Zambia Qualifications Authority

You Learn, We Standardize

NATIONAL OCCUPTIONAL STANDARD FOR AN AGRICULTURAL RESEARCH TECHNOLOGIST

NOS.ART.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)
15. Zambia Qualifications Authority (ZAQA)

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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 organizations, 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

An Agricultural Research Technologist is a key personnel in the agriculture research subsector as he/she is responsible for providing technical support in research, field preparations and planting, data collection, harvesting, analysis and reporting. In addition, they are also involved in setting up of laboratory equipment and their maintenance, preparation of laboratory samples and analysis.

ACRONYMS AND ABBREVIATIONS

ART	Agricultural Research Technologist
CS	Core Skill
NOS	National Occupational Standard
NOSDT	National Occupational Standards Development Team
OK	Organizational Knowledge
PC	Performance Criteria
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 is an introductory section providing a brief summary and specific information or commentary about the content of the NOS and the targeted sector and occupation to help the user judge whether it is relevant to them.

NOS Code	NOS.ART.01
Occupation	Agricultural Research Technologist
Job Title	Agricultural Research Technologist
Job Description	An Agricultural Research Technologist is responsible for enforcing health and safety regulations in the field and laboratory, monitoring the preparation of fields, establishing research trials, collection of data, collection of field samples, monitoring harvesting, analysing data, setting up and maintaining laboratory, preparation of laboratory samples and analysis, operating laboratory and field equipment.
Job Purpose	Agricultural Research Technologist is required to provide technical support on all aspects of agriculture such as research and production
ZQF Level	6
Sector	Agriculture
Sub sector	• Agricultural Research • Training institutions
Other Economic Sector(s) in which the Occupation is Practiced	Industry
Other Similar Jobs that can be performed by an Agricultural Research Technologist	• Agriculture extension
Minimum Educational Job Entry Qualification(s)	Diploma
Practicing License Requirements (if any)	N/A
Training/RPL	Prior Training in Agriculture Related Programmes
Minimum Job Entry Age	20 years
Prior Experience	N/A
Performance Criteria	As described in the Units under Section 4

2. SCOPE

This National Occupational Standard specifies the fundamental knowledge and understanding, skills and competencies that an Agricultural Research Technologist must possess to be successful in his/her job role. It is applicable to an Agricultural Technologist 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
- Mathematics 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 4 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 health, safety and environmental protection for the individual and the plant
Scope	This unit covers the following: • Health and 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 organizational 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. Government regulatory agency requirements for health & safety
Skills (S)	
A. Core Skills/ Generic Skills	**Writing 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, other company documents. CS4. Read from different sources- books, screens in machines and signage. CS5. Interpret 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 organization rule-based decision-making process. PS2. Take decisions 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 Recognize 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. Ask relevant questions for better understanding.

UNIT 2 [This unit is about monitoring the preparation of fields, planting and data collection].

Unit No.	**02**
Unit Title	**Field preparation, planting and data collection**
Description	This Unit is about monitoring the preparation of fields, planting and data collection
Scope	This Unit covers the following: • Selecting suitable site for experiment or crop production • Supervision of land preparation and planting • Supervision of weeding and fertilisation • Ensuring proper disease and pest management • Data collection and analysis • Supervision of harvesting
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Selecting suitable site for experiment or crop production	To be competent, the individual must be able to: PC1. Consider field topography, soil type, accessibility of the area PC2. Collect soil samples for testing PC3: Conduct soil analysis PC4. Identify and understand the production of crops in different season PC5. Providing information and advice to clients on land suitability for production
Supervision of land preparation and planting	To be competent, the individual must be able to: PC6. Ensure that regenerative agriculture is practiced (where applicable) PC7. Monitor the ploughing, discing and levelling of the field (where applicable) PC8. Manage trial establishment in conformity with the desired experimental design PC9. Ensure the best time to plant the materials PC10 Ensure use of appropriate planting methods PC11. Employ proper planting spacing and depths
Supervision of Weeding and Fertilisation	To be competent, the individual must be able to: PC12: Timely manage weeds and apply appropriate weed control methods PC13. Apply the right type, form and amount of fertiliser PC14. Apply fertiliser at the right time and consider the prevailing weather conditions PC15. Employ the correct application method
Ensuring proper disease and pest management	To be competent, the individual must be able to: PC16. Check for diseases or pests PC17. In case of a disease outbreak, take appropriate measures to prevent spread of diseases PC18. Diagnose the problem, pest/disease, and treat appropriately PC19. Identify new farming techniques for integrated pest and disease management

Data collection and analysis	To be competent, the individual must be able to: PC20. Record data at the right times using the correct procedure PC21. ensure accuracy and quality of the data collected PC22. Keep data safe and easily accessible PC23. Analyse the collected data using appropriate software PC24. Interpret results
Supervision of harvesting	To be competent, the individual must be able to: PC25. Observe the symptoms at right time to ascertain harvesting PC26. Ensure the crop is harvested at the appropriate stage PC27. Check for appropriate moisture levels before harvesting (crops) PC28. Ensure use of appropriate machines and equipment for harvesting PC29. Monitor activities and performance of helpers during harvesting PC30. Manage storage of harvested 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. Procedures followed in the organization for data collection relevant legislation, standards, policies, and procedures in work OK2. 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. Crop production practices TK2. Soil management practices TK3. Prevalent pest and diseases in the area TK4. Crop protection strategies TK5. Farm management TK6. Basic principles of agriculture research methods and practices TK7. Biostatistics
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 oneself 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 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 experimentation PS2. Analyse critical points in day to day tasks through experience and observation and identify control measures to solve the issue
	Plan and Organise
	The individual on the job must be able to: PS3. Plan and organise the work order and jobs received from the supervisor PS4. Plan and prioritise the work based on the instructions received from the supervisor PS5. Plan to utilise time and equipment effectively
	Customer Centricity
	The individual on the job must be able to: PS6. Manage good relationships with the manager and colleagues
	Problem Solving Skills
	The individual on the job must be able to: PS7. Study the problem and provide a best solution PS8. Identify problems and solve them immediately
	Analytical Thinking
	The individual on the job must be able to: PS9. Analyse the information received from officers and specialists PS10. Think analytically to come up with solutions
	Critical Thinking
	The individual on the job must be able to: PS11. Determine how to improve productivity and production PS12. Find innovative solution for promoting agricultural technology

UNIT 3 [This Unit is about preparation of laboratory samples and analysis].

Unit No.	**03**
Unit Title	**Preparation of laboratory samples and analysis**
Description	This Unit is about preparation of laboratory samples analysis
Scope	This Unit covers the following: • Collection of samples • Sample analysis • Interpretation of results and report writing
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Collection of samples	To be competent, the individual must be able to: PC1. Follow the sampling procedures PC2. Collect/receive samples (crop/soil) from the field using the appropriate method/protocol PC3. Collect samples (crop/soil) at the right time PC4. Collect soil samples at right depth using the correct sampling tools PC5. Obtain the accurate sample PC6. Label the samples for proper identification, this should include the following; date of collection, name of the area where samples were collected, coordinates of area PC7. Prepare samples for analysis, following proper protocols in order to ensure that they will be stored, prepared, and disposed of efficiently and effectively
Sample analysis	To be competent, the individual must be able to: PC8. Analyse collected samples using appropriate analytical tools/ methods for analysing samples
Interpretation of results and report writing	To be competent, the individual must be able to: PC9. Interpret results from the analysis PC10. Write report based on the results
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. Procedures followed in the organization for data collection OK2. Job role and responsibilities and sources for information pertaining to work OK3. Approach for support in order to obtain work related information, clarifications and support OK4. Health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business OK5. 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. Procedures of collecting plant and soil samples TK2. Good laboratory practices TK3. Different types of chemicals/reagent, their use and safe handling TK4. Different types of laboratory equipment, laboratory wares and their use TK5. Uses of different types of laboratory equipment and laboratory wares TK6. Computer Knowledge TK7. Statistics
Skills (S)	
A. Core Skills/ Generic Skills	**Writing Skills**
	The individual on the job must be able to: CS1. Maintain records CS2. Fill data collection forms/reports
	Reading Skills
	The individual on the job must be able to: CS3. Update oneself about latest technologies by reading research articles, attending seminars, conferences etc. CS4. Keep abreast with the latest knowledge by reading brochures, pamphlets, product information sheets etc. CS5. Read relevant newspapers/booklets etc.
	Oral Communication (Listening and Speaking skills)
	The individual on the job must be able to: CS6. Maintain effective relationships with senior officers and specialists CS7. Communicate clearly and effectively with seniors CS8. Communicate precisely CS9. Discuss issues, clarify doubts and seek solutions CS10. Be polite and courteous under all circumstances CS11. Employ etiquette and appropriate body language CS12. Make use of exposure visits to model farms
B. Professional Skills	**Decision Making Skills**
	The individual on the job must be able to: PS1. Make decisions pertaining to sampling method and analysis PS2. Identify problems that may arise in carrying out tasks and take preventive action following workplace procedures
	Plan and Organise
	The individual on the job must be able to: PS3. Plan number of samples to be collected and type of analysis to be conducted
	Customer Centricity
	The individual on the job must be able to: PS4. Establish a relationship with different partners through the immediate supervisors. PS5. Understand customer requirements, their priorities and provide timely response. PS6. Listen carefully and interpret the information given by the partners.
	Problem Solving Skills

	The individual on the job must be able to: PS 7. Think through problems, evaluate the possible solutions, select the best solution and take timely action.
	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 PS10. Apply, analyse and evaluate the information gathered from trainings PS11. Improve/adapt the technologies based on results found from analytical thinking
	Critical Thinking
	The individual on the job must be able to: PS12. Take up his/her own working and learning

UNIT 4 [This Unit is about operating field and laboratory equipment]

Unit No.	**04**
Unit Title	**Operate and maintain laboratory and Field Equipment**
Description	This Unit is about operating field and laboratory equipment
Scope	This Unit covers the following: • Operating laboratory equipment • Operating field equipment • Maintenance of laboratory and field equipment
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria (PC)**
Operating laboratory equipment	To be competent, the individual must be able to: PC1. Demonstrate knowledge of the types of equipment found in the laboratory and their use. PC2. Demonstrate skills to operate laboratory equipment PC3: Get readings from the laboratory equipment PC4: Demonstrate knowledge of, and adherence to handling and safety procedures.
Operating field equipment	To be competent, the individual must be able to: PC5. Demonstrate knowledge of the types of field equipment and their use. PC6. Operate field equipment PC7: Get readings from the field equipment PC8: Demonstrate knowledge of, and adherence to safety procedures.
Maintenance of laboratory and field equipment	To be competent, the individual must be able to: PC9: Carry out daily cleaning of all equipment after use PC10. Identify faults on the equipment PC11. Ensure that repairs are carried out using genuine spare parts PC12. Under take regular maintenance in accordance with the operator's manual PC13. Calibrate equipment regularly PC14. Ensure regular servicing of the equipment and tools PC15. Keep record of the equipment
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. Procedures followed in the organization for operating field and laboratory equipment OK2 Standard procedures for repair and maintenance OK3. Job role and responsibilities and sources for information pertaining to work OK4. Approach for support in order to obtain work related information, clarifications and support

	OK5. 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. Types of laboratory and field equipment on how to operate TK2. Function of different parts of laboratory and field equipment TK3. Importance of repair and maintenance TK4. Safe laboratory operation procedure TK5. Operation and maintenance of various laboratory equipment /instrument
Skills (S)	
A. Core Skills/ Generic Skills	**Writing Skills**
	The individual on the job must be able to: CS1. Note the equipment to use CS2. Maintain records or inventories of all laboratory and field equipment
	Reading Skills
	The individual on the job must be able to: CS3. Update oneself about latest technologies by reading research articles, attending seminars, conferences etc. CS4. Keep abreast with the latest knowledge by reading brochures, pamphlets, product information sheets etc. CS5. Read relevant newspapers/booklets etc.
	Oral Communication (Listening and Speaking skills)
	The individual on the job must be able to: CS6. Maintain effective relationships with all staff and relevant stakeholders CS7. Communicate clearly and effectively with all staff and relevant stakeholders CS8. Discuss issues, clarify doubts and seek solutions CS9. Be polite and courteous under all circumstances CS10. Observe etiquette and appropriate body language
B. Professional Skills	**Decision Making Skills**
	The individual on the job must be able to: PS1. Use the equipment accurately PS2. Decide when to maintain the equipment PS3. Identify problems that may arise in carrying out tasks and take preventive actions following work place procedures.
	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. Establish a relationship with different partners through the immediate supervisors. PS8. Understand customer requirements, their priorities and provide timely response. PS9. Listen carefully and interpret the information given by the partners.
	Problem Solving Skills
	The individual on the job must be able to: PS10. Think through problems, evaluate the possible solutions, select the best solution and take timely action.
	Analytical Thinking
	The individual on the job must be able to: PS11. Analyse the information received on the operation and maintenance of the equipment PS12. Think analytically to come up with solutions PS13. Apply, analyse and evaluate the information gathered from trainings on the operations and maintenance of the equipment PS14. Improve/ adapt the technologies based on results found from analytical thinking
	Critical Thinking
	The individual on the job must be able to: PS15. Find innovative solutions for operating and maintaining both laboratory and field equipment PS16. Take up his/ her own working and learning

5. EQUIPMENT, TOOLS AND CONSUMABLE MATERIALS

These include, but not limited to; Computer, Printer, and relevant Software programs, Personal protective equipment (PPE), moisture meter, measuring cylinders, beakers, crucibles, test tubes, funnels, flasks, microscope, test tubes, , magnifying glasses, weighing machines, Bunsen burners, dropper, tongs, wash bottle spatula, , auger, soil push probe, hammer probe, bucker auger, mortar pestle, sieves.

6. DILEMMAS/CHALLENGES AND COMPLEXITIES FOR A JOB HOLDER

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

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, stand/walk for long hours, working in laboratory environment, working in the field, working in shifts, areas that are noisy and dusty, areas with limited lighting and ventilation.

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

8.1 Internal/Within the Organization

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

8.2 External/Outside the Organization

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 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);
- Etc.

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 Criterion (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 criterion, 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.ART.01		
ZQF Level	6	**Version Number**	01
Sector	Agriculture	**Date of Approval**	19th May 2022
Sub Sector	Agriculture Research Training institutions	**Date of Last Review**	N/A
Occupation	Agriculturalist	**Date of Next Review**	May 2027

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