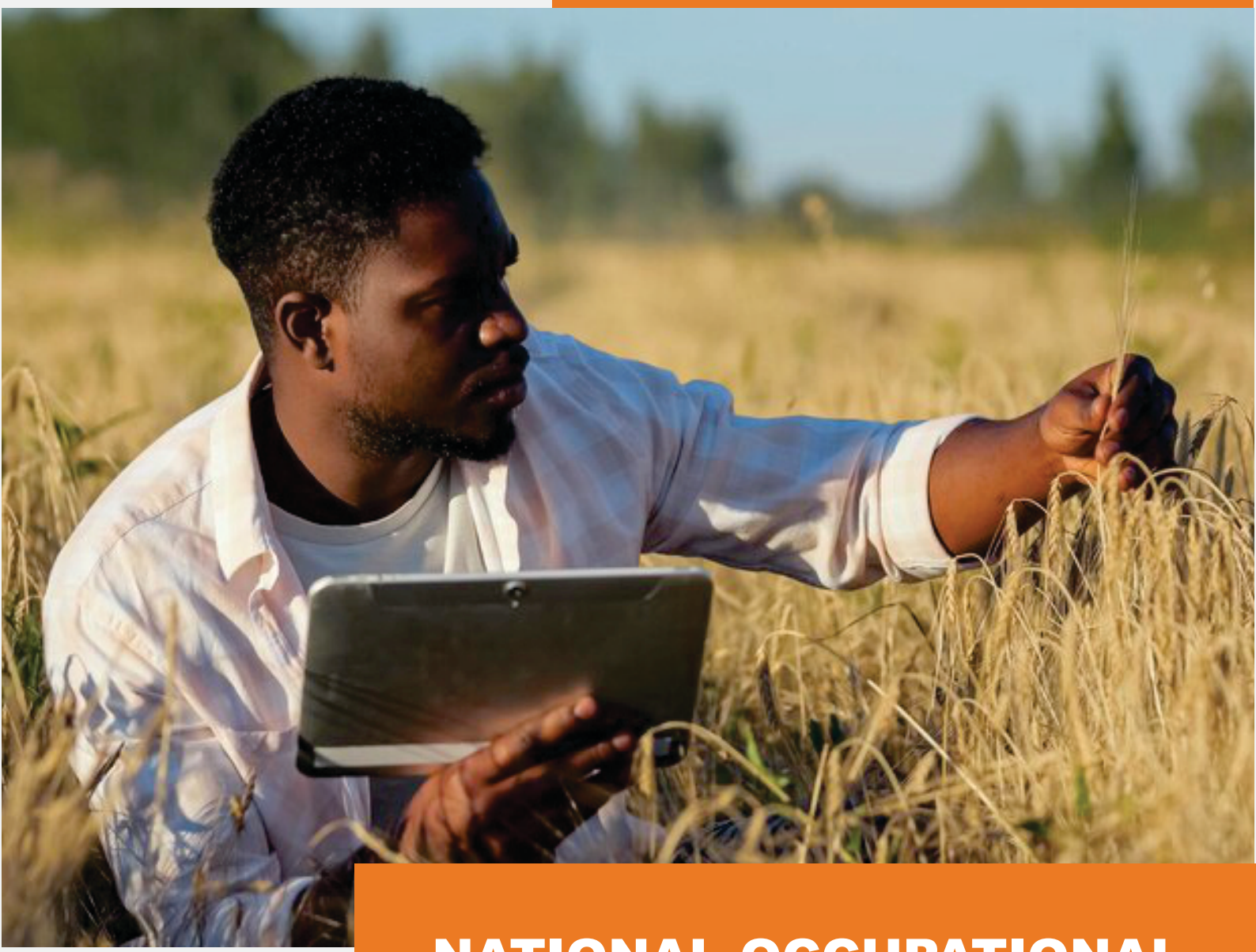
Zambia Qualifications Authority

You Learn, We Standardize



NATIONAL OCCUPATIONAL STANDARD FOR AGRONOMIST

NOS.A.01
First Edition

APPROVING AUTHORITY

This National Occupational Standard has been prepared and published under the authority of the Zambia Qualifications Authority Board on 19th May, 2022.

ZAMBIA QUALIFICATIONS AUTHORITY

The Zambia Qualifications Authority Act No. 13 of 2011 was enacted by the Government of the Republic of Zambia to ***"provide for the development and implementation of a national qualifications framework; establish the Zambia Qualifications Authority; provide measures to ensure that standards and registered qualifications are internationally comparable; and provide for matters connected with, or incidental to the foregoing".*** Among other functions, ZAQA is responsible for ***determining national standards for any occupation***, through various sector specific National Occupational Standards Development Teams (NOSDTs).

REVISION OF NATIONAL OCCUPATIONAL STANDARDS

National Occupational Standards shall be revised after every **5 years**, or whenever necessary, by the issue of either amendments or of revised editions. It is important that users of National Occupational Standards (NOS) ascertain that they are in possession of the latest amendments or editions.

NOS DEVELOPMENT TEAM RESPONSIBLE

This National Occupational Standard was prepared by the Agriculture National Occupational Standards Development Team, upon which the following organisations were represented:

1. Agricultural Institution of Zambia (AIZ)
2. Aquaculture Development Association of Zambia
3. CropLife Zambia
4. Ministry of Fisheries and Livestock (Department of Fisheries)
5. Golden Valley Agricultural Research Trust (GART)
6. Katete College of Agricultural Marketing
7. Ministry of Agriculture (Department of Agriculture)
8. Mulungushi University (MU)
9. Natural Resources Development College (NRDC)
10. University of Zambia (UNZA)
11. Veterinary Council of Zambia
12. Zambia Agriculture Research Institute (ZARI)
13. Zambia National Farmers Union (ZNFU)
14. Zambia Seed Trade Association (ZASTA)

ACKNOWLEDGEMENT

The Zambia Qualifications Authority would like to acknowledge the invaluable support of the following stakeholders that participated in the development of this National Occupational Standard:

1. Dr. Amy Kingdom (Zambia National Farmers Union - ZNFU)
2. Dr. BatisebaTembo (Zambia Agriculture Research Institute - ZARI)
3. Dr. Elias Kantashula (University of Zambia - UNZA)
4. Dr. Joself M. Chileshe (University of Zambia - UNZA)
5. Maj. Nelson kaluba (Rtd)(Aquaculture Development Association of Zambia)
6. Mr. Alex Dennis Chilala (Zambia Agriculture Research Institute – ZARI)
7. Mr. Davis Mwanza (Natural Resources Development College - NRDC)
8. Mr. Enerst Muzukutwa (CropLife Zambia/ZASTA)
9. Mr. Johnstone Mfula (Ministry of Fisheries and Livestock (Department of Fisheries)
10. Mr. Malumo Nawa (Ministry of Agriculture (Department of Agriculture)
11. Mr. Masautso E. Sakala (Natural Resources Development College - NRDC)
12. Mr. Mathews Ngosa (Agricultural Institution of Zambia (AIZ))
13. Mr. Shadreck C. Mubanga (Golden Valley Agricultural Research Trust - GART)
14. Mr. Stanford Phiri (Katete College of Agricultural Marketing)
15. Mr. Joseph T. Mwale (Mulungushi University)
16. Mrs. Precious Hamusute (Veterinary Council of Zambia)
17. Ms. Eva N. Kaonga (University of Zambia - UNZA)
18. Ms. Sylvia H. N'gandu (University of Zambia - UNZA)
19. Mr. Fidelis Cheelo (Zambia Qualifications Authority)
20. Miss Womba Soneka (Zambia Qualifications Authority)
21. Mr. Modest Hamalabbi (Zambia Qualifications Authority)

TABLE OF CONTENTS

FOREWORD

The Zambia Qualifications Authority (ZAQA) is a statutory body under the Ministry of Education established by ZAQA Act No. 13 of 2011 to "***provide for the development and implementation of a national qualifications framework; provide measures to ensure that standards and registered qualifications are internationally comparable; and provide for matters connected with, or incidental to the foregoing****".*

Among other functions, ZAQA is responsible for ***"determining national standards for any occupation"***, through various sector specific National Occupational Standards Development Teams (NOSDTs) of experts composed of representation from appropriate authorities, government departments, industry, academia, regulators, consumer associations and non-governmental organisations, etc.

This National Occupational Standard (NOS) has been developed by the Agriculture National Occupational Standards Development Team in accordance with the procedures and guidelines of ZAQA. All users should ensure that they have the latest edition of this publication as National Occupational Standards are revised from time to time.

This NOS shall be used by, among others, industry, employers, quality assurance bodies, awarding and professional bodies and education and training institutions, as a benchmark to identify training needs, develop job profiles/descriptions, develop curricula and learning programmes, in various sectors where the occupation exists. In the Agriculture sector, demonstration of competence against this NOS may be required in order to run a business or practice a craft or profession.

JUSTIFICATION

In a world of increasing food and nutritional demands as well as climate change and variability, crop diversification, food production and productivity and climate smart technologies are inevitable.

Agronomy by definition is an applied science that looks at agriculture from an integrated, holistic perspective. An agronomist is an important person in the field of agriculture. He/She integrates plant and soil science and ensures increased production and productivity that guarantees household food security and incomes, offering technical advice on the best practices of growing plants and soil management as well as carrying out research studies, analysing and interpreting results.

ACRONYMS AND ABBREVIATION

CS	Core Skill
ICT	Information Communication Technologies
NOS	National Occupational Standard
NOSDT	National Occupational Standards Development Team
OK	Organisational Knowledge
PC	Performance Criteria
PPE	Personal Protective Equipment
PS	Professional Skill
RK	Regulatory Knowledge
RPL	Recognition of Prior Learning
TK	Technical Knowledge
ZAQA	Zambia Qualifications Authority
ZQF	Zambia Qualifications Framework

GLOSSARY OF TERMS

For the purposes of this NOS, the following terms and definitions shall apply:

Core Skills/Generic Skills: are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.

Function: is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.

Job Title: defines a unique set of functions that together form a unique employment opportunity in an organisation.

Knowledge and Understanding: are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

National Occupational Standards (NOS): are statements of the standards of performance individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding. They are precise descriptions of what an individual is expected to be able to do in his/her work role.

National Occupational Standards (NOS) Code: is a unique reference code that identifies a NOS.

National Occupational Standards Development Team (NOSDT): means an established group of national stakeholders/experts responsible for the development of National Occupational Standards within a specific economic sector or occupation.

Occupation: is a set of job roles, which perform similar/related set of functions in an industry.

Organisational Context: includes the way the organisation is structured and how it operates, including the extent of operative knowledge that managers have in their relevant areas of responsibility.

Performance Criteria: are statements that together specify the standard of performance required when carrying out a task.

Scope: is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.

Sector: is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.

Sub Sector: is derived from a further breakdown based on the characteristics and interests of its components.

Technical Knowledge: is the specific knowledge needed to accomplish specific designated responsibilities.

Unit Title: gives a clear overall statement about what the incumbent should be able to do.

1. OVERVIEW

This NOS will describe what an Agronomist must do and should know as well as skills and knowledge required including risks and challenges for one to qualify to be suited for this occupation.

NOS Code	NOS. A.01
Occupation	Agronomist
Job Title	Agronomist
Job Description	An Agronomist should work towards increased crop production and productivity to ensure food security, nutrition and household incomes. The job holder is required to do the following; Planning for the subsequent cropping season to ensure timeliness. Conducting research that responds to agronomic challenges. Implementing all crop/plant husbandry practices ranging from land preparation to harvesting. Designing, initiating, training and disseminating strategies in improving crop production and management. Providing support and knowledge of agricultural products to clients to create demand.
Job Purpose	Develop and promote improved agronomic practices and packages that enhance increased and sustainable agricultural production and productivity.
ZQF Level	7
Sector	Agriculture
Sub sector	Crop production Agricultural research Forestry Livestock Agribusiness
Other Economic Sector(s) in which the Occupation is Practiced	Insurance Companies Financial institutions Mining
Other Similar Jobs that can be performed by an Agronomist	Lecturer, Teacher, Agro-forester, Agricultural Extension Officer, Farm manager, Agricultural officer, Pasture specialist, Production manager Seed technologist and Farmer (small to commercial farmer)
Minimum Educational Job Entry Qualification(s)	Bachelor's Degree in Agriculture
Practicing License Requirements (if any)	
Training/RPL	Plant and Soil sciences
Minimum Job Entry Age	21
Prior Experience	
Performance Criteria	As described in the Units under Section 4

2. SCOPE

This National Occupational Standard specifies the fundamental knowledge and understanding, skills and competences that an Agronomist must possess to be successful in his/ her job role. It is applicable to Agronomists working in public or private organisations or self-employed.

3. PERSONAL ATTRIBUTES (VALUES, ETHICS AND ATTITUDES)

This job requires an individual to possess:

- Creativity
- Problem solving skills
- Analytical skills
- Mathematical skills
- Entrepreneurial skills
- Integrity and respect for confidentiality
- Interpersonal skills
- Commercial Awareness
- Attention to details
- Ability to communicate effectively and clearly
- Self-motivated and team worker
- Ability to plan and prioritize,
- Quality consciousness
- Occupational health and safety oriented

4. UNITS AND ELEMENTS

This National Occupational Standard is divided into 06 Units representing the tasks that a job holder should undertake in his/her day to day work. Each unit is further broken down into elements depicting the number of activities to be carried out for the successful execution of a particular task.

UNIT 1 [This unit is about Health, Safety and Environment].

Unit No.	**01**
Unit Title	**Health, Safety and Environmental Management**
Description	This unit is about maintaining safety, health and environmental protection for the individual and the plant.
Scope	This unit covers the following: • Health & safety regulations • Environmental protection
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Health & safety regulations	To be competent, the individual must be able to: PC1. Read, interpret and implement national and organisational safety and health policies and regulations. PC2. Assess risks and possible safety hazards of all aspects of operations
Environmental protection.	To be competent, the individual must be able to: PC3. Read, interpret and implement the environmental policies for the organisation PC4. Read, interpret and implement environmental standard operating procedures and policies of the organisation PC5. Read, interpret and implement national and global environmental regulations.
Knowledge and Understanding (K)	
A. Organisational Context (Knowledge of the company/ organisation and its processes)	The individual on the job must demonstrate knowledge and understanding of: OK1. Company Quality, health, and safety policies OK2. Company environmental policies OK3. Company regulations and global best practices
B. Technical Knowledge	The individual on the job must demonstrate knowledge and understanding of: TK1. Safety and health risk assessment TK2. Environmental Risk assessment TK3. Toolbox talk
C. Regulatory context (Knowledge of Rules and Regulations)	The individual on the job must demonstrate knowledge and understanding of : RK1. Regulatory requirements for health & safety
Skills (S)	
	Writing Skills

A. Core Skills/ Generic Skills	The individual on the job must be able to: CS1.Write in English and give simple concise instructions.
	Reading Skills
	The individual on the job must be able to: CS2.Read and interpret internal/external documents. CS3.Read and understand manuals, health and safety instructions, memos, and other company documents. CS4.Demonstrate the ability to read from different sources- books, screens in machines, and signage. CS5.Understand the various colour codes, nomenclature, and acronyms related to the profession.
	Oral Communication (Listening and Speaking skills)
	The individual on the job must be able to : CS6. Express statements or information clearly so that others can hear and understand. CS7. Participate in and understand the main points of simple discussions. CS8. Respond appropriately to any queries.
B. Professional Skills	**Decision Making**
	The individual on the job must be able to: PS1. Follow organisation rule-based decision-making process. PS2.Take decision with systematic course of actions and/or response.
	Plan and Organise
	The individual on the job must be able to: PS3. Plan and organise work to meet deadlines. PS4. Work constructively and collaboratively with others.
	Customer Centricity
	The individual on the job must be able to: PS5. Follow code of conduct. PS6. Manage relationships with customers with intent on satisfying its requirements for service delivery.
	Problem Solving and Decision Making
	The individual on the job must be able to: PS7. Recognise problems and search for solutions. PS8. Choose best methods to complete assigned tasks. PS9. Approach relevant authority when required. PS10. Judiciously use common sense in day to day activities
	Analytical Thinking
	The individual on the job must be able to: PS11.Apply domain knowledge, observations and data to select course of action to perform tasks

	Critical Thinking
	The individual on the job must be able to: PS12. Critically evaluate information obtained from customers, supervisor and co-workers to perform day to day activities. PS13. Examine relevant questions for better understanding.

UNIT 2 [This unit is about planning for the subsequent cropping season to ensure timeliness].

Unit No.	**02**
Unit Title	**Planning for the subsequent cropping season to ensure timeliness**.
Description	This Unit is about planning for the subsequent cropping season to ensure timeliness. The job holder will be responsible for ensuring that the next cropping season is implemented on time. He or she should have a proper understanding of issues relating to weather patterns in that area, should decide on what crops to grow based on the set objectives of that company and understand the crop growing periods, competing needs of the farm equipment, human resource and labour demands, company financial regulations. He/ she should have basic knowledge in project management, agribusiness management, agro-climatology and a broad range of relevant skills
Scope	This Unit covers the following: • Market research • Budgeting and resource mobilisation • Preparation of field activities
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Market Research	To be competent, the individual must be able to: PC1. Use appropriate methods for conducting market surveys PC2. Identify available markets and consumer preferences
Budgeting and resource mobilisation	To be competent, the individual must be able to: PC3. Indicate all the growing costs per unit area of the crop being produced (e.g., fuel, land preparation, irrigation, planting, weeding, and so on) PC4. Ensure purchase or hire of tools and equipment/ machinery as approved by the superior and according to enterprise strategies. PC5. Organise according to the order of activities the delivery of materials and equipment/machinery to the site. PC6. Ensure the personnel are organized to be on site when they are required.
Preparation of field activities	To be competent, the individual must be able to: PC7. Clarify with the superior or collaborating institution the requirements of the fieldwork or project. PC8. Identify the people to work with, farm implements and other gargets or equipment, material resource, and other requirements according to the scope of work/ project and supervisors' instructions. PC9. Outline the order of activities and time allocation. PC10. Identify the risks involved in the proposed work site activities and the likely outcomes. PC11. Assess environmental and other risks involved in conducting the proposed field activities.

	PC12. Select personal protective equipment (PPE) to be used, maintained, and stored according to the type of worksite activities to be undertaken. PC13. Ensure all farming implements are calibrated and in good working conditions. PC14. Ensure all the tractors and implements are serviced to be used in the identified cropping activities.
Knowledge and Understanding (K)	
A. Organisational Context (Knowledge of the company/ organisation and its processes)	The individual on the job must demonstrate knowledge and understanding of: OK1.Relevant legislation, standards, policies, and procedures in work OK2. Relevant health and safety requirements applicable in the work environment OK3.Own job role and responsibilities and sources for information pertaining to work OK4.Who to approach for support in order to obtain work-related information, clarifications, and support OK5. The health, hygiene, safety, and quality standards and the impact of not following the standards on consumers and the business OK6. Documentation and related procedures applicable in the context of work
B. Technical Knowledge	The individual on the job must demonstrate knowledge and understanding of: TK1. Cropping history and field sizes TK2. Record keeping TK3. Different weather equipment and their use TK4. Soil and plant health (knowledge of various available forms of chemical elements) TK5. Labour requirements and management (Man days required per unit area of production, labour laws, working hours and labour costs) TK6. Available implements and their competing needs TP7. Resource mobilisation and company financial regulations TK8. Reporting structure of the organisation
Skills (S)	
A. Core Skills/ Generic Skills	**Reading Skills**
	The individual on the job must be able to: CS1. Read internal information documents sent by internal teams/ supervisor CS2. Update one-self about the latest technologies by reading research articles, attending seminars, workshops, etc. CS3. Read equipment manuals and process documents to understand the equipment operation and process requirement
	Writing Skills
	The individual on the job must be able to: CS4. Record and maintain all the information regarding equipment, farm power and machinery, weather, human resource, financials, and so on.

	CS5. Write reports
	Oral Communication (Listening and Speaking skills)
	The individual on the job must be able to: CS6. Effectively communicate with the staff, colleagues, and relevant stakeholders CS7. Demonstrate skills of being polite and courteous under all circumstances.
B. Professional Skills	**Decision Making Skills**
	The individual on the job must be able to demonstrate the following skills : PS1. Prioritising PS2. Problem-solving PS3. Leadership. PS4. Reasoning. PS5. Intuition. PS6. Teamwork. PS7. Emotional Intelligence. PS8. Creativity. PS9. Time management
	Plan and Organise
	The individual on the job must be able to: PS10. Plan and organise the work order and jobs received from the supervisor. PS11. Plan and prioritise the work based on the instructions received from the supervisor. PS12. Plan to utilise time and equipment effectively
	Customer Centricity
	The individual on the job must be able to: PS13. Manage good relationships with the supervisor and colleagues
	Problem Solving Skills
	The individual on the job must be able to: PS14. Quickly identify problems and solve them immediately
	Analytical Thinking
	The individual on the job must be able to: PS15. Demonstrate rigorous knowledge of scientific ideologies of the agronomy PS16. Demonstrate proven knowledge of planning and resource mobilisation PS17. Think analytically to come up with solutions.
	Critical Thinking
	The individual on the job must be able to: PS18. Determine how to effectively reduce operational costs

UNIT 3 [This unit is about developing innovative research based techniques in plants and soils].

Unit No.	**03**
Unit Title	**Developing innovative research based techniques in plants and soils**
Description	This Unit is about identifying the knowledge gaps, agronomic challenges and carrying out research. The job holder will be responsible for identifying research needs, writing protocols to respond to the needs, setting up the experiments, collecting data, analyzing the data, and publishing the findings with minimal supervision. The agronomist may have research technicians to help him/ her in certain instances depending on the organisation or may only work with casuals or farmers or institutions. The job holder should have basic knowledge of biostatistics, plant science, soil science, pest control, communication skills, and broad range of relevant skills.
Scope	This Unit covers the following: • Problem identification • Develop appropriate research protocols • Setup the experiment • Data Collection • Analysis and interpreting results • Dissemination of innovative findings • Collaboration with key scientists
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Problem identification	To be competent, the individual must be able to: PC1. Outline the farmers' or consumers' needs or challenges. PC2. Identify clearly the knowledge gap PC3: Develop a detailed problem statement that includes the problem's effect.
Develop appropriate research protocols	To be competent, the individual must be able to: PC4. Describe the subject matter PC5.Design the protocol format specific to the funding organisation or institution PC6. Write a research protocol singularly or in collaboration with other scientists
Setup the experiment,	To be competent, the individual must be able to: PC7: Select suitable site (s) for the experiment

	PC8. Identify the appropriate experimental design to use in the study. PC9. Successfully setup the research experiment based on the identified design.
Data collection	To be competent, the individual must be able to: PC10. Use appropriate data collection tools PC11. Plan for the whole process PC12. Ensure correct data collection methods and procedures are conducted at the right time. PC13. Keep data safe and easily accessible to team members PC14. Demonstrate the ethics of data collection
Analysis and interpreting results	To be competent, the individual must be able to: PC15. Analyse the collected data using appropriate software PC16. Interpret results and prepare a report
Dissemination of innovative findings	To be competent, the individual must be able to: PC17. Write reports PC18. Publish using electronic media PC19. Present research findings to the public PC20. Demonstrate and organise field days/ fairs/ expos
Collaboration with key scientists	To be competent, the individual must be able to: PC21. Identify potential customers and strategic partners within and outside the country PC22. Liaise with public and private sector partners in the design and implementation of trials as well as demonstrations PC23. Manage customer and partner relationships
Knowledge and Understanding (K)	
A. Organisational Context (Knowledge of the company/ organisation and its processes)	The individual on the job must demonstrate knowledge and understanding of: OK1. Relevant legislation, standards, policies, and procedures in work OK2. Relevant health and safety requirements applicable in the work environment OK3. Own job role and responsibilities and sources for information pertaining to work OK4. Who to approach for support in order to obtain work-related information, clarifications, and support OK5. The health, hygiene, safety, and quality standards and the impact of not following the standards on consumers and the business OK6. Documentation and related procedures applicable in the context of work
B. Technical Knowledge	The individual on the job must demonstrate knowledge and understanding of: TK1. Setting up experiments, data collection, and analysis TK2. Plant and soil nutrition requirements TK3. Sustainable agriculture farming methods

	TK4. Integrating trees into agriculture to promote sustainable crop production TK5. Pasture growing and management TK6. Common weeds, their effect on crop production and control TK7. Agribusiness management TK8. Common pests and diseases that attack various plants or crop of interest and management or control methods to use TK9. Different sources of farm power and their operation TK10.Equipment available on the farm, their operation and maintenance
Skills (S)	
A. Core Skills/ Generic Skills	**Reading Skills**
	The individual on the job must be able to: CS1. Read internal information documents sent by internal teams/ supervisor CS2. Update one-self about latest technologies by reading research articles, attending seminars, workshops, etc. CS3. Read equipment manuals and process documents to understand the equipment operation and process requirement
	Writing Skills
	The individual on the job must be able to: CS4. Record and maintain all the information regarding agricultural research CS5. Write and publish in scientific journals CS6. Summarise the work in PowerPoint presentation CS7. Develop manuals and posters
	Oral Communication (Listening and Speaking skills)
	The individual on the job must be able to: CS8. Effectively communicate with the staff, colleagues, and relevant stakeholders CS9. Present the findings using electronic means CS10.Apply skills of being polite and courteous under all circumstances. CS11. Defend his/ her findings effectively CS12. Train effectively
B. Professional Skills	**Decision Making Skills**
	The individual on the job must be able to: PS1. Devise the correct methods for agriculture experimentation (in cases of unforeseen circumstances)
	Plan and Organise
	The individual on the job must be able to: PS2. Plan and organise the work order and jobs received from the supervisor and or collaborating institutions PS3. Plan and prioritise the work based on the instructions received from the supervisor and or collaborating institutions

	PS4. Plan to utilise time and equipment effectively
	Customer Centricity
	The individual on the job must be able to: PS5. Manage good relationships with farmers and collaborators
	Problem Solving Skills
	The individual on the job must be able to: PS6. Quickly identify problems and solve them immediately
	Analytical Thinking
	The individual on the job must be able to: PS7. Rearrange noisy data and information into action PS8. Analyse the information received from officers and specialists PS9. Think analytically to come up with solutions PS10. Develop mind set growth and informed decision making among team members.
	Critical Thinking
	The individual on the job must be able to: PS11. Identify the problem or question PS12. Gather data, opinions and arguments PS13. Analyse and evaluate the data PS14. Identify the assumptions PS15. Measure significance PS16. Make a decision/ reach a conclusion

UNIT 4 [This unit is about implementing crop/plant husbandry practices from land preparation to harvesting].

Unit No.	**04**
Unit Title	**Implementing crop/plant husbandry practices from land preparation to harvesting.**
Description	This Unit is about ensuring sustainable agricultural practices are followed to ensure good crop growth. The job holder will be responsible for ensuring the following are implemented correctly; site selection, sustainable tillage methods, appropriate seeds or seedlings identified and planted, recommended pest and disease control methods, and fertiliser application methods. The job holder should demonstrate basic knowledge of Agriculture engineering, plant agronomy and agroforestry, soil and plant nutrition, integrated pest management, communication skills, and a broad range of relevant skills.
Scope	This Unit covers the following: • Site selection and land preparation • Soil and plant nutrition • Seed biology • Sustainable tillage methods • Planting methods • Weed control • Water management • Integrated pest and disease management • Fertilizer application methods • Crop monitoring • Harvesting
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Site selection and land preparation	To be competent, the individual must be able to: PC1. Assess the soil type and water availability as well as requirements for the particular crop of interest. PC2. Identify the appropriate site on which to grow the crops or plants PC3. Identify the chemical needs for pre-plant soil improvement PC4. Use appropriate tools and equipment needed for cultivation
Soil and plant nutrition	To be competent, the individual must be able to: PC5. Identify plant nutrients and their deficiency symptoms PC6. Analyse and compute nutrient compositions of different fertilizer sources. PC7. Ensure correct soil sampling methods in collecting soil samples are followed and taken for lab testing PC8. Interpret and make recommendations based on lab results
Seed biology	To be competent, the individual must be able to: PC9. Identify the modes of reproduction of the particular plant/ crop and understand their seed dormancy

	PC10. Identify the Seed to be used and consider the importance of seed quality PC11. Ensure the use of viable seeds.
Sustainable tillage methods	To be competent, the individual must be able to: PC12. Identify the appropriate tillage methods PC13. Ensure use of appropriate implements and tillage methods that are climate smart (e.g., use of a ripper)
Planting methods	To be competent, the individual must be able to: PC14.Identify the appropriate plant population that will result in increased production and productivity PC15.Identify the appropriate sowing methods either mechanically or manually PC16.Ensure timely planting with an understanding of the growing period of the crop, weather conditions, and agro-ecological zones
Weed control	To be competent, the individual must be able to: PC17. Identify the different types of weeds PC18. Identify appropriate methods of managing and controlling weeds
Water management	To be competent, the individual must be able to: PC19.Identify the water source, capacity, and crop water demands PC20.Analyse the soil type and recommend the appropriate irrigation facility to suit such soils. PC21. Identify appropriate water harvesting techniques PC22. Enforce efficient water utilisation PC23. Identify appropriate irrigation method to use if need be PC24. Develop an irrigation plan and ensure it is implemented PC25. Facilitate efficient utilisation of ground water and comply to water rights requirements. PC26. Facilitate maintenance of irrigation equipment
Integrated pest and disease management	To be competent, the individual must be able to: PC27. Use resistant cultivars and varieties and cultural practices such as crop rotation that minimize the pressure and maximize biological prevention of pests and diseases. PC28. Identify different sampling methods PC29. Scout regularly and identify beneficial and harmful insects as well as diseases. PC30.Apply pest and disease projecting techniques where available. PC31. Identify levels of action for control PC32. Decide on the appropriate sustainable control method to use, bearing in mind their short- and long-term effects on farm productivity and the environment. PC33.Ensure storage, use, and disposal of agrochemicals conform to legal requirements e.g. registration for individual crops, rates, timings, and pre-harvest intervals. PC34.Ensure only specially trained and knowledgeable staff handle agrochemicals.

	PC35. Maintain accurate records of agrochemical use.
Fertilizer application methods	To be competent, the individual must be able to: PC36.Analyse the advantages and disadvantages of using different methods of fertilizer application PC37.Identify and employ appropriate methods of applying fertilizers to ensure sustainability
Crop monitoring	To be competent, the individual must be able to: PC38. Identify appropriate crop monitoring tools PC39. Conduct regular crop/plant inspections PC40.Backstop to ensure timely control or prevention of crop yield loss PC41.Supervise subordinates and provide the correct guidance based on the crop monitoring
Harvesting methods	To be competent, the individual must be able to: PC42. Identify when a crop has reached its physiological maturity. PC43. Employ appropriate methods of harvesting
Knowledge and Understanding (K)	
A. Organisation-al Context (Knowledge of the company/ organisation and its processes)	The individual on the job must demonstrate knowledge and understanding of: OK1. Relevant legislation, standards, policies, and procedures in work OK2. Relevant health and safety requirements applicable in the work environment OK3. Own job role and responsibilities and sources for information pertaining to work OK4. Who to approach for support in order to obtain work related information, clarifications, and support OK5. The health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business OK6. Documentation and related procedures applicable in the context of work
B. Technical Knowledge	The individual on the job must demonstrate knowledge and understanding of: TK1. Cropping history and field sizes TK2. Record keeping of all inputs and equipment, their status, and competing needs TK3. Different weather equipment and their use TK4. Soil and plant health (knowledge of various available forms of chemical elements) TK5. Labour requirements and management (Man days required per unit area of production, labour laws, working hours, and labour costs) TK6. Sustainable agriculture farming methods TK7. Integrating trees into agriculture to promote sustainable crop production TK8. Pasture growing and management TK9. Common weeds, their effect on crop production and control

	TK10.Common pests and diseases that attack various plants or crops of interest and management or control methods to use TK11. Different sources of farm power and their operation
Skills (S)	
A. Core Skills/ Generic Skills	**Reading Skills**
	The individual on the job must be able to: CS1. Read internal information documents sent by internal teams/ supervisor CS2. Update one-self about latest technologies by reading research articles, attending seminars, workshops, etc. CS3. Read equipment manuals and process documents to understand the equipment operation and process requirement CS4. Read and understand the labels
	Writing Skills
	The individual on the job must be able to: CS5. Record and maintain all the information regarding crop husbandry practices CS6. Write reports
	Oral Communication (Listening and Speaking skills)
	The individual on the job must be able to: CS7. Effectively communicate with the staff, colleagues and relevant stakeholders CS8. Be polite and courteous under all circumstances
B. Professional Skills	**Decision Making Skills**
	The individual on the job must be able to: PS1. Solve problems relating to crop/ plant husbandry practices PS2. Provide Leadership to his/ her subordinates PS3. Show reasoning, intuition, emotional intelligence, teamwork, creativity and time management skills
	Plan and Organise
	The individual on the job must be able to: PS4. Plan and organise the work order and jobs received from the supervisor PS5. Plan and prioritise the work based on the instructions received from the supervisor PS6. Plan to utilise time and equipment effectively
	Customer Centricity
	The individual on the job must be able to: PS7. Manage good relationships with the manager and colleagues
	Problem Solving Skills
	The individual on the job must be able to: PS8. Study the problem and provide a best solution PS9. Quickly identify problems and solve them immediately
	Analytical Thinking
	The individual on the job must be able to: PS10. Analyse the information received from officers and specialists

	PS11. Think analytically to come up with solutions
	Critical Thinking
	The individual on the job must be able to: PS12. Determine how to improve productivity and production PS13. Find innovative solutions for promoting agricultural technology

UNIT 5 [This unit is about designing and disseminating strategies for improving crop production and management]

Unit No.	**05.**
Unit Title	**Designing and disseminating strategies for improving crop production and management**
Description	This unit is about designing and disseminating strategies in order to improve crop production and management
Scope	This Unit covers the following: • Designing improved crop production and management strategies for field staff and farmers • Dissemination of improved crop production and management strategies to field staff and farmers • Monitoring and evaluation of technology update
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Designing of improved crop production and management strategies for field staff and farmers	To be competent, the individual must be able to: PC1. Identify major commodities being produced and their level of production. PC2. Identify social, economic, and environmental opportunities and constraints for specific commodity production. PC3.Assess and identify commodities with high potential for production in the area. PC4. Assess the production practices of farmers and knowledge gaps in the use of improved agricultural technologies. PC5. Identify technologies and services available. PC6. Identify and prioritize technologies with the potential to be promoted. PC7. Identify training needs for farmers and field staff PC8.Design and prepare appropriate crop production and management interventions.
Dissemination of improved crop production and management strategies to field staff and farmers	To be competent, the individual must be able to: PC9. Organise farmers and other stakeholders through appropriate channels PC10.Use appropriate information communication technologies (ICT) to promote specific innovations. PC11. Design and produce appropriate training materials for farmers and field officers. PC12.Conduct training for farmers and field staff in all agronomic related activities. PC13. Set up and conduct various on-farm demonstrations (planning, management, and evaluation)
Monitoring and evaluation of technology uptake	To be competent, the individual must be able to: PC14. Design appropriate data collection tools for technology adoption. PC15. Keep records of all farm demonstrations in easily retrievable formats. PC16. Conduct cost-benefit analysis for the selected technologies. PC17. Use basic research methodologies to measure technology adoption rates.

	PC18. Identify challenges and opportunities to foster technology adoption.
Knowledge and Understanding (K)	
A. Organisational Context (Knowledge of the company/ organisation and its processes)	The individual on the job must demonstrate knowledge and understanding of: OK1. Relevant legislation, standards, policies, and procedures in work OK2. Relevant health and safety requirements applicable in the work environment OK3. Job roles, responsibilities, and sources for information pertaining to work OK4. Who to approach for support in order to obtain work-related information, clarifications, and support OK5. The health, hygiene, safety, and quality standards and the impact of not following the standards on consumers and the business OK6. Documentation and related procedures applicable in the context of work
B. Technical Knowledge	The individual on the job must demonstrate knowledge and understanding of: TK1. Cropping history and field sizes TK2. Record keeping of all inputs and equipment, their status, and competing needs TK3. Different weather equipment and their use TK4. Soil and plant health (knowledge of various available forms of chemical elements) TK5. Labour requirements and management (Man days required per unit area of production, labour laws, working hours and labour costs) TK6. Sustainable agriculture farming methods TK7. Integrating trees into agriculture to promote sustainable crop production TK8. Pasture growing and management TK9. Common weeds, their effect on crop production and control TK10. Common pests and diseases that attack various plants or crops of interest and management or control methods to use TK11. Different sources of farm power and their operation TK12. Reporting structure of the organisation TK13. Rural sociology (how to organise farmers and have access to village communities, communication skills, and adoption-related issues)
Skills (S)	
A. Core Skills/ Generic Skills	**Reading Skills**
	The individual on the job must be able to: CS1. Read internal information documents sent by internal teams/ supervisor CS2. Update one-self about latest technologies by reading research articles, attending seminars, workshops, etc. CS3. Read equipment manuals and process documents to understand the equipment operation and process requirement
	Writing Skills
	The individual on the job must be able to:

	CS4.Record and maintain all the information regarding dissemination CS5. Write manuals, fliers and other related reports
	Oral Communication (Listening and Speaking skills)
	The individual on the job must be able to: CS6. Effectively communicate with the staff, colleagues and relevant stakeholders CS7. Be polite and courteous under all circumstances
B. Professional Skills	**Decision Making Skills**
	The individual on the job must be able to: PS1. Use the correct methods for agriculture knowledge sharing
	Plan and Organise
	The individual on the job must be able to: PS2. Plan and organise the work order and jobs PS3. Plan and prioritise the work PS4. Plan to utilise time and equipment effectively
	Customer Centricity
	The individual on the job must be able to: PS5. Manage good relationships with the manager and colleagues
	Problem Solving Skills
	The individual on the job must be able to: PS6. Study the problem and provide a best solution PS7. Quickly identify problems and solve them immediately
	Analytical Thinking
	The individual on the job must be able to: PS8. Analyse the information received from officers and specialists PS9. Think analytically to come up with solutions
	Critical Thinking
	The individual on the job must be able to: PS10.Determine how to disseminate and improve productivity and production PS11. Find innovative solutions for promoting agricultural technology

UNIT 6 [This unit is about providing support and knowledge of agricultural products to clients].

Unit No.	**06**
Unit Title	**Providing support and knowledge of agricultural products to clients**
Description	This Unit is about providing support and knowledge of agricultural products to clients to create demand
Scope	This Unit covers the following: • Product marketing • Sales and product development
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Product Marketing	To be competent, the individual must be able to: PC1. Train clients on basic concepts of agronomy. PC2. Provide professional advice to clients/farmers on agronomic activities needed to improve or sustain production on a regular basis PC3. Assess all competitors that provide similar services PC4.Maintain industry awareness regarding technical developments through networking, personal development, and training PC5. Actively listen to clients in order to maintain close relations with clients PC6. Assess clients' expectations and provide solutions PC7. Respond to any queries from clients PC8. Maintain a good relationship with clients PC9. Arrange and coordinate various technical and marketing activities such as field days.
Sales and product development	To be competent, the individual must be able to: PC10. Assess the demand and supply of the products and set prices PC11. Ensure products and services are promoted and sold to clients PC12. Keep records of sales and products
Knowledge and Understanding (K)	
A. Organisational Context (Knowledge of the company/ organisation and its processes)	The individual on the job must demonstrate knowledge and understanding of: OK1. Relevant legislation, standards, policies, and procedures in work OK2. Relevant health and safety requirements applicable in the work environment OK3. Own job role and responsibilities and sources for information pertaining to work OK4. Who to approach for support in order to obtain work related information, clarifications and support OK5. The health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business OK6. Documentation and related procedures applicable in the context of work

B. Technical Knowledge	The individual on the job must demonstrate knowledge and understanding of: TK1. Entrepreneurship TK2. Record keeping of all inputs and equipment, their status, and competing needs TK3. Different weather equipment and their use TK4. Soil and plant health (knowledge of various available forms of chemical elements) TK5. Labour requirements and management (Man days required per unit area of production, labour laws, working hours, and labour costs) TK6. Sustainable agriculture farming methods TK7. Integrating trees into agriculture to promote sustainable crop production TK8. Pasture growing and management TK9. Common weeds, their effect on crop production and control TK10.Common pests and diseases that attack various plants or crops of interest and management or control methods to use TK11. Different sources of farm power and their operation TK12. Reporting structure of the organisation TK13. Rural sociology (how to organise farmers and have access to village communities, communication skills, and adoption related issues) TK14. Research TK15. Project management TK16. Product handling and operations
Skills (S)	
A. Core Skills/ Generic Skills	**Reading Skills**
	The individual on the job must be able to: CS1. Read internal information documents sent by internal teams/ supervisor CS2.Update one-self about latest technologies by reading research articles, attending seminars, workshops, etc. CS3. Read product labels and process documents to understand the product functions
	Writing Skills
	The individual on the job must be able to: CS4. Record and maintain all the information regarding agriculture marketing and sales CS5. Write reports CS6. Develop fliers and product plans
	Oral Communication (Listening and Speaking skills)
	The individual on the job must be able to: CS7.Effectively communicate with the staff, colleagues and clients CS8.Show polite and courteous behaviour under all circumstances
B. Professional Skills	**Decision Making Skills**
	The individual on the job must be able to: PS1. Decide on the available market PS2. Decide on product development

	PS3. Decide on issues of value addition PS4. Decide on issues of competition
	Plan and Organise
	The individual on the job must be able to: PS5. Plan for market research PS6. Plan for demonstrations and training PS7. Plan for product development and sales PS8. Plan to utilise time and equipment effectively
	Customer Centricity
	The individual on the job must be able to: PS9. Manage good relationships with the manager and colleagues
	Problem Solving Skills
	The individual on the job must be able to: PS10. Study the problem and provide the best solution PS11. Quickly identify problems and solve them immediately
	Analytical Thinking
	The individual on the job must be able to: PS12. Analyse the markets and information received from officers and specialists PS13. Think analytically to come up with solutions
	Critical Thinking
	The individual on the job must be able to: PS14. Determine how to improve productivity and production PS15. Find innovative solutions for promoting agricultural technology

5. EQUIPMENT, TOOLS AND CONSUMABLE MATERIALS

These include, but not limited to; Computer, Printer, farm implements, machinery and relevant Software programs, Personal protective equipment (PPE).

6. DILEMMAS/CHALLENGES AND COMPLEXITIES FOR A JOB HOLDER

Dilemmas associated with the job of an Agronomist include long working hours, exposure to chemical, physical and biological hazards, time pressure to complete tasks, working in extreme weather conditions such as hot and cold, working in noisy, wet and dusty environments, covering longer distances and working hours.

6.1. Alternative Choices (Solutions) to Dilemmas and Complexities

Solutions to dilemmas include carrying out risk assessment and implementing appropriate control measures, ensuring good time management and planning, participating in workplace safety sensitization and awareness, supporting capacity building through training, managing work stress, adhering to company's safety and standard operating procedures at all times, paying attention to detail, consulting extensively within and outside one's department/team on safety and other issues.

7. WORKING CONDITIONS/ ENVIRONMENT

Working conditions include working in cold, hot and wet conditions, working at heights, drive/ stand/ walk for long hours, working in laboratory environment, working for longer hours, areas that are noisy, dusty and polluted, poor road networks and game areas.

8. PARTIES INVOLVED/ INTERACTING WITH THE JOB HOLDER OR TRAINEE

8.1 Internal/Within the Organisation

Parties involved/interacting with the job holder who are internal to the organisation include supervisors, subordinates, and other employees.

8.2 External/Outside the Organisation

Parties involved/ interacting with the job holder who are external include customers/ clients, government regulators, trainers, suppliers of equipment/ tools/ consumables, occupational health and safety associations, Academia etc.

9. PHYSICAL DEMANDS ON THE BODY

- Physique to sustain strenuous conditions;
- Be able to drive, walk and stand for long periods of time;
- Bend, stretch, twist, or reach out;
- Be able to lift relatively heavy materials, tools and equipment;
- Be able to use fingers, hands and feet with ease to complete the assigned task (dexterity);

ANNEX A

Criteria for Assessments based on this NOS

A.1 Guidelines for Assessment

A.1.1 Criteria for assessment for curricula and learning programmes based on this NOS will be created by curricula and programmes developers. Each Performance Criteria (PC) will be assigned marks proportional to its importance in the NOS. Curricula and programmes developers will also lay down proportion of marks for theory and practical skills for each performance criteria, giving more weight to practical skills.

There shall be allocated the 'Total Mark', which will be the sum of all marks in each Unit, distributed across the number of PCs in that particular Unit. The 'out of' mark will be the mark allocated to each PC, which will be shared between theory and skills practical assessments.

A.1.2 Awarding/assessment bodies or institutions and other users of the NOS will create unique question papers for the theory part and evaluations for skill practical part for their respective candidates.

ANNEX B

NOS Version Control

This Annex gives details necessary for the tracking of the NOS versions based on the number of revisions.

NOS Code	NOS.A.01		
ZQF Level	7	**Version Number**	01
Sector	Agriculture	**Date of Approval**	19th May, 2022
Sub Sector	Crops, agricultural research, forestry, Livestock, and agribusiness	**Date of Last Review**	N/A
Occupation	Agronomist	**Date of Next Review**	May 2027

REGISTERED OFFICE

Zambia Qualifications Authority
Ground Floor, Finsbury Park
P.O Box 51103
Lusaka, Zambia
Tel: +260 211 843050/ 843053
Mobile: +260 963 922 730/ 0956 037 185 / 0972 559 301
Email: info@zaqa.gov.zm
Website: www.zaqa.gov.zm