

Appendix P

AGRICULTURE, FOOD, AND NATURAL RESOURCES (AFNR) YOUTH APPRENTICESHIP

PLANT PATHWAY GREENHOUSE/FLORAL UNIT UNIT 8

Unit 8: Plant Pathway Greenhouse/Floral

Competency

1. Service customers

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Becomes familiar with product lines and any applicable information to assist the customer in choosing a product
- ***Demonstrates customer service skills***
- Greets and assists guests
- Uses effective sales techniques with customers such as focusing on customer needs and priorities
- Responds to dissatisfied guests
- Assists guests by telephone if applicable

Learning Objectives

- Research & list effective sales techniques
- Identify the steps of the selling process
- Name methods for making the initial approach in retail sales
- Identify product information in the use of selling
- Describe ways to determine customer needs
- List common objections to purchasing
- Explain how to address customer objections
- Explain how a theme might determine the types of products/services/events available

Comments:

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Competency

2. Process sales

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Calculates total sale purchase, including taxes, accurately
- Accepts cash payments
- Accepts credit card transactions
- Gives customer correct change
- Thanks guests
- Operates a POS (point of sale) system and/or cash register
- Balances end of shift transactions

Learning Objectives

- Describe how to process cash and credit cards using a POS and cash register
- Demonstrate how to calculate and hand back cash change without a calculator
- Describe end of shift audit procedures
- Explain how sales are recorded for cash collected and paid out of a cash drawer
- Explain how cash banks are issued to cashiers
- Describe how cashiers turn in cash banks and prepare cash deposits
- Explain how cash banks and cashier cash deposits are reconciled

Comments:

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Competency

3. Assist to design crop plantings, displays, and/or floral arrangements

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

DISPLAYS

- Constructs or assembles displays and display components
- Stocks and maintains displays
- Changes or rotates window displays, interior display areas, and signage to reflect changes in inventory, season, or promotion

CROP PLANTINGS

- Creates crop planting design plan based on past sales, customer requirements, and site capacity
- Utilizes design elements of line, form, texture, and color to express visual effect
- Determines plants, trees, hardscaping, moisture, fertilizer, soil, equipment and power requirements for crop
- Determines a crop planting design for seasonal displays of foliage, plants, and flowers
- Documents design elements and decisions made for crop growth
- Develops crop planting plan based on design

FLORAL DISPLAYS/BOUQUETS, ETC

- Assembles the required flowers into bouquets, boutonnières, centerpieces, vases, wreaths, etc.
- Applies basic design principles to product
- Handles and arranges cut flowers appropriately

Learning Objectives

- List and define terms associated with nursery/floral design
- Identify design elements
- Discuss applications of art in horticulture and landscaping
- Discuss principles of design that form the basis for visual impression
- Define the categories of nursery plants
- List common hardscaping materials used in nurseries

DISPLAYS

- Explain how retail displays are used in marketing retail items
- Describe types of display arrangements

FLORALS

- Analyze the principles of floral design

- Explain how the concept of proportion, balance, dominance, focal point and rhythm are applied to floral design
- Explain how flowers incorporate space, depth, texture and color in floral design
- Distinguish between an annual and a perennial
- Describe how to design a flower garden
- Describe proper handling and preparation of cut flowers
- Explain how to bundle cut flowers for bouquets, boutonnieres, vases, wreaths, etc.
- Describe the major forms used in floral design
- Identify cutting tools used in floral design
- Recognize floral design supplies for centerpieces, sprays, and vase arrangements
- Describe floral design supplies for corsages, bouquets, and boutonnieres
- Describe designing with everlasting plant materials (dried and silk)

Comments:

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Competency

4. Implement crop planting plan

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the planting and safety procedures
- Adjusts and calibrates any equipment according to facility requirements
- Wears any required Personal Protective Equipment (PPE)
- **Prepares planting spaces**
- **Prepares soils/media**
- **Plants seeds, seedlings, or cuttings**
 - Grows liners from seed
 - Grows liners from cuttings
 - Grows liners from divisions
 - Sows grass seed or plants plugs of grass
- Transplants liners
- **Monitors crop plantings**
- **Mixes fertilizers and additives**
- **Applies fertilizers**
- Pinches crop plantings as required
- Spaces crop plantings
- Forces bulbs
- Transplants to pots
- Harvests flowers

Learning Objectives

- Contrast the different types of nursery facilities
- Demonstrate how the plant-hardiness zone map and the plant heat-zone map are used
- Describe automated systems involved in planting
- Describe the process of lining out nursery stock
- Examine the field practice schedules for different types of plants
- Describe the process of flowering, pollination, fertilization and fruit development in plants in general
- Explain the role of the shoot in propagation, branching and plant form
- Compare development of grassy versus broad leaf plants
- Compare sexual and asexual propagation
- Distinguish between bulbs, corms, tubers, and rhizomes
- Discuss production practices used in growing foliage plants in the greenhouse
- Explain practices used in caring for foliage plants in the home or office
- Examine the factors involved in getting bedding plants started

- Explain production practices used in growing bedding plants
- Discuss the factors involved in propagating perennials
- Examine production practices used in forcing perennial plants to flower
- Analyze when and how to harvest everlasting flowers
- Demonstrate the proper staking of a tree in the field

Comments:

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Competency

5. Assist to maintain and monitor crop plantings

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the monitoring requirements for the particular crop planting
- WATER
- **Assists to install and maintain watering and/or irrigation systems**
 - Calibrates watering equipment
 - Applies correct amounts of water based on water holding capacity of media and crop water needs

GREENHOUSE ENVIRONMENT

- Monitors temperature, light, humidity and air controls
- Adjusts as required for crop needs

OBSERVE

- **Assists to regularly monitor crop plantings** growth and conditions
- Takes soil, media, and plant samples as required
- Scouts for weeds, insects and plant diseases
- Adjusts actions based on crop plantings conditions for pest spraying, irrigating, fertilizing, etc. **NOTE:** Only certified professionals can prepare, load, apply, and handle pesticide(s).
- Documents actions taken and results of action

Learning Objectives

- Identify basic principles of plant monitoring and management of common horticultural crops in nurseries
- Describe methods of heating greenhouse structures
- Contrast major greenhouse cooling and ventilation systems
- Discuss how energy curtains are used to maintain greenhouse temperatures
- Discuss the advantages of automated systems
- Identify automated systems involved in moving plants in the greenhouse
- Compare automated systems involved in watering plants
- Describe proper sampling techniques used when monitoring nursery plants
- Examine the developmental stages of a common floral plant, and determine factors that affect each stage
- Examine the developmental stages of a common green plant, and determine factors that affect each stage
- Describe the process of scouting for weeds, insects, and plant diseases

Comments:

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Competency

6. Assist to prevent the spread of weeds, pests, and diseases

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the pest reduction and safety procedures
- Adjusts and calibrates any equipment according to facility requirements
- Wears any required Personal Protective Equipment (PPE)
- Identifies plant pests (e.g., insects, diseases, weeds, rodents)
- Determines pest management safety practices and methods to be used
- Implements pest control plan with appropriate treatments
- Documents pest identity and control actions taken

INSECTS/RODENTS/DISEASES

- Arranges for pesticide application or apply pesticide if licensed. **NOTE:** Only certified professionals can prepare, load, apply, and handle pesticide(s).

Learning Objectives

- Identify common weeds, insects, and diseases that affect greenhouse nurseries

PESTS

- Identify and describe types of pests
- Describe how pests affect plants and cause economic losses
- Define integrated pest management (IPM) and keys to a successful IPM program
- Compare and contrast the methods used in IPM to control pest problems

PESTICIDES

- Define toxicity
- Identify the major classifications of pesticides, and describe how they are used
- Identify the information that should be included on the pesticide label
- Identify the safety practices that should be followed when applying pesticides
- Identify the environmental concerns involved with pesticide use
- Explain pesticide persistence and its impact on the environment

WEEDS

- Define weed and explain how weeds affect crop plantings
- Determine how vegetative characteristics are used to identify weeds
- Identify common weeds in nursery production
- Discover how weeds are spread
- Describe methods of weed control
- Describe the types of herbicides

INSECTS

- Identify and classify insects

- Identify insect damage signs
- Describe the biological characteristics of insects
- Compare and contrast the types of insect life cycles
- Explain how insects damage plants
- Describe methods of insect control
- Describe the types of insecticides

DISEASES

- Identify and describe the agents that cause infectious and non-infectious plant diseases
- List conditions that are necessary for disease problems
- List and describe common plant diseases caused by bacteria
- Examine methods used to control bacterial diseases
- Describe how fungi diseases are spread
- Examine methods used to control diseases caused by fungi
- List and describe common plant diseases caused by fungi
- Identify symptoms associated with fungi diseases
- Describe common viral plant diseases
- Identify symptoms of viral diseases
- Describe how viral diseases are spread
- Examine methods used to control viral plant diseases

Comments:

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Competency

7. Perform sanitization procedures

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the sanitization and safety procedures
- Adjusts and calibrates any equipment according to facility requirements
- Wears any required Personal Protective Equipment (PPE)
- Regularly and thoroughly cleans floor of soil, organic matter and weeds
- Installs physical weed mat barriers on dirt and gravel floors
- Disinfects benches and bench tops
- Discards old OR disinfects reusable pots, flats and trays
- Cleans hose ends and stores hose ends off the ground
- Verifies growing media is covered and area is clean
- Cleans media mixing area routinely of plant material, contaminated pots, and used media
- Disinfects the growing and plant holding area
- Disinfects the irrigation system

Learning Objectives

- List common plant diseases found in nursery environments
- Describe the importance of a nursery sanitation plant
- Discuss the timing and cleaning schedule for sanitation at your facility to prevent diseases
- Describe factors that contribute to a microbe friendly environment in a nursery
- Explain the best times to conduct sanitation procedures in a nursery/greenhouse
- Discuss common disinfectants and sanitizers used in greenhouse nurseries
- Describe how to manage algae and other fungi
- Explain how improper watering can lead to algae growth
- Explain the process for cleaning irrigation systems
- Explain why wood structures are not recommended in greenhouse nurseries

Comments:

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Competency

8. Prepare, sort, and store products

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the product preparation requirements
- Sorts through the product and remove damaged or diseased product immediately if required
- Confirms that products conform to specified requirements
- If applicable, processes and grades the product prior to shipments for sale or further processing
 - Cuts, rolls and stacks sod
 - Dips cut flowers, counts into bunches and ties
 - Wraps plant, tree, shrub roots
 - Harvests plants and pot
- Stores product as required for humidity, temperature and in appropriate containers for maximum storage life
- Documents inspection, sorting and storage activities

Learning Objectives

- Compare storage requirements for different plantings
- Describe techniques for inspecting, grading, handling and storing nursery crops for distribution
- Demonstrate the process of grading with a caliper
- Describe the types of storage used for nursery stock
- Describe the techniques used in the defoliation of plants before storage
- List and describe the problems that might occur to plants in storage
- Compare processing techniques for cut flowers, potted plants, trees/shrubs, and grass/sod
- Describe factors that influence plant quality in storage including temperature, moisture, aeration, pests, handling and length of storage
- Explain the basic requirements of cut flowers
- Understand the causes of deterioration and death of flowers
- Describe the steps of effective conditioning of flowers and foliage
- Explain the importance of using floral preservatives

Comments:

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Competency

9. Fill and package orders

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the packaging and safety procedures for inspecting and sorting
- Adjusts and calibrates any equipment according to facility requirements
- Wears any required Personal Protective Equipment (PPE)
- Determine storage location of items needed
- Pulls items from storage location
- Verifies item pulled matches description and location of item required
- Notifies appropriate worksite professional of any discrepancies
- Prioritizes orders to be filled based on order plan
- Folds and prepares boxes for packaging
- Follows packaging plan for crop plantings into flats, trays and boxes
- Uses packaging methods that keep returns and claims for damage to a minimum
- Verifies that outgoing labels have all relevant information
- Confirms numbers of crop plantings packaged
- Checks container to verify that packing has proper labeling and meets shipping and safety regulations
- Notifies worksite professional when defective contents are identified
- Prepares packing slip
- Compares packing slip TO order and materials to be shipped
- Resolves any discrepancies

Learning Objectives

- Compare different storage and packing areas and their function
- Describe common labels used on crops to be readied for packaging
- Demonstrate the use of scanners and scales for inventory management and counting
- List common markings found on cartons/containers
- Explain basic guidelines for labeling
- List common types of information on a packing slip
- Examine commercial packing and shipping
- Explain the methods of preserving plant materials
- Differentiate the three types of packaging of nursery crops
- Discuss the advantages and disadvantages of bare root, balled-and burlapped, and containerized packaging
- Describe how to ball-and-burlap stock properly

Comments:

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Competency

10. Load product for sale, delivery, or further distribution

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Identifies and adheres to all related safety standards/regulations
- Loads orders safely
- Uses any loading equipment safely and according to regulations
- Determines load capacities of transport vehicle
- Loads transportation equipment according to load capacity
- Packs transportation vehicles to ensure no damage to shipment
- Secures load
- Checks load
- Verifies destination
- Documents loading and transport of product as applicable
- Updates inventory records as required

Learning Objectives

- Describe safety processes for loading, transporting and unloading
- List the regulations pertaining to loading/unloading of materials and supplies
- Describe different kinds of loading equipment and their applicable safety and regulatory use standards
- Discuss the function of verification at the loading/shipping stage
- Explain how loading plans are created for different types of transportation equipment
- List common types of transportation vehicles used for different types of nursery crops
- Describe storage conditions for transportation required for the nursery crops you work with
- Explain the importance of efficient transportation of nursery crops
- Compare processes for transporting and unloading different types of nursery crops

Comments:

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Competency

11. Assist to maintain facility & equipment

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

PREVENTATIVE MAINTENANCE (PM)

- Performs routine preventative maintenance (PM) according to facility schedule
- Communicates scheduled PM to management
- Assures that alternative equipment is available if needed
- Gathers supplies to perform PM
- Ensures that equipment is properly labeled and pulled from use
- Follows appropriate Lock Out/Tag Out procedures prior to performing PM
- Follows all safety requirements and wears appropriate Personal Protective Equipment (PPE) as required
- Assists worksite professional to follow PM schedule to calibrate and maintain equipment, tools and workstations
- Assists worksite professional to re-qualify equipment for operation
- Cleans up area after PM
- Documents preventative actions taken

REPAIR

- Assures that alternative equipment is available if needed
- Consults worksite professionals, maintenance manuals, and equipment history to diagnose possible equipment problems
- Gathers supplies to perform repair
- Ensures that equipment is properly labeled and pulled from use
- Follows appropriate Lock Out/Tag Out procedures prior to performing repair
- Follows all safety requirements and wears appropriate Personal Protective Equipment (PPE) as required
- Assists worksite professional to isolate system and component failure and to repair equipment problems
- Assists worksite professional to identify root cause of problem and develop corrective action plan
- Assist worksite professional to re-qualify equipment for operation
- Cleans up area after repair
- Documents repairs completed
- Evaluates repair work through follow up

FACILITY

- Reviews procedures for constructing or repairing facility structures
- Ensures utility companies have pre-marked locations of buried utility lines if required

- Wears the appropriate Personal Protective Equipment (PPE)
- Prepares base if needed
- Lays stone, concrete, hardscape material as required
- Builds or adds on the structural elements required
- Cleans equipment used

Learning Objectives

EQUIPMENT

- Differentiate the types of equipment used in nurseries
- Identify the cutting and digging equipment used in nurseries
- Describe the tillage and soil-moving equipment used in nurseries
- Describe how diagrams schematics, equipment manuals, and equipment specifications to determine the schedule and process for PM
- Describe how diagrams schematics, equipment manuals, and equipment specifications to determine repair
- Describe the most common causes of tool/equipment failure in your facility
- Compare what equipment and equipment material are recyclable and what is not at your facility
- Evaluate methods for equipment maintenance and repair to avoid downtime
- Compare repairing on site to securing a technician from off-site
- List factors to consider in selecting a technician
- List the factors involved with preventive maintenance (time, cost) and emergency repair (downtime, cost)

FACILITY

- Differentiate greenhouse designs
- Identify and describe greenhouse glazing materials
- Describe the functions of the headhouse
- Describe greenhouse bench options
- List common types of facility and structure projects
- List common equipment used in facility and structure projects
- Describe the process for preparing a common hardscape base
- Compare the types of materials used in paving
- Explain common steps and warnings for working with concrete
- Describe how to install a walkway
- Discuss how to properly install a fence
- Describe the different materials used to build a retaining wall
- Explain how to install a retaining wall
- Identify the major lighting techniques available for the nursery
- Explain the difference between high and low voltage
- Describe the proper installation of low-voltage lighting systems
- Identify the different materials needed to create a water feature
- Describe the proper technique for creating a small pond
- Explain how to construct a waterfall feature

Comments:

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Competency

12. Sharpen hand tools

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Checks blades regularly as required
- Reviews sharpening procedure and edge bevel angle required for hand tool
- Wears appropriate PPE
- Removes surface rust and dirt
- Sands any splintered tool handles
- Replaces or tightens broken or loose tool handles
- Uses an appropriate file or stone to sharpen nicked or dull tools
- Moves file away from and diagonally across the sharp edge to maintain the factory bevel
- Consults manual for sharpening tools with serrated edges
- For bow saws, uses a triangular file to sharpen both sides of each saw's teeth to the appropriate bevel
- Hones and maintains sharp edges of all cutting tools with a sharpening stone
- Periodically wipes tools with a light oil on metal parts for corrosion protection

Learning Objectives

- Discuss the types of digging and grading hand tools and their uses
- Explain the major types of pruning and cutting hand tools and their uses
- Discuss common shop hand tools used in horticulture
- List common hand tools in landscaping that require sharpening
- Discuss how to determine the correct sharpened bevel angle for a cutting tool
- Explain how serrated edges are sharpened
- Compare sharpening tools such as file and stones
- Discuss when to use which type of sharpening tool
- Demonstrate the process for sharpening

Comments: