TRAINING REGULATIONS

AGRICULTURAL CROPS PRODUCTION NC II

AGRICULTURE, FORESTRY AND FISHERY SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Superhighway, Taguig City, Metro Manila

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AGRI-FISHERY SECTOR

AGRICULTURAL CROPS PRODUCTION NC II

TRAINING REGULATIONS FOR
AGRICULTURAL CROPS PRODUCTION NC II

Section 1 AGRICULTURAL CROPS PRODUCTION NC II QUALIFICATION

The **AGRICULTURAL CROPS PRODUCTION NC II** Qualification consists of competencies that a person must achieve to produce various agricultural crops which include performing nursery operations, planting, caring and maintaining of crops and carrying-out harvest and postharvest operations.

This Qualification is packaged from the competency map of the Agri-Fishery Sector as shown in Annex A.

The unit of competency comprising this qualification includes the following:

Code	BASIC COMPETENCIES
500311105	Participate in workplace communication
500311106	Work in a team environment
500311107	Practice career professionalism
500311108	Practice occupational health and safety procedures

Code	COMMON COMPETENCIES
AFF 321201	Apply safety measures in farm operations
AFF 321202	Use farm tools and equipment
AFF 321203	Perform estimation and calculations
AFF 321206	Process farm wastes
SOC 413206	Perform record keeping

Code	CORE COMPETENCIES
AFF 610301	Perform nursery operations
AFF 610302	Plant crops
AFF 610303	Care and maintain crops
AFF 610304	Carry-out harvest and postharvest operations

A person who has achieved this Qualification is competent to be:

- Farmer/Grower
- Farm worker
- Nursery operator
- Farm aide
- Farm caretaker

SECTION 2 COMPETENCY STANDARDS

These guidelines are set to provide the Technical Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for **AGRICULTURAL CROPS PRODUCTION NC II.**

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 500311105

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols*** 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and maters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines

RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1. Team members 1.2. Suppliers 1.3. Trade personnel 1.4. Local government 1.5. Industry bodies
2. Medium	2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information discussion 2.5. Follow-up or verbal instructions 2.6. Face to face communication
3. Storage	3.1. Manual filing system 3.2. Computer-based filing system
4. Forms	4.1. Personnel forms 4.2. Telephone message forms 4.3. Safety reports
5. Workplace interactions	5.1. Face to face 5.2. Telephone 5.3. Electronic and two way radio 5.4. Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	6.1. Observing meeting 6.2. Compliance with meeting decisions 6.3. Obeying meeting instructions

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1. Prepared written communication following standard format of the organization 1.2. Accessed information using communication equipment 1.3. Made use of relevant terms as an aid to transfer information effectively 1.4. Conveyed information effectively adopting the formal or informal communication
2. Underpinning Knowledge and Attitudes	2.1. Effective communication 2.2. Different modes of communication 2.3. Written communication 2.4. Organizational policies 2.5. Communication procedures and systems 2.6. Technology relevant to the enterprise and the individual's work responsibilities
3. Underpinning Skills	3.1. Follow simple spoken language 3.2. Perform routine workplace duties following simple written notices 3.3. Participate in workplace meetings and discussions 3.4. Complete work related documents 3.5. Estimate, calculate and record routine workplace measures 3.6. Basic mathematical processes of addition, subtraction, division and multiplication 3.7. Ability to relate to people of social range in the workplace 3.8. Gather and provide information in response to workplace Requirements
4. Resource Implications	The following resources must be provided: 4.1. Fax machine 4.2. Telephone 4.3. Writing materials 4.4. Internet
5. Methods of Assessment	5.1. Direct Observation 5.2. Oral interview and written test
6. Context of Assessment	6.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY: WORK IN TEAM ENVIRONMENT

UNIT CODE : 500311106

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Describe team role and scope	1.1. The ***role and objective of the team*** is identified from available ***sources of information*** 1.2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources
2. Identify own role and responsibility within team	2.1. Individual role and responsibilities within the team environment are identified 2.2. Roles and responsibility of other team members are identified and recognized 2.3. Reporting relationships within team and external to team are identified
3. Work as a team member	3.1. Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives 3.2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and ***workplace context*** 3.3. Observed protocols in reporting using standard operating procedures 3.4. Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Machine/equipment manufacturer's specifications and instructions 2.4. Organizational or external personnel 2.5. Client/supplier instructions 2.6. Quality standards 2.7. OHS and environmental standards
3. Workplace context	3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Operated in a team to complete workplace activity 1.2. Worked effectively with others 1.3. Conveyed information in written or oral form 1.4. Selected and used appropriate workplace language 1.5. Followed designated work plan for the job 1.6. Reported outcomes
2. Underpinning Knowledge and Attitude	2.1. Communication process 2.2. Team structure 2.3. Team roles 2.4. Group planning and decision making
3. Underpinning Skills	3.1. Communicate appropriately, consistent with the culture of the workplace
4. Resource Implications	4.1. The following resources MUST be provided: 4.2. Access to relevant workplace or appropriately simulated environment where assessment can take place 4.3. Materials relevant to the proposed activity or tasks
5. Methods of Assessment	5.1. Competency may be assessed through: 5.2. Observation of the individual member in relation to the work activities of the group 5.3. Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal 5.4. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
6. Context for Assessment	6.1. Competency may be assessed in workplace or in a simulated workplace setting 6.2. Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY: PRACTICE CAREER PROFESSIONALISM

UNIT CODE : 500311107

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Integrate personal objectives with organizational goals	1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2 Intra- and interpersonal relationships is being maintained in the course of managing oneself based on performance evaluation 1.3 Commitment to the organization and its goal is demonstrated in the performance of duties
2. Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 ***Resources*** are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
3. Maintain professional growth and development	3.1 ***Trainings and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognitions*** are sought/received and demonstrated as proof of career advancement 3.3 ***Licenses and/or certifications*** relevant to job and career are obtained and renewed

RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Attained job targets within key result areas (KRAs) 1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Completed trainings and career opportunities which are based on the requirements of the industries 1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification
2. Underpinning Knowledge and Values	2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 2.2 Company policies 2.3 Company operations, procedures and standards 2.4 Fundamental rights at work including gender sensitivity 2.5 Personal hygiene practices
3. Underpinning Skills	3.1 Appropriate practice of personal hygiene 3.2 Intra and Interpersonal skills 3.3 Communication skills
4. Resource Implications	The following resources **MUST** be provided: 4.1 Workplace or assessment location 4.2 Case studies/scenarios
5. Methods of Assessment	**Competency may be assessed through:** 5.1 Portfolio Assessment 5.2 Interview 5.3 Simulation/Role-plays 5.4 Observation 5.5 Third Party Reports 5.6 Exams and Tests
6. Context of Assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**

UNIT CODE : **500311108**

UNIT DESCRIPTOR : This unit covers the outcomes required to comply with regulatory and organizational requirements for occupational health and safety.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify hazards and risks	1.1 ***Safety regulations*** and workplace safety and hazard control practices and procedures are clarified and explained based on organization procedures 1.2 ***Hazards/risks*** in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures. 1.3 ***Contingency measures*** during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures.
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 ***Personal protective equipment (PPE)*** is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol.
4. Maintain OHS	1.1 ***Emergency-related drills and trainings*** are participated in as per established organization guidelines and procedures 1.2 ***OHS personal records*** are completed and updated in accordance with workplace requirements.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics 2.4.1 Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles 2.4.2 Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. PPE	May include but are not limited to: 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hair Net/cap/bonnet 4.5 Face mask/shield 4.6 Ear muffs 4.7 Apron/Gown/coverall/jump suit 4.8 Anti-static suits

VARIABLE	RANGE
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Explained clearly established workplace safety and hazard control practices and procedures 1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Recognized contingency measures during workplace accidents, fire and other emergencies 1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV. 1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
2. Underpinning Knowledge and Attitude	2.1 OHS procedures and practices and regulations 2.2 PPE types and uses 2.3 Personal hygiene practices 2.4 Hazards/risks identification and control 2.5 Threshold Limit Value -TLV 2.6 OHS indicators 2.7 Organization safety and health protocol 2.8 Safety consciousness 2.9 Health consciousness
3. Underpinning Skills	3.1 Practice of personal hygiene 3.2 Hazards/risks identification and control skills 3.3 Interpersonal skills 3.4 Communication skills
4. Resource Implications	The following resources must be provided: 4.1 Workplace or assessment location 4.2 OHS personal records 4.3 PPE 4.4 Health records
5. Methods of Assessment	Competency may be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Case Study/Situation
6. Context for Assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

COMMON COMPETENCIES

UNIT OF COMPETENCY : APPLY SAFETY MEASURES IN FARM OPERATIONS

UNIT CODE : AFF 321201

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform safety measures effectively and efficiently. It includes identifying areas, tools, materials, time and place in performing safety measures.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Determine areas of concern for safety measures	1.1 ***Work tasks*** are identified in line with farm operations 1.2 ***Place*** for safety measures are determined in line with farm operations 1.3 ***Time*** for safety measures are determined in line with farm operations 1.4 Appropriate ***tools, materials and outfits*** are prepared in line with job requirements
2. Apply appropriate safety measures	2.1 Tools and materials are used according to specifications and procedures 2.2 Outfits are worn according to farm requirements 2.3 Effectivity/shelf life/expiration of materials are strictly observed 2.4 ***Emergency procedures*** are known and followed to ensure a safework requirement 2.5 Hazards in the workplace are identified and reported in line with farm guidelines
3. Safekeep/dispose tools, materials and outfit	3.1 Used tools and outfit are cleaned after use and stored in designated areas 3.2 Unused materials are properly labeled and stored according to manufacturers recommendation and farm requirements 3.3 ***Waste materials*** are disposed according to manufacturers, government and farm requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work tasks	**Work task may be selected from any of the subsectors:** 1.1 Aquaculture 1.2 Animal Production 1.3 Crop Production 1.4 Post-harvest 1.5 Agri-marketing 1.6 Farm Equipment
2. Place	2.1 Animal pens, cages, barns 2.2 Fish ponds, cages 2.3 Stock room/storage areas/warehouse 2.4 Field/farm/orchard
3. Time	3.1 Vaccination and medication period 3.2 Fertilizer and pesticides application 3.3 Feed mixing and feeding 3.4 Harvesting and hauling 3.5 Cleaning, sanitizing and disinfecting 3.6 Dressing, butchering and castration
4. Tools, materials and outfits	4.1 Tools 4.1.1 Wrenches 4.1.2 Screw driver 4.1.3 Pliers 4.2 Materials 4.2.1 Bottles 4.2.2 Plastic 4.2.3 Bags 4.2.4 Syringe 4.3 Outfit 4.3.1 Masks 4.3.2 Gloves 4.3.3 Boots 4.3.4 Overall coats 4.3.5 Hat 4.3.6 Eye goggles
5. Emergency procedures	5.1 Location of first aid kit 5.2 Evacuation 5.3 Agencies contract 5.4 Farm emergency procedures
6. Waste materials	6.1 Animal manure 6.2 Waste water 6.3 Syringes

	6.4 Unused farm chemicals e.g. pesticides, chemicals, fertilizers 6.5 Expired reagents 6.6 Dead animals
7. Hazards	7.1 Chemical 7.2 Electrical 7.3 Falls

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determined areas of concern for safety measures 1.2 Applied appropriate safety measures according to industry requirements 1.3 Prepared tools, materials and outfit needed 1.4 Performed proper disposal of used materials 1.5 Safekeep/cleaned tools, materials and outfit in designated facilities
2. Required Knowledge	2.1 Safety Practices 2.1.1 Implementation of regulatory controls and policies relative to treatment of area and application of chemicals 2.1.2 Proper disposal of waste materials 2.2 Codes and Regulations 2.2.1 Compliance to health program of DOH and DENR 2.2.2 Hazard identification 2.2.3 Emergency procedures 2.3 Tools & Equipment: Uses and Specification 2.3.1 Masks, gloves, boots, overall coats for health protection 2.4 Maintenance 2.4.1 Regular check-up and repair of tools, materials and outfit before and after use
3. Required Skills	3.1 Ability to recognize effective tools, materials and outfit 3.2 Ready skills required to read labels, manuals and other basic safety information
4. Resource Implications	**The following resources should be provided:** 4.1 Farm location 4.2 Tools, equipment and outfits appropriate in applying safety measures
5. Method of Assessment	**Competency in this unit may be assessed through:** 5.1. Practical demonstration 5.2. Third Party Report
6. Context of Assessment	6.1 Assessment may occur in the workplace or in a simulated workplace or as part of a team under limited supervision

UNIT OF COMPETENCY : USE FARM TOOLS AND EQUIPMENT

UNIT CODE : AFF 321202

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use farm tools and equipment. It includes selection, operation and preventive maintenance of farm tools and equipment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Select and use farm tools	1.1 Appropriate farm tools are identified according to requirement/use 1.2 Farm tools are checked for faults and defective tools reported in accordance with farm procedures 1.3 Appropriate tools and equipment are safely used according to job requirements and manufacturers conditions
2. Select and operate farm equipment	2.1 Appropriate farm equipment is identified 2.2 Instructional manual of the farm tools and equipment are carefully read prior to operation 2.3 Pre-operation check-up is conducted in line with manufacturers manual 2.4 Faults in farm equipment are identified and reported in line with farm procedures 2.5 Farm equipment is used according to its function 2.6 Safety procedures are followed
3. Perform preventive maintenance	3.1 Tools and equipment are cleaned immediately after use in line with farm procedures 3.2 Routine check-up and maintenance are performed 3.3 Tools and equipment are stored in designated areas in line with farm procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Farm equipment	1.1 Engine 1.2 Pumps 1.3 Generators 1.4 Sprayers
2. Farm tools	2.1 Sickle 2.2 Cutters 2.3 Weighing scales 2.4 Hand tools 2.5 Measuring tools 2.6 Garden tools
3. Pre-operation check-up	3.1 Tires 3.2 Brake fluid 3.3 Fuel 3.4 Water 3.5 Oil 3.6 Lubricants 3.7 Battery

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Correctly identified appropriate farm tools and equipment 1.2 Operated farm equipments according to manual specification 1.3 Performed preventive maintenance
2. Required Knowledge and Attitudes	2.1 Safety Practices 2.1.1 Ideal good work habits to demonstrate to workers easy and safety standards during operation of farm equipment 2.2 Codes and Regulations 2.2.1 Environmental Compliance Certificate (ECG) 2.2.2 Effective work supervision in the operations of farm equipment 2.3 Tools & Equipment: Uses and Specification 2.3.1 Knowledge in calibrating and use of equipment 2.3.2 Safety keeping of equipments every after use 2.4 Maintenance 2.4.1 Regular upkeep of equipments 2.4.2 Preventive maintenance skills 2.5 Values 2.5.1 Positive outlook towards work 2.5.2 Possesses pre-emptive/anticipatory skills
3. Required Skills	3.1 Ability to recognized defective farm equipment 3.2 Perform proper management practices of safety measures
4. Resource Implications	**The following resources should be provided:** 4.1 Service/operational manual of farm tools and equipment 4.2 Tools and equipment 4.3 Farm implements
5. Method of Assessment	**Competency in this unit may be assessed through:** 5.1 Direct observation 5.2 Practical demonstration 5.3 Third Party Report
6. Context of Assessment	6.1 Assessment may occur in the workplace or in a simulated workplace or as part of a team under limited supervision

UNIT OF COMPETENCY : PERFORM ESTIMATION AND BASIC CALCULATION

UNIT CODE : AFF 321203

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform basic workplace calculations.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Perform estimation	1.1 Job requirements are identified from written or oral communications 1.2 Quantities of materials and resources required to complete a work task are estimated 1.3 The time needed to complete a work activity is estimated 1.4 Accurate estimate for work completion are made 1.5 Estimate of materials and resources are reported to appropriate person
2. Perform basic workplace calculation	2.1 ***Calculations*** to be made are identified according to job requirements 2.2 Correct ***method of calculation*** identified 2.3 ***System and units of measurement*** to be followed are ascertained 2.4 Calculation needed to complete work tasks are performed using the four basic process of addition, division, multiplication and subtraction 2.5 Calculate whole fraction, percentage and mixed when are used to complete the instructions 2.6 Number computed in self checked and completed for alignment

RANGE OF VARIABLES

VARIABLE	RANGE
1. Calculations	1.1 Quantity of feeds 1.2 Amount of fertilizer 1.3 Amount of medicines
2. Method of calculation	2.1 Addition 2.2 Subtraction 2.3 Multiplication 2.4 Division 2.5 Ratio and proportion
3. System of measurement	3.1 English 3.2 Metric
4. Units of measurement	4.1 Area 4.2 Volume 4.3 Weight

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Performed estimation 1.2 Performed basic workplace calculation 1.3 Applied corrective measures as maybe necessary
2. Required Knowledge and Attitudes	2.1 Mathematics 2.1.1 Basic mathematical operations 2.1.2 Percentage and ratios 2.1.3 Unit Conversion 2.1.4 Basic accounting principles and procedures 2.1.4.1 Production cost 2.1.4.2 Sales 2.1.4.3 Accounts receivables/payables 2.2 Systems, Processes and Operations 2.2.1 Knowledge in different management practices and operational procedures 2.3 Values 2.3.1 Safety consciousness 2.3.2 Time consciousness and management 2.3.3 Cost consciousness 2.3.4 Precision
3. Required Skills	3.1 Ability to perform basic calculation 3.2 Communicate effectively
4. Resource Implications	The following resources should be provided: 4.1 Relevant tools and equipment for basic calculation 4.2 Recommended data
5. Method of Assessment	**Competency in this unit may be assessed through:** 5.1 Practical demonstration 5.2 Written examination
6. Context of Assessment	6.1 Assessment may occur in the workplace or in a simulated workplace or as part of a team under limited supervision

UNIT OF COMPETENCY : **PROCESS FARM WASTES**

UNIT CODE : **AFF 321206**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to process farm wastes. It comprises functions such as collecting farm wastes, conducting waste identification and segregation, treating and processing farm wastes and performing housekeeping duties.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range Statement
1. Collect farm wastes	1.1 ***Tools and materials*** are prepared for collection of farm wastes. 1.2 ***Wastes*** are collected following OSHS and waste collection requirements and plan. 1.3 ***Dangerous and hazardous wastes*** are collected following the HAZMAT(hazardous material) protocol. 1.4 Appropriate personal protective equipment (PPE) are worn as prescribed by Occupational Safety and Health Standards (OSHS).
2. Identify and segregate wastes	2.1 Wastes are identified by ***categories*** according to industry standards and environmental legislation. 2.2 Wastes are segregated according to organizational requirements and relevant legislation. 2.3 Sorted waste is placed into labelled container to avoid littering and prevent cross-contamination. 2.4 Information on waste is obtained by asking authority to ensure correct identification.
3. Treat and process farm wastes	3.1 Dangerous and hazardous wastes are handled according to organizational requirements and relevant legislation following OSHS procedures. 3.2 ***Processing of farm wastes*** is done following environmental legislation and codes. 3.3 Principles of 3Rs (reduce, reuse and recycle) are applied accordingly. 3.4 Farm wastes are disposed of according to environmental legislation and codes.
4. Perform housekeeping	4.1 Appropriate warning signs and labels are displayed in conspicuous places around the workplace. 4.2 Work area is cleaned according to 5S principles.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range Statement
	4.3 Tools are checked, cleaned and stowed according to established industry procedures and following user's manual. 4.4 Materials are stored following industry standard procedures and manufacturer's specifications. 4.5 PPE is checked for damage prior to ensuring that clean and undamaged equipment is stored. 4.6 Storage facility is checked to ensure no contamination in the area according to organizational requirements and legislation and codes. 4.7 ***Record*** keeping is done according to industry requirements***.***

RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools and materials	Tools and materials include: 1.1. Tools 1.1.1 Spade 1.1.2 Wheel borrow 1.1.3 Broomstick 1.1.4 Sprayer or pressurized pump 1.2. Materials 1.2.1 Sacks 1.2.2 Containers 1.2.3 Disinfectants 1.2.4 Detergents 1.2.5 First-aid kit 1.2.6 Chemical spill kit 1.2.7 Personal Protective Equipment o Goggles o Disposal gloves o Face mask o Rubber boots o Overall
2. Agricultural wastes	Agricultural wastes may include: 2.1. Plant materials 2.2. Hay 2.3. Weeds 2.4. Twigs 2.5. Twines 2.6. Empty wooden crates 2.7. Animal manure 2.8. Feed refuse 2.9. Spoiled feeds (Forage and feed supplements)

VARIABLE	RANGE
	2.10. Spent bedding materials 2.11. Empty sacks 2.12. Trash fish 2.13. Fish meal 2.14. Effluent
3. Dangerous and hazardous wastes	Dangerous and hazardous wastes may include: 3.1 Pesticides 3.2 Syringes 3.3 Expired biologics 3.4 Expired veterinary drugs 3.5 Spoiled milk 3.6 Diseased plant and plant parts 3.7 Empty veterinary bottles/syringes
4. Categories	Categories may include**:** 4.1 Re-usable 4.2 Recyclable 4.3 Solid 4.4 Liquid
5. Processing of wastes	Processing of wastes may include: 5.1. Composting 5.2. Compacting 5.3. Liquefying 5.4. Shredding 5.5. Carbonizing 5.6. Charcoaling
6. Record	Record includes: 6.1. Record of farm wastes generated and disposed 6.2. Record of incidence of infection and accidents 6.3. Record of chemical spillage 6.4. Record of destroyed carcasses 6.5. Inventory of tools, materials and equipment

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Collected farm wastes 1.2. Identified and segregated farm wastes 1.3. Processed farm wastes 1.4. Performed housekeeping
2. Required Knowledge and Attitudes	2.1. Knowledge, Theory, Practices and Systems Operations 2.1.1. Tools and materials use in wastes management 2.1.2. Categories of farm wastes 2.1.3. Wastes collection and segregation procedures 2.1.4. Farm-waste handling, storage and disposal procedures

	2.1.5. Dangerous and hazardous wastes, hazardous materials (hazmat) protocols 2.1.6. Principles of 5S and 3R 2.2. Communications 2.2.1 Preparation of inventory reports and production records 2.2.2 Report on untoward incidence in the area 2.3. Mathematics and Mensuration 2.3.1. Profitability of the operation 2.3.2. Volume of farm wastes 2.4. Safety Practices 2.4.1. Personal Protective Equipment (PPE) 2.4.2. Material Safety Data Sheets(MSDS) 2.5. Codes and Regulations 2.5.1. Appropriate legal regulatory body such as BAI, EMB and DOH,BFAD 2.5.2. Occupational Safety and Health Standards 2.5.3. RA 9003 2.5.4. RA 6969 2.6. Materials, Tools & Equipment: Uses, Specifications and Maintenance 2.6.1. Tools and Equipment 2.6.1.1. Can understand and follow instructional manuals 2.6.1.2. Safe keeping of equipment every after use 2.6.2. Materials 2.6.2.1. Where to source good quality supplies, materials and equipment needed in the maintenance of the poultry house and farm 2.6.3. Maintenance 2.6.3.1. Regular upkeep of equipment and facilities 2.6.3.2. Preventive maintenance skills for farm area 2.7. Values 2.7.1. Safety and health consciousness 2.7.2. Resourcefulness 2.7.3. Diligence 2.7.4. Time consciousness 2.7.5. Cost-consciousness 2.7.6. Personal integrity in doing routine management practices 2.7.7. Perseverance in executing routine works 2.7.8. Ability to work with others harmoniously
3. Required Skills	3.1 Occupational health safety 3.2 Skills in using tools and equipment 3.3 Calculations 3.4 Communicate effectively
4. Resource Implications	**The following resources should be provided:** 4.1 Farm area 4.2 Different farm wastes 4.3 Farm-waste processing area

	4.4 Tools, supplies and materials use in farm wastes collection, segregation and processing 4.5 Housekeeping tools and supplies 4.6 PPE
5. Method of Assessment	**Competency in this unit may be assessed through:** 5.1 Observation and questioning 5.2 Third-Party Report 5.3 Demonstration and oral questioning
6. Context of Assessment	6.1 Competency maybe assessed individually in the actual workplace or in accredited farms or institution

UNIT OF COMPETENCY : **PERFORM RECORD-KEEPING**

UNIT CODE : **SOC 413206**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to carry-out inventory activities, maintain production record and prepare financial records.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range Statement
1. Carry out inventory activities	1.1 ***Inventory inputs*** are determined according enterprise requirements. 1.2 Defective tools and equipment are determined according to operation manuals 1.3 Facilities are inspected according to according standard codes and laws.
2. Maintain production record	2.1 Production plan are prepared according to enterprise requirements. 2.2 Schedule for ***production activities*** are prepared based from enterprise requirements and plan. 2.3 ***Production report*** are prepared in accordance with enterprise reporting procedures 2.4 ***Input*** and ***production*** are monitored using monitoring chart.
3. Prepare financial records	3.1. ***Production cost*** are computed using established computation procedures. 3.2. Revenue is computed using established computation procedures.

RANGE OF VARIABLES

VARIABLE	SCOPE
1. Inventory inputs	1.1 Plant 1.1.1. Planting materials 1.1.2. Fertilizer 1.1.3. Concoctions (Pesticides and insecticides) 1.1.4. Beneficial microorganisms 1.2 Animals 1.2.1. Stocks 1.2.2. Feeds 1.2.3. Concoctions 1.2.4. Medications 1.2.5. Beneficial microorganisms 1.2 Miscellaneous materials
2. Production activities	2.1. Plant o Planting o Fertilizer application o Pesticides application o Implementation of bio-security measures o Irrigation/watering o Weeding o Harvesting o Post-harvesting 2.2. Animal o Feeding o Cleaning and Sanitization o Implementation of bio-security measures o Growth and health condition o Harvesting o Post harvesting 2.3. Miscellaneous activities
3. Production report	3.1. Categorize and record quality of harvest 3.2. volume /quantity of products harvested
4. Input	4.1. Input(plant) o Fertilizer o Concoctions (Pesticides and insecticides) o Beneficial microorganisms 4.2. Input(animal) o Feeds o Concoctions o Medications o Beneficial microorganisms 4.3. Miscellaneous inputs
5. Production	5.1 Growth rate 5.2 Survival rate
6. Production cost	6.1. Labor 6.2. Inputs 6.3. Tools, equipment and facility depreciation cost 6.4. Administrative cost 6.5. Miscellaneous

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Determined inventory inputs according enterprise requirements 1.2. Determined defective tools and equipments according to operation manuals. 1.3. Inspected facilities according to standard codes and laws. 1.4. Prepared production plan and report according to enterprise requirements and reporting procedures.
2. Required Knowledge and Attitudes	2.1. Knowledge, Theory, Practices and Systems Operations 2.1.1. Kinds of tools and equipment 2.1.2. Defects of tools and equipment 2.1.3. Monitoring method 2.1.4. Farm planning and budgeting 2.1.5. Methods and process of production 2.1.6. Quality control 2.1.7. Basic bookkeeping 2.1.8. Practice 3Rs and 5S 2.1.9. Program of work activities are implemented as scheduled 2.2. Communication 2.2.1. Prepare and submit required reports 2.2.2. Documentation of production and financial data 2.3. Mathematics and Mensuration 2.3.1. Basic mathematical operations 2.3.2. Metric system 2.3.3. Computation for production of organic fertilizer 2.3.4. Unit conversion 2.4. Safety Practices 2.4.1. Safety during inspections of tools, farm implements and equipment. 2.5. Codes and Regulations 2.5.1. Codes and laws on quality control 2.5.2. Codes and laws on inspection of facilities 2.6. Materials, Tools & Equipment: Uses, Specifications and Maintenance 2.6.1. Tools and Equipment 2.6.1.1. Can understand and follow instructional manuals 2.6.2. Materials 2.6.2.1. Where to source good quality supplies and materials needed in record keeping 2.6.3. Maintenance 2.6.3.1. Maintenance of records 2.7. Values 2.7.1. Time consciousness and management 2.7.2. Resourcefulness 2.7.3. Cost consciousness 2.7.4. Diligence 2.7.5. Determined

3. Required Skills	3.1 Work safety 3.2 Skills in determining defective tools and equipment 3.3 Measuring and calculations 3.4 Estimation 3.1. Basic mathematical skills 3.2. Skills in preparation of reports 3.3. Bookkeeping 3.4. Oral and written communication
4. Resource Implications	**The following resources should be provided:** 4.1. All supplies, materials and farm implements needed during farm operations should be readily available at the farm site: 4.1.1. Farm site 4.1.2. Office supplies, materials, tools and farm equipment 4.2. Protective clothing equipment and materials. All workers involved in different activities must be fully oriented and cautioned on the different specific work activities of the farm. 4.3. Technical supervisors should have skills and ability in the successful implementation of work program activities.
5. Method of Assessment	Competency in this unit may be assessed through: 5.1. Demonstration with questioning 5.2. Written examination
6. Context of Assessment	6.1. Assessment may occur in an appropriately simulated environment through TESDA accredited assessment centers

CORE COMPETENCY

UNIT OF COMPETENCY : **PERFORM NURSERY OPERATIONS**

UNIT CODE : **AFF 610301**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform nursery operations for agricultural crops including establishing nursery shed, preparation and handling of planting materials, preparation of growing media, transplanting germinated seedlings and handling of nursery tools and equipment.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range Statement
1. Prepare nursery tools, farm implements and simple equipment	1.1 ***Tools, farm implements and simple equipment*** are prepared according work requirements. 1.2 Basic pre-operative checking of tools, farm implements and equipment is performed in accordance with manufacturer's manual and GAP standard. 1.3 Tools with wear and corrosions are segregated and treated according to maintenance plan and procedures.
2. Maintain nursery facilities	2.1 Nursery sanitation is maintained according to GAP standard. 2.2 Repair and maintenance of nursery facilities are performed to maximize their efficiency and effectiveness. 2.3 Preventive measures are applied for inclement weather. 2.4 Safety measures are practice according to OSHS.
3. Handle seeds/planting material	3.1 ***Planting materials*** are determined according to kinds and varieties. 3.2 ***Quality seeds*** are selected according to prescribed characteristics. 3.3 ***Seed testing*** is conducted to determine the percentage germination of the seedstock in accordance with the standard procedures 3.4 Planting materials are treated following standard protocol. 3.5 ***Seed scarification*** is performed for germination purposes based on type of crop.
4. Prepare growing media	4.1 Growing ***media*** are prepared according to prescribed mixture and crop requirement. 4.2 Growing media are placed in prescribed ***containers*** according to crop requirements. 4.3 Containers are arranged and labelled according to varieties/species. 4.4 Seedbed is prepared based on crop species.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range Statement
5. Conduct propagation activities	5.1 Nursery shed is set-up according to plant requirement 5.2 ***Quality seedlings*** *are selected based on prescribed characteristics.* 5.3 Propagation materials are selected according to propagation activity. 5.4 ***Plant propagation techniques*** **are** performed based on recommended practices. 5.5 Germinated seedlings are maintained until fully established. 5.6 Pricking and thinning of seedlings are performed based on recommended practices.

RANGE OF VARIABLES

VARIABLE	SCOPE
1. Tools, farm implements and simple equipment	Include the following but not limited to: 1.1. Tools: 1.1.1. Digging tools 1.1.2. Propagation tools 1.1.3. Harvesting tools 1.1.4. Measuring tools 1.2. Farm implements and simple equipment: 1.2.1. Water pumps 1.2.2. Hand tractor 1.2.3. Plow 1.2.4. Harrow 1.2.5. Sprayer
2. Planting materials	Include the following but not limited to: 2.1. Seeds 2.2. Suckers 2.3. Tissue cultured plantlets 2.4. Cuttings 2.5. Rhizome 2.6. Corm 2.7. Grafted material 2.8. Tuber 2.9. Runner/Stolon 2.10. Bulb
3. Quality seeds	Characteristics of quality seeds include the following: 3.1. Damage free 3.2. Viability 3.3. Free from mixture

4. Seed Testing	Seed testing methods include the following but not limited to: 4.1. Rag doll method 4.2. Petri dish 4.3. Seed bed/seedbox
5. Seed scarification	Seed scarification include the following: 5.1. Physical 5.2. Chemical
6. Growing media	Include but not limited to the following: 6.1. Garden soil 6.2. Peat moss 6.3. Saw dust 6.4. Coco coir 6.5. Rice hull/carbonized rice hull 6.6. Compost 6.7. River sand 6.8. Animal manure 6.9. Wood cuttings 6.10. Fern slabs 6.11. Drift wood
7. Containers	Include but not limited to the following: 7.1. Polyethylene bags 7.2. Clay pots 7.3. Plastic containers 7.4. Seed tray 7.5. Seed box 7.6. Coconut husk 7.7. Wired basket
8. Quality seedlings	Include but not limited to the following: 8.1. Healthy 8.2. Vigorous growth 8.3. Height 8.4. Age 8.5. Number of leaves
9. Plant propagation techniques	Include but not limited to the following: 9.1. Sexual (Seeds) 9.2. Asexual 9.2.1 Grafting (cleft, side, saddle) 9.2.2 Budding 9.2.3 Marcotting/ air layering 9.2.4 Inarching/approached grafting 9.2.5 Cuttings 9.2.6 Division

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1. Selected planting materials. 2. Conducted seed testing 3. Prepared growing medium. 4. Performed plant propagation techniques
2. Required Knowledge and Attitudes	2.1 Safety Practices 2.1.1 Knowledge on HACCP principles 2.1.2 Knowledge on Good Agricultural Practices (GAP) 2.1.3 Knowledge on Occupational Safety and Health Standards (OSHS) 2.2 Mathematics and Measurement 2.2.1 Measurement of humidity and temperature 2.2.2 Measurement of area, volume, and weight 2.2.3 Measurement of fertilizer and pesticides 2.3 Tools & Equipment: Uses and Specification 2.3.1 Use of measuring devices 2.3.2 Use of tools and equipment 2.4 Systems, Processes and Operations 2.4.1 Preparation of calendar of activities 2.4.2 Irrigation methods 2.4.3 Different seed/planting materials 2.4.4 Different growing media 2.4.5 Preparation and mixing of growing media 2.4.6 Transplanting procedure 2.4.7 Propagation techniques 2.4.8 5S and 3Rs 2.5 Pest control procedures 2.5.1 Pest monitoring 2.5.2 Pesticide application methods 2.6 Values 2.6.1 Effective team player 2.6.2 Smooth Interpersonal Relationship (SIR) 2.6.3 Observant of work ethics
3. Required Skills	3.1 Basic mathematical processes of addition, subtraction, division and multiplication 3.2 Skills in plant propagation techniques 3.3 Interpretation of procedural manuals
4. Resource Implications	**The following resources should be provided:** 4.1 Shed/ Greenhouse 4.2 Writing instruments 4.3 Nursery tools/ implements/ equipment 4.4 Nursery supplies 4.5 Logbooks 4.6 Irrigation system and parts

	4.7 References (NSIC catalogue, GAP, OSHS, HACCP manuals, etc.)
5. Methods of Assessment	**Competency in this unit may be assessed through:** 5.1. Direct Observation and questioning 5.2. Demonstration 5.3. Oral interview and written test 5.4. Third party report
6. Context of Assessment	6.1 Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : **PLANT CROPS**

UNIT CODE : **AFF 610302**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to conduct activities related to land preparation and planting of agricultural crops. This unit also includes proper handling of seeds/seedlings/saplings for planting and transplanting, proper use of tools and equipment, conduct land preparation and field lay-out.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range Statement
1. Prepare land for planting	1.1 ***Tools, materials and equipment*** are prepared for land clearing 1.2 The land is cleared according to prescribed methods of land preparation 1.3 ***Debris*** are removed and disposed according to waste management standards. 1.4 Soil samples are collected for analysis based on standard procedure 1.5 ***Land preparation*** is conducted according to ***crop*** requirement. 1.6 Basal ***fertilizer*** is applied based on crop requirement 1.7 Safety procedures for fertilizer application is followed according to OSHS
2. Conduct field lay-out	2.1 Tools and materials are prepared for field lay-out. 2.2 Interpret field lay-out plan according to the recommended planting system. 2.3 Field is laid-out according to recommended ***planting system***
3. Dig holes	3.1 Diggings of holes are performed based on crop requirement. 3.2 Top soil is separated to be used in covering the hole after planting. 3.3 Basal fertilizer application is performed based on recommended amount.
4. Perform direct seeding	4.1 Seeds are planted according to recommended rate, distance and depth 4.2 Replanting are timely done according to recommended practices for a particular crop 4.3 Safety procedures are followed according to Occupational Safety and Health Standards (OSHS) and Good Agricultural Practices (GAP)
5. Transplant seedlings	5.1 Handling of seedlings from nursery is performed based on prescribed practices. 5.2 Transplanting of seedlings is done based on crop practices 5.3 Re-bagging is done for a particular crop requirement 5.4 Replanting is timely done based on planting protocol. 5.5 Safety procedures are followed according to Occupational Safety and Health Standards (OSHS) and Good Agricultural Practices (GAP)

RANGE OF VARIABLES

VARIABLE	SCOPE
1. Tools, materials and equipment	Include but not limited to the following: 1.1. Bolo 1.2. Scythe 1.3. Spade or shovel 1.4. Garden hoe 1.5. Rake 1.6. Grasscutter 1.7. Compost 1.8. Hand tractors and attachments
2. Debris	Include but not limited to the following: 2.1. Stones 2.2. Sticks 2.3. Unwanted vegetation 2.4. Other garbage
3. Land preparation	Include but not limited to the following: 3.1. Plowing 3.2. Harrowing 3.3. Leveling 3.4. Furrowing
4. Crop	May include the following: 4.1. Ornamental plants 4.2. Plantation crops 4.3. Fruit crops 4.4. Vegetables 4.5. Root crops 4.6. Forage crops 4.7. Cereals 4.8. Herbs and spices
5. Fertilizer	Include the following: 5.1. Organic 5.2. Inorganic
6. Planting system	May include but not limited to the following: 6.1 Open Field 6.1.1. Raised bed 6.1.2. Square 6.1.3. Quincunx or diagonal 6.1.4. Hexagonal or triangular 6.1.5. Contour system 6.1.6. Single row 6.1.7. Double row 6.1.8. Broadcast method 6.2 Green house 6.2.1. Raised bed 6.2.2. Potted

EVIDENCE GUIDE

1. Critical Aspects of Competency	1.1 Carry-out land clearing 1.2 Conducted proper soil sampling/collection 1.3 Performed appropriate land preparation 1.4 Laid out site for planting 1.5 Dug holes 1.6 Sown seeds 1.7 Planted and transplanted seeds/seedlings/saplings
2. Required Knowledge and Attitudes	2.1 Systems of planting 2.2 Handling of fertilizers 2.3 Proper use and maintenance of cutting, digging and tillage tools 2.4 Use of measuring device 2.5 Proper use of tools and equipment 2.6 Occupational Health and Safety Standards 2.7 Good Agriculture Practice Standards by BAFPS 2.8 Waste management standards 2.9 Collection of soil sample
3. Required Skills	3.1. Proper handling of tools and equipment 3.2. Fertilizer application 3.3. Interpret lay-out 3.4. Digging holes 3.5. Operate hand tractors
4. Resource Implications	The following resources should be provided: 4.1. Tool room and farm house 4.2. Farm tools/ implements/ equipment 4.3. Writing device 4.4. Farm supplies 4.5. Logbooks 4.6. References (fertilizer and pesticide manual/ catalogue, protocols, field guides, OHSP and GAP manuals) 4.7. Production guide
5. Methods of Assessment	Competency in this unit may be assessed through: 5.1. Direct Observation 5.2. Demonstration 5.3. Oral interview and/or written test 5.4. Third party report
6. Context of Assessment	6.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : **CARE AND MAINTAIN CROPS**

UNIT CODE : **AFF 610303**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to apply pest control, measure, apply fertilizer, water crops, perform pruning and perform physical growth-enhancing practices.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range Statement
1. Apply pest control measure	1.1 ***Pests*** incidence is monitored based on prescribed procedure. 1.2 ***Tools and materials*** are prepared according to specific pest control measure. 1.3 Appropriate ***pest control measures*** are followed based on GAP 1.4 Safety measures are observed and practiced according to Occupational Health and Safety (OHS) procedures.
2. Apply fertilizer	2.1 Tools and materials are prepared according to prescribed user's manual 2.2 ***Fertilizers*** are identified based on kinds. 2.3 Fertilizer rates are applied based on crop requirements. 2.4 Appropriate ***method of fertilizer application*** is employed based on crop requirements. 2.5 Precautionary measures are applied to avoid cross contamination based on GAP. 2.6 Safety procedures are followed according to Occupational Safety and Health Standards
3. Water crops	3.1. Soil moisture content is determined based on soil field capacity 3.2. ***Watering*** performed following the prescribed method and schedule 3.3. Good Agricultural Practices is observed.
4. Perform pruning	4.1. Pruning method is performed according to crops. 4.2. Tools and materials for pruning are prepared. 4.3. Safety procedures is followed according to Occupational Safety and Health Standards and PNS:PAES 101
5. Perform physical growth-enhancing practices	5.1. Tools and equipment for cultivation are prepared according to PNS:PAES 101. 5.2. Cultivation practices are carried out based on crop requirement. 5.3. Rejuvenating activities are performed according to established cultural practices. 5.4. Growth training technique are performed for different crops 5.5. Mulching techniques are carried out based on crops. 5.6. Safety procedures are followed according to Occupational Safety and Health Standards.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Pests	Include but not limited to: 1.1. Weeds 1.2. Insects 1.3. Diseases 1.4. Mites 1.5. Rodents 1.6. Other pests
2. Tools and materials	Includes but not limited to: 2.1. Knapsack/ power sprayers 2.2. Measuring devices 2.3. Insect traps 2.4. Pesticides (bio or synthetic) 2.5. Pruning shears 2.6. Shovel 2.7. Safety gears 2.8. Paper/plastic sleeves 2.9. Fertilizer 2.10. Pail 2.11. Measuring cup 2.12. Hoe 2.13. Shovel 2.14. Carabao pulled implements 2.15. Pruning shear 2.16. Pruning saw 2.17. Bolo 2.18. Paint
3. Pest control measures	Include but not limited to: 3.1. Physical 3.2. Mechanical 3.3. Biological 3.4. Cultural 3.5. Chemical (biopesticide, synthetic) 3.6. IPM 3.7. Sanitation
4. Fertilizers	Include the following: 4.1. Organic 4.2. Inorganic
5. Method of fertilizer application	Include but not limited to the following: 5.1. Basal 5.2. Sidedress 5.3. Topdress 5.4. Localized 5.5. Band 5.6. Foliar/Spray

VARIABLE	RANGE
	5.7. Broadcast
6. Watering	Include but not limited to: 6.1. Drip 6.2. Furrow 6.3. Sprinkler
7. Rejuvenating activities	Include but not limited to the following: 7.1. Grafting 7.2. Ratooning 7.3. De-suckering
8. Growth training technique	Include but not limited to the following: 8.1. Hardening 8.2. Pricking 8.3. Thinning

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Performed pruning according to crops 1.2. Controlled weed population 1.3. Monitored pests through recording and reporting of pests incidence. 1.4. Practiced pest control measures 1.5. Applied fertilizer with appropriate method 1.6. Applied proper irrigation/watering of crops 1.7. Carried out cultivation practices based on crop requirement 1.8. Performed rejuvenating activities 1.9. Performed growth training technique for different crops 1.10. Carried out mulching techniques 1.11. Followed Occupational Health and Safety Standards
2. Required Knowledge and Attitudes	2.1. Pruning techniques 2.2. Weeding methods 2.3. Pest control procedures 2.4. Fertilizer application 2.5. Irrigation methods 2.6. Occupational Safety and Health Standards
3. Required Skills	3.1. Basic mathematical processes of addition, subtraction, division and multiplication 3.2. Proper handling of tools and equipment 3.3. Pest monitoring by recording and reporting pests incidence 3.4. Fertilizer and pesticide application
4. Resource Implications	**The following resources should be provided:** 4.1. Farm or plantation area 4.2. Storage shed 4.3. Farm tools/ implements/ equipment 4.4. Farm supplies 4.5. Logbooks 4.6. Irrigation system and parts 4.7. References (fertilizer and pesticide manual/ catalogue, protocols, field guides, etc.)
5. Methods of Assessment	**Competency in this unit may be assessed through:** 5.1. Direct Observation 5.2. Demonstration 5.3. Oral interview and/or written test 5.4. Third party report
6. Context of Assessment	6.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : **CARRY-OUT HARVEST AND POSTHARVEST OPERATIONS**

UNIT CODE : **AFF610304**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform harvest and postharvest operations of major agricultural crops including maintaining quality of produce for distribution. This unit also includes proper use of tools and equipment required to perform the activities. This unit does not include secondary processing.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range Statement
1. Perform pre – harvest operations	1.1 Crop maturity is identified according to parameters affecting ***physiological growth*** and ***physical indicators***. 1.2 Records of crop ***agronomic history*** is verified and referenced for maturity. 1.3 ***Obstructions*** from the field are removed for efficient harvesting 1.4 ***Harvesting tools and materials,*** and temporary shed are readied 1.5 ***Records*** regarding crops to be harvested are checked
2. Perform harvesting activity	2.1 Appropriate harvesting methods are implemented based on best cultural practices for each crop using suitable tools 2.2 ***Crops*** are handled according to the ***postharvest treatment.*** 2.3 Crops are harvested based on maturity indices and ***characteristics affecting harvest*** quality 2.4 Harvesting is performed while observing GAP principles
3. Perform postharvest operation	3.1 ***Postharvest operations*** are employed based on standard are followed. 3.2 Use of ***postharvest equipment*** is monitored avoiding ***damage*** to crop in line with manufacturer/enterprise procedures. 3.3 Handling and ***packaging*** are done according to variety and destination. 3.4 Crops are ***stored and stacked*** in cool dry place prior to distribution in line with enterprise procedures
4. Monitor storage pest and diseases	4.1 Pest are identified based on ***references*** for storage pest and diseases 4.2 Identified ***storage pest and diseases*** are logged and reported to immediate authority.

RANGE OF VARIABLES

VARIABLE	SCOPE
1. Physiological growth	Include the following: 1.1 Days after flower induction 1.2 Days after fruit setting
2. Physical indicators	Include the following: 2.1. Change in color 2.2. Change in size 2.3. Change in texture
3. Agronomic history	Include the following: 3.1 Nursery source 3.2 Variety of plant 3.3 Planting calendar 3.3.1 Days after planting 3.3.2 Days at flowering 3.3.3 Days at fruit set
4. Obstructions	May include but not limited to: 4.1. Weeds 4.2. Dead branches 4.3. Stakes and wedges
5. Harvesting tools and materials	May include the following: 5.1. Picking poles 5.2. Scythes 5.3. Scissors 5.4. Shears 5.5. Shovels 5.6. Collecting baskets with liners 5.7. Harvesting crates with liner 5.8. Container with clean water with preservative 5.9. Sacks 5.10. Twines 5.11. Labels and markers
6. Records	Include the following: 6.1. Crop history 6.2. Farm calendar 6.3. Farm records
7. Crops	May include the following but not limited to: 7.1. Fruitcrop 7.1.1. Mangoes 7.1.2. Papayas 7.1.3. Pineapple 7.1.4. Banana 7.1.5. Citrus 7.2. Plantation crop 7.2.1. Coffee

	7.2.2. Cacao 7.2.3. Abaca 7.2.4. Coconut 7.2.5. Sugarcane 7.3. Forage 7.4. Ornamentals 7.4.1. Rose 7.4.2. Sampaguita 7.4.3. Anthurium 7.4.4. Chrysanthemum 7.5. Cereals 7.5.1. Rice 7.5.2. Corn 7.6. Vegetables 7.6.1. Leafy 7.6.2. Fruit vegetable 7.6.3. Legumes 7.6.4. Bulbs 7.7. Medicinal plants 7.7.1. Sambong 7.7.2. Lagundi 7.7.3. Tsaang-gubat 7.7.4. Yierba-buena 7.7.5. Acapulko 7.7.6. Bayabas 7.7.7. Ampalaya 7.7.8. Pansit-pansitan 7.7.9. Niyog-niyugan 7.7.10. Bawang 7.8. Essential Oil plants 7.8.1. Ilang-ilang 7.8.2. Sampaguita 7.8.3. Citronella 7.8.4. Vanilla 7.9. Culinary Herbs 7.9.1. basil 7.9.2. lemon grass 7.9.3. mint 7.9.4. tarragon 7.9.5. parsley 7.10. Spices 7.10.1. black pepper 7.10.2. chili 7.10.3.

8. Postharvest treatments	May include the following: 8.1 Hot water treatment 8.2 Vapor heat treatment 8.3 Chemical treatment 8.4 Best practices in drying 8.5 Pre-cooling treatment
9. Characteristics affecting harvest	Include the following: 9.1. Continued occurrence of physiological changes 9.2. High in water content 9.3. Susceptible to attack by pathogens and insects
10. Postharvest operation	Include the following: 10.1. Washing 10.2. Cleaning 10.3. Sorting 10.4. Trimming 10.5. Chemical Treatment 10.6. Grading 10.7. Fermenting 10.8. Drying 10.9. Blanching
11. Postharvest equipment	Include the following: 11.1. Hot water treatment machine 11.2. Sorter 11.3. Weighing scale
12. Damage	Include the following: 12.1. Bruising 12.2. Wounding 12.3. Abrasion
13. Packaging	Includes: 13.1. Crates (wooden, plastics andstyro) 13.2. Paper wrap 13.3. Carton box 13.4. PEB(Polyethylene bags) 13.5. Styro 13.6. Sacks/bags
14. Storage and stacking	14.1. On-farm storage 14.2. Off-farm storage
15. References	15.1. Pictorial guide 15.2. Posters 15.3. Pamphlets
16. Storage pest and diseases	16.1. Insect pest 16.2. Rodents 16.3. Fungi 16.4. Bacteria

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Prepared field and materials/tools used for harvesting and postharvest 1.2 Identified and applied maturity indices when harvesting 1.3 Harvested and handled crops properly 1.4 Maintained quality of crops during distribution and storage applying consideration for optimum condition 1.5 Monitored storage pest and diseases
2. Required Knowledge and Attitudes	2.1 Safety Practices 2.1.1 Knowledge on HACCP principles 2.1.2 Knowledge on Good Manufacturing Practices 2.2 Mathematics and Measurement 2.2.1 Measurement of humidity and temperature 2.2.2 Measurement of area, volume, and weight 2.2.3 Simple mathematical computation 2.3 Tools & Equipment: Uses and Specification 2.3.1 Use of measuring devices 2.3.2 Operation of machines and equipment 2.4 Systems, Processes and Operations 2.4.1 Principles and practices in harvest and postharvest 2.4.1.1 Different storage pest and diseases 2.4.1.2 Different handling and packaging of produce 2.4.2 Identification of postharvest facilities, 2.5 Values 2.5.1 Effective team player 2.5.2 Smooth Interpersonal Relationship (SIR) 2.5.3 Observant of work ethics
3. Required Skills	3.1 Communicating ideas and info 3.2 Collecting information 3.3 Proper use and maintenance of tools and equipment 3.4 Monitoring skills 3.5 Maintain quality of stored commodities 3.6 Physical analysis of crop for quality standards
4. Resource Implications	The following resources should be provided: 4.1 Facilities and equipment appropriate for harvest and postharvest of crops 4.2 Supplies and materials contingent to machines 4.3 Farm house 4.3.1 Packing area 4.3.2 Storage facilities 4.4 Farm tools/ implements/ equipment 4.5 Writing instruments 4.6 Farm supplies 4.7 Logbooks 4.8 References (catalogue, protocols, field guides, GAP, OHSS manuals)

5. Method of Assessment	Competency in this unit may be assessed through: 5.1 Direct observation and questioning 5.2 Demonstration (simulated) 5.3 Oral interview and written test 5.4 Third party report
6. Context of Assessment	6.1 Competency may be assessed individually in the actual workplace or through TESDA accredited institution 6.1.1 Private farms 6.1.2 Farm school

SECTION 3. TRAINING STANDARDS

These guidelines are set to provide the Technical and Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for **AGRICULTURAL CROPS PRODUCTION NC II.**

3.1 CURRICULUM DESIGN

Course Title: **AGRICULTURAL CROPS PRODUCTION** **NC Level** **NC II**

Nominal Training Duration:

18 hrs – Basic Competencies
58 hrs – Common Competencies
260 hrs – Core Competencies
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336 hrs – Total

Course Description:

This course is designed to enhance the knowledge, desirable attitudes and skills of performing nursery operations, planting crops, caring and maintaining crops and carrying-out harvest and post harvest operations. It also includes competencies in workplace communication, teamwork, safety in the use of hand tools and equipment, housekeeping antd processing of farm wastes.

BASIC COMPETENCIES
18 hours

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Participate in workplace communication	1.1 Obtain and convey workplace information. 1.2 Complete relevant work related documents. 1.3 Participate in workplace meeting and discussion.	• Group discussion • Interaction	• Demonstration • Observation • Interviews/ questioning
2. Work in a team environment	2.1 Describe and identify team role and responsibility in a team. 2.2 Describe work as a team member.	• Discussion • Interaction	• Demonstration • Observation • Interviews/ questioning

3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals. 3.2 Set and meet work priorities. 3.3 Maintain professional growth and development.	• Discussion • Interaction	• Demonstration • Observation • Interviews/ questioning
4. Practice occupational health and safety	4.1 Identify hazards and risks 4.2 Evaluate hazard and risks 4.3 Control hazards and risks 4.4 Maintain occupational health and safety awareness	• Discussion • Plant tour • Symposium	• Observation • Interview

COMMON COMPETENCIES

58 hours

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Apply safety measures in farm operations	1.1 Apply appropriate safety measures while working in farm 1.2 Safe keep/dispose tools, materials and outfit.	• Self-paced/modular • Lecture/Discussion • Interaction • Practical Demonstration • Visit/tour	• Oral/Written Interviews • Direct Observation • Practical Demonstration
2. Use farm tools and equipment	2.1 Prepare and use farm tools 2.2 Prepare and operate farm equipment 2.3 Perform preventive maintenance procedures/practices	• Self-paced/modular • Lecture/Discussion • Interaction • Practical Demonstration • Visit/tour •	• Oral/Written Interviews • Direct Observation • Practical Demonstration
3. Perform estimation and basic calculation	3.1 Perform estimation 3.2 Perform basic workplace calculation	• Self-paced/modular • Lecture/Discussion • Interaction • Practical Exercise	• Oral/Written examination • Practical exercise

4. Process farm wastes	4.1 Collect farm wastes 4.2 Identify and segregate wastes 4.3 Treat and process farm wastes 4.4 Perform housekeeping	• Self-paced/modular • Lecture/Discussion • Interaction • Practical Demonstration • Visit/tour	• Oral/Written Interviews • Direct Observation • Practical Demonstration
5. Perform record keeping	5.1 Carry out inventory activities 5.2 Maintain production record 5.3 Prepare financial records	• Self-paced/modular • Lecture/Discussion • Interaction • Practical Demonstration • Visit/tour	• Oral/Written Interviews • Practical Demonstration

CORE COMPETENCIES
260 hour

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Perform nursery operations	1.1. Prepare nursery tools, farm implements and simple equipment 1.2. Maintain nursery facilities 1.3. Handle seeds/planting material 1.4. Prepare growing media 1.5. Conduct propagation activities	• Hands- on • Lectures/ Discussion • Videos/ Illustrations • Demonstration	• Written examination • Oral evaluation • Demonstration with questions
2. Plant crops	2.1 Prepare land for planting 2.2 Conduct field lay-out 2.3 Dig holes 2.4 Perform direct seeding 2.5 Transplant seedlings	• Hands- on • Lectures/ Discussion • Videos/ Illustrations • Demonstration	• Written examination • Oral evaluation • Demonstration with questions
3. Care and maintain crops	3.1. Apply pest control measure 3.2. Apply fertilizer 3.3. Water crops 3.4. Perform pruning 3.5. Perform physical growth-enhancing practices	• Hands- on • Lectures/ Discussion • Videos/ Illustrations • Demonstration	• Written examination • Oral evaluation • Demonstration with questions

4. Carry-out harvest and postharvest operations	4.1. Perform pre – harvest operations 4.2. Perform harvesting activity 4.3. Perform postharvest operation 4.4. Monitor storage pest and diseases	• Hands- on • Lectures/ Discussion • Videos/ Illustrations • Demonstration	• Written examination • Oral evaluation • Demonstration with questions

3.2 TRAINING DELIVERY

The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of competency-based TVET.

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training program allows for recognition of prior learning (RPL) or current competencies;
- Training allows for multiple entry and exit; and
- Training programs are registered with UTPRAS.

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer facilitates the training delivery
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies prescribed in the training regulations.

- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, or audio, video or computer technologies.
- Project-Based Instruction is an authentic instructional model or strategy in which students plan, implement and evaluate projects that have real world applications.

3.3 TRAINEE ENTRY REQUIREMENTS

Trainees or students wishing to enroll in this course should possess the following requirements:

- Able to read and write;
- With good moral character;
- Able to communicate, both orally and in writting; and
- Physically fit and mentally healthy as certified by a Public Health Officer

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS

AGRICULTURAL CROPS PRODUCTION NC II

Recommended list of tools, equipment and materials for the training of 25 trainees for Agricultural Crops Production NC II

TOOLS		EQUIPMENT		MATERIALS	
QTY.		QTY		QTY.	
25 pcs.	• Budding knife	5 units	• Soil moisture and pH meter	25 pcs.	• Petri dish
12 pcs.	• Bolo	5 units	• Wheel barrow	25 pcs.	• Calculator
5 pcs.	• Basin	1 unit	• Comb-tooth harrow*	5 units	• Puncher
10 pcs.	• Broomstick	1 unit	• Hand tractor*	100 pcs.	• Seedling tray with different holes
25 pcs.	• Pail-12Li.	5 units	• Knapsack sprayer	10 m.	• Agri bag/plastics
Cutting tools		5 units	• Hand sprayer	1000 pcs.	• PE bag with different sizes
5 pcs.	○ Pruning saw	1 unit	• Power sprayer	10 sacks	• Growing media (50 kg.)
5 pcs.	○ Hedge shear	2 units	• Grass cutter*	1 bot.	• Rooting hormone
5 pcs.	○ Kitchen knife	5 units	• Overhead sprinkler	25 pcs.	• Basket

5 pcs.	○ Cutter	5 units	• Sprinkler mist	20 m.	• Fish net
5 pcs.	○ Pliers	5 units	• Button dripper	5 pcs.	• Strainer
25 pcs.	○ Pruning shears	1 unit	• LCD/Overhead projector	10 kilos	• Plastic sheet
Digging tools		1 unit	• Post harvest treatment equipment*	10 kilos	• Fertilizers
5 pcs.	○ Steel bar	1 unit	• Desktop computer/laptop	1 kilo	• Flower inducer
5 pcs.	○ Pick mattock	25 units	• PPE	2 pcs.	• Board marker
5 pcs.	○ Hole digger			1 unit	• White board
5 pcs.	○ Garden hoe			1 pc.	• Eraser
5 pcs.	○ Shovel			1 bot.	• Pesticides
Crates				1 roll	• Rope
25 pcs.	○ Wooden crates			1 box	• Rubber band
25 pcs.	○ Plastic crates			5 units	• Seed box
25 pcs.	○ Styro crates			100 pcs.	• Seedlings assorted
Harvesting tools				1 box	• Detergent soap
25 pcs.	○ Scythe			1 bundle	• Bamboo stick
13 pcs.	○ Harvesting pole			1 ream	• Bond paper
2 pcs.	○ Ladder			1 box	• Clips
25 pcs.	○ Hand trowel			1 set	• First aid supplies
25 pcs.	• Hard Hat			5 pcs.	• Permanent pens
2 pcs.	• Measuring cups			1 roll	• Mulching materials
12 pcs.	• Sprinklers			1 roll	• String
1 pc.	• tools cabinet			1 roll	• Plastic twine
1 pc.	• Plow			5 pcs.	• Brush
25 pcs.	• Scissors			1 pc.	• Measuring tape
5 pcs.	• Rake			5 pcs.	• Meter stick
1 unit	• Soil auger			2 pcs.	• Sharpening stone

3.5 TRAINING FACILITIES

AGRICULTURAL CROPS PRODUCTION NC II

Based on a class size of 25 students/trainees

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS	GRAND TOTAL AREA IN SQ. METERS
A. Building (permanent)				**215.00**
• Student/Trainee Working Space	2.00 x 1.00 per student/trainee	2.00 per student	50.00	
• Learning Resource Center	3.00 x 5.00	15.00	15.00	
• Activity Room (including facilities, wash room, and store room)	2.00 x 3.00	6.00 per student	150.00	
B. Demo Farm				**2,550.00**
• Nursery area • Field plot and Working shed (100sq.m.)	1 x 2 per trainee 10 x 10 per trainee	2 per trainee 100 per trainee	50.00 2500.00	

3.6 TRAINER'S QUALIFICATIONS FOR AGRICULTURE SECTOR

Trainers who will deliver the training on **AGRICULTURAL CROPS PRODUCTION NCII** should have the following:

- Must be a holder of National TVET Trainer Certificate I (TM I and Agricultural Crops Production NCII)
- Preferrably computer literate
- Must be physically and mentally fit

Reference: TESDA Board Resolution No. 2004 03

3.7. INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency . A certificate of achievement is issued for each unit of competency.

SECTION 4 ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1. To attain the National Qualification of Agricultural Crops Production NC II, the candidate must demonstrate competence in all the units listed in Section 1. Successful candidates shall be awarded a National Certificate signed by the TESDA Director General.

4..2.1. Accumulation of Certificates of Competency (COCs) in the following areas:

4.2.1.1. Perform nursery operations
4.2.1.2. Plant crops
4.2.1.3. Care and maintain crops
4.2.1.4. Carry-out harvest and postharvest operations

Successful candidates shall be awarded Certificates of Competency (COCs) bearing the signature of the Regional Director and Chair of the recognized local industry body.

4.2.2. Demonstration of competence through project-type assessment covering all required units of the qualification.

4.2. Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.

4.3. The following are qualified to apply for assessment and certification:

4.3.1 Graduates of formal, non-formal and informal including enterprise-based training programs
4.3.2. Experienced Workers (wage employed or self-employed)

4.4. The guidelines on assessment and certification are discussed in detail in the Procedures Manual on Assessment and Certification and Guidelines on the Implementation of the Philippine TVET Qualification and Certification System (PTQCS).

COMPETENCY MAP FOR AGRICULTURE, FORESTRY AND FISHERY SECTOR
Agricultural Crops Production NCII

ANNEX A

BASIC

Receive and Respond to Workplace Communication	Participate in Workplace Communication	Lead Workplace Communication	Use relevant technologies	Develop Team and Individual	Work with Others	Work in a Team Environment	Lead Small Team	Solve problems related to work activities	Apply Problem Solving Techniques in the Workplace
Practice basic housekeeping procedures	Demonstrate work values	Develop and practice negotiation skills	Use mathematical concepts and techniques	Plan and Organize Work	Practice career professionalism	Practice occupational health and safety procedures			

COMMON

Apply safety measures in farm operations	Use farm tools and equipment	Perform estimation and calculation	Process farm waste	Perform record keeping	Apply basic first aid

CORE

Supervise agronomic crop maintenance	Produce fruit bearing crops	Undertake agronomical crop maintenance activities	Implement vertebrate pest control program	Implement a plant establishment program	Maintain the workplace	Perform post harvest operations of major tropical fruits	Undertake agronomic crop harvesting activities	Monitor and operate water treatment processes	Transport, handle and store chemicals
Support agronomic crop work	Perform post harvest operation of major lowland and semi-temperate vegetable crops	Save, prepare and store agricultural seed	Collect samples for a rural production of horticulture monitoring program	Supervise agricultural crop establishment	Support horticultural crop work	Prepare land for agricultural crop production	Undertake field budding and grafting	Save, prepare and store agricultural seed	Implement and monitor quality assurance procedures

Support irrigation work	Prepare and apply chemicals	Coordinate a horticultural crop maintenance program	Undertake agronomic crop maintenance activities	Support and review business structures and relationships	Support nursery work	implement a plant nutrition program	Establish horticultural crops	Coordinate machinery and equipment maintenance and repair for agricultural crops	Promote plant health
Conduct pre-horticultural farm operations	Control weeds	Undertake a propagation program	Operate pertigation equipment	Implement and monitor a property improvement plan	Produce vegetables	Implement a post-harvest program	Coordinate horticultural crop harvesting	Operate within a budget framework	Supervise maintenance of machinery and equipment
Plan & implement a chemical use program	Establish agronomic crops	Supervise horticultural crop harvesting	Comply with industry quality assurance requirements	Keep records for a farm business	Apply basic first aid	Implement vertebrate pest control program	Control weeds, pests and /or diseases in crops	Supervise agronomic crop harvesting	Analyze and interpret production data
Conduct Variety and Seed Selection	Perform Land preparation	Carry-out Crop Establishment	Manage crop	Conduct of Harvest and Post-Harvest Operations	Perform nursery operations	Plant crops	Care and maintain crops	Carry-out harvest and postharvest operations	

GLOSSARY OF TERMS

For the purpose of this standard, the word

- **Aflatoxin** – the toxin produced by some strains of the fungi *ASPERGILUS FLAVUS* and *ASPERGILUS PARASTICUS*; the most potent carcinogen yet discovered.

- **Ambient condition**– ordinary room temperature and relative humidity.

- **Ambient air** – the surrounding air (atmospheric).

- **Ambient storage** – any treatment or practice extending post harvest life of harvested commodity beyond that of similar commodity held under ambient conditions without treatment.

- **Airflow rate** – the amount of air passing through an obstruction per unit of time.

- **Curing** – process of toughening and self-healing of bruises and skinned areas in root and tubes crops or the rapid closing of the neck of bulb crops under favourable conditions

- **Driller** – a machine for sowing in furrows

- **Drip Irrigation** – application of water through small tubes and orifices or emitters which discharge small quantity of water to the base of the plant

- **Dry-bulb temperature** – the temperature of air indicated by a standard temperature

- **Equilibrium moisture content** – the moisture content at which moisture in a product is in equilibrium with the surrounding air. The product does not gain or loss moisture.

- **Fogging** – to cover or envelope with fog

- **Foliar fertilizer** – fertilizer formulation containing nitrogen, phosphorous and potassium plus selected micronutrient element such as (Ca, Mg, Mn, Fe, Zn, Cl, B, Cu, S) applied by spraying on the leaves

- **Fumigant** – a chemical compound which acts in the gaseous state to destroy insects and their larvae.

- **Fumigation** – the process of treating stored products with insecticides/pesticides and the like in fumes or vapor form.

- **Furrow Irrigation** – a method of supplying water through a canal system wherein water flows down or across the slope of the field

- **Furrowing** – final step in land preparation by making furrows or beds for planting

- **GATT** – General Agreement on Tariff and Trade

- **Grading** – the process of classifying into groups according to a set of recognized criteria of quality and size, each group bearing an accepted name and size grouping.

- **Growing medium** – mixture of different materials such as soil, sand, compost, coir dust, rice hull, perlite, peat, etc. for growing seedlings

- **HACCP** – Hazard Analysis Critical Control Points

- **Hardening** – the process of gradually withholding water and exposing to direct sunlight to prevent seedlings from transplanting stress/shock

- **Harrowing** – breaking of large soil clods that are caused by plowing

- **Hilling-up** – the process of covering the applied fertilizer material by raising the soil towards the base of the plant to further stabilize its stand for better plant growth.

- **Hygrometer** – an instrument that measures humidity.

- **Insect pest** – a destructive or harmful insect.

- **Irrigation** - any method of supplying water to sustain plant growth

- **Off-Baring**- process of cultivating the soil away from the base of the plants

- **Pricking-off**- methods of transferring of seedling to avoid overcrowding

- **Larvae** – the first stage of the life cycle of insects after leaving the egg.

- **Manometer** – an instrument that measures air pressure.

- **Maturity** – the quality or state of ripeness, or of being fully developed grain.

- **Maturity index** – signs or indications that a commodity is mature and is ready to be harvested.

- **Moisture content** – the conventional index used to determine whether the seed is dry enough for safe storage or for milling usually expressed in percent (% M.C.).

- **Molds** – superficial often woolly growth produced on various forms of organic matter, especially when damp or decaying.

- **NFA** – National Food Authority

- **Packaging** – technology or process to ensure adequate protection and safe delivery of a product from the produces to the ultimate consumer.

- **Packing** – act of putting commodities in a container.

- **Packinghouse** – place where the preparatory steps for storage or marketing are done.

- **Pallet** – low portable platform made of wood or metal or in combination to facilitate handling, storage or transport of materials as a unit load using forklift.

- **Perishables** – food crops for which value and/or quality is maintained over a short period of time after harvest. These include fruits, vegetables, flowers, young coconut, nursery stocks and some staple root crops such as sweet potato, cassava and yam.

- **Postharvest disease** – disease observed after harvest regardless of when or where initial infestation took place.

- **Post harvest handling** – specific term used for the movement of commodities and operations through which a commodity undergoes from harvest to possession of the fixed consumer, includes the technological aspects of marketing and distribution.

- **Post harvest infection** – infection that takes place after harvest.

- **Post harvest life** – period of time during which a commodity is still acceptable for its intended purpose.

- **Pre cooling** – strictly, it means the rapid cooling (48 hours or less) of a commodity to a desired transit or storage temperature soon after harvest before it is stored or moved in transit.

- **Pupa** – an intermediate stage of an insect that preys on one or more plants and animals that man wishes to preserve for his own use.

- **Refrigeration** – process of removing heat from a compartment or substance so that temperature is lowered and then maintained at a desirable level, usually refers to refrigeration by mechanical means.

- **Relative humidity** – the actual vapor pressure of the air relative to saturation.

- **Respiration** – biological process by which organic materials are broken down to simpler forms accompanied by the release of energy and heat.

- **Ripening** – the state of development of a fruit when it becomes soft and edible applies strictly to climacteric type fruit.

- **Rodents** – refer to rats and mice which destroy grains and other stored products.

- **Senescence** – final phase in the life of an organ in which a series of normally irreversible events are initiated leading to cellular breakdown or death of the organ.

- **Side-dress fertilizer** – additional amount of any fertilizer materials applied at the onset of flowering to complete the nutritional requirement of the crop

- **Sprinkler irrigation** – a mechanical method of supplying water over the standing crop by means of a nozzle which is rotated by water pressure

- **Synthetic mulch** – mulching materials made either of polyethylene or non-woven fabric

- **Sorting** – the process of classifying into groups designated by the person classifying crops or commodities the produce either according to a set criterion.

- **Standard** – the set of criteria and specifications of quality determining the grades, described as product characteristics such as maturity, color, cleanliness, shape, free from decay and blemishes and uniformity of size.

- **Storage** – process of keeping horticultural crops in a structure designed to protect the stored products from inclement weather and pests for a short or long period of time to await processing or movement to other location.

- **Storage life** – the longest time produce can be kept in a sound marketable condition.

- **Tachometer** – an instrument that measures revolutions per minute

- **Tillage** – the mechanical manipulation of the soil
- **Transplants** – vegetable seedlings produced for transplanting
- **Trellis** – a support structure for viny crops and can either be T, I, Y, A shaped
- **Velometer** – an instrument that measures velocity of air flow
- **Waxing** – application of a thin film of surface coating to fruits and vegetables.
- **Wet-bulb temperature** – temperature of moist air indicated by a thermometer whose bulb is covered with a moist wick which the air flow passing over has a velocity of 15 ft per second.

ACKNOWLEDGEMENTS

The Technical Education and Skills Development Authority (TESDA) wishes to extend gratitude and appreciation to the many representatives of business, industry, academe and government agencies and labor groups who donated their time and expertise to the development and validation of these Training Regulations.

This undertaking was also made possible through the collaborative project between TESDA and DA entitled **DA-TESDA National Convergence Program on Enhancing Agricultural Productivity through Skills Development** which is supported by the Department of Agriculture-Agricultural Training Institute.

- **THE TECHNICAL ADVISORY PANEL (TAP)**

Dr. RODOLFO P. ESTIGOY
Chief
Bureau of Post Harvest Research and Extension
Central Luzon State University, Science City of Muñoz, Nueva Ecija
Member
Philippine Society of Agricultural Engineer

Mr. ALEJANDRO T. ESCANO
President
Philippine Chamber of Agriculture and Food (PCAFI)
MFI Bldg. Otigas Avenue Extension, Pasig City

Dr. ALMA M. DELA CRUZ
Professor
Central Luzon State University
Muñoz, Nueva Ecija

- **THE TECHNICAL EXPERT PANEL (TEP)**

Mr. ROLANDO SIANGHIO
President
Lacto Asia Pacific Corporation

Ms. PILIPINAS BALANTAC
Instructor
Rizal Experimental Station and Pilot School Cottage Industries (RESPSCI)
Pasig City

Ms. MIRIAM A. ACDA
Chief
Bureau of Post Harvest Research and Extension
CLSU Compound
Muñoz, Nueva Ecija

Mr. JAIME R. RACHO SR.
Assistant Professor
Quezon National Agricultural School (QNAS)
Malicboy, Pagbilao, Quezon

Mr. EDUARDO T. CAYABYAB
Chief
Bureau of Post Harvest Research and Extension
CLSU Compound

Mr. LITO BULAONG
Chief
Bureau of Post Harvest Research and Extension
CLSU Compound

Muñoz, Nueva Ecija

Muñoz, Nueva Ecija

Mr. LORENZO A. BELINO
Benguet Farmers Multipurpose Cooperative

- **THE REVIEW PANEL**

MS. ALICIA S. ACOBA
Supervising Agriculturist
Bureau of Plant Industry,
San Andres, Malate, Manila

DR. DIVINA M. AMALIN
Balikscientist
Cocoa Foundation of the Philippines,
1365 E. Rodriguez Sr. Avenue, Quezon City

ENGR. ENGR. REYNALDO P. GREGORIO
Supervising Science Research Specialist
Philippine Center for Post Harvest Development and Mechanization,
CLSU Compound, Science City of Muñoz

MR. PROCESO H. MANGUIAT
University Researcher
Institute of Plant Breeding,
University of the Philippines Los Baños College Laguna

DR. PEDRITO S. NITURAL
Professor V
Central Luzon State University,
Science City of Muñoz, Nueva Ecija

MS. JULIE ANN A. ARAGONES
Agriculturist II
Bureau of Plant Industry
San Andres, Malate, Manila

MR. RAMIL G. RUBIA
Farmer
AANI, Antipolo City

DR. CONSTANCIO C. DE GUZMAN
Professor
Herbs and Spices, Medicinal Plants
Crop Science Cluster
U.P. Los Baños, Laguna

MR. MANOLITO B. VELA
Agriculturist II
Office of the Provincial Agriculturist - NEPG
Palayan City, Nueva Ecija

MR. OSCAR AALA
Senior Agriculturist (Research/Crop Production)
Bureau of Plant Industry
San Andres, Manila

MR. RICHARD D. ROMANILLOS
Science Research Specialist
Community Development
PHILRICE
U.P. Los Baños, Laguna

MR. GARY A. PUNTA I
Instructor/Animal Nutrition Expert (Forage Crop)
Cavite State University
Indang, Cavite

MR. ALEXANDER F. FERRE

MR. ROMEO P. AYOS

Dean/Professor V
Horti-Crop Production and Physiology
Cavite State University
Indang, Cavite

Senior Agriculturist (Crop Production)
Bureau of Plant Industry
San Andres, Manila

MS. LUZVIMINDA RAZON
Supervising Agriculturist
Agricultural Training Institute
Department of Agriculture

DR. KHAYANG LUY BATTAD
Senior Agriculturist
Agricultural Training Insitute
Department of Agriculture

- **THE RESPONDENTS OF VALIDATION:**

QUEZON

MS. MERLE C. FELIZARDO
Farmer
Samahan ng magsasaka ng gulay ng Pagbilao
Binahaan, Pagbilao Quezon

MR CERILO ARDEN A. ALIYAS
Farm Owner
Aliyas Pharmacy
Gumaca Public Market, Gumaca Quezon

MR. FLORENCIO B. SERA
Farmer
Samahan ng magtatanim ng gulay sa bayan ng Pagbilao
Sitio Centro Binahaan, Pagbilao Quezon

MR. MELCHOR F. SANTIAGO
Farmer
Gunaca Mango Growers Association
Gumaca Quezon

MS. PRIMITIVA G. MEMORANDO
Farmer
Quezon Mango Growers Association
Binahaan, Pagbilao Quezon

MR. HAGENIO C. QUIPID
Farm Owner
Quipid abaca Fiber Industry
Binahaan, Pagbilao quezon

MR. RAUL T. EDRAD
President
Samahan ng Maggugulay sa bayan na Pagbilao
Barangay Binahaan, Pagbilao Quezon

MR. CESAR M. ORIAS
Ipilan, Tayabas City

MR. ROSALIO G. FULGAR
Agriculturist
Fulgar Eco Farrm, Agri- Consultancy Farm Development
Malicboy, Pagbilao Quezon

MR. PABLITO A. DOMINGO
Farmer President
Quezon Mango Growers Association
Pagbilao Chapter, Pagbilao Quezon

MR. FRANCIS IAN CEAZAR E. AVILA
Farmer Admin. Aide
Local Government Unit
Lucban, Quezon

MR. DOMINGO O. ORIG
Member
MAPROTAS
Tongko, Tayabas City

MR. FLORENCIO P. CUAREZ
Board Member
Pagbilao Organic Farmer Association
Ilaya Talipan, Pagbilao Quezon

MR. CARLITO O. PALAMBIANO
Member
MAPROTAS
Ilayang Nangka, Tayabas Quezon

MR. ERNESTO JR. R. VILLASANTA
Secretary
Pagbilao Organic Farmers Association
Ilayang Talipan, Pagbilao Quezon

MR. FRANCISCO JR. M. RUGAYAN
Farmer
Ibabang Palale, Tayabas City Quezon

MS. VIVIAN V. ZAGALA
Member
MAPROTAS
Barangay Ilaya Nangka, Tayabas City

MS. DOLORES M. DURANA
President
MAPROTAS
Barangay Pandakaki, Tayabas City

MR. NILO C. CABUYAO
Sales Supervisor/ Member
MAPROTAS
SM Ville Subd. Lita Phase 3 Tayabas Quezon

MS. FELINA J. CABUTIHAN
Secretary
MAPROTAS
Calumpang, Tayabas City

MR. EDMUNDO S. MERANO
Adviser, MAPROTAS
16 Allarey St. Lucena City

MR. ANSELMO D. QUIPID
Owner/ Worker
Quipid Ornamentals and Bonsai Production
Binahaan, Pagbilao Quezon

MR. ROSALIO G. FULGAR
Proprietor/ Agriculturist
Fulgar Eco- Farm Agri- Consultancy and Farm Devt.
Kan. Malicboy, Pagbilao Quezon

BUKIDNON

MR JACINTO JR. L. ALINGASA
Project Coordinator
Community Agri-tech Network
Bukidnon Wiode

MS. RACHEL JOY D. SALINGAY
Supervisor
Del Monte Philippines Incorporation
Camp Phillips, Manolo Portich
Bukidnon

MR. PETROCINCO B. BUTLAY
Barangay Kagawad
Brgy. Govt. Banbo Valencia City Buk.
Banbo Valencia City Bukidnon

MR. PAQUITO D. SUBAYCO
Farm Supervisor
First Fruit Agro Industrial Corporation
Purok 17, Hindangoy Valencia City
Bukidnon

MR. HENRY S. BINAHON
CEO
Binahon Agroforestry Foundation Inc.
0292CM Recto Ave. Malaybalay City

MS. LYDIA C. SISON
Professor V
Central Mindanao University
Musuan, Bukidnon

MR. DEBERT S. DADANG
Farm Supervisor
Jocel Mabao Corporation
Valencia City Bukidnon

MR. JULIUS C. TAGUPA
Supervisor
Del Monte Philippines Incorporation
Camp Phillips, Manolo Portich Camp
Bukidnon

MR. MAX D. DAY-YO
P7 Batangan Valencia City
Bukidnon

MS. MARIA LENNA LUZ U. RIZON
Supervisor
Del Monte Phils. Inc.
Camp Phillips, Bukidnon

MR. MARIO M. DESCALLAR
Chairman
Valencia Organic Products Processors,
Trainors Traders Association
Valencia City c/o City Agriculture Office

MS. JESSICA R. VELOS
Manager
Del Monte Phils. Inc.
Camp Phillips Manolo Portich Bukidnon

MR. NICASIO F. ENGALLADO
Manager/Owner
Engallados Nature Farms and Natural
Food Products
P-6 Sto Nino Tongantongan Valencia
City

MR DAVID M. PORTICOS
Farm Owner
DMP Farms
Kahapduan, Valencia City

MR. GREGORIO T. GONZALEZ
OIC.
Del Monte Phils. Inc.
Camp Phillips, Bukidnon

LAGUNA

MR. ROMUALDO B. MERGILLA
Agricutural Technician
LGU, Luisiana
Brgy. San Diego, Luisiana Laguna

MR. DELFIN JR I. ESPERANZA
Pangulo ng Magsasaka
Samahang Magsasaka
Brgy. San Roque Luisiana Laguna

MS. CONSTANCIA A. DE LUMBAN
Municipal Agriculturist
Local Government Unit
Luisiana Laguna

MR LORETO A. VILLANUEVA
Farm Owner
Samahan ng Magtatanim ng Cacao
Barangay San Juan Luisiana Laguna

MR. ZOSIMO D. IGLORIA
Kasapi

MR. DANILO P. ROMULO
Farmer

Samahan ng Magtatanim ng Cacao
Barangay San Pedro

Samahan ng Magtatanim ng Cacao
Luisiana, Laguna

MR. EMILIANO S. DALEPIAS
Kasapi
Samahan ng Magtatanin ng Kakacon
Barangay San Buenaventura

MS. MERCEDITA C. GALLARDO
Chairman
Samahan ng Magtatanim ng Cacao
San Juan Luisiano Laguna

MR. LORETO T. RACOMA
Farmer
Member Cacao Association
Brgy. San Pablo, Luisiana Laguna

MS. LUCIA F. ARCA
Business Permit/License
Inspector\LGU Luisiana
Rizal St. Zone VIII, Luisiana Laguna

MR. GENARO M. RUAZOL
Farmer
Barangay San Jose, Luisiana Laguna

MS. NARCISA M.ABELA
Magsasaka
Brgy. Sto Tomas Luisiana Laguna

MR. ROMULO S. PEREZ
Kagawad
Samahan ng Magtatanim ng Cacao
Barangay San Pablo

LUCBAN, QUEZON

WORKERS OF INSULAR BOTANICAL INTERNATIONAL, (IBI)

MR. JERRY J. SALUMBIDES
Supervisor C.F. Expert
Insular Botanicals International Inc.
Barangay Kilib

MR. LUIE R. GOMEZ
Inducer
Insular Botanical Int. Inc.
KM 131 Brgy. Kilib Lucban Quezon

MR. ROLANDO R. CONSTANTINO
Laborer
T.B.I.I.
Barangay Kilib Lucban Quezon

MS. T. A. FLORES
Supervisor
I.B.I.I.
Barangay Liblib Lucban Quezon

MR. FERDINAND A. MERLE
Worker
Insular Botanicals International Inc.
Barangay Kilib, Lucban Quezon

MR. ARMANDO O. DEAN
Worker
Insular Botanical Int.Inc.
20 Barangay Kulapi. Lucban Quezon

Farmers/Growers

MR. DANILO R. BARRIENTOS
Farmer/Laborer
#26 brgy. Nagsinamo, Lucban Quezon

MS. ROSALINA L. LITANA
Ornamental
Barangay Nagsinamo, Lucban Quezon

MS. CATALINA D. BARRIENTOS

MS. ALICIA M. BOA

Farmer
26 Barangay Nagsinamo Lucban Quezon

Ornamental Producer
Sitio Pabdog, Brgy. Nasinamo Lucban Quezon

MS. LORNA R. MARASIGAN
Farmer
26 Barangay Nagsinamo, Lucban Quezon

MS. ELENITA R. RACELIS
Agri- Tech.
Barangay Nagsinamo, Lucban Quezon

MS. AURELIA A.LUNAR
Ornamental Farmer
Barangay Nagsinamo, Lucban Quezon

MS. NORITA A. LITANA
Farmer
Barangay Nagsinamo, Lucban Quezon

LOVELY GLORY ANGELM L. LITANA
Farmer
26 Barangay Nagsinamo, Lucban Quezon

MS. LEALYN L. NOLASCO
Ornamental farmer
26 Brgy. Nagsinamo, Lucban Quezon

MS. LORETA M. LITANA
Ornamental Farmer
Barangay Nagsinamo, Lucban Quezon

MS. GHELYN D. GARCIA
Admin. Aide I
40 Conception St. Brgy. 8 Lucban Quezon

MS. ROGILDA A. LUNAR
Farmer
Barangay Nagsinamo. Lucban Quezon

GUGUINTO, BULACAN

JULIUS V. FIGUEROA
Agriculturist (Ornamental Plants)
Municipal Agriculture Office
Guguinto, Bulacan

OLIVER R. SANTOS, JR.
Agricultural Technician (Ornmental Plants)
Municipal Agriculture Office
Guguinto, Bulacan

The Management and Staff of the TESDA Secretariat

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- Competency Assessment and Certification Office