Horticulture Technician Foundation Program Outline
HORTICULTURE TECHNICIAN FOUNDATION
PROGRAM OUTLINE

APPROVED BY INDUSTRY
MAY 2013

BASED ON
NOA 2010

Developed by
Industry Training Authority
Province of British Columbia
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Section 1

INTRODUCTION

Horticulture Technician Foundation
Foreword

This Program Outline describes the Landscape Horticulturist Apprenticeship Program. This program represents the new standard for horticulture apprenticeship training in British Columbia. All tasks identified in the National Occupational Analysis (NOA) have been included, as well as those competencies that apply specifically to Landscape Horticulture in British Columbia.

This document is intended as a guide for the course instructors in the classroom, laboratories and for practical training. Since this is a practical trade it is expected that instructor demonstration and student participation will be integrated into all learning activities.

Note: The Achievement Criteria for the practical assessments may be combined at the instructor’s discretion and as time permits.

Safe working practices may not be specified in all competencies and learning tasks, however they are an implied part of this training program and should be stressed throughout the apprenticeship training.

This Program Outline also lists the Training Provider Standards which includes:

- Facility Requirements
- Tools and Equipment (for each level of technical training)
- Reference Materials
- Instructor Requirements

SAFETY ADVISORY

Be advised that references to the WorkSafeBC safety regulations contained within these materials do not/may not reflect the most recent Occupational Health and Safety Regulation (the current Standards and Regulation in BC can be obtained on the following website: http://www.worksafebc.com). Please note that it is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety Regulation pertaining to his/her work.
Acknowledgements

The Program Outline was prepared with the advice and direction of an industry steering committee convened initially by HortEducationBC (HEBC). Members include:

- **Anne Kadwell**, CEO HortEducationBC
- **Bill Hardy**, HEBC Board Chair (Northwest Landscape Ltd.)
- **Don Fraser**, Past Chair (Northwest Landscape Ltd.)
- **Mary Ann Van Den Berge**, BCLNA Representative (Trice Farms Pond & Garden Centre)
- **Cable Baker**, BCLNA Representative (RCB Garden Service)
- **Bruce McTavish**, BCLNA Representative (Kwantlen Polytechnic University, McTavish Resource & Management Consultants Ltd.)
- **Garfield Marshall**, BCLNA Representative (Advance Orchard Co. Ltd.)
- **Ted de Crom**, WCTA Representative (City of Richmond Parks & Recreation Department)
- **Gail Szostek**, GreenSpace Consulting (former HortEducation BC Board Member)
- **Bill Reid**, the Corporation of the District of Powell River, Department of Parks, Recreation and Culture (former HortEducation BC Board Member)
- **Egan Davis**, HortEducationBC Board Member (City of Vancouver)
- **Rob Welsh**, Education Representative (Kwantlen Polytechnic University)
- **Dale Toronitz**, Education Representative (Camosun College)
- **Denis Gour**, Apprentice Representative (Blasig Landscape Design & Construction Ltd.)

Industry Subject Matter Experts retained to assist in the development of Program Outline content:

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- **Ron Brown**, Ron's Landscaping
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- **Suzanne Wilkinson**, Horticulture Centre of the Pacific

Facilitators:

- J. Jankola & Associates Consulting

The Industry Training Authority would like to acknowledge the dedication and hard work of all the industry representatives appointed to identify the training requirements of the Landscape Horticulturist occupation.
How to Use this Document

This Program Outline has been developed for the use of individuals from several different audiences. The table below describes how each section can be used by each intended audience.

<table>
<thead>
<tr>
<th>Section</th>
<th>Training Providers</th>
<th>Employers/ Sponsors</th>
<th>Apprentices</th>
<th>Challengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Credentialing Model</td>
<td>Communicate program length and structure, and all pathways to completion</td>
<td>Understand the length and structure of the program</td>
<td>Understand the length and structure of the program and pathway to completion</td>
<td>Understand challenger pathway to Certificate of Qualification</td>
</tr>
<tr>
<td>OAC</td>
<td>Communicate the competencies that industry has defined as representing the scope of the occupation</td>
<td>Understand the competencies that an apprentice is expected to demonstrate in order to achieve certification</td>
<td>View the competencies they will achieve as a result of program completion</td>
<td>Understand the competencies they must demonstrate in order to challenge the program</td>
</tr>
<tr>
<td>Training Topics and Suggested Time Allocation</td>
<td>Shows proportionate representation of general areas of competency (GACs) at each program level, the suggested proportion of time spent on each GAC, and percentage of time spent on theory versus practical application</td>
<td>Understand the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application</td>
<td>Understand the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application</td>
<td>Understand the relative weightings of various competencies of the occupation on which assessment is based</td>
</tr>
<tr>
<td>Program Content</td>
<td>Defines the objectives, learning tasks, high level content that must be covered for each competency, as well as defining observable, measurable achievement criteria for objectives with a practical component</td>
<td>Identifies detailed program content and performance expectations for competencies with a practical component; may be used as a checklist prior to signing a recommendation for certification (RFC) for an apprentice</td>
<td>Provides detailed information on program content and performance expectations for demonstrating competency</td>
<td>Allows individual to check program content areas against their own knowledge and performance expectations against their own skill levels</td>
</tr>
<tr>
<td>Section</td>
<td>Training Providers</td>
<td>Employers/ Sponsors</td>
<td>Apprentices</td>
<td>Challengers</td>
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</tr>
<tr>
<td>Training Provider Standards</td>
<td>Defines the facility requirements, tools and equipment, reference materials (if any) and instructor requirements for the program</td>
<td>Identifies the tools and equipment an apprentice is expected to have access to; which are supplied by the training provider and which the student is expected to own</td>
<td>Provides information on the training facility, tools and equipment provided by the school and the student, reference materials they may be expected to acquire, and minimum qualification levels of program instructors</td>
<td>Identifies the tools and equipment a tradesperson is expected to be competent in using or operating; which may be used or provided in a practical assessment</td>
</tr>
</tbody>
</table>
Section 2

PROGRAM OVERVIEW

Horticulture Technician Foundation
Program Credentialing Model

Landscape Horticulturist Level 4
Technical Training: 180 hours (6 weeks*)
Work-Based Training: 6,480 hours total
Interprovincial Red Seal Exam

Landscape Horticulturist Level 3
Technical Training: 180 hours (6 weeks*)
Work-Based Training: Accumulate hours
ITA Standardized Written Exam

Production Horticulturist Level 3
Technical Training: 240 hours (8 weeks*)
Work-Based Training: 4,860 hours total
ITA Certificate of Qualification Exam

Common Core Level 1 and Level 2
Technical Training: 360 hours (12 weeks*)
Work-Based Training: Accumulate hours
ITA Standardized Written Exam Level 1 and Level 2

*Suggested duration based on 30-hour week

C of Q = Certificate of Qualification
C of A = Certificate of Apprenticeship
C of C = Certificate of Completion
WBT = Work-Based Training
## Occupational Analysis Chart

### Horticulture Technician Foundation

<table>
<thead>
<tr>
<th>USES OCCUPATIONAL SKILLS</th>
<th>A</th>
<th>Uses personal protective equipment (PPE)</th>
<th>A1</th>
<th>Use fire types and extinguishing methods</th>
<th>A2</th>
<th>Use WHMIS</th>
<th>A3</th>
<th>Recognize work hazards</th>
<th>A4</th>
<th>Demonstrate basic horticultural skills</th>
<th>A5</th>
<th>Identify relevant legislation, regulations and standards</th>
<th>A6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
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<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>USES AND MAINTAINS TOOLS AND EQUIPMENT</td>
<td>B</td>
<td>Use and maintain hand tools and power tools</td>
<td>B1</td>
<td>Use and maintain measuring equipment</td>
<td>B2</td>
<td>Operate vehicles and motorized equipment</td>
<td>B3</td>
<td>Maintain vehicles and motorized equipment</td>
<td>B4</td>
<td>Use and maintain equipment attachments</td>
<td>B5</td>
<td></td>
<td></td>
</tr>
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<td>2</td>
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</tr>
<tr>
<td>ORGANIZES WORK</td>
<td>C</td>
<td>Communicate with others</td>
<td>C6</td>
<td>Organize plants, materials and equipment</td>
<td>C9</td>
<td>Maintain safe work environment</td>
<td>C10</td>
<td>Examine interpersonal and supervisory skills</td>
<td>C11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td>1</td>
<td></td>
</tr>
<tr>
<td>ANALYZES AND MAINTAINS PLANT HEALTH</td>
<td>E</td>
<td>Identify plants and plant requirements</td>
<td>E1</td>
<td>Manage growing conditions</td>
<td>E2</td>
<td>Manage pests and diseases</td>
<td>E3</td>
<td>Describe plant science as it applies to horticulture</td>
<td>E4</td>
<td>Describe physical and biological characteristics of soil and soilless media</td>
<td>E5</td>
<td>Describe chemical characteristics of soil and soilless media</td>
<td>E6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
<td></td>
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</tbody>
</table>
## Training Topics and Suggested Time Allocation
### Horticulture Technician Foundation – Level 1

<table>
<thead>
<tr>
<th>Line</th>
<th>USES OCCUPATIONAL SKILLS</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Use personal protective equipment (PPE)</td>
<td>15%</td>
<td>75%</td>
<td>25%</td>
<td>100%</td>
</tr>
<tr>
<td>A2</td>
<td>Identify fire types and extinguishing methods</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>Use WHMIS</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A4</td>
<td>Recognize work hazards</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A5</td>
<td>Demonstrate basic horticultural skills</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A6</td>
<td>Identify relevant legislation, regulations and standards</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line</th>
<th>USES AND MAINTAINS TOOLS AND EQUIPMENT</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Use and maintain hand tools and power tools</td>
<td>25%</td>
<td>40%</td>
<td>60%</td>
<td>100%</td>
</tr>
<tr>
<td>B2</td>
<td>Use and maintain measuring equipment</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td>Operate vehicles and motorized equipment</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B4</td>
<td>Maintain vehicles and motorized equipment</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line</th>
<th>ORGANIZES WORK</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6</td>
<td>Communicate with others</td>
<td>10%</td>
<td>80%</td>
<td>20%</td>
<td>100%</td>
</tr>
<tr>
<td>C10</td>
<td>Maintain safe work environment</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C11</td>
<td>Examine interpersonal and supervisory skills</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line</th>
<th>ANALYZES AND MAINTAINS PLANT HEALTH</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Identify plants and plant requirements</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>E3</td>
<td>Manage pests and diseases</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E4</td>
<td>Describe plant science as it applies to horticulture</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E5</td>
<td>Describe physical and biological characteristics of soil and soilless media</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Percentage for Horticulture Technician Foundation Level 1**

100%
# Training Topics and Suggested Time Allocation

## Horticulture Technician Foundation – Level 2

<table>
<thead>
<tr>
<th>Line</th>
<th>USES OCCUPATIONAL SKILLS</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Use personal protective equipment (PPE)</td>
<td>10%</td>
<td></td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>A5</td>
<td>Demonstrate basic horticultural skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line</th>
<th>USES AND MAINTAINS TOOLS AND EQUIPMENT</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Use and maintain hand tools and power tools</td>
<td>20%</td>
<td></td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>B3</td>
<td>Operate vehicles and motorized equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B4</td>
<td>Maintain vehicles and motorized equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B5</td>
<td>Use and maintain equipment attachments</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line</th>
<th>ORGANIZES WORK</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6</td>
<td>Communicate with others</td>
<td>20%</td>
<td></td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>C9</td>
<td>Organize plants, materials and equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C10</td>
<td>Maintain safe work environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C11</td>
<td>Examine interpersonal and supervisory skills</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line</th>
<th>ANALYZES AND MAINTAINS PLANT HEALTH</th>
<th>% of Time</th>
<th>Theory</th>
<th>Practical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Identify plants and plant requirements</td>
<td>50%</td>
<td></td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>E2</td>
<td>Manage growing conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E3</td>
<td>Manage pests and diseases</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E4</td>
<td>Describe plant science as it applies to horticulture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E6</td>
<td>Describe chemical characteristics of soil and soilless media</td>
<td></td>
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</tr>
</tbody>
</table>

**Total Percentage for Horticulture Technician Foundation - Level 2**

100%
Section 3

PROGRAM CONTENT

Horticulture Technician Foundation
Level 1

Horticulture Technician Foundation
Line (GAC): A USES OCCUPATIONAL SKILLS
Competency: A1 Use personal protective equipment (PPE)

Objectives
To be competent in this area, the individual must be able to:
• Describe and demonstrate personal safety in the workplace.
• Demonstrate proper use of PPE.

LEARNING TASKS
1. Select and use PPE as required for task, tools, equipment, machinery and environment
   • Ear protection
   • Eye protection
   • Hand protection
   • Foot protection
   • Safety vests
   • Respiratory protection
   • Fall protection
2. Ensure safe use of PPE
   • Inspect
   • Maintain
3. Store PPE to maintain its integrity
   • Dry area
   • Protected area
4. Check PPE prior to use
   • Operation
   • Condition
5. Check PPE inventory
   • Ensuring there is a ready supply
6. Recognize damaged and expired PPE
   • Check expiration date
   • Ensure integrity of PPE
7. Check and replace PPE components
   • According to manufacturers’ specification
   • According to workplace requirements

Achievement Criteria
Performance The learner will select PPE for specified tasks.
Conditions The learner will be given the appropriate PPE commonly used in the trade.
Criteria The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:
Selected correct PPE required for specified tasks as designated by the instructor
Line (GAC): A USES OCCUPATIONAL SKILLS
Competency: A2 Identify fire types and extinguishing methods

Objectives
To be competent in this area, the individual must be able to:
• Identify various types and classes of fires.
• Describe the procedure for using a fire extinguisher.

LEARNING TASKS

1. Describe conditions necessary to support a fire
   • Air
   • Fuel
   • Heat
   • Chemical chain reaction
   • Weather conditions

2. Describe classes of fires according to the materials being burned
   • Class A
   • Class B
   • Class C
   • Class D
   • Symbols and colours

3. Describe the procedure for using a fire extinguisher
   • Extinguisher selection
   • P.A.S.S.
     ○ Pull
     ○ Aim
     ○ Squeeze
     ○ Sweep
Line (GAC): A USES OCCUPATIONAL SKILLS
Competency: A3 Use WHMIS

Objectives
To be competent in this area, the individual must be able to:
• Summarize Workplace Hazardous Material Information System (WHMIS).
• Complete the online WHMIS certification.

LEARNING TASKS
1. Describe WHMIS requirements

CONTENT
• WHMIS certification
• WHMIS symbols
  o Compressed gas
  o Flammable and combustible material
  o Oxidizing Material
  o Poisonous and Infectious Material
  o Poisonous and Infectious Material that will cause immediate or serious toxic effects
  o Poisonous and Infectious Material that will cause other toxic effects
  o Corrosive material
  o Dangerously reactive material
• WHMIS labels

NOTE: WHMIS certification is mandatory to complete Level One.
Line (GAC): A USES OCCUPATIONAL SKILLS
Competency: A4 Recognize work hazards

Objectives
To be competent in this area, the individual must be able to:
• Identify workplace hazards.
• Identify how to mitigate the risk of workplace accidents and injuries.

LEARNING TASKS

1. Identify workplace hazards and potential risks
   • Electrical and utility
   • Working at heights
   • Gravitational (“slips, trips and falls”)
   • Thermal (heat and cold stress)
   • Motorized equipment/mechanical (pinch point, “struck against”, vehicle)
   • Public
   • Behavioural (fatigue, rushing, complacency, stress, substance abuse, ignorance, frustration)
   • Chemical
   • Compressed gas
   • Environmental (insects, plants, weather)
   • Hazardous trees

2. Identify how to mitigate the risks of workplace accidents and injuries
   • Visual assessments
   • Safe work plan
   • Post-job inspection
Line (GAC): A USES OCCUPATIONAL SKILLS
Competency: A5 Demonstrate basic horticultural skills

Objectives
To be competent in this area, the individual must be able to:
• Practice basic skills used in general horticulture.
• Use safe work habits.
• Identify, select, use and maintain appropriate hand tools for the task.
• Practice safe operation of common power equipment.
• Identify levels of landscape maintenance and plant standards stated in the BC Landscape Standard.

LEARNING TASKS
1. Demonstrate basic horticultural skills

CONTENT
• Range of workplace hazards
  o Hazards versus risks
• Hand tools used in basic horticulture
  o Refer to Level One B1- Use and maintain hand tools and power tools
• BC Landscape Standard
  o Objectives of the BC Landscape Standard
  o Guide to use
  o Format of the BC Landscape Standard
  o Scope of sections
• Basic horticultural tasks
  o Maintenance
  o Determining maintenance levels
  o Appropriate maintenance procedures
  o Common landscape maintenance tasks and tools
• Operating horticulture power equipment safely and efficiently
  o Refer to Level One B1- Use and maintain hand tools and power tools
• Safe work practices when lifting and bending
• Basic calculations
  o Landscape calculations
  o Calculating quantities: fertilizer application rates
  o Conversions
• Cooperative work methods
Achievement Criteria

Performance  The learner will maintain beds, borders, lawns, nurseries, and containers on campus.
Conditions  The learner will be given the appropriate materials, equipment and tools.
Criteria  The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:
- Performed tasks in a safe manner
- Used tools and equipment safely and correctly
- Performed tasks in a logical sequence
Line (GAC): A USES OCCUPATIONAL SKILLS
Competency: A6 Identify relevant legislation, regulations and standards

Objectives
To be competent in this area, the individual must be able to:
• Describe and apply relevant legislation and regulations to activities that impact onsite activities.

LEARNING TASKS | CONTENT
1. Identify applicable federal legislation and regulations | • Where to find standards
                                                          | • How specific federal requirements apply to horticulture activities
2. Identify applicable provincial legislation and regulations | • How specific provincial requirements apply to horticulture activities
3. Identify applicable local regulations | • How specific local requirements apply to horticulture activities
4. Examine applicable regulations | • Applying regulations, standards, and procedures to the job
5. Examine relevant WorkSafeBC procedures | • Applying WorkSafeBC accident and near miss reporting procedures
                                             | • Applying accident investigation requirements
Line (GAC): B USES AND MAINTAINS TOOLS AND EQUIPMENT

Competency: B1 Use and maintain hand tools and power tools

Objectives
To be competent in this area, the individual must be able to:
• Describe safe use and maintenance of hand and power tools.

LEARNING TASKS

1. Identify hand and power tools for basic horticultural tasks
   • (See the list of Tools and Equipment for Level One, detailed in the Training Provider Standards of this Program Outline)

2. Describe hand tool maintenance
   • Cleaning and disinfecting hand tools to ensure proper operation and to prevent transfer of contaminants
   • Lubricating hand tools such as secateurs and shears
   • Checking tools regularly for damage, excessive wear and proper operation
   • Storing hand tools for organization, safety and security
   • Sharpening hand tools such as secateurs, shears and shovels
   • Replacing components in tools such as secateurs and loppers due to damage and wear

3. Describe power tool maintenance
   • Lubricating power tools according to manufacturers’ specifications
   • Adjusting power tools such as chain saws, mowers and power washers
   • Checking tools for wear, damage and malfunction
   • Following recommended maintenance schedule according to manufacturers’ specifications
   • Checking fluid levels and air pressure
   • Greasing nipples on motorized equipment
   • Sharpening and balancing mower blades
   • Sharpening tools such as chainsaws and power edgers according to manufacturers’ specification
   • Disinfecting tools to prevent cross-contamination from site to site
   • Storing power tools for organization and security
Line (GAC): B  USES AND MAINTAINS TOOLS AND EQUIPMENT
Competency: B2  Use and maintain measuring equipment

Objectives
To be competent in this area, the individual must be able to:
• Safely use and maintain measuring equipment.

LEARNING TASKS

1. Select and use appropriate measuring equipment for the task
   • (see the list of Measuring Equipment for Level One, detailed in the Training Provider Standards of this Program Outline)

2. Maintain measuring equipment
   • Cleaning and disinfecting measuring equipment to ensure proper operation and to prevent transfer of contaminants
   • Calibrating measuring equipment such as thermometers, pH meters, levels and EC meters
   • Checking and replacing batteries on measuring equipment
   • Checking tools for damage, excessive wear and proper operation
   • Storing measuring equipment for organization, safety and security

Achievement Criteria

Performance  The learner will calibrate measuring equipment.
Conditions  The learner will be given thermometers, pH meters, levels and EC meters.
Criteria  The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:
   • Calibrated to manufacturers’ specifications
Line (GAC): B USES AND MAINTAINS TOOLS AND EQUIPMENT
Competency: B3 Operate vehicles and motorized equipment

Objectives
To be competent in this area, the individual must be able to:
- Identify engine designs and functions of motorized equipment.
- Apply safe work practices as related to motorized horticulture equipment.

LEARNING TASKS

1. Identify engine components of motorized equipment engines
   - Differences between a two-stroke, four-stroke, and hybrid four-stroke engines
   - Carburetor
   - Ignition system
   - Starter components
   - Piston
   - Compression

2. Demonstrate personal safety in the workplace
   - Safety procedures
   - Use of PPE

3. Demonstrate safe operating procedures for motorized horticulture equipment such as starting, stopping and adjusting
   - String trimmers
   - Lawnmowers
   - Backpack blowers

Achievement Criteria
Performance The learner will start, stop and adjust power equipment.
Conditions The learner will be given string trimmers, lawnmowers and backpack blowers.
Criteria The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:
- Started, stopped and adjusted power equipment to manufacturers’ specifications
Line (GAC): B USES AND MAINTAINS TOOLS AND EQUIPMENT
Competency: B4 Maintain vehicles and motorized equipment

Objectives
To be competent in this area, the individual must be able to:
- Maintain motorized equipment.
- Apply safe work practices as related to motorized horticulture equipment.

LEARNING TASKS

1. Use hand tools to maintain horticulture equipment
   - Sockets and wrenches
   - Ignition tester
   - Tachometer
   - Torque wrench
   - Feeler gauges

2. Perform and document circle check of vehicles and motorized equipment
   - Lights
   - Plates
   - Brakes

3. Inspect equipment
   - Inspect visually for:
     - Damage and wear
   - Lock-out and tag-out as necessary
   - Inspect equipment to ensure efficient functioning

4. Check position of safety features as applicable
   - Lock-out devices
   - Chutes
   - Trimmer and belt guards
   - Operator presence switches

5. Check and replace fluids according to manufacturers’ specifications
   - Oil
   - Coolant
   - Hydraulic fluids

6. Check and replace components
   - Spark plugs
   - Belts
   - Pull cords

7. Check and adjust air pressure in components
   - Tires
   - Air compressors

8. Check and tighten components
   - Loose connections
   - Loose fittings
LEARNING TASKS

9. Check cutting height and adjust
   - According to client expectations
   - Turf needs

10. Apply preventive maintenance procedures
    - Equipment maintenance
      - Clean fuel
      - Clean air
      - Clean lubricating oil
    - Maintenance schedule
    - Maintain a lawn mower or edger: Every three months or 50 hours
      - Change engine oil
      - Replace or service air filter
      - Sharpen blade
      - Check spark plug
      - Check and adjust controls and drive mechanisms
      - Lube controls and drive mechanisms
      - Clean cooling fins
      - Tighten bolts
    - Maintain a hedge or string trimmer
    - Mixing gas and oil

Achievement Criteria

Performance
The learner will service motorized equipment (at the instructor’s discretion).

Conditions
The learner will be given any of the motorized equipment listed:
- Lawn mower
- Edger
- Dethatcher
- Rototiller
- String trimmer
- Hedge
- Chainsaw
- Backpack blower
- Aerator

Criteria
The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:
- Inspected power equipment to manufacturers’ specifications
- Checked position of safety features to manufacturers’ specifications
- Checked and replaced fluids according to manufacturers’ specifications
- Cleaned and/or replaced air and oil filters to manufacturers’ specifications
- Cleaned and/or replaced spark plugs to manufacturers’ specifications
- Adjusted carburetor, if required, to manufacturers’ specifications
Line (GAC): C ORGANIZES WORK
Competency: C6 Communicate with others

Objectives
To be competent in this area, the individual must be able to:
• Effectively communicate verbally and in written form.
• Effectively communicate trade related information to various people.

LEARNING TASKS
1. Use effective verbal and written communication
   • Effective communication:
     - Four basic communication skills (listening, speaking, reading, writing)
     - Communication process
     - Active listening
     - Non-verbal communication
     - Barriers to communication
     - Preparing for meetings

2. Relay information
   • Relaying information to
     - Co-workers
     - Clients
     - Suppliers
     - Office staff
   • Relaying information in laypersons’ terms to
     - Clients
     - Public
**Line (GAC):** C  **ORGANIZES WORK**

**Competency:** C10  Maintain safe work environment

**Objectives**

To be competent in this area, the individual must be able to:

- Assess site hazards and apply appropriate safety procedures.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>1. Assess site hazards</td>
<td>• High voltage</td>
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<td></td>
<td>• Motorized equipment</td>
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<td></td>
<td>• Working at heights</td>
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<tr>
<td>2. Identify PPE and safety equipment</td>
<td>• For task</td>
</tr>
<tr>
<td>3. Maintain worksite to avoid injuries to self and others</td>
<td>• Clean</td>
</tr>
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<td></td>
<td>• Tidy</td>
</tr>
</tbody>
</table>
Line (GAC): C ORGANIZES WORK
Competency: C11 Examine interpersonal and supervisory skills

Objectives
To be competent in this area, the individual must be able to:
- Describe the basic interpersonal and supervisory skills based on time stress management, ethics, communication, power and teams.

<table>
<thead>
<tr>
<th>LEARNING TASKS</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>1. Manage time</td>
<td>• Role of the supervisor&lt;br&gt;• Ability to effectively manage personal and work time</td>
</tr>
<tr>
<td>2. Explain stress management</td>
<td>• Individual&lt;br&gt;• Organizational&lt;br&gt;• How organizations can help manage stress</td>
</tr>
<tr>
<td>3. Recognize ethical and social responsibility issues in the work place</td>
<td>• Ethical and social consequences of workplace practices&lt;br&gt;  o Personal experience&lt;br&gt;  o Religious beliefs impact personal ethics&lt;br&gt;  o Culture affects ethical norms&lt;br&gt;  o Internal reflection&lt;br&gt;  o Organizational ethics&lt;br&gt;  o Legal responsibilities&lt;br&gt;  o BC Acts</td>
</tr>
<tr>
<td>4. Communicate effectively</td>
<td>• Identifying and using verbal and non-verbal communication techniques (review Level One C6 – Communicate with others)</td>
</tr>
<tr>
<td>5. Describe conflict management</td>
<td>• Defining conflict&lt;br&gt;• Sources of conflict&lt;br&gt;• Basic styles for managing conflict&lt;br&gt;• Conflict management strategies&lt;br&gt;• Guidelines of managing interpersonal conflict</td>
</tr>
<tr>
<td>6. Examine the concept of power in an organization</td>
<td>• Recognizing power structure in the organization and how power is applied within the organization</td>
</tr>
</tbody>
</table>
LEARNING TASKS

7. Describe characteristics of an effective team

CONTENT

- Characteristics of a high performing crew/team
- Recognizing ineffective work crews
- Supervisory role
Line (GAC): E ANALYZES AND MAINTAINS PLANT HEALTH
Competency: E1 Identify plants and plant requirements

Objectives
To be competent in this area, the individual must be able to:

- Identify a wide range of plants, morphological characteristics, growing requirements, use and availability.

LEARNING TASKS

1. Recognize a range of plant materials commonly used in commercial horticulture

   - Life cycle of a plant
   - Plant growth patterns
     - Annuals
     - Biennials
     - Perennials
     - Herbaceous perennials
     - Woody perennials
   - Deciduous and evergreen plants
     - Deciduous plants
     - Evergreens
     - Broadleaf evergreens
     - Coniferous evergreens
   - Climbing plants
     - Stems specialized for climbing
     - Monocarpic plants

2. Employ correct naming and plant identification terminology

   - Origin of plant naming systems
     - Common names
     - Nomenclature
     - Binomial system for naming plants
     - Plant taxonomy
     - Writing botanical names

3. Name the plant family for each plant identified

   - Plant families
   - Plant families commonly found in British Columbia
     - ASTERACEAE – Aster Family
     - CARYOPHYLLACEAE – Pink Family
     - ERICACEAE – Heath Family
     - LAMIACEAE – Mint Family
     - LILIACEAE – Lily Family
     - RANUNCULACEAE – Buttercup Family
     - ROSACEAE – Rose Family
## LEARNING TASKS

### CONTENT

- **SAPINDACEAE – Soapberry Family**

4. Recognize and describe bud, bark, foliage, flower and fruit characteristics

- Plant morphology
- Morphology descriptors for leaves
- Leaf arrangement
- Needles
- Scales and awls
- Patterns of inflorescence
- Descriptors for flowers
- Plant types
- Descriptors for fruit
- Woody stems

5. Use a dichotomous key for plant identification

- Limitations of plant keys
- Conifer key
- Deciduous key

6. Identify and describe 50 woody and non-woody plants.

- Using botanical terms
- According to its cultural and maintenance requirements
Line (GAC): E
Competency: E3 Manage pests and diseases

Objectives
To be competent in this area, the individual must be able to:
- Identify signs and symptoms of living and non-living factors that cause plant stress.

LEARNING TASKS

1. Define plant stress

2. Describe conditions that lead to plant stress
   - Abiotic factors
     - Light temperature
     - Humidity
     - Air
     - Water supply
     - Mechanical damage
     - Nutrition
     - Other common symptoms of abiotic plant stress
   - Distinguishing between biotic and abiotic causes of plant stress
   - Biotic plant stress
     - Common indicators
   - Biotic plant stress factors
     - Common plant insect indicators
     - Common plant disease indicators
   - Susceptibility to biotic stress factors (insects and diseases)
   - Potential stress-inducing environmental conditions

3. Categorize plant pest types and broadly associate the symptoms of biotic plant stress with type of plant
   - Major plant pest types including:
     - Plant feeding pests
     - Plant feeding animals
     - Diseases
     - Weeds
   - Damage caused by various pests

4. Describe the life stages of example pests
   - Lifecycle of typical pests
   - Disease lifecycles

5. Describe basic arthropod morphology and identify typical examples of arthropod to order
   - Basic arthropod morphology
   - Eight orders of insects
### LEARNING TASKS

6. Identify the four types of plant-pathogens

7. Describe the characteristics that make plants weeds

8. Describe established methods for controlling pests (IPM)

### CONTENT

- Categories of pathogens:
  - Fungi
  - Bacteria
  - Viruses
  - Nematodes

- Defining weeds
  - Competition
  - Common characteristics

- Classification of weeds by life histories
  - Annuals
  - Biennials
  - Herbaceous perennials
  - Woody perennials

- Integrated Pest Management (IPM)
  - Six steps of IPM
    - Prevention
    - Identification
    - Monitoring
    - Thresholds
    - Treatments
    - Evaluation

- Establishing methods for controlling pests
  - Cultural
  - Biological
  - Chemical
**Line (GAC): E**

**Competency:**

E4 Describe plant science as it applies to horticulture

**Objectives**

To be competent in this area, the individual must be able to:

- Explain plant morphological characteristics, life cycles, and adaptations as they apply to plant identification, plant propagation, arboriculture and turf maintenance.

**LEARNING TASKS**

<table>
<thead>
<tr>
<th>Task</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the external parts of herbaceous and woody stems</td>
<td>• Plant identification using features of a stem</td>
</tr>
<tr>
<td></td>
<td>o Woody and herbaceous stems</td>
</tr>
<tr>
<td>2. Describe the parts of a leaf and variations in shape</td>
<td>• Parts of a simple leaf</td>
</tr>
<tr>
<td></td>
<td>• Leaf shapes</td>
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<td></td>
<td>• Leaf tips</td>
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<td></td>
<td>• Leaf margins</td>
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<td></td>
<td>• Leaf surfaces</td>
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<td></td>
<td>• Pattern of veins within the leaf blade</td>
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<td></td>
<td>• Simple and compound leaves</td>
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<tr>
<td>3. Describe parts of the flower</td>
<td>• Flower structure</td>
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<td></td>
<td>o Complete and incomplete flowers</td>
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<td></td>
<td>o Perfect vs. imperfect flowers</td>
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<tr>
<td></td>
<td>o Monoecious vs. dioecious plants</td>
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<td></td>
<td>o Flower symmetry</td>
</tr>
<tr>
<td>4. Identify typical inflorescences</td>
<td>• Inflorescence types</td>
</tr>
<tr>
<td>5. Identify typical fruit</td>
<td>• Placing fruit types</td>
</tr>
<tr>
<td></td>
<td>o Fleshy fruits</td>
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<td></td>
<td>o Dry fruits</td>
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<tr>
<td></td>
<td>• Dehiscent and indehiscent fruits</td>
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<tr>
<td>6. Describe stages in the life cycle of a flowering plant</td>
<td>• Reproduction</td>
</tr>
<tr>
<td>7. Describe parts of a seed and seedling</td>
<td>• Monocot seed development</td>
</tr>
<tr>
<td></td>
<td>• Dicot seed development</td>
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<tr>
<td></td>
<td>• Dicot seedling development</td>
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<tr>
<td></td>
<td>• Monocot seedling development</td>
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</tbody>
</table>
LEARNING TASKS

8. Identify stem, root, and leaf modifications

9. Identify plant adaptations to environmental effects

10. Describe basic growth responses to plant hormones

CONTENT

- Roots
  - Root systems
  - Specialized underground storage structures

- Plant adaptations
- Stem modifications for protection
- Stems specialized for colonizing

- Response to hormones
  - Auxins
  - Gibberellins (GA)
  - Cytokinins
  - Ethylene
  - Abscisic acid (ABA)
**Line (GAC):** E  
**Competency:** E5 Describe physical and biological characteristics of soil and soilless media

### Objectives
To be competent in this area, the individual must be able to:
- Recognize soil and soil management as keys to the successful practice of horticulture.
- Examine soil formation, the physical and biological properties of soils, and soilless media as they relate to use, soil quality, and plant growth.

### LEARNING TASKS

<table>
<thead>
<tr>
<th>TASK</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| 1. Define soil | • Soil  
• Soil formation  
• Parent material  
• Biotic – living organisms  
• Topography  
• Time |
| 2. Define soil quality | • Soil quality and the importance of soil quality, relative to plant growth and environmental sustainability |
| 3. Describe a soil profile | • Soil profiles  
  o LFH horizon  
  o A horizon  
  o B horizon  
  o C horizon |
| 4. Explain the physical properties of soil and soilless medias | • Texture  
• Structure  
• Density  
• Porosity  
• Soil compaction  
• Soil structure and plant growth  
  Soilless media |
| 5. Describe the behaviour of water in soil | • Water in soils  
• Soil water holding capacity  
• Available water  
• Water movement through soil  
• Wetting front  
• Hydraulic conductivity of a soil |
LEARNING TASKS

6. Examine the key soil biological processes and their effects on plant growth and soil quality

CONTENT
- Water retention and flow in layered soils
- Water movement in urban soils
- Managing soils in the urban landscape

7. Explain the role of organic matter in soil

CONTENT
- Biological process in soil
- Plants
- Soil animals
- Other organisms
- Role of soil organisms in soil quality
- Promoting beneficial soil organisms

8. Describe composting methods

CONTENT
- Basic composition of soil organic matter
- Key roles of soil organic matter relative to soil chemical and physical behaviour
- Composting processes
- Aerobic vs. anaerobic microorganisms
- Food web of the compost pile
- Use of compost
Level 2

Horticulture Technician Foundation
Competency: A1 Use personal protective equipment (PPE)

Objectives
To be competent in this area, the individual must be able to:
• Describe and demonstrate personal safety in the workplace.
• Demonstrate proper use of PPE.

Learning Tasks
1. Review personal protective requirements (as per Level One A1 – Use personal protective equipment)
   • Selecting and using PPE as required for task, tools, equipment, machinery and environment
   • Ensuring the safe use of PPE
   • Storing PPE
   • Checking PPE prior to use
   • Checking PPE inventory
   • Recognizing damaged and expired PPE
   • Checking and replacing PPE components

2. Examine chemical handling requirements
   • Goggles
   • Rubber gloves
   • Face shields
   • Chemical protection suits
Program Content
Level 2

Line (GAC): A USES OCCUPATIONAL SKILLS
Competency: A5 Demonstrate basic horticultural skills

Objectives
To be competent in this area, the individual must be able to:
- Assess plant quality.
- Demonstrate plant-handling requirements.

LEARNING TASKS

<table>
<thead>
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<th>CONTENT</th>
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<tbody>
<tr>
<td>1. Perform plant-grading according to the Canadian Standard for Nursery Stock and British Columbia Landscape Standard</td>
</tr>
<tr>
<td>Assessing and grading plants according to standards for plant:</td>
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<tr>
<td>Foliage density</td>
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<td>Caliper</td>
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<tr>
<td>Height</td>
</tr>
<tr>
<td>Width rations</td>
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<tr>
<td>2. Identify containers used for growing and shipping ornamental plant material</td>
</tr>
<tr>
<td>Calculating container volume and comparing results to the standards</td>
</tr>
<tr>
<td>3. Describe standards for root ball sizing</td>
</tr>
<tr>
<td>Calculating root ball sizes for:</td>
</tr>
<tr>
<td>Containers</td>
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<tr>
<td>Field grown stock</td>
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<td>4. Prepare balled and burlapped plants</td>
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<tr>
<td>Rootballs:</td>
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<td>Digging</td>
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<td>Wrapping</td>
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<tr>
<td>Tying</td>
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<tr>
<td>Safely and efficiently lifting and carrying plant material to avoid physical damage to self and plants</td>
</tr>
<tr>
<td>Methods of harvesting plant material for field grown stock</td>
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<td>5. Securely load plant material</td>
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<td>Safety</td>
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<td>Loading</td>
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<td>Unloading</td>
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<tr>
<td>Securing plant material to a truck</td>
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<td>6. Prepare plant materials</td>
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<td>Removal of containers</td>
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<tr>
<td>Scarifying root ball</td>
</tr>
</tbody>
</table>
LEARNING TASKS

7. Demonstrate proper planting procedures for bare root stocks

- Appropriate depth and width of the planting hole
- Placing the plant in hole and back filling with appropriate material
- Appropriate post-planting maintenance requirements
- Appropriate storage of dormant and non-dormant plant material
- Appropriate storage onsite

8. Operate truck and trailer

- Safety
- Coupling the truck/tractor and trailer
- Operating either combination in reverse
- Securely parking the vehicle
- Compliance to guidelines established in Certified Horticulture Technician Program (CHT)
Line (GAC): B USES AND MAINTAINS TOOLS AND EQUIPMENT
Competency: B1 Use and maintain hand tools and power tools

Objectives
To be competent in this area the individual must be able to:
- Demonstrate safe use and maintenance of hand tools.
- Demonstrate safe use and maintenance of power tools.

LEARNING TASKS
1. Identify hand and power tools for basic horticultural tasks for Level Two technical training
   (see the list of Tools and Equipment for Level Two, detailed in the Training Provider Standards of this Program Outline)
2. Demonstrate hand tool maintenance
   Review Level One B1 - Use and maintain hand tools and power tools.
3. Demonstrate power tool maintenance
   Review Level One B1 - Use and maintain hand tools and power tools.
Line (GAC): B USES AND MAINTAINS TOOLS AND EQUIPMENT
Competency: B3 Operate vehicles and motorized equipment

Objectives
To be competent in this area, the individual must be able to:
- Examine vehicle and motorized equipment designs and functions.
- Operate and apply safe work practices as related to horticulture task requirements.

LEARNING TASKS

1. Identify horticulture vehicle and motorized equipment engine components and function
   - Differences between gas and diesel engines
   - Carburetor
   - Alternator
   - Radiator
   - Piston
   - Compression

2. Describe and demonstrate personal safety as related to large multiple cylinder equipment
   - Safe lifting and moving techniques
   - Entry onto and exit from machinery using the three point contact
   - Appropriate personal protective equipment
   - Work place hazards and mitigation of the risk of accident and injury
   - General shop safety

3. Describe and demonstrate safe operating procedures for horticulture equipment
   - General points for safe tractor operation
   - Tractor precautions:
     o Starting, speed and slopes
     o Hitch attachments
     o Transfer of tractors and equipment
     o Tractor transfer warnings
   - Operating a skid steer loader and zero turn walk behind machine
   - Power take-off precautions
   - Connecting attachments

Achievement Criteria

Performance The learner will safely operate a vehicle.
Conditions The learner will be given a skid steer and specified attachments (e.g., bucket, forks).
Criteria The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:
- Performed a circle check
- Used three point contact when entering and exiting
- Hooked up appropriate attachments
- Started and maneuvered machine and attachments safely
Line (GAC): B USES AND MAINTAINS TOOLS AND EQUIPMENT
Competency: B4 Maintain vehicles and motorized equipment

Objectives
To be competent in this area, the individual must be able to:
- Perform basic maintenance on larger multiple cylinder engines and equipment as applied to horticulture.
- Apply safe work practices as related to horticulture equipment.

LEARNING TASKS

1. Use hand tools to maintain horticulture equipment
   - Sockets and wrenches
   - Ignition tester
   - Multimeter
   - Battery charger
   - Tire gauge
   - Hydrometer

2. Practice preventive maintenance and troubleshooting procedures
   - Tune up equipment
   - Diagnose work or defective parts

3. Perform and document circle check of vehicles and motorized equipment
   - Lights
   - Plates
   - Brakes

4. Inspect equipment
   - Inspecting visually for:
     - Damage and wear
     - Lock out and tag out as necessary
   - Inspecting equipment to ensure efficient functioning

5. Check position of safety features
   - Lockout devices
   - Chutes
   - Trimmer and belt guards
   - Rollover protection devices (ROP)
   - Operator presence switches

6. Check and replace fluids according to manufacturers' specifications
   - Oil
   - Coolant
   - Hydraulic fluids

7. Check and replace components
   - Spark plugs
   - Belts
   - Pull cords
LEARNING TASKS

8. Check and adjust air pressure in components
   - Tires
   - Air compressors

9. Check and tighten components
   - Loose connections
   - Loose fittings

10. Check cutting height and adjust components
    - According to client expectations
    - Turf needs

11. Develop a preventive maintenance plan
    - Performing preventive maintenance every 3 months or 50 hours
      - Checking engine oil
      - Changing engine oil
      - Checking air filter
      - Oil-bathing air filter
      - Greasing fittings
      - Checking hydraulic oil
      - Checking tire pressures
      - Testing coolant
      - Checking belts
      - Checking hoses

Achievement Criteria

Performance The learner will practice preventive maintenance on vehicles and motorized equipment.

Conditions The learner will be given:
- Skid steer loader
- Gear tractor
- 3 - reel turf mower
- Gas powered utility vehicle (Gator)
- Electric powered utility vehicle

Criteria The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria and in accordance with manufacturers’ specifications:
- Checked engine oil
- Changed engine oil
- Checked air filter
- Oil-bathing air filter
- Greased fittings
- Checked hydraulic oil
- Checked tire pressures
- Tested coolant
- Checking belts
- Checking hoses
Line (GAC): B USES AND MAINTAINS TOOLS AND EQUIPMENT
Competency: B5 Use and maintain equipment attachments

Objectives
To be competent in this area, the individual must be able to:
- Safely use equipment attachments for the appropriate task.
- Maintain equipment attachments.

LEARNING TASKS
1. Identify, select and use the appropriate equipment attachments for the task

   • (see the list of Equipment Attachments for Level Two, detailed in the Training Provider Standards of this Program Outline)

2. Maintain equipment attachments

   • Greasing fittings on equipment such as trailers, aerators and cultivators
   • Inspecting attachments for damage and wear and lock-out and tag-out as necessary
   • Adjusting attachments for parking, travel and operation
   • Checking hydraulic fluids to ensure optimum and safe operation of equipment
   • Cleaning and disinfecting attachments such as drop spreaders, sprayers and mowers
   • Replacing damaged and worn components such as bushings, blades and tines
   • Performing a circle check of equipment attachments to check for items such as lights, plates and brakes
   • Checking operation of safety brake pin on trailers
Achievement Criteria

Performance: The learner will inspect and service equipment.

Conditions: The learner will be given equipment such as trailers, aerators, and rototillers.

Criteria: The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:

- Greased fittings on equipment
- Inspected attachments for damage and wear and locked-out and tagged-out as necessary
- Adjusted attachments for parking, travel, and operation
- Checked hydraulic fluids to ensure optimum and safe operation of equipment
- Cleaned and disinfected attachments such as drop spreaders, sprayers, and mowers
- Replaced damaged and worn components such as bushings, blades, and tines
- Performed a circle check of equipment attachments to check for items such as lights, plates, and brakes
- Checked operation of safety brake pin on trailers
Line (GAC): C ORGANIZES WORK
Competency: C6 Communicate with others

Objectives
To be competent in this area, the individual must be able to:
- Effectively communicate trade related information to various people.
- Use a variety of communication techniques such as hand signals, communication equipment, and communication skills.

LEARNING TASKS
1. Use communication skills
   - Mentoring apprentices
   - Ensuring co-workers understand instructions using methods such as
     - Mirroring
     - Repeating back
   - Practicing active listening skills
   - Reporting discrepancies and seeking direction from supervisor

2. Use communication equipment
   - Two-way radios
   - Computers
   - Cell phones

3. Use universal hand signals to communicate visually
   - Communicating with
     - Machine operators
     - Truckers
     - Crane operators
   - WorkSafeBC requirements
Line (GAC): C ORGANIZES WORK

Competency: C9 Organize plants, materials and equipment

Objectives
To be competent in this area, the individual must be able to:
- Inspect and verify plants, materials and equipment.
- Receive, unload, record, protect and store plants, materials and equipment.
- Lay out plants on site.
- Perform final checks of plants, materials and equipment.

LEARNING TASKS

1. Inspect and verify plants and materials

   • Accuracy
   • Quality
   • Quantity

2. Remove and inspect monitoring devices when necessary

   • Temperature recorders
   • Environmental recorders

3. Receive, unload, record and protect materials and products in an organized fashion

   • Plant materials
     - Group/match plants by size and species
     - Place received products in designated areas to maintain product quality
   • Other materials
     - Wood chips
     - Soil
     - Aggregates
     - Store in designated areas to avoid contamination
   • Products
     - Soils
     - Seed
     - Plugs
     - Roots
     - Labels
     - Containers

4. Allocate specified storage areas for equipment and hazardous materials

   • Equipment
   • Hazardous materials

5. Lay out plants on site

   • According to landscape plans
LEARNING TASKS

6. Perform final check onsite

7. Process substandard materials

CONTENT

- Required
  - Plants
  - Materials
  - Equipment

- Quarantine
- Reject
- Dispose of

Achievement Criteria

Performance The learner will organize plant materials and equipment onsite.

Conditions The learner will be given the appropriate plants, materials and equipment to handle a range of ornamental plant material.

Criteria The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:

- Sourced and selected plants
- Laid out plants according to landscape plans
- Performed final check
- Processed substandard materials
Line (GAC): C ORGANIZES WORK
Competency: C10 Maintain safe work environment

Objectives
To be competent in this area, the individual must be able to:
• Assess site hazards and follow specified safety procedures.

LEARNING TASKS

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<th>1. Coordinate task with other workers</th>
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<td>Avoiding injury to</td>
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<td>o Self</td>
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<td>o Co-workers</td>
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<td>o Others</td>
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<th>2. Follow safety procedures when working in high traffic areas</th>
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<td>Flagging</td>
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<td>Pylons</td>
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<td>Signage</td>
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<tr>
<th>3. Handle hazardous materials in accordance with government regulations and WHMIS procedures</th>
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<td>Disposing</td>
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<td>Labelling</td>
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<td>Using PPE</td>
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<th>4. Participate in safety meetings and discussion</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td></td>
<td>Ensuring that information is recorded and distributed to all team members</td>
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<tr>
<th>5. Report unsafe conditions to supervisor</th>
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<tr>
<td></td>
<td>Recognizing</td>
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<td>Reporting</td>
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<tr>
<th>6. Recognize safety warning signals</th>
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<tr>
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<td>Back-up signals</td>
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<td>Back-up alarms</td>
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<td>Warning lights</td>
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<th>7. Contain and dispose of spill contaminants</th>
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<td>According to regulations</td>
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<th>8. Coordinate with other agencies</th>
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<tr>
<td></td>
<td>Private and public line locators</td>
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<td>Emergency response teams</td>
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</tbody>
</table>
Line (GAC): C ORGANIZES WORK

Competency: C11 Examine interpersonal and supervisory skills

Objectives
To be competent in this area, the individual must be able to:
- Demonstrate supervisory skills based on leadership, motivation, and delegation.
- Describe safety management and managing in a diverse workplace.

LEARNING TASKS

1. Describe leadership in the organization
   - Definition of leadership
   - Role of leaders
   - Characteristics of leaders

2. Describe leadership skills
   - Motivational theories
   - Delegation learning
   - Skills needed for effective delegation
   - Setting goals for effective delegation and employee commitment
   - Team management: coaching and training

3. Describe safety culture
   - Role of WorkSafeBC
   - Safety culture in the workplace

4. Describe managing a diverse workplace
   - Managing diversity
     - Characteristics of culture
     - Elements of cultural difference
     - Cultural orientation
   - Legal Requirements
     - Canadian Charter of Rights And Freedoms
     - Canadian Human Rights Act of 1985
     - BC Human Rights Code
   - Enforcement of Human Rights

5. Interpret the employment standards
   - Impacts of the Employment Standards Act on horticultural operations
Line (GAC): E ANALYZES AND MAINTAINS PLANT HEALTH
Competency: E1 Identify plants and plant requirements

Objectives
To be competent in this area, the individual must be able to:
• Identify plants used in all segments of horticulture.
• Identify plants suitable for planting in difficult situations.

LEARNING TASKS

1. Recognize a range of plant materials commonly used in commercial horticulture
   • Natural habitat
     o Alpine plants
     o Woodland understory plants
     o Mediterranean plants
     o Bog plants
     o Native plants
   • Plant use characteristics
     o Bedding plants
     o Cut flowers
     o Trees and shrubs
     o Groundcovers
     o Climbers
   • Characteristics of individual plants and plant groups
   • Plant size
   • Texture
   • Plant form

2. Explain plant hardiness zones
   • Plant hardiness zones
   • Relationship between plant health and hardiness zones

3. Recognize plants suitable for planting in difficult situations
   • Provenance
   • Difficult planting conditions
     o Sunny arid conditions
     o Shade
     o Dry shade
     o Dry soil conditions
     o Wetlands
     o Compacted soils
     o Slopes
### LEARNING TASKS

<table>
<thead>
<tr>
<th>Task</th>
<th>Content</th>
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<tbody>
<tr>
<td>4. Identify weeds and invasive plants</td>
<td>- Introduction of aliens</td>
</tr>
<tr>
<td></td>
<td>- Characteristics of invasive and weed plants</td>
</tr>
<tr>
<td>5. Recognize and describe bud, bark, foliage, flower, and fruit characteristics</td>
<td>- Bud characteristics such as</td>
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<td>- Morphology</td>
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<td>- Type (vegetative or flower)</td>
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<td>- Arrangement</td>
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<td>- Bark characteristics such as</td>
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<td>- Furrowed</td>
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<td>- Smooth</td>
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<td>- Plate-like</td>
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<td>- Others</td>
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<tr>
<td>6. Identify and describe 75 woody and non-woody plants</td>
<td>- Describing leaves using botanical terminology and distinguishing a range of inflorescence type and fruit to aid in plant identification</td>
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<tr>
<td></td>
<td>- Using botanical terms</td>
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<td></td>
<td>- According to its cultural and maintenance requirements</td>
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</tbody>
</table>
Line (GAC): E ANALYZES AND MAINTAINS PLANT HEALTH  
Competency: E2 Manage growing conditions

Objectives
To be competent in this area, the individual must be able to:
• Describe managing a variety of growing conditions.

LEARNING TASKS
1. Describe managing growing conditions as applicable to interior and exterior horticulture operations

CONTENT
• Determining exposure to conditions such as
  o Light
  o Wind
  o Heating
  o Ventilation
  o Air conditioning (HVAC) systems
  o Moisture
  o Reflective heat load based on location
• Using light meters for measuring light level for interior plants
• Collecting growing media samples using core samplers
• Checking growing media samples manually or by lab analysis for
  o Texture
  o Drainage
  o pH
  o Nutrients
  o Contaminants
• Determining air quality that might affect interior and exterior plants
• Taking corrective measures such as
  o Fertilization
  o Liming
  o Adding organics
  o Neutralizing water
  o Correcting drainage
Program Content
Level 2

Line (GAC): E ANALYZES AND MAINTAINS PLANT HEALTH
Competency: E3 Manage pests and diseases

Objectives
To be competent in this area, the individual must be able to:
- Examine biological characteristics of weeds, plant feeders and pathogens.
- List control strategies.

LEARNING TASKS

1. Describe and distinguish between the major plant pest types
   - Weeds as pests
   - Invertebrates as pests
   - Vertebrates as pests
   - Pathogens as pests

2. Describe characteristics that make plants weeds
   - Review what is a weed
   - Weeds as competitors
   - Weed classification
   - Hidden effects of weeds
   - Seeds of weedy plants

3. Describe characteristics that make vertebrates pests
   - Wildlife management
   - Vertebrate plant-feeding pests
     - Birds
     - Deer
     - Rodents

4. Describe characteristics that make invertebrates pests
   - Pest ecology
   - Insect pest success
   - Common invertebrate pests
     - Aphids
     - Leafhoppers
     - Scales
     - Weevils and beetles
     - Caterpillars and moths
     - Lacebugs
     - Sawflies
     - Thrips
     - Mites
     - Fungus gnats
     - Leaf miners
     - Slugs and snails
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<th>LEARNING TASKS</th>
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<tbody>
<tr>
<td>5. Describe the characteristics that make pathogens pests</td>
<td>• Pathogen success</td>
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<tr>
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<td>• The disease triangle</td>
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<td>• The disease cycle</td>
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<td>• Common diseases</td>
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<td></td>
<td>o Diseases caused by bacteria</td>
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<td>o Fungal diseases</td>
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<td></td>
<td>o Diseases caused by nematodes</td>
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<td>o Diseases caused by viruses</td>
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<tr>
<td>6. Describe the principles of cultural control methods as applied to horticultural plant pests</td>
<td>• Cultural methods of controlling weeds</td>
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<tr>
<td></td>
<td>o Organic mulches</td>
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<td></td>
<td>o Non-organic mulches</td>
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<td></td>
<td>o Weed control in established plantings</td>
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<td></td>
<td>• Cultural control of plant feeding pests</td>
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<td></td>
<td>• Cultural control of pathogens</td>
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<td>7. Describe the principles of biological control methods as applied to horticultural plant pests</td>
<td>• Biological control of weeds</td>
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<td>• Biological control of plant-feeding pests</td>
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<td>• Beneficial organisms</td>
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<td>• Biological agents</td>
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<td>• Biological control of pathogens</td>
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<td>8. Describe the principles of chemical control methods as applied to horticultural plant pests</td>
<td>• Chemical control of plant pests</td>
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<tr>
<td></td>
<td>o Pesticides</td>
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<td>• Chemical control of weeds</td>
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<td>o Herbicides</td>
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<td>• Chemical control of plant feeding pests</td>
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<td></td>
<td>o Horticultural oil</td>
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<td></td>
<td>o Botanicals</td>
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<td></td>
<td>o Inorganics</td>
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<td></td>
<td>o Insecticidal soaps</td>
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<td>o Synthetic pesticides (organic)</td>
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<td>9. Describe the integrated strategies and tactics for control of viruses</td>
<td>• Integrated control strategies for common plant viral diseases</td>
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<td></td>
<td>• Methods for the exclusion and eradication of plant pest vectors</td>
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<td></td>
<td>• Management of virus-infected plants</td>
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<td>10. Describe integrated strategies and tactics for the control of bacteria</td>
<td>• Biological control</td>
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<td></td>
<td>• Cultural control method</td>
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<td>LEARNING TASKS</td>
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<td>11. Describe integrated strategies and tactics for the control of fungi</td>
<td>• Biological control</td>
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<td>• Cultural control</td>
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<td>• General prevention</td>
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<td>12. Describe the integrated strategies and tactics for the control of plant-feeding pests</td>
<td>• Biological control</td>
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<td>• Cultural control</td>
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<td>• Plant-feeding pests</td>
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<td>• Invertebrates</td>
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<td>• Nematodes (invertebrates)</td>
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<td>• Arthropod plant feeding pest (invertebrates)</td>
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<td>• Vertebrate plant feeding pests and control</td>
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</tbody>
</table>
Line (GAC): E ANALYZES AND MAINTAINS PLANT HEALTH
Competency: E4 Describe plant science as it applies to horticulture

Objectives
To be competent in this area, the individual must be able to:
- Examine the internal anatomy of stems, roots and leaves as they relate to photosynthesis, respiration, and transpiration.

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<thead>
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<th>LEARNING TASKS</th>
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<tr>
<td>1. Describe the internal anatomy of stems, roots, and leaves</td>
<td>• The plant cell</td>
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<td>• Cell types, tissues, and their functions</td>
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<td>• Primary growth</td>
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<td></td>
<td>• Secondary growth</td>
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<td>2. Describe plant part anatomy</td>
<td>• Stems</td>
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<tr>
<td></td>
<td>▪ Herbaceous stems</td>
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<td>▪ Woody stems</td>
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<td>▪ Bark</td>
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<td>• Roots</td>
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<td>▪ Root apical meristems</td>
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<td>▪ Root cap</td>
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<td>▪ Epidermis</td>
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<td>▪ Cortex</td>
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<td>▪ Endodermis</td>
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<td>▪ Pericycle</td>
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<td>▪ Vascular tissue</td>
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<td></td>
<td>▪ Adventitious roots</td>
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<td></td>
<td>▪ Secondary growth</td>
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<tr>
<td>3. Describe the movement of sap through a plant and the effects of environment on the rate of flow</td>
<td>• Leaves</td>
</tr>
<tr>
<td></td>
<td>▪ Anatomy of a leaf</td>
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<td>4. Describe the flow of sugars, produced in photosynthesis, through the plant</td>
<td>• Water movement</td>
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<td>▪ Diffusion</td>
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<td>▪ Osmosis</td>
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<td>▪ Capillary attraction</td>
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<td>▪ Active transport</td>
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<td></td>
<td>• Photosynthesis</td>
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<td>▪ Chlorophyll</td>
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<td>▪ Translocation for sugars</td>
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<td>▪ Respiration</td>
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LEARNING TASKS

5. Explain the influence of temperature, water availability, and light on the rates of photosynthesis and respiration

6. Describe the growth response to external stimuli

CONTENT

- Influence of environmental factors
- Effect of light, carbon dioxide availability, water, and nutrient availability on the rate of photosynthesis
- Environmental effects on the plant growth
- Effect of temperature on plant development
- Effect of water stress on plant growth

- Photoperiod and flower production
  - Photoperiod
  - Tropisms and plant growth
Line (GAC): E  ANALYZES AND MAINTAINS PLANT HEALTH
Competency:  E6  Describe chemical characteristics of soil and soilless media

Objectives
To be competent in this area, the individual must be able to:
• Examine soil and soil management in horticulture.
• Examine the chemical properties of soil and soilless media (soil reaction, soil salinity, soil fertility).
• Sample soils.

LEARNING TASKS
1. Describe how soil colloids determine soil chemical properties
   • Soil colloids
   • Soil pH and colloidal material
   • Cations and plant roots

2. Behaviour of nutrients in soil
   • Mineral nutrients
   • Primary macronutrients
   • Secondary macronutrients
   • Micronutrients

3. Acquisition of nutrients by plants
   • Nutrient uptake
   • The nitrogen cycle
   • Root absorption

4. Measure soil reaction (pH)
   • Define pH
   • Testing soil for pH

5. Manage soil reaction
   • Adjusting the pH of soil
   • Buffering capacity

6. Explain how soil reaction (pH) relates to soil fertility
   • Plant growth and pH tolerance
     o Importance of pH to plant growth
     o Phosphorus
     o Pathogens and pH

7. Measure and manage salinity and sodicity
   • Salinity in soils
   • Measurement of salinity and sodicity
   • Measurement of electrical conductivity
   • Sodic soils

8. Describe soil salinity and sodicity and impact on soil properties
   • Impact of salinity and sodicity on soil physical and chemical characteristics
LEARNING TASKS

9. Discuss nutrient management

- Nutrient management
  - Slow-release fertilizers
  - Water soluble fertilizers
- Field stock and landscape fertilizer management
- Turf fertilizer management
- Organic fertilizers and amendments
- Inorganic fertilizers

10. Sample soils

- Soil testing
  - Collecting soil samples in field crops and on landscape sites
  - Procedures of soilless media samples
- Limitations of soil nutrient analysis

11. Interpret soil test information

- Interpreting basic soil test results
- Calculate fertilizer application rates

12. Interpret fertilizer label information

- Classifications of fertilizers
- Fertilizer labeling

Achievement Criteria

Performance: The apprentice will examine soil samples and identify chemical properties.

Conditions: The learner will be given soil samples and testing equipment.

Criteria: The learner will score a passing grade of 70% or better on a rating sheet according to the following criteria:

- Performed sodic and salinity analysis
- Performed pH analysis
- Performed nutrient management analysis
Section 4

TRAINING PROVIDER STANDARDS
Facility Requirements

LEVEL ONE

Classroom Area
- Approximately 900 square feet
- Comfortable seating and tables suitable for training, teaching, lecturing and drafting
- Compliance with all local and national fire code and occupational safety requirements
- Lighting controls to allow easy visibility of projection screen while also allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/Air conditioning for comfort all year round
- In-room temperature regulation to ensure comfortable room temperature
- In-room ventilation sufficient to control training room temperature
- Acoustics in the room must allow audibility of the instructor
- White marking board with pens and eraser (optional: flipchart in similar size)
- Projection screen or projection area at front of classroom
- Overhead projector and a multi-media (data) projector

Shop Area
- Access to a service bay – approximately 600 square feet
- Access to a site for equipment operation – minimum 1 acre
- Access to all tools and equipment as listed for Level One

Lab Requirements
- Botany or Science teaching lab outfitted with compound and dissecting microscopes - approximately 600 square feet
  - Access to live ‘in situ’ plant material as well as herbaria, and visual samples (slides, photographic databases, etc.)
  - Microscope slides of showing root, stem and leaf anatomy (monocot and dicot)
  - Microscope slides showing woody stem growth
  - Hand lens (10X)
  - Glassware, lamps, stir plate (with heating capacity)
  - Refrigerator and microwave
  - Collection of arthropods, disease organisms, and examples of plant stress
- Soil Science or Chemistry teaching lab - approximately 600 square feet
  - Glassware, lamps, stir plate (with heating capacity)
  - Refrigerator, drying oven and microwave
  - Nested sieves, shakers, scales
  - Hydrometers and sedimentation cylinders
  - Munsell colour books
Student Facilities

- Adequate lunch room as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements
- Personal storage lockers

Instructor’s Office Space

- Suitable space and office furniture necessary for instructor to prepare lessons and secure file records

Other

- Access to botanical gardens
LEVEL TWO

Classroom Area

- Approximately 900 square feet
- Comfortable seating and tables suitable for training, teaching, lecturing and drafting
- Compliance with all local and national fire code and occupational safety requirements
- Lighting controls to allow easy visibility of projection screen while also allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/Air conditioning for comfort all year round
- In-room temperature regulation to ensure comfortable room temperature
- In-room ventilation sufficient to control training room temperature
- Acoustics in the room must allow audibility of the instructor
- White marking board with pens and eraser (optional: flipchart in similar size)
- Projection screen or projection area at front of classroom
- Overhead projector and a multi-media (data) projector

Shop Area

- Access to a service bay – approximately 600 square feet
- Access to a site for equipment operation – minimum 1 acre
- Access to all tools and equipment as listed for Level Two

Lab Requirements

- Botany or Science teaching lab outfitted with compound and dissecting microscopes - approximately 600 square feet
  - Access to live ‘in situ’ plant material as well as herbaria, and visual samples (slides, photographic databases, etc.)
  - Microscope slides showing root, stem and leaf anatomy (monocot and dicot)
  - Microscope slides showing woody stem growth
  - Hand lens (10X)
  - Glassware, lamps, stir plate (with heating capacity)
  - Refrigerator and microwave
  - Collection of arthropods, disease organisms, and examples of plant stress
- Soil Science or Chemistry teaching lab - approximately 600 square feet
  - Glassware, lamps, stir plate (with heating capacity)
  - Refrigerator, drying oven and microwave
  - Nested sieves, shakers, scales
  - Hydrometers and sedimentation cylinders
  - Munsell colour books
  - pH meters
  - Soil sampling equipment
Student Facilities

- Adequate lunch room as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements
- Personal storage lockers

Instructor’s Office Space

- Suitable space and office furniture necessary for instructor to prepare lessons and secure file records

Other

- Access to a botanical garden
- Access to container nursery stock
- Access to field-grown stock/plant material that can be prepared for transplanting
- Trailer and tractor nursery equipment
- Access to large tree transplanting equipment
- Nursery hand carts and tree dollies
- Multiple nursery stock containers
Tools and Equipment

LEVEL ONE

Shop Equipment

Motorized Equipment

- Baggers for leafs
- Blowers (backpack, hand held, push, earth auger)
- Dethatcher
- Edgers
- Hedge trimmer (extension, long reach)
- Lawn/weed trimmers (gas & electric)
- Pressure washer
- Soil screener
- String trimmer
- Sterilizers

Shop (Facility) Tools

Standard Power Tools

- Chainsaw
- Grinder
- Pole chainsaw
- Pallet Jack
- Power cultivator (rototiller)
- Vacuum (wet/dry, leaf)
- Walk-behind aerator

Standard Hand Tools

- Brooms
- Cultivator (manual)
- De-thatching rake
- Garden forks
- Grease guns
- Handheld watering equipment
- Landscape rakes
- Loppers
- Mallet
- Microscope
- Pickaxes
- Picks
- Pitch forks
- Pliers (various types)
- Pruning shears
- Rakes (various types)
- Screwdrivers (various types)
- Seed/fertilizer spreader
- Sharpening tools
- Shovels (coal, clam, scoop/barn, spade, garden)
- Spades (various types)
- String line
- Tarps
- Trowels
- Weed digger
- Wheelbarrow
- Wrenches
Specialty (Facility) Tools

Measuring Equipment

- EC meters Levels
- Hydrometer
- Levels
- pH meter
- Scales
- Sedimentation cylinder
- Tape measure
- Thermometers
- Tire pressure meter

Student Equipment (supplied by school)

Required - PPE and Safety Equipment

- Ear protection
- Eye protection (glasses, shields)
- Eye wash kit
- Fall protection (harness)
- Fire extinguisher
- First Aid kits
- Flares
- Hardhat
- Lanyard
- Particle masks
- Reflective shirts, jackets
- Respirators
- Safety vests
- Spill kit
- Traffic cones

Office Equipment

Recommended

- Camera
- Communication devices
- Computers

Student Tools (supplied by student)

Required

- CSA-approved steel-toed footwear
- Calculator
- Hand lens (10x)
- Secateurs

Recommended

- Work gloves
- Rainwear
LEVEL TWO

Shop Equipment

*Motorized Equipment*
- 3-reel turf mower
- Backhoe
- Baggers for leaves
- Blowers (backpack, hand held, push, earthauger)
- Brush cutter
- Clearing saw
- Edgers
- Electric powered utility vehicle
- Elevated work platforms
- Excavator
- De-thatcher
- Flat filler
- Fork lift
- Front end loader
- Gas powered utility vehicle (Gator)
- Hedge trimmer (extension, long reach)
- Lawn/weed trimmers (gas & electric)
- Pot filler
- Powered rollers
- Pressure washer
- Pumps
- Ram compactor (jumping jack)
- Riding mowers/mulchers
- Skid steer loader
- Soil screener
- Sterilizers
- String trimmer
- Tractors
- Trucks
- Turf and tree sprayer

*Required – Attachments*
- Bucket
- Forks

*Recommended – Attachments*
- Aerator
- Auger/post hole digger
- Blade
- Cultivator
- Discer
- Harrow
- Leaf vacuum
- Overseeder
- Plough
- Power sweeper
- Rototiller
- Snow blower
- Soil profiler
- Top dresser
- Tow behind de-thatcher
- Tow behind thatcher
- Tree spade
- U-blade
- Vacuum
Shop (Facility) Tools

**Standard Power Tools**
- Chainsaw
- Electric drill
- Fertilizer injector
- Grinder
- Hammer drill
- Mower/mulcher
- Power cultivator (rototiller)
- Power sprayer
- Vacuum (wet/dry, leaf)
- Walk-behind aerator

**Standard Hand Tools**
- Axes
- Backpack sprayer
- Boxcutters
- Brick carriers
- Brick splitter
- Brooms
- Bulb planters
- Cart
- Chains
- Chisels
- Clearing axes
- Core samplers (probe)
- Crimpers
- Crowbars
- Cultivator (manual)
- De-thatching rake
- Dolly
- Files
- Flags
- Garden forks
- Grease guns
- Hammers (hand, sledge)
- Hand tamper
- Handheld watering equipment
- Landscape rakes
- Loppers
- Mallet
- Microscope
- Pickaxes
- Picks
- Pitch forks
- Pliers (various types)
- Pry bar
- Punch
- Rakes (various types)
- Screwdrivers (various types)
- Seed/fertilizer spreader
- Sharpening tools
- Shovels (coal, clam, scoop/barn, spade, garden)
- Side cutters
- Soil screener
- Spades (various types)
- String line
- Tap and die
- Tape measure
- Tarps
- Tie-downs (straps, chains)
- Tree cart
- Trowels
- Water key
- Weed digger
- Wheelbarrow
- Wheel chocks
- Wrenches
Specialty (Facility) Tools

Measuring Equipment

- Anemometer
- EC meter
- Hydrometer
- Hygrometer
- Levels (line, hand, zip laser)
- Light meter
- pH meter
- Tape measure
- Thermometer
- Tire pressure meter

Student Equipment (supplied by school)

Required - PPE and Safety Equipment

- Cones
- Chemical protection suits
- Ear protection
- Eye protection (glasses, shields)
- Eye wash kit
- Face shields
- Fall protection (harness)
- Fire extinguisher
- First Aid kits
- Flares
- Goggles
- Hard hat
- Lanyard
- Particle masks
- Reflective shirts, jackets
- Respirators
- Rubber gloves
- Safety vests
- Spill kit
- Traffic cones

Recommended - Office Equipment

- Camera
- Communication devices
- Computers

Student Tools (supplied by student)

Required

- CSA-approved steel-toed footwear

Recommended

- Calculator
- Hand lens (10x)
- Work gloves
- Rainwear
Reference Materials

LEVEL ONE

Required Reference Materials

- Kwantlen University College School of Horticulture Plant identification Database, www.kwantlen.ca/horticulture/
  https://appserver1.kwantlen.ca/apps/plantid/plantid.nsf/search
- Identify Plants and Describe Their Use – Module 1, HEBC 2012
- Communication and Organizational Skills – Module 1, HEBC 2012
- Equipment Maintenance and Safety – Module 1, HEBC 2012
- Plant Science for Horticulture – Module 1, HEBC 2012
- Plant Stress – Signs and Symptoms, HEBC 2012
- Soil and Soilless Media – Physical and Biological Characteristics – Module 1, HEBC 2012
- Horticultural Skills – Module 1, HEBC 2012

Recommended Resources

- WorkSafeBC Website (http://www.worksafebc.com/)
- Equipment Manufacturers Websites (Internet)
Suggested Texts

- Abiotic Disorders of Landscape Plants: A Diagnostic Guide - Costello, Laurence Raleigh. 2003. University of California, Agriculture and Natural Resources, Oakland, CA

NOTE:
This list of Reference Materials is for training providers. Apprentices should contact their preferred training provider for a list of recommended or required texts for this program.
LEVEL TWO

Required Reference Materials

- Kwantlen University College School of Horticulture Plant identification Database, www.kwantlen.ca/horticulture/
  https://plantdatabase.kwantlen.ca
- Identify Plants and Describe Their Use – Module 2, HEBC 2012
- Leadership and Organizational Skills – Module 2, HEBC 2012
- Equipment Maintenance and Safety – Module 2, HEBC 2012
- Plant Science for Horticulture – Module 2, HEBC 2012
- Plant Stress – Causes and Controls – Module 2, HEBC 2012
- Soils and Soilless Media – Chemical Characteristics – Module 2, HEBC 2012
- Horticultural Skills – Plant Quality and Handling – Module 2, HEBC 2012

Recommended Resources

- Kwantlen University College School of Horticulture Plant identification Database, www.kwantlen.ca/horticulture/
  https://plantdatabase.kwantlen.ca
- WorkSafeBC Website (http://www.worksafebc.com/)
- Equipment Manufacturers Websites (Internet)

Suggested Texts

- Pacific Northwest; Plant Disease Management Handbook - 2008. Extension Services of Oregon State University, Washington State University, and the University of Idaho


• Considerations for their use - Ministry of Education, Skills and Training and the Ministry of Labour and the Centre for Curriculum and Professional Development. 1995. BC.

Instructor Requirements

Occupation Qualification
The instructor must possess:

- Subject matter competence as demonstrated by a Horticulture Trades Qualification/Apprentice Certificate or Horticulture Diploma
- Teaching competence as demonstrated by successful completion of Provincial Instructor Diploma (PIDP) or equivalent or regular faculty status at an institution which has a defined faculty review process (as specified by institutional policy) or contract faculty who have at least completed the Instructional Skills Workshop (PIDP 3102) or equivalent.

Work Experience

- Instructors with the Landscape Horticulture C of Q must have a minimum 2 years experience working in the industry as a journeyperson
- Or credentials for related subject matter competence

ADDITIONAL CREDENTIALS AND EXPERIENCE RECOMMENDED FOR SPECIFIC SUBJECT MATTER

LEVEL ONE

Subject Matter: Plant Identification and Use
Subject matter competence as demonstrated by a Horticulture Trades Qualification/Apprentice Certificate or Horticulture Diploma or Baccalaureate Degree in Horticulture and 2 years of plant identification experience.

Subject Matter: Communication and Supervision
Subject matter competence as demonstrated by a Business Diploma with Human Resource or Organizational Behaviour specialty or Baccalaureate Degree in with a minor in Business or Certified Landscape Professional.
Two years supervisory or management experience in a private or public organization.

Subject Matter: Equipment Operation and Maintenance
Subject matter competence as demonstrated by an Outdoor Power Equipment Trades Qualification/Apprentice Certificate.
5 years of relevant industry experience.

Subject Matter: Plant Science
Subject matter competence as demonstrated by a Baccalaureate Degree in Horticulture, Botany, Agronomy, Plant Biology, Forestry, or Crop Science and/or a Diploma in Horticulture, Agriculture or Forestry with a minimum of 5 years of experience in plant science.

Subject Matter: Analyze and Maintain Plant Health
Subject matter competence as demonstrated by a Horticulture Diploma or Baccalaureate Degree in Horticulture, Agronomy, Forestry, Crop Science, or Pest Management and/or a Diploma in Agriculture or Forestry with a minimum of 5 years of experience in analyzing and maintaining plant health.
Subject Matter: Physical and Biological Characteristics of Soil and Soilless Media
Subject matter competence as demonstrated by a Baccalaureate Degree in Soil Science Horticulture, Agronomy, Forestry, or Crop Science and/or a Diploma in Horticulture, Agriculture or Pest Management with a minimum of 5 years of experience in analyzing physical and biological characteristics of soil and soilless media.

Subject Matter: Practical Horticultural Skills
Subject matter competence as demonstrated by a Horticulture Trades Qualification/Apprentice Certificate or Horticulture Diploma or Baccalaureate Degree in Horticulture and 2 years of practical landscape or nursery experience.

LEVEL TWO

Subject Matter: Plant Identification and Use
Subject matter competence as demonstrated by a Horticulture Trades Qualification/Apprentice Certificate or Horticulture Diploma or Baccalaureate Degree in Horticulture and 2 years of plant identification experience.

Subject Matter: Communication and Supervision
Subject matter competence as demonstrated by a Horticulture Trades Qualification/Apprentice Certificate or Horticulture Diploma or Baccalaureate Degree in with a minor in Business or Certified Landscape Professional. Two years of relevant industry experience.

Subject Matter: Equipment Operation and Maintenance
Subject matter competence as demonstrated by an Outdoor Power Equipment Trades Qualification/Apprentice Certificate or equivalent within Horticulture training or education, with a minimum of 2 years of relevant industry experience.

Subject Matter: Plant Science
Subject matter competence as demonstrated by a Baccalaureate Degree in Horticulture, Botany, Agronomy, Plant Biology, Forestry, or Crop Science and/or a Diploma in Horticulture, Agriculture or Forestry with a minimum 5 years of experience in plant science.

Subject Matter: Analyze and Maintain Plant Health
Subject matter competence as demonstrated by a Horticulture Diploma or Baccalaureate Degree in Horticulture, Agronomy, Forestry, Crop Science, or Pest Management and/or a Diploma in Agriculture or Forestry with a minimum of 5 years of experience in analyzing and maintaining plant health.

Subject Matter: Chemical Characteristics of Soil and Soilless Media
Subject matter competence as demonstrated by a Baccalaureate Degree in Soil Science Horticulture, Agronomy, Forestry, or Crop Science and/or a Diploma in Horticulture, Agriculture or Pest Management with a minimum of 5 years of experience in analyzing physical and biological characteristics of soil and soilless media.

Subject Matter: Practical Horticultural Skills
Subject matter competence as demonstrated by a Horticulture Trades Qualification/Apprentice Certificate or Horticulture Diploma or Baccalaureate Degree in Horticulture and 2 years of practical landscape or nursery experience.