Compliance documentation	May include but not limited: • Legislative, organisation and site requirements and procedures • Manufacturer's guidelines and specifications • Codes of practice • Employment and workplace relations legislation
Personal protective equipment	May include but not limited to: • Overall • Safety shoes • Sun glass • Dust mask • Gloves • Ear plugs
equipment	May include but not limited to: • Transport trailers • Transport trucks
Header	May include but not limited to : • Maize header • Cereal header
Harvested crops	May include but not limited to :

	• Wheat • Barley • Grain legumes • Oilseeds • Maize/corn • Teff

Evidence guide	
Critical aspects of competence	must demonstrate knowledge and skills competence to: • Complete pre and post operational checks on tools, combiner and its component • Perform routine safety, service and maintenance procedures on tools and combiner • ***Operator controls*** and their functions are identified • Operate combine harvester safely • Adjust work units to suit the crop to be harvested • Monitor efficiency of harvesting equipment and make adjustments to height and other settings • Transport, clean and store combine harvester
Required knowledge and attitude	Demonstrate knowledge of: • Appropriate legislative requirements, manufacturer's instructions and organisation procedures/instructions • Pre-operational and safety checks, servicing and maintenance procedures for tools and equipment • Potential hazards and safe operating procedures for basic tools and equipment • Safe operating procedures and standards for harvesting and ancillary equipment • Grain quality and the impact of harvesting practices • General machine maintenance procedures • Combine harvester operating principles and operating methods • Procedures for making adjustments to work units of combine harvester • Environmental impacts associated with the operation of machinery and equipment in a harvesting context • Hygiene procedures for harvesting machinery and equipment • Organisation moisture and hygiene requirements for the crop and equipment that comes into contact with the crop • Requirements for harvesting machinery and equipment transport • Fire prevention strategies • organisation recording and reporting procedures

Required skills	Demonstrate skills to: • Handle and manoeuvre combine harvester • Operate combine harvester efficiently • Implement procedures for seed handling and hygiene • Identify hazards and implement ohs procedures for all harvest tasks • Complete pre- and post-operational checks on tools, harvesting machinery and equipment • Perform routine, service and maintenance procedures on tools, harvesting machinery and equipment • Inspect, adjust various work units of harvester • Use literacy skills to read, interpret and follow organisational policies and procedures, follow sequenced written instructions, record accurately and legible information collected and select and apply procedures for a range of tasks • Use numeracy skills to estimate, calculate and record routine workplace measures
Resource implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and ohs practices.
Methods of assessment	Competence may be assessed through: • Interview / written test • Observation / demonstration with oral questioning
Context of assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Field Machinery and Equipment Operation Level III	
Unit Title	**Operate Grab Loader and Haulage Machinery**
Unit Code	**AGR AMO3 07 0322**
Unit Descriptor	This unit of competence covers the knowledge, skills and attitudes to prepare Grab Loader and Haulage machinery, operate grab loader, Operate haulage machinery, Perform Cane Transportation Complete operation and transporting machinery.

Elements	Performance Criteria
1. Prepare Grab Loader and Haulage machinery	1.1 Routine pre-operational checks for cane transportation machinery equipment are prepared according to company working procedure 1.2 Grab load is checked for loading 1.3 Haulage machinery and implement are prepared and used according enterprise work procedure 1.4 Potential and existing ***Occupational Health and Safety (OHS) hazards*** in the workplace are recognised, risk is assessed and minimised according to enterprise requirements. 1.5 Suitable ***Personal Protective Equipment*** is selected, used and maintained according to OHS requirements. 1.6 Identify grab loader operating system and component
2. Operate grab loader	2.1 operating principle of grab loader is identified 2.2 Operate grab loader in safe and control manner according to enterprise safe operating procedures 2.3 Grab Loader and ancillary equipment are operated in a safe collecting and handling of process for cane loading.
3. Operate haulage machinery	3.1 Legal requirements are arranged for permits, clearances and escorts for transporting oversized loads. 3.2 Machines are driven on or off road in compliance with relevant legislation. 3.3 ***Haulage machinery and equipment*** is loaded and driven safely to destination in compliance with relevant legislation. 3.4 Machineries are unloaded safely in line with accepted workplace policy.
4. Perform Cane Transportation	4.1 Carry out cane haulage operation tractor is operated in a safe, controlled and correct manner according to enterprise working procedure 4.2 Safe operating procedures are observed and noted during the use of tractor, and equipment in accordance with workplace guidelines. 4.3 Cane haulage tractor and trailer are correctly selected, hauled and delivered efficiently, safely and co-operatively. 4.4 Risks to self, others and the environment are anticipated and minimisation strategies implemented accordingly. 4.5 Emergency procedures are identified and followed as per organization's guideline.

	4.6 Environmental implications associated with cane haulage are identified, assessed and reported to the supervisor.
5. Complete operation and transporting machinery	5.1 Grab Loader, attachments and haulage tractors other ancillary equipment are cleaned and stored to minimise damage and to maximise hygiene according to manufacturer's specifications, organisational procedures and regulations. 5.2 All containers, leftover fluids, waste and debris from the servicing work are disposed safely and according to environmental requirements. 5.3 All required records and documentation are completed accurately and promptly in accordance with enterprise requirements.

Variable	**Range**
The types of machinery	May include but not limited to: • Grab loader • Trailer • haulage
Occupational Health and Safety (OHS) hazards	May include but not limited to: • Sharp cutting tooling and instruments, • Torn or improper use personal protective equipment • Worn out repair tools • Servicing while engine is running • Working under machines not secured • Unprotected moveable parts • Damaged packing material or containers, • Broken or damaged equipment, • Flammable materials and fire hazards, • Stumps and logs in the soil or covered by debris • Crash with tractors/trucks
Personal Protective Equipment	May include but not limited to: • Safety shoes • Overall • Eye glass • Glove • Helmet • Face mask
Safe operating procedures	May include but not limited to: • Operational risk assessment and treatments associated with vehicular movement, toxic substances, electrical safety, machinery movement and operation, manual and mechanical lifting and shifting, • Working in proximity to others and site visitors • Emergency shutdown and stopping of equipment, extinguishing

	fires, enterprise first aid requirements and site evacuation
Emergency procedures	May include but not limited to: • Emergency shutdown • stopping of equipment, • Extinguishing fires, • Enterprise first aid requirements • Site evacuation
Haulage Machinery	May include but not limited to: • Tractors • High Beds • Trailers

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Operate grab loader in safe and controlled manner • Use Grab loader for loading of cane on cane haulage machinery • Load and secure machinery for transport • Drive haulage machinery to destination, and unloading complying with requirements for moving wide loads • Unload haulage machinery safely
Required Knowledge and Attitudes	Demonstrate knowledge of: • The provisions, requirements and legislation pertaining to heavy transport • Machinery loading • Principles for machine operation • Cane transporting machinery • Vehicle and operator licensing, and road transport legislation • Ohs and environmental legislation, codes of practice and enterprise requirements
Required Skills	Demonstrate skills to: • Pre and post operation of grab loader and haulage tractor routine maintenance is performed according manufactures instruction. • Identify hazards and implement safe work procedures • Load and unload grab loader machines • Secure machinery as a transport load • Operate haulage tractor • Follow sequenced written instructions, record accurately and legible information collected • Select and apply procedures for a range of tasks • Use numeracy skills to calculate and record routine workplace measures
Resource	Access is required to real or appropriately simulated situations, including

Implications	work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competency may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Operate Cotton Picker**
Unit Code	**AGR AMO3 08 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required Identify systems, components and controls of cotton picker, Prepare Cotton picker for harvesting operation, Operate cotton picker, Complete cotton picker Operation.

Elements	Performance Criteria
1. Identify systems, components and controls of cotton picker	1.1 Main components and operating principles of functional units of cotton picker are identified. 1.2 Routine checks of cotton ***Operator controls*** and their functions are identified. 1.3 Engine, transmission, steering mechanisms and hydraulic systems are identified. 1.4 ***Occupational Health and Safety (OHS***) hazards are identified and safety concerns are reported and personal protective equipment needs are used. 1.5 Suitable ***personal protective*** picker are conducted prior to use according to manufacturer's specifications and enterprise requirements. 1.6 Pre-start, start-up, park and shutdown procedures are carried out according to manufacturer's operator's manual. 1.7 Cotton picker controls and functions are checked for serviceability and any faults rectified or reported. 1.8 Risks to self, others and the environment are recognized and avoided according to enterprise requirements. 1.9 Driving posture that permits effective control and operation of the Cotton picker is adopted. 1.10 Gauges and warning lights are checked after the engine starts. 1.11 Cotton picker is driven safely to forward and reverse direction in a controlled manner. 1.12 Smooth efficient gear changing and gear selection are demonstrated. 1.13 Cotton harvesting Machine moved between sites and on public roads in compliance with legislation including hygiene requirements.
2. Prepare Cotton picker for harvesting operation	2.1 Requirements for the work to be undertaken to understand the harvesting calendar is applied. 2.2 Occupational Health and Safety (OHS) hazards are identified, risks assessed and risk controls implemented for the harvesting operation. 2.3 Safety requirements are obtained, confirmed and applied to the allotted task. 2.4 The environmental impacts of harvesting the crop are identified and action is taken were required. 2.5 Roads and fields are surveyed before operation, and dangerous sections and obstacles are clearly marked.

	2.6 Cotton picker and other ***equipment*** are cleaned of debris and foreign materials to maintain the quality of cotton harvested as per manufacturer's instruction. 2.7 The appropriate type ***header*** is fitted that suits the crop to be harvested and all the required adjustments are carried out. 2.8 The harvester is serviced, assessed for reliability, adjusted for harvesting conditions and appropriate parts are replaced to ensure reliability during harvesting 2.9 Fire extinguishers are checked and placed in an accessible location,
3. Operate cotton picker	3.1 The harvest strategy is followed and completed for each paddock. 3.2 Harvesting machinery and ancillary equipment are operated in a safe manner and at speeds to suit crop conditions. 3.3 Cleanliness and purity of the ***harvested crop*** are maximised by maintaining the hygiene of all surfaces that come into contact with the crop. 3.4 The quality of product is optimised by continually checking and, where necessary, adjusting the harvester and ancillary equipment, including their height and other settings.
4. Complete cotton picker Operation	4.1 Harvester and attachments and other ancillary equipment are cleaned and stored to minimise damage and to maximise hygiene according to manufacturer's specifications, organisational procedures and regulations. 4.2 Insecticides are applied as required by the organisation and the harvest strategy. 4.3 All containers, leftover fluids, waste and debris from the maintenance and servicing work are disposed of safely and according to environmental requirements. 4.4 All required records and documentation are completed accurately and promptly in accordance with enterprise requirements.

Variable	**Range**

Functional units of cotton picker	May include but not limited to:
	• Stripping Unit
	• Cotton picking unit
	  • Spindles and its arrangement
	  • Spindle Moistening Unit
	• Harvesting Devices (Brush and rollers)
	• Conveying unit

Operator controls	May include but not limited to: • Gear shifting lever • Clutch pedal • Brake pedal • Hydraulic control unit • Crank handle
Machinery and implement	May include but not limited to: • Tractor-mounted, • tractor-pulled, or

	• self-propelled strippers
Occupational Health and Safety (OHS) hazards	May result from but not limited to: • header, blades • Torn or improper use personal protective equipment • Worn out repair tools • unprotected moveable parts • electricity and water, • toxic substances, • damaged packing material or containers, • broken or damaged equipment, • flammable materials and fire hazards, • Stumps and logs in the soil or covered by debris • crash with tractors/trucks • overheating
Personal protective equipment	May include but not limited to: • Overall • Safety shoes • Sun glass • Dust mask • Gloves • Ear plugs
equipment	May include but not limited to: • Transport trailers • Transport trucks

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Complete pre and post operational checks on tools, cotton picker and its component • Perform routine safety, service and maintenance procedures on tools and cotton picker • Operate cotton picker safely • Adjust work units to suit the cotton to be harvested • Monitor efficiency of harvesting equipment and make adjustments to height and other settings • Transport, clean and store cotton picker
Required Knowledge and Attitude	Demonstrate knowledge of: • Appropriate legislative requirements, manufacturer's instructions and organisation procedures/instructions • Pre-operational and safety checks, servicing and maintenance procedures for tools and equipment • Potential hazards and safe operating procedures for basic tools and equipment • Safe operating procedures and standards for harvesting and ancillary equipment • Grain quality and the impact of harvesting practices • General machine maintenance procedures • Cotton picker operating principles and operating methods • Procedures for making adjustments to work units of cotton picker Environmental impacts associated with the operation of machinery

	and equipment in a harvesting context • Hygiene procedures for harvesting machinery and equipment • Organisation moisture and hygiene requirements for the crop and equipment that comes into contact with the crop • Requirements for harvesting machinery and equipment transport • Fire prevention strategies • Organisation recording and reporting procedures
Required Skills	Demonstrate skills to: • Handle and manoeuvre cotton picker • Operate cotton picker efficiently • Implement procedures for seed handling and hygiene • Identify hazards and implement OHS procedures for all harvest tasks • Complete pre- and post-operational checks on tools, harvesting machinery and equipment • Perform routine, service and maintenance procedures on tools, cotton harvesting machinery and equipment • Inspect, adjust various work units of harvester • Use literacy skills to read, interpret and follow organisational policies and procedures, follow sequenced written instructions, record accurately and legible information collected and select and apply procedures for a range of tasks • Use numeracy skills to estimate, calculate and record routine workplace measures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Field Machinery and Equipment Operation Level III	
Unit Title	**Operate Cane Harvester**
Unit Code	**AGR AMO3 09 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to prepare and harvest cane harvest for operation and complete cane harvesting operations.

Elements	Performance Criteria
1. Prepare a cane harvester for operation	1.1 Main components and operating principles of ***functional units*** of cane harvester are identified. 1.2 Operator controls and their functions are identified. 1.3 Engine, transmission, steering mechanisms and hydraulic systems are identified. 1.4 Routine pre-operational checks of cane harvester are completed to manufacturer's specifications and enterprise requirements. 1.5 Cabin drill is carried out according to enterprise instructions and safety routines. 1.6 Potential and existing ***hazards*** in the workplace are recognised; risks assessed and controlled according to Occupational Health and Safety (OHS) requirements**.** 1.7 Suitable Personal Protective Equipment is selected, used and maintained according to OHS requirements. 1.8 Crop class, variety and field for harvest are correctly located and selected.
2. Carry out cane harvesting	2.1 Harvester is set and operated in a safe, controlled and correct manner and monitored for performance and efficiency. 2.2 Harvester is operated in co-ordination with haul out vehicles and other associated harvesting equipment. 2.3 ***Cane is harvested*** in a productive, safe and controlled manner and correctly consigned. 2.4 Risks to self, others and the environment are anticipated and minimisation strategies implemented accordingly. 2.5 Environmental implications associated with cane harvesting are identified, assessed and reported.
3. Complete cane harvesting operations	3.1 Shut-down procedures for cane harvester are completed according to manufacturer's specifications and enterprise requirements. 3.2 Harvester is sterilised at scheduled times according to operators manual and enterprise requirements. 3.3 Records are completed and maintained according to enterprise

	requirements. 3.4 Malfunctions, faults, irregular performance and damage to cane harvester are identified, detailed and reported according to enterprise requirements. 3.5 Cane harvester is cleaned, secured and stored according to OHS and enterprise requirements.

Variable	**Range**
Functional Unit	May include but not limited to: • Cutting unit • Conveying unit • Separating unit • Collecting tank • Loading and unloading unit
Hazards	May include but not limited to: • Disturbance of services • Solar radiation • Dust • Noise • Through traffic • Uneven surfaces and holes • Moving machinery and machinery parts • Overhead hazards including power lines
Cane is harvested	May include but not limited: • Green cane

Evidence guide	
Critical aspects of competence	Demonstrate knowledge and skills to: • Conduct pre-start and shut-down procedures • Control cane spillage • Operate cane harvester in safety and controlled manner • Communicate and co-operate with other personnel such as haul-out drivers • Demonstrate emergency driving procedures • Effectively sterilise the harvester to prevent cross-property contamination • Maintain operational records
Required knowledge and attitudes	Demonstrate knowledge of: • Components, controls and features of cane harvesters and their functions • Operating principles and operating methods for cane harvesters • Cane harvester processes and spillage minimisation techniques • Legislative requirements with regard to licensing • Harvest and haulage processes and procedures • Principles of the safe removal of obstacles from harvesters and adjustment of harvester settings • Ohs and environmental protection legislation, codes of practice and enterprise procedures • Environmental impacts and minimisation measures
Required skills	Demonstrate skills of: • Identify hazards and implement safe operating procedures • Perform routine safety, basic service and maintenance procedures on cane harvesters • Operate cane harvester safely • Undertake routine maintenance of cane harvester • Demonstrate emergency operating procedures • Demonstrate safe and environmentally responsible workplace practices • Read and interpret property maps, operators manuals, manufacturers specifications, work and maintenance plans, and msds • Identify communication faults, malfunctions and workplace hazards, report and maintain operational records

	• Measure and calculate volumes, feed rates, consumption and servicing requirements • Use interpersonal skills to work with and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities
Resource implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and ohs practices.
Methods of assessment	Competence may be assessed through: • Interview / written test • Observation / demonstration with oral questioning
Context of assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Operate Animal Feed Processing Machinery and Equipment**
Unit Code	**AGR AMO3 10 0322**
Unit Descriptor	This unit of competence covers the knowledge, skills and attitudes to prepare animal feed processing machinery and equipment for use, operate animal feed processing machinery and equipment, complete animal feed processing machinery and equipment operation.

Elements	Performance Criteria
1. Prepare animal feed processing machinery and equipment for use	1.1 Product to be processed for animal feed is identified and prepared according enterprise requirement. 1.2 Animal feed processing ***machinery and equipment*** are selected and prepared to job requirements and confirmed against work plan. 1.3 Appropriate work place and characteristics of animal feed processing machinery and equipment is identified. 1.4 Routine pre-operational checks of animal feed processing machinery and equipment are completed to manufacturer's specifications and enterprise requirements. 1.5 ***Occupational Health and Safety (OHS) hazards*** are identified, risks assessed and risk controls implemented.
2. Operate animal feed processing machinery and equipment	2.1 Animal feed processing machinery and equipment are operated in a safe and controlled manner and monitored for performance and efficiency. 2.2 Risks to self, others and the environment are anticipated and prevention strategies implemented accordingly. 2.3 ***Personal Protective Equipment (PPE)*** is selected, used and maintained according to procedures. 2.4 Environmental implications associated with machinery operation are identified, assessed and reported to the supervisor.
3. Complete animal feed processing machinery and equipment operation	3.1 Shut-down procedures for animal feed processing machinery and equipment are completed to manufacturer's specifications and enterprise requirements. 3.2 Animal feed processing machinery and equipment operational records are completed and maintained according to enterprise requirements. 3.3 Malfunctions, faults, irregular performance and damage to animal feed processing machinery and equipment are detailed and reported according to enterprise requirements. 3.4 Animal feed processing machinery and equipment are cleaned, secured and stored according to OHS and enterprise requirements.

Variable	Range
Machinery and equipment	May include but not limited to: • Feed miller • Feed mixer • Poultry feed mills and mixers • Pelleting machine • Block making Machine • Baller • Hay making • Mills and mixers • livestock feeding systems • animal feed handling equipment
Occupational Health and Safety (OHS) hazards	May include but not limited to: • sharp cutting tooling and instruments, • torn or improper use personal protective equipments • worn out repair tools • servicing while machine is running • unprotected moveable parts • electricity and water • toxic substances • damaged packing material or containers • broken or damaged equipment • flammable materials and fire hazards • lifting practices
Personal Protective Equipment (PPE)	May include but not limited to: • Overall • Eye glass • Glove • Safety shoes

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • prepare animal feed product and animal feed processing machinery and equipment in accordance with manufacturer specifications • operate the animal feed processing machinery and equipment in a safe, efficient and controlled manner • conduct pre and post operational checks • perform minor maintenance and fault finding • record work activities • evidence records must include a description of the machinery and equipment that the candidate was assessed
Required Knowledge and Attitudes	Demonstrate knowledge of: • pre-operational checks • machinery operation techniques • operator level servicing • shutdown • emergency procedures • basic diagnostic techniques

	• equipment characteristics, technical capabilities and limitations • components and controls features and functions • OHS and environmental legislation, Codes of Practice and enterprise requirements • licensing requirements for machinery
Required Skills	Demonstrate skills of: • identify hazards and implement safe work procedures • select the appropriate animal feed machinery and equipment for appropriate work • determine and check operating methods with management • carry out pre-operational checks on animal feed processing machinery • examine faults or breakdowns and specify repairs • use machinery or equipment in a safe and controlled manner to perform specific tasks by utilising the various components, controls and features • maintain and monitor performance and maintenance records • use environmentally responsible practices for operation of machinery and equipment, and to dispose of used oils and machinery parts • Use literacy skills to read, interpret and follow organisational policies and procedures. • use numeracy skills to estimate, calculate and record routine workplace measures
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level III	
Unit Title	**Apply Digital Technology in Agriculture.**
Unit Code	**AGR AM03 110322**
Unit Descriptor	This unit covers the knowledge, skills and attitude required to Understand the Concept of digital technology, apply Digital technologies among rural population and recording and documentation system.

Element	Performance Criteria
1. Understand the Concept of digital technology	1.1. ***Digital technologies*** are understood to apply digital technology. 1.2. ***Importance of digital technologies*** are understood in agricultural sector 1.3. ***Role of digital technologies*** in agriculture is identified to enhance agricultural development. 1.4. ***Principles of Agricultural technology*** are identified to apply in the agricultural sector 1.5 Mobile/Smart phones and template functions are understood to collect data and use in the reporting system
2. Apply Digital technologies among rural population and farmers	2.1. Require ***tools and equipment*** are identified and coordinated to apply digital technologies 2.2. Digital technology ***infrastructures*** are identified to implement in agricultural development 2.3. Digital technology skills are developed among the rural population 2.4. Digital ***Agri-preneurial*** skill is developed for agricultural transformation. 2.5. ***Digital technology communication tools are*** used to collect data and reporting system 2.6. Digital technologies, tools and ***techniques*** are used to deliver digital education 2.7. Implementation of digital technologies is promoted to enhance productivity
3. Recording and documentation	3.1. ***Data collecting formats*** are developed based on the needs 3.2. ***Data collection methodologies*** are identified and selected based on the intended objectives 3.3. Collected data are organized, analyzed and interpreted based on the intended objectives 3.4. Organized, analyzed and interpreted data are documented and reported 3.5. Feedbacks are collected from the relevant stakeholders

Variable	Range
Digital technologies	May include, but not limited to: • Internet • Computer • Smart phone • Tablet • GPS • Web browser
Importance of digital technologies	May include, but not limited to: • Sharing and searching information • Collect data • Enable storage of massive information • Time saving • Cost minimizing • Data accuracy and reliability • Data centralizing and administration • Improve collaboration • Enhance creativity • Enhances work accuracy
Role of digital technologies	May include, but not limited to: • Create connectivity between operations • Facilitate communication in agricultural sectors • Globalize communication • Strengthen market linkage
Principles of Agricultural technology	May include, but not limited to: • Design with user • Understand the existing ecosystem • Design for scale • Build for sustainability • Data driving • Reuse and improve • Address privacy and security • Collaborative
tools and equipment	May include, but not limited to: • Chargers • Computer • Smart phone • Tablet • I pad • GIS • Website

	• Online resources • Digital programs
infrastructures	May include, but not limited to: • Telecommunications utilities • Electricity power • Server • Information and communication Technologies • Mobiles Phones • Computers systems
Agri-preneurial	May include, but not limited to: • Online marketing • Online Learning
Digital technology communication tools	May include, but not limited to: • Smart phone • Cell phone • Email • Telegram • SMS • What's APP
technique	May include, but not limited to: • Video chat • Virtual meeting • E-learning • Email • Video conference
Data collecting formats	May include, but not limited to: • Google sheet • Templates • Ex-cell • Google drive storage
Data collection methodologies	May include, but not limited to: • Interview • Questionnaire • Surveying • Focus group discussion (FGD) • Case study

Evidence guide	
Critical aspects of competence	Demonstrate knowledge and skills on: • Understand the basic digital technologies. • Use mobile/Smart phones and template to collect data and reporting the data

	• Understand the basic digital technology communication tools. • Identify the require tools and equipment to apply digital technologies • Apply digital technology • Understand the basic virtual meeting.
Required knowledge and attitude	Demonstrate knowledge on: • Understand the basic digital technology communication tools. • Understand the basic digital technologies. • New or upgraded technology performance • Environmental considerations • Appropriate performance evaluation.
Required skills	Demonstrate skills to: • Use Digital technology communication to collect data and report system • Use digital technologies applications • Use software applications (word processing, spread sheets, data base management • Apply skills for accessing and using spreadsheets and databases • Literacy skills for data analysis and interpretation • Determine and confirm digital technology communication tools**.**
Resources implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of assessment	Competence may be assessed through: • Interview/written test • Observation/demonstration with oral questioning
Context of assessment	Competence may be assessed in the work place or in a simulated work place setting.

NTQF Level IV

Occupational Standard: Agricultural Machinery and Equipment Operation Level IV	
Unit Title	**Operate Small-scale Horticultural product Processing Equipment**
Unit Code	**AGR AMO4 01 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to prepare, Operate, use, clean, machinery and equipment used in fruit and vegetable processing plant and storage and Complete operation and report on machinery and equipment operation

Elements	Performance Criteria
1. Prepare machinery and equipment for use	1.1 ***Small-scale*** horticultural product processing equipment are identified and understood 1.2 pre-operational checks of ***horticulture processing equipment*** are completed according to manufacturer's user guidelines 1.3 Product safety and ***hygiene requirements*** are applied 1.4 ***Occupational Health and Safety (OHS) hazards*** are identified, risks assessed and risk controls implemented.
2. Operate machinery and equipment	2.1 ***Personal Protective Equipment (PPE)*** is selected, used and maintained according to procedures. 2.2 Machinery and equipment are operated in a safe and controlled manner and monitored for performance and efficiency according to work standard. 2.3 Risks to self, others and the environment are anticipated and minimisation strategies implemented accordingly. 2.4 Environmental implications associated with machinery operation are identified, assessed and reported to the supervisor.
3. Complete and report on equipment operation	3.1 Shut-down procedures for machinery and equipment are completed to manufacturer's specifications 3.2 Equipment operational records are completed and documented according to enterprise requirements. 3.3 Malfunctions, faults, irregular performance and damage to machinery and equipment are detailed and reported according to enterprise requirements. 3.4 Waste materials are disposed of according to enterprise operating procedures and relevant legislative requirements 3.5 Processing equipments` are cleaned, secured and stored according to OHS and enterprise requirements.

Variable	Range
Small-scale	Equipment designed to be used on farm levels that are applicable for small scale at farmers' level. Small-scale processing may also use indigenous (native)

	technology for manufacturing and processing the products. As against, large scale processing industries which use advanced technology to create the value added products so as to reduce the cost and maximize profit.
Horticultural crops	May include but not limited to: • Fruits • Vegetables • Coffee/Tea • Spices • Enset/Cassava
Horticulture product processing Equipment	May include but not limited to: • Fruit crushers • Extractors • driers • washing machine • slicers/grater/decorticator • Pulper • Grinders • Mixers • Boilers • Cans • Bottles • Roaster • Cleaning, grading and sorting equipment
hygiene requirements	May include but not limited to • Cleanliness of the working area and machinery • Personal hygiene
Occupational Health and Safety (OHS) hazards	May include but not limited to: • Sharp cutting tooling and instruments, • Torn or improper use personal protective equipments • Worn out repair tools • Servicing while machine is running • Unprotected moveable parts • Electricity and water • Toxic substances • Damaged packing material or containers • Broken or damaged equipment • Flammable materials and fire hazards • lifting practices
Personal Protective Equipment (PPE)	is to include that prescribed under legislation/regulations/codes of practice and workplace policies and practices

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skills to: • Prepare and operate the machinery in accordance with

	manufacturer specifications • Confirm machine setup is ready to achieve production requirement • Operate the machinery in a safe, efficient and controlled manner • Conduct pre and post operational checks • Perform minor maintenance and fault finding • Record work activities • Evidence records must include a description of the machinery and equipment that the candidate was assessed
Required Knowledge and Attitudes	Demonstrate knowledge of: • Basic operating principles • Pre-operational checks • Machinery operation techniques • Shutdown procedures • Emergency procedures • Basic diagnostic techniques • Equipment characteristics, technical capabilities and limitations • Components and controls features and functions • OHS and environmental legislation, codes of practice and enterprise requirements
Required Skills	Demonstrate skills of: • Operator level servicing of equipment • Identify hazards and implement safe work procedures • Select the appropriate machinery and equipment for the work plan • Determine and check operating methods with management • Carry out pre-operational checks on machinery • Examine faults or breakdowns and specify repairs • Use equipment in a safe and controlled manner to perform specific tasks by utilising the various components, controls and features • Maintain and monitor performance and maintenance records • Use environmentally responsible practices for operation of equipment, and to dispose of used oils and machinery parts • Use numeracy skills to estimate, calculate and record routine workplace measures • Use interpersonal skills to work with and relate to people
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Farm Machinery and Equipment Operation Level IV	
Unit Title	**Operate Precision Agriculture Technology**
Unit Code	**AGR AMO4 02 0322**
Unit Descriptor	This unit of competency covers the knowledge, attitudes and skills to Prepare machinery and equipment, use precision control technology and complete precision agriculture operation work.

Elements	Performance Criteria
1. Prepare machinery and equipment for use	1.1 Characteristics, types and working principle of ***precision technology*** are understood and identified. 1.2 ***Pre-operational checks*** are completed in accordance with manufacturer specifications. 1.3 Ancillary equipment is checked for correct operation. 1.4 Data that complies with job specifications is checked. 1.5 Occupational Health and Safety (OHS) hazards are identified and control measures applied.
2. Use precision control technology	2.1 Fixing and installation procedure of automatic components of farm machinery is performed. 2.2 Precision machinery is operated in accordance with task requirements, conditions and manufacturer operating guidelines. 2.3 Activities are monitored to ensure that machinery is operating in an efficient and controlled manner and adjustments made as required. 2.4 Potential risks to self, others and the environment are assessed and minimized during operation.
3. Complete work	3.1 Safe Shutdown procedures are followed. 3.2 Data and/or complete operational records are downloaded. 3.3 Malfunctions, faults and irregular performance are identified and reported.

Variable	Range
Precision Technology	May include but not limited to: • Drone sprayer (Small scale), • Chemical sprayers fitted with sensors • GPS, sensor guided auto steer tractors and combine harvester • Variable rate fertilizer applicators
Pre-operational checks	May include but not limited to: • Oils and water level • Tyre pressure • Couplings • Loose bolts, nuts and tightness of clamps • Wear and tear of body and components • Nozzle size , drop volume, and clogging • Hose tear and wear • Ready sensors • GPS readers • Pump pressure, • Leakage of chemicals, oils and fuel • Corrosion on pumps and agitator systems
Occupational Health and Safety (OHS) hazards	May include but not limited to: • Sharp cutting tooling and instruments, • Improper use personal protective equipments • Worn out repair tools • Chemical contact, burn or swallowing • Working under machines not secured • Unprotected moveable parts • Toxic substances, • Damaged packing material or containers, • Broken or damaged equipment, • Flammable materials and fire hazards, • Wrong spraying direction in relation to the wind, • Stumps and logs in the soil or covered by debris • Crash with tractors/trucks

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • identify characteristics, types and working principle of precision technology • Check data that complies with job specifications.

	• operate precision machinery • identify and report malfunctions, faults and irregular performance
Required Knowledge and Attitudes	Demonstrate knowledge of: • manufacturer specifications and requirements for: ➢ pre-operational checks ➢ precision instrument controls, feature and functions ➢ minor servicing • uploading and downloading of data • characteristics, technical capabilities and limitations of associated machinery and equipment • components and controls features and functions
Required Skills	Demonstrate skills of: • conduct pre-operational checks • use technology to operate machinery in an efficient and controlled manner • perform routine maintenance tasks • use literacy skills to read, interpret and follow organisational policies and procedures, follow sequenced written instructions, record information collected accurately and legibly, and select and apply procedures for a range of tasks • use oral communication skills/language competence to fulfil the job role as specified by the organisation, including questioning techniques, active listening, clarifying information and consulting with supervisors as required • use numeracy skills to estimate, calculate and record routine workplace measures • use interpersonal skills to work with and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: ➢ Interview / Written Test

	➢ Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level IV	
Unit Title	**Perform New Farm Land Development Operation**
Unit Code	**AGR AMO4 03 0322**
Unit Descriptor	This unit of competency involves the knowledge, attitude and skills required to prepare for operation, perform and complete new land development operation.

Elements	**Performance Criteria**
1.Prepare for new land development operation	1.1 Tools and ***supplies*** required to carry out basic ***new land development operations*** are identified according to enterprise requirements. 1.2 Suitable ***personal protective equipment*** *is* selected, used and maintained according to ***OHS requirements***. 1.3 ***Routine operational checks*** and ***maintenance*** of ***machinery*** and ***equipment*** are carried out and adjustments made according to manufacturer's specifications and enterprise requirements. 1.4 Faulty or unsafe new land development machinery and equipment are identified. 1.5 ***OHS hazards*** in the workplace are identified and safety concerns reported.
Operate land development machineries	2.1 Types of land development machinery and equipment are identified 2.2 Machinery and equipment are operated in a safe, efficient and controlled manner. 2.3 Operate machinery in accordance with task requirements, conditions and manufacturers operating guidelines 2.4 Check attachment ancillary equipment for correct operation 2.5 Machinery performance and efficiency are monitored and adjustments are made as required.

	2.6 Potential risks to self, others and the environment are assessed and minimized.
2. Perform new land development operation	2.1 ***Field information*** and site map are accessed 2.2 Site drawing and plans are read and interpreted 2.3 Basic new land development operation is carried out according to ***enterprise policies and procedures***. 2.4 Land clearing with dozer machinery /equipment operation is carried out. ***2.5*** Conduct precision land-forming machinery and equipment routine pre-operational checks 2.6 Ripping machinery and land forming operation carried out. ***2.7*** Basic techniques are applied and land development operation requirements identified and faults are rectified according to enterprise requirements.
3. Complete new land development operation	3.1 Work activity is evaluated and most productive operating technique is determined. 3.2 Machinery, equipment and tools are cleaned, returned to operating order and stored according to manufacturer's specifications and enterprise requirements. 3.3 Environmental procedures are followed and waste from new land development activities is collected, treated and disposed or recycled according to enterprise requirements. 3.4 Malfunctions, faults, wear or damage to tools are reported according to enterprise requirements. 3.5 New land development activities are recorded and reported according to enterprise requirements.

Variable	**Range**
Supplies	May include but not limited to: • Fuel • lubricants • spare parts • cleaning materials
New Land development operations	May include but not limited to: • Site clearing • Remove stumps • Remove debris • Land forming • Cutting and filling • Precision Levelling
Personal protective equipment	May include but not limited to: • Safety shoe

	• Overall clothe • Helmet • Eye glass • Gloves • Face Mask • include that prescribed under legislation/regulations/codes of practice and workplace policies and practices
OHS requirements	May include but not limited to:- • Legislations, regulations/codes of practice and enterprise safety policies and procedures. • protective clothing and equipment • use of tooling and equipment • workplace environment and safety • handling of material • use of fire fighting equipment • enterprise first aid • hazard control and hazardous materials and substances
Field information	May include but not limited to: • Site plan reading • Field layout and design slope information • Field condition
Machinery	May include but not limited to: • Dozers • Heavy duty tractors • Scrapper • Laser jet leveller
Routine pre-operational checks and maitenance	May include but not limited to: • oils and coolant levels • tyre pressure • torn/worn and broken parts • loose parts(guards, bolts, nuts, screws, clamps, belts and chains) • lubrication/greasing of exposed parts • checking, • adjusting • tighten parts
Equipment	May include but not limited to: • Rake • Ripper • Sub-soiler • Root Plough • Land forming

Occupational Health and Safety (OHS) hazards	May result from but not limited to: • sharp cutting tooling and instruments, • Stumps and logs in the soil or covered by debris • Torn or improper use personal protective equipments • Worn out repair tools • Servicing while engine is running • Working under machines not secured • unprotected moveable parts • electricity and water, • toxic substances, • damaged packing material or containers, • broken or damaged Equipment, • flammable materials and fire hazards, • lifting practices, • spillages, waste and debris especially on floors
Enterprise policies and procedures	May include but not limited to: • quality policies and procedures, including Relevant Ethiopian standards • OHS, sustainability, environment, equal opportunity and anti-discrimination • manufacturer specifications and industry codes of practice • safe work procedures • reporting and recording procedures

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Check machinery and equipment for the operation. • Carry-out new land development operation. • Report simple faults or report and tag more serious faults • Collect, remove and dispose of wastes/ clean-up work area • Keep records of new land development operation.
Required Knowledge and Attitudes	• Land clearing influencing factors • Land Clearing Methods • types, characteristics and functions of land clearing machinery and equipment • Land development machinery and equipment checking and operating procedures • types, characteristics and functions of tools used in maintenance of machinery and equipment • types and uses of lubricants and other commonly used servicing

	materials • functions of components of common mechanical and hydraulic systems • OHS legislative requirements • Codes of Practice with regard to the use and control of hazardous substances and/or working in confined spaces • environmental Codes of Practice with regard to maintenance activities and disposal of fuels and oils
Required Skills	Demonstrate skills to: • demonstrate safe and environmentally responsible workplace practices • Read and interpret manufacturers' specifications, work and maintenance plans, and safety decals. • measure and calculate volumes, consumption and Fuel, lubrication/coolant requirements • Identify new land development operation machinery and equipment • carry out new land development operation • refer complex mechanical faults to appropriate technician • follow procedures to dispose of waste • measure and calculate volumes, consumption and lubrication requirements • use literacy skills to read and follow a range of basic instructions • use numeracy skills to complete basic calculations
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level IV	
Unit Title	**Manage Machinery Custom Hiring And Rental Services**
Unit Code	**AGR AMO4 04 0322**
Unit Descriptor	This unit of competency covers the knowledge, skills and attitudes required to undertake entrepreneurship activities, setting up custom hiring centres, Operationalize machinery hiring center, Contribute to quality machinery service quality standards, Document and maintain records.

Elements	Performance Criteria
1. Undertake machinery service need assessment activities	1.1 Market need assessment conducted and demand is analysed based on market trend, existing competition, current requirement, market status, etc. 1.2 Potential farmers are identified and farmer database is maintained. 1.3 Opportunities and risks are identified. 1.4 Possible sources of ***support services*** are identified. 1.5 Target market assessment conducted and positioning of products/services which is easily accessible to potential buyers are decided.
2. Prepare for setting up custom hiring centres	2.1***. Location*** for the custom hiring agro ***service center*** is identified 2.2. Appropriate ***machineries and equipment*** required for the hiring service are identified 2.3. information about sources of procurement for machinery and mode of purchase are identified 2.4. A clear business goal with a timeline to accomplish the goal is set 2.5. Marketing and sales plan are developed. 2.6. Organizational plan is developed. 2.7. Financial management plan is developed. 2.8. Finances required for the service busines are obtained.
3.Operationalize machinery hiring center	3.1 The required machinery and equipment are selected with prior consultation. 3.2 Suppliers of machineries and equipment are identified and selected. 3.3 Selected machineries and equipment are procured. 3.4 Basic safety checks before operation of all machinery are carried out and all potential hazards are reported to the supervisor.

	3.5 Annual operational plan is prepared. 3.6 Workers and machinery operators got adequate training. 3.7 Operations are monitored on daily basis and success or failure of business evaluated. 3.8 Adequate spare part for machineries and equipment are stocked. 3.9 A good farmer relationship is built and continuous engagement is ensured.
4. Maintain quality service Standards	4.1 Quality of service delivery is evaluated 4.2 Machinery service standards are accessed, interpreted, applied and monitored in the workplace in accordance with enterprise policies and procedures 4.3 Contributions are made to the development, refinement and improvement of service policies, standards and processes.
4. Document and maintain records	4.1 Records of ***operational costs*** are documented and maintained 4.2 Records of tools, equipment and machineries and their supplier/manufacturer details, manuals, annual maintenance details, etc are documented and maintained. 4.3 A log book for tool, equipment or machinery use is maintained. 4.4 Records of periodical maintenance of each tool, equipment or machinery are maintained and documented. 4.5 Database of farmers along with frequency of visit and sales details are maintained and documented. 4.6 To assess profitability of business a balance sheet is maintained. 4.7 Daily cash record to keep a record of cash received from sales on a daily basis is maintained.

Variables	**Range**
Support services	May include but not limited to: • mechanics – for maintenance and repair services; • fuel suppliers; • manufacturers and blacksmiths; • dealers – for tractors, equipment and spare parts; • credit and finance suppliers – formal and informal; and • Extension services.
Location	May include but not limited to: • availability of basic utilities like water, electricity • accessibility to farms, farmers homes • safe environmental surroundings, e.g. away from factories which produce hazardous chemicals
service providers	May include but not limited to:

	• Private investors • Unions • Youth groups • Farmers own machinery and give service to farmers in rental bassis
Relevant association	May include but not limited to: • agricultural machinery service providers associations • farmers associations • government agencies and departments • specific interest or support groups • advisory committees
The people	May include but not limited to: • operators • supervisors or managers • work colleagues with supervisory responsibilities
Machinery and equipment	Includes but not limited to: • tractor/power tiller • land preparation equipment • land leveling equipment for soil conservation work • irrigation devices and equipment • sowing and fertilizer equipment • plant protection equipment • harvesting/reaping equipment • threshing/shelling equipment • trollies for material handling
Operational costs	Includes: • inventory cost for storage of agriculture tools, equipments and machineries • fuel/lubricant cost • labour charges • interest on bank loans • maintenance cost of job performed by centre

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Market need assessment conducted and demand is analysed based on market trend, existing competition, current requirement, market status, etc • Opportunities and risks are identified • Target market assessment conducted and positioning of products/services which is easily accessible to potential buyers are decided • Organizational plan is developed.

	• Financial management plan is developed • Suppliers of machineries and equipment are identified and selected • Records of operational costs are documented and maintained • Quality of service delivery is evaluated • Adequate spare part for machineries and equipment are stocked.
Required Knowledge and Attitudes	Demonstrate knowledge of: • OHS and environmental regulations/requirements, equipment, material and personal safety requirements • dangers of working with industries machines and equipment • operating principles of mechanical and hydraulic systems and their relationship to each other • operating principles of processing machines and system • importance and types of service and repair manuals • inspection and service procedures • enterprise quality procedures • work organisation and planning processes
Required Skills	Demonstrate skills of: • identify hazards and implement safe work procedures • select the appropriate machinery and equipment for the work plan • determine and check operating methods with management • carry out pre-operational checks on machinery • examine faults or breakdowns and specify repairs • use machinery or equipment in a safe and controlled manner to perform specific tasks by utilising the various components, controls and features • maintain and monitor performance and maintenance records • use environmentally responsible practices for operation of machinery and equipment, and to dispose of used oils and machinery parts • use literacy skills to read, interpret and follow organisational policies and procedures, follow sequenced written instructions, record accurately and legible information collected and select and apply procedures for a range of tasks • use oral communication skills/language competence to fulfil the job role as specified by the organisation, including questioning techniques, active listening, clarifying information and consulting with supervisors as required • use numeracy skills to estimate, calculate and record routine workplace measures • use interpersonal skills to work with and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities

Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Agricultural Machinery and Equipment Operation Level IV	
Unit Title	**Manage Agricultural Machinery and Equipment**
Unit Code	**AGR AMO4 05 0322**
Unit Descriptor	This unit covers the knowledge, attitudes and skills to evaluate machinery and equipment coordinate maintenance and monitor operation.

Elements	**Performance Criteria**
1. Evaluate Machinery and equipment	1.1 Available machinery and equipment are reviewed and matched with farming operation requirements 1.2 Operation and servicing costs of machinery and equipment are calculated to justify total operation costs. 1.3 Productivity returns from machinery and equipment usage are estimated to identify cost-benefit analysis. 1.4 Machinery and equipment replacement cycles are monitored according to enterprise requirement 1.5 Number and appropriate size of machinery required for the agricultural operation are identified 1.6 Machinery and equipment acquiring options are evaluated and selection of tractors and equipment are made. 1.7 Basic criteria for technical Specification are prepared according to job requirement 1.8 Machinery and equipment are accessed through appropriate ***procurement option***
2. Coordinate and	2.1 Maintenance and service cycles are identified and scheduled to

facilitate maintenance needs	ensure servicing according to manufacturer's specifications and production processes. 2.2 ***Storing and housing*** of machinery and equipment organized. 2.3 Maintenance is documented and recorded to ensure operational and service history. 2.4 ***OHS hazards*** in the workplace are identified, risk assessed, and risk controls are recorded and reviewed according to enterprise requirements. 2.5 Suitable ***Personal Protective Equipment*** is provided, used, maintained and stored according to ***OHS requirements***.
3. Monitor operation	3.1 ***Consumables and operational support materials*** are made available, maintained and disposed of according to ***enterprise requirements.*** 3.2 Machinery and equipment ***work performance*** data is recorded 3.3 Performance quality of work operations are inspected/checked 3.4 ***Environmental implications*** and workplace safety practices are monitored according to OHS and enterprise requirements. 3.5 Operational procedures are cleared, documented and followed according to manufacturer's specifications. 3.6 Operators are provided with competent instruction and appropriate supervision according to OHS requirements.

Variable	**Range**
Procurement options	May include but not limited to: • leasing, hiring, hire purchase • purchasing, share/part-purchasing • renting,
Storing and housing	May include but not limited to: • On site, off site, seasonal, covered • open air, secured and protected
OHS hazards	May include but not limited to: • exposure to loud noise and fumes, solar radiation, dust, and hazardous substances • oil and grease spills • electricity

	• mechanical malfunctions and entanglement with machinery • equipment from exposed moving parts including hydraulics

Personal Protective Equipment	May include but not limited to: • boots, hat/hard hat, overalls, gloves, • protective eyewear, safety harness, • hearing protection, respirator or face mask • sun protection (sun hat, sunscreen)
OHS requirements	May include but not limited to: Safe systems and procedures for: ➢ operating and maintaining machinery and equipment including hydraulics and guarding of exposed moving parts ➢ hazard and risk control ➢ manual handling including lifting and carrying the provision of safety decals and signage ➢ handling, application and storage of hazardous substances ➢ outdoor work including protection from solar radiation, dust and noise ➢ lock out or danger tag procedures ➢ protection of people in the workplace ➢ the appropriate use, maintenance and storage of personal protective clothing and equipment
Consumables and operational support materials used and maintained	May include: • fuel, oils, lubricants, and battery water • wheels, tyres, • fan belts, leads, lines, connections, and air filters
Enterprise requirements	May include but not limited to: • Standard Operating Procedures (SOP) • industry standards • production schedules • Material Safety Data Sheets (MSDSs) • work notes, minimizing downtime, product labels • manufacturers specifications, operator's manuals • enterprise policies and procedures (including waste disposal, recycling and re-use guidelines), and OHS procedures
Work Performance	May include but not limited to: • Machinery hours • Fuel consumption/types of oils • Work rate • Service hours • Fast-moving spare parts • Labour cost
Environmental implications	May include but not limited to: • Negative environmental impacts may result from excessive noise and exhaust emissions,

	• the incorrect use and disposal of maintenance debris (oil containers, chemical residues), and hazardous substances (fuel, fertilizer) Impacts may also include: • run-off flows of water and cleaning agents from servicing, • maintenance and cleaning activities, • soil disturbance and dust problems from machinery and equipment operation

Evidence Guide	
Critical aspects of Competence	Must demonstrate knowledge and skills competence to: • develop machinery and equipment operation procedures in compliance with environmental Codes of Practice and OHS and hazardous substances legislation • schedule, supervise and record the service and maintenance of machinery and equipment • calculate the total running cost of machines • monitor machinery and equipment operations and maintenance and review risk assessments periodically to ensure a safe operating environment • examine the specific needs of the agricultural operations and assess the applicability of specific kinds of machinery and equipment to these processes • inspect and analyse performance data of the machineries and equipment • ensure safe work place practice • an awareness of enterprise environmental practices to minimize negative impact • assess staff capability in machinery maintenance and operation and provide training and mentoring
Required Knowledge and Attitudes	Demonstrate knowledge of: • Methods of calculating the cost of machines and their

	contribution • Training and instruction techniques for directing the learning of staff • Monitor machinery and equipment operations • Identify and remove potential workplace hazards • Evaluate machinery and equipment • Identify skill needs of staff • Keep records, including machine maintenance histories • Use written and oral information about workplace requirements • Plan and organise work arrangements • Communicate orally, document plans and write reports for staff and management • Calculate resources, machinery and equipment and servicing costing • Identifying, assessing and controlling hazards • Relevant ohs and environmental issues, legislative requirements and codes of practice • Ohs hazard identification, risk assessment and developing risk controls • Environmental legislation and codes of practice with regard to maintenance of machinery and equipment, disposal of wastes and hazardous substances • Legislative and enterprise requirements for ohs
Required Skills	Demonstrate skills of: • identify hazards and implement safe systems of work • monitor machinery and equipment operations • evaluate machinery and equipment • identify skill needs of staff • identifying, assessing and controlling hazards • use literacy skills to fulfil job roles as required by the organisation; The level of skill may range from reading and understanding documentation to completion of written reports • hazard identification, assessment and control • Environmental Codes of Practice with regard to maintenance of machinery and equipment and hazardous substances • use oral communication skills/language competence to fulfil the job role as specified by the organisation including questioning,

	active listening, asking for clarification, negotiating solutions and responding to a range of views • use interpersonal skills to work with others and relate to people from a range of cultural, social and religious backgrounds and with a range of physical and mental abilities
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and Equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competency may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

Occupational Standard: Agricultural Machinery and Equipment Operation Level IV	
Unit Title	**Plan and Implement Machinery Operational Plan**
Unit Code	**AGR AMO4 06 0322**
Unit Descriptor	This unit covers Knowledge, attitude and skills required to determine operation process requirements, determine monitoring requirements, plan and implement the operational plan by monitoring and adjusting operational performance.

Elements	**Performance Criteria**
1. Determine operation process requirements	1.1 Information regarding agricultural operation is accessed. 1.2 Information land under production and quality and amount of existing infrastructure and weather are confirmed from different sources. 1.3 Historical data, including recent data from organisational records are identified and accessed for input to operational plan 1.4 Requirements of the organisation are taken into consideration during analysis. 1.5 Monitoring points and performance indicators for ***the operation process*** are established using target, environmental management and scheduling information.
2. develop operational plan	2.1 Operational plans of farm operation are developed to contribute to the achievement of organisation's performance/business plan. 2.2 Key Performance Indicators (KPIs) are identified and used to monitor farm machinery operational performance. 2.3 Planning and consultation processes are undertaken as per organization guideline. 2.4 Assistance is provided in the development and presentation of proposals for resource requirements in line with farm machinery operational planning processes.
3. Perform resource	3.1 Employees are recruited within ***organisation's policies***, ***practices***

acquisition	***and procedures***. 3.2 Physical resources and services based on organisation's policies, practices and procedures are acquired in consultation with relevant personnel.
4. Implement and Monitor operational plan	4.1 Follow up the implementation of the operational plan 4.2 Prepare norms for the operations 4.3 Budget and actual financial information are analysed and used to monitor the activity productivity performance. 4.4 ***Performance systems and processes*** are monitored to assess progress in achieving organizational objectives and targets. 4.5 Unsatisfactory performance is identified and prompt action is taken to rectify the situation according to organisational policies. 4.6 Mentoring, coaching and supervision are provided to support individuals and teams to use resources effectively, economically and safely. 4.7 Recommendations for variation to operational plans are presented to the ***designated persons***/***groups*** and approval is gained. 4.8 ***Systems***, ***procedures and records*** associated with performance are implemented in accordance with organisation's requirements. 4.9 Recommendations for future plans are prepared based on the analysis of the data. 4.10 A report that documents the plans implementation is prepared according to the organisations requirements and guidelines

Variable	**Range**
The operation process	May include but not limited to: • Land clearing • Ploughing • Subsoiling • Harrowing • Levelling/land shaping • Furrowing • Planting • Fertilizing

	• Spraying • Cultivating • Harvesting • Transporting • The resources, personnel, methodology, and any between them for an agricultural or horticultural enterprise
Resource requirements	May include but not limited to: • Goods and services to be purchased and ordered • Human, physical and financial resources - both current and projected • Stock requirements and requisitions
Relevant personnel**,** colleagues and specialist resource managers	May include but not limited to: • Colleagues and resource managers • Managers • Occupational health and safety committees and other people with specialist responsibilities • Other employees, customers • Supervisors
Operational plans	May include but not limited to: • Organisational plans • Tactical plans developed by the department or section to detail product and service performance
Key Performance Indicators (kpis)	May include but not limited to: • Measures for monitoring or evaluating the efficiency or effectiveness of a system, and which may be used to demonstrate accountability and to identify areas for improvements
Contingency planning	May include but not limited to: • Contracting out or outsourcing human resources and other functions or tasks • Diversification of outcomes • Finding cheaper or lower quality raw materials and consumables • Increasing sales or production

	• Recycling and re-use • Rental, hire purchase or alternative means of procurement of required materials, equipment and stock • Restructuring of organisation to reduce labour costs • Risk identification, assessment and management processes • Seeking further funding • Strategies for reducing costs, wastage, stock or consumables • Succession planning
Consultation processes	May include but not limited to: • Mechanisms used to provide feedback to the work team in relation to outcomes of consultation • Meetings, interviews, brainstorming sessions, email/intranet communications, newsletters or other processes and devices which ensure that all employees have the opportunity to contribute to team and individual operational plans
Organisation's policies, practices and procedures	May include but not limited to: • Organisational culture • Standard Operating Procedures • Organisational guidelines which govern and prescribe operational functions, such as the acquisition and management of human and physical resources • Undocumented practices in line with organisational operations
Performance systems and processes	May include but not limited to: • Informal systems used by frontline managers for the work team in the place of existing organisation-wide systems • Formal processes within the organisation to measure performance, such as: ➢ Feedback arrangements ➢ Individual and teamwork plans

	➢ Kpis ➢ Specified work outcomes
Designated persons/groups	May include but not limited to: • Other affected work groups or teams and groups designated in workplace policies and procedures • Those who have the authority to make decisions and/or recommendations about operations such as workplace supervisors, other managers
Systems, procedures and records	May include but not limited to: • Databases and other recording mechanisms for ensuring records are kept in accordance with organisational requirements • Individual and team performance plans • Organisational policies and procedures relative to performance

Evidence Guide	
Critical Aspects of Competence	Must demonstrate knowledge and skills competence to: • Identify operation processes required to achieve targeted production • Establish operation targets for each enterprise and each product, crop, herd, or flock • Schedule operation processes with monitoring points and performance indicators • Evaluate operation processes and make modifications • Create, and maintain records and documentation as described in the operation plan • Ability to monitor and adjust operational performance, produce short-term plans for the department or section, plan and acquire resources, and provide reports on performance as required • Knowledge of principles and techniques associated with monitoring and implementing operations and procedures
Required Knowledge and Attitudes	Demonstrate knowledge of: • Principles and techniques associated with machinery and equipment management and Relevant legislation and regulations relating to OHS • Planning processes

	• Cost benefit analysis • Contingency planning • Methods for monitoring and reporting on performance • Monitoring and implementing operations and procedures • Problem identification and methods of resolution • Relevant budgeting and financial analysis, interpretation and reporting requirements • Resource management systems at the tactical implementation level • Resource planning and acquisition • Tactical risk analysis including identification and reporting requirements
Required Skills	Demonstrate skills of: • Coaching and mentoring skills to provide support to colleagues • Analytical skills to access and use workplace information and to prepare reports • Planning and organising skills to monitor performance and to sequence work to achieve planned outcomes
Resource Implications	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview / Written Test • Observation / Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational standard : Agricultural Machinery and Equipment Operation Level IV	
Unit Title	**Develop value chain Analysis**
Unit Code	**AGR AMO4 07 0322**
Unit Descriptor	This unit covers the knowledge, skills, and attitude needed to Understand value chain ,Identify concepts of value chain ideas Develop the value chain and Upgraded value addition

Elements	**Performance Criteria**
1. Understand concepts of value chain	1.1 ***Concept of value chain*** are understood 1.2 Value chain scopes are understood and identified 1.3 ***Principle of value chain*** are understood and identified 1.4 Value chain ***characteristic*** are understood and identified 1.5 Value chain ***Importance*** are discussed and understood 1.6 ***Concept of value addition*** are understood and determined
2.Identify Value chain analysis	2.1 ***Dimension*** and ***structures*** of Value chain are identified and interpreted 2.2 ***Value chain actors*** are identified according to the objective and interest or need of chain actors 2.3 ***Value chain maps*** are illustrated for different ***agricultural products*** 2.4 Value chain techniques for **value addition** are identified and analyzed 2.5 ***Contract farming*** system is established to promote value chain.
3.Develop value chain	3.1 Value chain ***parameter***s are analyzed to compare the gaps between the existing and the benchmark. 3.2 ***Constraints and gaps*** are collected, analyzed and ranked according to the priority used to develop value chain 3.3 ***Steps of value chain*** development are identified 3.4 Value Chain ***selection techniques*** are identified to develop value chain 3.5 Potential ***interventions*** for value chain development are identified
4. Upgrade value addition	4.1 ***Environmental considerations*** are understood to upgrade value addition development 4.2 Value chain actors are identified for ***Value addition*** 4.3 Value chain is ***upgraded*** for agricultural products to measure performance of value chain development 4.4 Custemer feedbacks are collected, organized and documented to improve

	Custemer satisfaction

Variable	Range
Concept value chain	May include, but not limited to • Market oriented products • General Principle • Value chain actor • Mapping • Value addition
Principles of value chain	May include, but not limited to • Value chain mapping • Identifying the distribution of benefits of actors • Examining the role of upgrading • Governance in the value chain
Characteristic	May include, but not limited to • Inbound logistic • Operation • Out bound logistic • Marketing • Sales • Services
Importance	May include, but not limited to • Simple and better way to identify gaps and technologies. • Increases efficiency and systemic competitiveness of local enterprise • Primary targets involvement between local sector and sub sector • Reduces production costs and improves profitability • Improves customer satisfaction by providing quality product and service
Dimension	May include, but not limited to • Sourcing of Inputs and supplies • Production capacity and technology • End-markets and trade • Governance of value chains
Structures	May include, but not limited to • Input sector: • Farm/production sector: • Product sector

Value chain actors	May include, but not limited to • Farmers, • Traders, • Processors, • Transporters • Wholesalers • Retailers and final consumers
Agricultural sectors	May include, but not limited to • Crop farming • Forestry • Livestock • Fisher and aquaculture • Agricultural cooperative • Agricultural extension service
Parameters	May include, but not limited to • Yield • Quality • Cost • Time
Technology constraints	May include, but not limited to • Marketability • Profitability • Capability and Usefulness • Functionality • Import Substitution • Feasibility • Adaptability • Potential Impact to the MSE • Woman Empowerment • Employment
Steps of value chain	May include, but not limited to • Value chain selection • Data collection • Value chain mapping • Value analysis • Gap identification • Prioritizing constraints • Technology identification & categorization

Selection technique	May include, but not limited to • Integration economic • Environmental • Social • Institutional
Environmental considerations .	May include , but not limited to: • Sustainability of the land use system for production and processing • Sources of energy • Efficiency of energy use • Greenhouse gas emissions • Water use efficiency and possibilities of contamination • Quantity and character of chemicals being used • Waste production and management
Value addition	May include, but are not limited to: • Measured against its contribution to the customer • Technical benefits/features • Location benefits/features • Aesthetic benefits/features • Information benefits/features
Contract farming	May include, but are not limited to: • Agreement between buyer and seller • Farmer and processing making firm for production • Supple of agricultural product
Upgraded	May include, but are not limited to: • Farm crop • Milk and Milk Products • Meat and Meat Products • Poultry Products • Fish and Fish Products • Honey and Honey Products

Evidence Guide	
Critical Aspects of Competence	Candidate must demonstrate the ability to: • Understand concept of value chain • Identify Value chain actors • Apply techniques for value addition • Understand selection technique to develop value chain • Identify potential interventions to value chain analysis • Evaluate value chain addition

	• Contract farming system is established to promote value chain • Describe value chain upgraded and identify environmental issues for value chain development
Required Knowledge and Attitude	A candidate must demonstrate the knowledge and attitude to : • Understand concepts of value chain • Understand and Recognize characteristic of value chain • Understand dimension and structures of value chain • Identify principles of value chain for agricultural production • Identify value chain actors and Illustrate value chain mapping in agricultural product • Identify value chain analysis improve vale chain development • Understand the Bench mark analyze to develop value chain analysis • Observe environmental issue to upgrade Value chain • Determine value chain upgrade and focus on Value chain addition
Required Skills	A candidate must demonstrate the Skills to : • Identify concepts of value chain • Recognize and describe characteristic of value chain • Describe dimension and structures of value chain • Apply principles of value chain for agricultural production • Classify value chain actors and Illustrate value chain mapping in agricultural sector • Analyze the Bench mark to develop value chain analysis • Apply value addition and determine value chain upgrade development value chain analysis • Contract farming system is established to promote value chain • Describe value chain upgraded and identify environmental issues for value chain development
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

List of participants

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