



National Competency Standards for
“Pesticide & Fertiliser Technology”
(Assistant Technician)

Level-2



National Vocational and Technical Training Commission
(NAVTTTC) Government of Pakistan



TABLE OF CONTENTS

S.No	TABLE OF CONTENTS	Pages
1.	Title of qualifications	1
2.	Introduction	3
3.	Purpose of the qualification	3
4.	Date of Validation	3
5.	Code of qualifications	4
6.	Entry Requirements	4
7.	Members of qualifications development committee	5
8.	Members of qualifications review and validation committee	7
9.	Summary of Competency Standards	8
CORE COMPETENCIES		
CS1	081PF01A - Perform Soil Sampling for Lab Test	16
CS2	081PF01B - Diagnose Plant health problems	17
CS3	081PF01C - Perform Pesticide Pre-Application Tasks	18
CS4	081PF01D - Apply Fertiliser	19
	Complete List of Tools and Equipment	22
Digital Skills		
CS1	724DOT04A - Operate Computer Functions (General)	14
Soft Skills		
CS1	102200843 - Comply with Work Health and Safety Policies	9
CS2	101200829 - Maintain Personal Health, hygiene and safety	11
CS3	073200592 - Perform Basic Communication skills	12



INTRODUCTION

Fertilisers and Pesticides have extensive application all around the globe including Pakistan, considered as a vital component of modern farming. The main objective of Fertilisers application is to enrich soil with essential nutrients to attain higher crop yield. The application of manure for nutrient was the principal fertilizer method for quite some time, but in 1940's the chemical-based Fertilisers rapidly gained great attention. Today, Fertilisers are available in many forms and are extensively used to enhance crop growth and production. Pesticides are the chemicals, used to target the weeds and insects which pose threat to crop production both in field and store conditions.

Efficient application of fertilizer and Pesticides is very crucial for agriculture sector. Government of Pakistan investing millions of rupees by offering subsidies on Fertilisers and Pesticides, but the outcomes are not achieving the set-targets. Knowledge regarding soil chemistry, insect behavior and morphology are the important criteria for dose recommendation. The purpose of this course is to enable the candidate to play his/her vital role to adopt economically feasible and environmentally sustainable approaches. In short, the main objective of this study pack is to minimize the input cost and generates the product in accordance with international standards.

To become more beneficial "Fertiliser and pesticide technician" he/she must be vigilant and smart accordingly, and for the purpose they need to work on the first impression, manipulating procedures to highlight the importance of the product, knowing professional metrics and being responsive etc.

PURPOSE OF THE QUALIFICATION

The competency based NVQ has been developed to train the unskilled men and women of Pakistan on the technical and entrepreneurial skills to be employed / self-employed and inevitably set sustainable impact on their lives by increase in their livelihood income generation.

The purpose of these qualifications is to set professional standards for Fertiliser and



Pesticide technician, who will serve as key elements enhancing quality of Pakistan Agriculture sector. The specific objectives of developing these qualifications are as under:

- Improve the professional competence of Fertiliser and pesticide industry
- Capacitate the local community and trainers in modern CBT trainings, methodologies and processes as envisaged under NVQF
- Provide flexible pathways and progressions in Fertiliser and pesticide industry
- Enable the trainees to perform their duties in efficient manner
- Establish a standardized and sustainable system of training in Fertiliser and pesticide industry in Pakistan

DATE OF VALIDATION

This national vocational qualification (NVQ) has been validated by the Qualifications Development Committee (QDC) in January 2021 and will remain in currency until 2023

CODE OF QUALIFICATIONS

Qualification Title	Code
National Vocational Certificate Level 5, in Pesticide & Fertiliser Technology (Assistant Technician)	081PF01

ENTRY REQUIREMENTS

- For National Vocational Certificate Level-2 in Pesticide & Fertiliser Technology, the entry requirement is Matriculation or equivalent to Matriculation.

QUALIFICATIONS DEVELOPMENT COMMITTEE

The following members participated in the qualification development of these



qualifications:

Sr. No.	Name	Designation	Organization
1.	M. Asim	Assistant Director, NAVTTC Co-ordinator	NAVTTC HQ, Islamabad
2.	Ms. Mehwish Aisha	DACUM Facilitator	CBT Expert/Certified Assessor
3.	Dr Shah Alam Khan	Chairman Plant Protection	The University of Agriculture, Peshawar
4.	Dr Adnan Zahid	Lecturer	Institute of Agricultural Sciences, University of Punjab
5.	Dr Sumaira Maqsood	Assistant Professor/Entomologist	Institute of Agricultural Sciences, University of Punjab
6.	Mr Saeed Alam Malik	CEO	Pestex, Lahore
7.	MsHina Ashraf	PhD Scholar	Institute of Agricultural Sciences, University of Punjab
8.	Ms Noor Ul Ain	M. Phill Scholar	Institute of Agricultural Sciences, University of Punjab
9.	Mr Abid Hussain Shah	Agronomist	Philip Morris Mardan, Pakistan LTD
10.	Faiz Ur Rehman	CEO	Pest Out, PVT. LTD.
11.	Mr Nisar Hussain	General Manager	R&D Tara Group Pakistan
12.	Mslqra Haider Khan	PhD Scholar	Institute of Agricultural Sciences, University of Punjab
13.	Mr Ch. Athar Amin	Principal Engineer	PCSIR, Lahore
14.	MrKhwaja Junaid	Lecturer	The University of Agriculture, Peshawar
15.	Muzamil Usman Khan	Consultant	Greenlands PVT. Limited

QUALIFICATIONS REVIEW AND VALIDATION COMMITTEE

The following members participated in the qualification development of these



qualifications:

Sr. No.	Name	Designation	Organization
1.	M. Asim	Assistant Director, NAVTTC Co-ordinator	NAVTTTC HQ, Islamabad
2.	Ms. Mehwish Aisha	DACUM Facilitator	CBT Expert/Certified Assessor
3.	Mr. Shaukat Ali Rana	Controller	PBTE
4.	Engr. Rizwan Ahmed	Assistant Manager	Punjab TEVTA
5.	Mr. Haider Ali	Assistant Manager	Punjab TEVTA
6.	Mr Saeed Alam Malik	CEO	Pestex, Lahore
7.	MissHina Ashraf	PhD Scholar	Institute of Agricultural Sciences, University of Punjab
8.	Mr. Ibrahim Anwar	Lecturer	KP TEVTA
9.	Mr. Abid Hussain Shah	Agronomist	Philip Morris Mardan, Pakistan LTD
10.	Mr. Faiz Ur Rehman	CEO	Pest Out, PVT. LTD.
11.	Mr. Iqra Haider Khan	PhD Scholar	Institute of Agricultural Sciences, University of Punjab
12.	Mr. Ch. Athar Amin	Principal Engineer	PCSIR, Lahore
13.	Muzamil Usman Khan	Consultant	Greenlands PVT. Limited
14.	Mr. Muhammad Asif	Master Trainer	Off Season Vegetable Production Lahore
15.	Mr Nisar Hussain	General Manager	R&D Tara Group Pakistan



SUMMARY OF COMPETENCY STANDARDS

“Pesticide & Fertiliser Assistant Technician”

(6 Months)

Code	Competency Standards	Level	Theory		Practical		Total	
			C	Hr.	C	Hr.	C	Hr.
1.	Comply with Work Health and Safety Policies	2	2	20	1	10	3	30
2.	Maintain Personal Health, hygiene and safety	2	2	20	1	10	3	30
3.	Perform Basic Communication Skills	2	2	20	1	10	3	30
4.	Operate Computer Functions (General)	2	1	10	2	20	3	30
5.	Perform Soil Sampling	2	2	20	9	90	11	110
6.	Diagnose Plant health problems	2	2	20	10	100	12	120
7.	Perform Pesticide Pre-Application Tasks	2	2	20	11	110	13	130
8.	Apply Fertiliser	2	2	20	10	100	12	120
Total			19	190	15	150	45	450



Competency Standard A: 102200843 Comply with Work Health and Safety Policies

Overview: This unit describes the performance outcomes, skills and knowledge required to apply general work health and safety requirements in the workplace. Communicate work and health safety assess at work place. It describes generic work health and safety responsibilities applicable to employees without managerial or supervisory responsibilities.

Competency Units	Performance Criteria
<p>CU1. Work safely at work place</p>	<p>You must be able to:</p> <p>P1. Identify relevant organizational safety policies and procedures</p> <p>P2. Categorize tools and equipment as per requirements</p> <p>P3. Maintain tools and equipment</p> <p>P4. Follow established safety procedures during work activities</p> <p>P5. Identify existing or potential safety issues to designated persons</p> <p>P6. Report work-related incidents and accidents to supervisor</p> <p>P7. Take necessary measures to minimizing risks</p>
<p>CU2. Communicate work health and safety (WHS) assess at work place</p>	<p>You must be able to:</p> <p>P1. Raise work health and safety issues with supervisor.</p> <p>P2. Contribute to workplace meetings and other consultative processes for work health and safety management at the workplace</p> <p>P3. Make suggestions for improving work health and safety practices</p>
<p>CU3. Minimize risks to personal safety at work place</p>	<p>You must be able to:</p> <p>P1. Identify situations that may endanger the personal safety</p> <p>P2. Document the incident regarding personal safety at work place</p> <p>P3. Eliminate workplace hazards regarding personal safety</p> <p>P4. Identify damaged items and equipment for personal safety</p> <p>P5. Notify supervisor regarding damaged items and equipment for personal safety</p>



CU4. Minimize risks to public safety	You must be able to: P1. Identify situations that may endanger the public safety P2. Document the incident at work sites P3. Eliminate workplace hazards at work sites P4. Identify damaged items and equipment related to public safety P5. Notify Situation that may endanger situation for safety measures.
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Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1.** Identify the commonly used tools and equipment used at workplace.
- K2.** Rights and responsibilities of employers and employees
- K3.** Consultative processes to manage and monitor health and safety issues to enable active participation in maintaining a safe workplace
- K4.** State potential hazards in the workplace
- K5.** State commonly used hazard signs and safety symbols

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

1. Identify health and safety policies to maintain and avoid any unwanted incident.



Competency Standard B: Maintain Personal Health, Hygiene and Safety - 101200829

Overview: This Competency Standard identifies the competencies required to protect/apply occupational Safety, Health and Environment at workplace according to the industry's approved guidelines, procedures and interpret environmental rules/regulations. Trainee will be expected to identify and use Personal Protective Equipment (PPE) according to the work place requirements. The underpinning knowledge regarding Observe Occupational Safety and Health (OSH) will be sufficient to provide the basis for the job at workplace.

Competency Units	Performance Criteria
CU1. Identify Hazards at Workplace	<p>You must be able to:</p> <p>P1. Interpret work processes and procedures correctly to identify risk to Health, hygiene and safety at workplace</p> <p>P2. Recognize processes, tools, equipment and consumable materials that have the potential to cause harm</p> <p>P3. Prepare Report of the identified risk to Health, hygiene and safety</p>
CU2. Apply Personal Protective and Safety Equipment (PPE)	<p>You must be able to:</p> <p>P1. Select personal protective equipment in terms of type and quantity according to work orders.</p> <p>P2. Wear, adjust, and maintain personal protective equipment to ensure correct fit and optimum protection in compliance with company procedures.</p> <p>P3. Ensure personal protective equipment is cleaned and stored in proper place.</p>
CU3. Observe Occupational Safety and Health (OSH)	<p>You must be able to:</p> <p>P1. Maintain cleanliness and hygiene as per organizational policy</p> <p>P2. Comply with Health, hygiene and safety precautions before starting work</p> <p>P3. Follow organizational Health, hygiene and safety guidelines during work</p> <p>P4. Deal with resolvable problems according to prescribed procedures</p>



	<p>P5. Place the tools equipment etc at their prescribed place after completion of work</p> <p>P6. Identify the safety signs and symbols</p> <p>P7. Erect barricades, hoardings, signage in the hazardous areas</p> <p>P8. Maintain cleanliness and hygiene as per organizational policy</p> <p>P9. Follow organizational Health, hygiene and safety guidelines during work</p> <p>P10. Report unsafe condition to immediate supervisor</p>
<p>CU4. Dispose of hazardous Waste/materials</p>	<p><i>You must be able to:</i></p> <p>P1. Identify hazardous waste/ drug materials which needs to be disposed off</p> <p>P2. Collect hazardous or non-hazardous waste carefully from the designated area as per approved procedure</p> <p>P3. Use proper disposal hazardous containers for dispose-off hazardous waste as per procedure</p> <p>P4. Take necessary precautions like putting masks and gloves while disposing hazardous waste/ materials as per standard operating procedure</p>
<p>CU5. Carry out First aid</p>	<p><i>You must be able to:</i></p> <p>P1. Identify items of first aid kit</p> <p>P2. Check expiry date of medicines</p> <p>P3. Identify potential dangers</p> <p>P4. Call for help</p> <p>P5. Check for a response</p> <p>P6. Check the casualty's airway</p> <p>P7. Check the casualty is breathing</p> <p>P8. Check the casualty's circulation</p> <p>P9. Perform first aid treatment for accidental bleeding</p>

Knowledge & Understanding

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

- K1.** Safety rules and regulations of organization
- K2.** List of Personal protection and safety Equipment
- K3.** Meaning of Safety signs and symbols



- K4. Safety related Standard Operating Procedure/guidelines
- K5. Waste disposal SOP
- K6. Best practices relating to clean work environment
- K7. Best practices relating to safe work environment

Critical Evidence(s) Required

The candidate needs to produce following critical evidence (s) to be competent in this competency standard:

1. Explain Health, hygiene and safety procedures/precautions
2. Interpret Health, hygiene and safety signs and symbols
3. Describe Techniques and methods to identify the risks of hazards at workplace
4. Describe Techniques and methods to identify the risks of hazards at workplace
5. Safety reporting procedures and documentation
6. Use of Personal Protective Equipment
7. First Aid treatment methods
8. Identify possible hazards at workplace

Competency Standard C: Perform Basic Communication Skills - 073200592

Overview: This unit describes the skills and knowledge required to assist in the development of communication competence by providing information regarding different forms of communication and their appropriate use.



Competency Units	Performance Criteria
CU1. Work in Team	<p>You must be able to:</p> <p>P1. Treat team members with respect and maintain positive relationships to achieve common organizational goals</p> <p>P2. Listen to instructions carefully & comply with those instructions</p> <p>P3. Provide work related information to team members and identify interrelated work activities to avoid confusion</p> <p>P4. Adopt communication skills, appropriate to work activities and organizational/medical procedures</p> <p>P5. Identify problems and resolve them through discussion and mutual agreement</p>
CU2. Follow Supervisor's instructions	<p>You must be able to:</p> <p>P1. Carefully listen and note down the instructions of Supervisor</p> <p>P2. Carry out the instructions of the supervisor</p> <p>P3. Report to the supervisor as per organizational SOPs</p>

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- K1.** Reporting techniques
- K2.** importance and application of Work ethics
- K3.** Explain the importance of Good communication skills (7Cs of effective communication)
- K4.** Explain the importance of Basic computer skills
- K5.** Workplace dress code
- K6.** Describe the role of team members and functionality of the teams
- K7.** Describe team dynamics and stages of team development
- K8.** Describe Conflict resolution strategies
- K9.** Prepare relevant documents and reports

Critical Evidence(s) Required



The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

1. Effective communication with colleagues, clients and supervisors
2. Office reports
3. Computer literacy certificate



Competency Standard D: Operate Computer Functions (General) - 724DOT04A

Overview: The competency Standard describe skills and knowledge required to setup a computer system, organize files in folders, and shutdown a computer system.

Competency Units	Performance Criteria
CU1. Set up the computer for use	<p>You must be able to:</p> <p>P1. Identify physical components of computer</p> <p>P2. Identify peripheral devices of the computer</p> <p>P3. Connect all components of computer</p> <p>P4. Follow procedures to turn on the computer system</p>
CU2. Organise files in folder	<p>You must be able to:</p> <p>P1. Create folders/subfolders with suitable names</p> <p>P2. Save files in relevant folders.</p> <p>P3. Rename and move folders in different drives.</p> <p>P4. Move folders and files using drag and drop techniques</p> <p>P5. Save folders and files on different media</p> <p>P6. Search for folders/subfolders and files using appropriate tool bars</p> <p>P7. Delete Folder files</p> <p>P8. Restore deleted folder files</p>
CU3. Shut down computer system	<p>You must be able to:</p> <p>P1. Save any work to be retained</p> <p>P2. Close open application programs correctly</p> <p>P3. Shut down computer</p> <p>P4. Switch off any unused peripheral devices</p> <p>P5. Ensure computer safety</p>

Knowledge & Understanding

This competency standard will provide knowledge related to:

- K1.** Basic parts of a computer
- K2.** Definition of computer



K3. Definition of Drives

K4. Enlist computer component



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

1. Switch on the computer
2. Attach Computer component
3. Switch on Peripheral devices
4. Make a folder in any partition(drive) in hard disk
5. Give name to the folder
6. Save file in the folder
7. delete the folder/File
8. Shut down computer



Competency Standard E: Perform Soil Sampling for Lab Test - 081PF01A

Overview: This competency standard deal with learning the competencies needed to Perform Soil Sampling. That includes identification, collection and transportation of soil samples for laboratory analysis. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Identify soil area for sampling	<p>You must be able to:</p> <p>P1. Identify areas on basis of soil topography for sampling</p> <p>P2. Select the field to be surveyed on the base of crop, salinity, soil level, etc.</p>
CU2. Collect soil sample for analysis	<p>You must be able to:</p> <p>P1. Select tools and equipment as per requirement</p> <p>P2. Perform Homogenous and Heterogeneous soil sampling</p> <p>P3. Perform Composite soil sampling</p>
CU3. Transport soil sample to the lab for analysis	<p>You must be able to:</p> <p>P1. Perform labelling of collected soil sample as per set standards</p> <p>P2. Perform Packaging appropriately as per set standards</p> <p>P3. Dispatch Soil sample for lab testing</p>

Knowledge & Understanding

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

- K1.** Soil sampling types and techniques
- K2.** Soil classification
- K3.** Labelling, packaging and transportation protocols
- K4.** Soil collection tools and equipment

Critical Evidence(s) Required



The candidate needs to produce any or all of the following documents/evidences:

1. Portfolio
2. Assignment(s)/Project(s)

Furthermore, the candidate must execute demonstration(s) which may include the following:

1. Collect the soil sample using appropriate method



Competency Standard F: Diagnose Plant health problems - 081PF01B

Overview: This competency standard deal with learning the competencies needed to Diagnose Plant health problems. That includes identification of signs and symptoms of plant health problems. Assess the severity, extent and speed of onset of health problems in a specific situation. Determine possible causes of the problem. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Identify Plant Symptoms	You must be able to: P1. Identify symptoms of Plant disease P2. Identify biotic/abiotic factors P3. Study habit and habitat of the pest P4. Assess the severity and extent of disease in a crop
CU2. Collect plant sample for analysis	You must be able to: P1. Select tools and equipment as per requirement P2. Select diseased Plant Sample
CU3. Dispatch Plant sample to the lab for analysis	You must be able to: P1. Perform labeling of collected plant sample as per set standards P2. Perform Packaging appropriately as per set standards P3. Dispatch plant sample for lab testing

Knowledge & Understanding

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

- K1.** Plant pests and their natural enemies
- K2.** Labelling, packaging and transportation protocols
- K3.** Biotic/abiotic factors
- K4.** Collection tools and equipment
- K5.** Classification of insect/pests and diseases



Critical Evidence(s) Required

The candidate needs to produce any or all of the following documents/evidences:

1. Portfolio
2. Assignment(s)/Project(s)

Furthermore, the candidate must execute demonstration(s) which may include the following:

1. Collect the plant sample using appropriate method



Competency Standard G: Perform Pesticide Pre-Application Tasks - 081PF01C

Overview: This competency standard deal with learning the competencies needed to Perform Pesticide Pre-Application Tasks. That includes comprehensive knowledge of pest identification, scouting and data recording. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Perform Pest Scouting	You must be able to: P1. Select appropriate time for scouting P2. Select appropriate method for scouting (Zig zag, Maryo's and Diagonal) P3. Perform field visit for pest inspection P4. Assess the severity of pest infestation P5. Prepare a site report for supervisor
CU2. Collect Pest for Identification	You must be able to: P1. Select appropriate tools and equipment P2. Collect pest sample P3. Submit a pest collection report to the supervisor

Knowledge and Understanding:

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

- K1.** Economic Threshold Level (ETL)
- K2.** Define Economic Injury Level (EIL)
- K3.** Methods for pest scouting

Critical Evidence (s) required:

The candidate needs to produce any or all of the following documents/evidences:

1. Portfolio
2. Assignment(s)/Project(s)



Furthermore, the candidate must execute demonstration(s) which may include the following:

1. Perform pest scouting and collect the sample as per given instructions



Competency Standard H: Apply Fertiliser - 081PF01D

Overview: This competency standard deal with learning the competencies needed to apply Fertiliser. That includes comprehensive knowledge of identification and application of Fertiliser. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Identify different Fertilisers	You must be able to: P1. Classify different types of Fertilisers (Urea, CAN, DAP, SSP, MOP, SOP, etc.) P2. Select Fertilisers according to crop requirement as per given instructions
CU2. Apply Fertiliser	You must be able to: P1. Adopt appropriate method for the application of Fertiliser P2. Select appropriate tools/equipment P3. Perform the Fertiliser application as per instructions

Knowledge and Understanding:

The student must be able to demonstrate knowledge and understanding required to carry out tasks covered in this competency standards. This includes the knowledge of:

- K1.** Different types of Fertilisers
- K2.** Different relevant tools and equipment
- K3.** Calculation methods for the composition of Fertilisers

Critical Evidence(s) Required

The candidate needs to produce any or all of the following documents/evidences:

1. Portfolio
2. Assignment(s)/Project(s)

Furthermore, the candidate must execute demonstration(s) which may include the following:

1. Calculate and apply Fertiliser according to the given instructions.



COMPLETE LIST OF TOOLS AND EQUIPMENT

SR#	Tools & Equipment	Quantity
1.	Computer Systems	25
2.	Scanner	1
3.	Printer	1
4.	Pen	25
5.	Pencil	25
6.	Eraser	25
7.	Notebooks	25
8.	Chart Papers	25
9.	Board markers	1
10.	File covers	25
11.	Scotch tape	25
12.	Masks	25
13.	Gloves	25
14.	Goggles	25
15.	Fertilizer mixer	5
16.	Motors	5
17.	Measuring cylinders/containers	25
18.	Spade	25
19.	Microscopes	5
20.	Sprayer Tank	10
21.	Air Blast Sprayers	5
22.	Spraying Nozzle Sets	10
23.	Fire Buckets	1



24.	Respiratory Mask	25
25.	First Aid Box	5
26.	Calculator	25
27.	Measuring Tape	25
28.	Measuring Scale	25
29.	Ladder	1
30.	Soil Augars	12
31.	Polyethylene Sheets	100
32.	Sample collection Polyethylene bags	500
33.	Ice Box	5
34.	Magnifying glass/Lens	25
35.	Forceps	25
36.	Gardening Tool Kit	25