

CONTENT STANDARD 1.0: SAFETY IN THE ORNAMENTAL HORTICULTURE INDUSTRY

Performance Standard 1.1: Safe Work Practices

- 1.1.1 Identify and properly use personal protection equipment.
- 1.1.2 Read, understand and follow label directions and SDS (safety data sheet).
- 1.1.3 Properly identify common hand tools and power equipment.
- 1.1.4 Safely use common hand tools and power equipment.
- 1.1.5 Complete (EPA) worker protection handler verification card training.

CONTENT STANDARD 2.0: PLANT ANATOMY

Performance Standard 2.1: Plant Cells

- 2.1.1 Label the parts of a plant cell.
- 2.1.2 Differentiate between a plant and animal cell.
- 2.1.3 Explain the function of plant cell organelles.

Performance Standard 2.2: Root Anatomy

- 2.2.1 Investigate the functions of roots in plants.
- 2.2.2 Identify the parts of a root.
- 2.2.3 Differentiate the two major types of root systems.
- 2.2.4 Investigate specialized structures in roots.
- 2.2.5 Investigate the functions of roots in plants.

Performance Standard 2.3: Stem Anatomy

- 2.3.1 List the functions of a stem.
- 2.3.2 Recognize the external structures of a stem.
- 2.3.3 Analyze the internal structures of a stem cell.
- 2.3.4 Investigate specialized structures in stems.

Performance Standard 2.4.: Leaf Anatomy

- 2.4.1 Name the main parts of a leaf.
- 2.4.2 Compare common vein patterns found in leaves.
- 2.4.3 List three functions of a leaf, including photosynthetic energy conversion.
- 2.4.4 Differentiate major leaf arrangements.
- 2.4.5 Investigate specialized cell structures in a leaf.

Performance Standard 2.5: Flower Anatomy

- 2.5.1 Label and describe the parts of a flower.
- 2.5.2 Summarize the purpose of a flower.
- 2.5.3 Distinguish between different types of flowers.
- 2.5.4 Describe the difference between monocot and dicot flowers.
- 2.5.5 Diagram the process of plant pollination and fertilization.

Performance Standard 2.6: Fruit Anatomy

- 2.6.1 Label and describe the parts of a fruit.
- 2.6.2 Identify and distinguish between basic types of fruits.

Performance Standard 2.7: Seed Anatomy

- 2.7.1 Identify and list the major parts of a seed.
- 2.7.2 List the function of each major part of a seed.

CONTENT STANDARD 3.0: PLANT PHYSIOLOGY

Performance Standard 3.1: Energy Conversion In Plants

- 3.1.1 Interpret the process of photosynthesis.
- 3.1.2 Interpret the process of respiration.
- 3.1.3 Compare the process of respiration to photosynthesis.

Performance Standard 3.2: Transport Within a Plant System

- 3.2.1 Compare the active and passive transport of minerals into and through the root systems to plant nutrition.
- 3.2.2 Compare the structure and function of xylem and phloem cells and tissues.
- 3.2.3 Describe the process of translocation.

Performance Standard 3.3: Environmental Requirements for Plant Growth

- 3.3.1 Examine the effects of light quality on plant growth (i.e., spectrum, light measurement).
- 3.3.2 Examine the effects of water quality on plant growth (i.e., pH, hardness).
- 3.3.3 Examine the effects of temperature on plant growth.

Performance Standard 3.4: Plant Growth Regulators

- 3.4.1 Compare the functions of plant hormones.
- 3.4.2 Examine commercial uses for plant growth regulators.

Performance Standard 3.5: Plant Tropisms

- 3.5.1 Investigate plant tropisms (e.g., photo, thigma or gravi-).

CONTENT STANDARD 4.0: PLANT IDENTIFICATION SKILLS

Performance Standard 4.1: Categorize Plants

- 4.1.1 Discuss the classification and naming of plants.
- 4.1.2 Distinguish the major groups of plants.
- 4.1.3 Correctly categorize common plants by life cycle (i.e., annuals, perennials, etc.).
- 4.1.4 Correctly categorize plants by growth habits (i.e., mounding, trailing, etc.).
- 4.1.5 Utilize resources to establish plant suitability for a selected site (i.e., Hardiness Zone Maps, Heat Zone Maps).
- 4.1.6 Identify common plants by botanical and common names.

CONTENT STANDARD 5.0: GROWING MEDIA

Performance Standard 5.1: Soil Texture and Structure

- 5.1.1 List the components of soil.
- 5.1.2 Describe the concept of soil texture and its importance.
- 5.1.3 Classify the texture of a soil sample.
- 5.1.4 Identify various soil structures, their formation, and importance in agriculture production.

Performance Standard 5.2: Soilless Growing Media

- 5.2.1 Identify the components and source of soilless growing media.
- 5.2.2 Describe the functions of growing media.
Determine desirable properties of growing media (i.e., drainage, organic matter, micro-organisms).
- 5.2.3
- 5.2.4 Evaluate the advantages and disadvantages of soilless media.

Performance Standard 5.3: Chemical Characteristics of Growing Media

- 5.3.1 Test and determine pH level of various growing media.
- 5.3.2 Interpret pH test results of a growing media sample.
- 5.3.3 Test and determine the electrical conductivity (EC) of various growing media.
- 5.3.4 Interpret EC test results of a growing media sample.
- 5.3.5 Interpret soil test results and make recommendation accordingly.
- 5.3.6 Analyze the relationship between soil media and nutrient availability.

Performance Standard 5.4: Water-Holding Capacity (WHC)

- 5.4.1 Describe water-holding capacity of soils and its relationship to the water cycle.
- 5.4.2 Explain what determines a soil's water-holding capacity.

CONTENT STANDARD 6.0: PLANT NUTRITION

Performance Standards 6.1: Fertilizer Formulation

- 6.1.1 Differentiate between macronutrients and micronutrients.
- 6.1.2 Measure pH and describe how it is modified.
- 6.1.3 Identify the components of a fertilizer and their role in the biochemical cycle.
- 6.1.4 Interpret a fertilizer label.
- 6.1.5 Categorize methods of application (i.e., granular, time released, injector, foliar).
- 6.1.6 Evaluate application methods to ornamental crops.
- 6.1.7 Develop a fertilizer management plan for an ornamental crop.

Performance Standards 6.2: Plant Nutrients

- 6.2.1 Correlate plant symptoms to the appropriate nutritional deficiency.
- 6.2.2 Correlate plant symptoms to the appropriate plant toxicity.

CONTENT STANDARD 7.0: INTEGRATED PEST MANAGEMENT (IPM)

Performance Standard 7.1: Integrated Pest Management

- 7.1.1 Define Integrated Pest Management (IPM).
- 7.1.2 Summarize the benefits of IPM.

Performance Standard 7.2: Common Pests and Diseases

- 7.2.1 Identify types of plant pests and diseases.
- 7.2.2 Identify weed, insect, rodent, and fungi pests.
- 7.2.3 Differentiate between infectious and noninfectious diseases.
- 7.2.4 Identify abiotic plant injuries.

Performance Standard 7.3: Safe Handling, Use, and Storage of Pesticides

- 7.3.1 Identify and utilize appropriate safety measures when applying pesticides.
- 7.3.2 Interpret pesticide labels.
- 7.3.3 Explain procedures for storing and disposing of pesticides.
- 7.3.4 Evaluate environmental and consumer concerns regarding pest management and biodiversity.
- 7.3.5 Demonstrate how to mix pesticides according to label directions.
- 7.3.6 Calibrate common application equipment and calculate application rate.
- 7.3.7 Explore requirements for obtaining pesticide applicator licenses.

CONTENT STANDARD 8.0: PLANT PROPAGATION

Performance Standard 8.1: Sexual Propagation of Ornamental Plants

- 8.1.1 Compare the difference between sexual and asexual propagation.
- 8.1.2 Diagram the process of seed germination.
- 8.1.3 Identify the conditions needed for seed germination.
- 8.1.4 Compare the methods of seed preparation.
- 8.1.5 Demonstrate techniques for sowing seeds.
- 8.1.6 Determine germination percent.

Performance Standard 8.2: Asexual Propagation of Ornamental Plants

- 8.2.1 Summarize optimum conditions for asexual propagation.
- 8.2.2 Demonstrate techniques used to propagate plants by cutting.
- 8.2.3 Demonstrate techniques used to propagate plants by division.
- 8.2.4 Demonstrate techniques used to propagate plants by separation.
- 8.2.5 Demonstrate techniques used to propagate plants by layering.

CONTENT STANDARD 9.0: ORNAMENTAL HORTICULTURE CROPS

Performance Standard 9.1: Crop Production

- 9.1.1 Plan a growing schedule to maximize the production of a growing facility.
- 9.1.2 Utilize best management practices when spacing crops.
- 9.1.3 Select appropriate containers and medium for a crop.

Performance Standard 9.2: Growth Maintenance Procedures

- 9.2.1 Compare and contrast hard and soft pinches.
- 9.2.2 Pinch plants using best management practices.
- 9.2.3 Examine proper pruning techniques.
- 9.2.4 Demonstrate proper watering techniques.
- 9.2.5 Develop a plant lighting schedule for a crop.
- 9.2.6 Develop a fertilizer schedule for a crop.

Performance Standard 9.3: Transplanting

- 9.3.1 Identify the proper stage of plant growth for transplanting.
- 9.3.2 Select appropriate plants for transplanting.
- 9.3.3 Demonstrate transplanting procedures to industry standards.

Performance Standard 9.4: Production Standards

- 9.4.1 Compare hardening processes
- 9.4.2 Prepare plants for sale using best management practices.
- 9.4.3 Examine current industry crop standards (i.e. ANSI, ASNS, NALP).

CONTENT STANDARD 10.0: BUSINESS CONCEPTS

Performance Standard 10.1: Basics of Marketing

- 10.1.1 Compare and contrast advertising methods.
- 10.1.2 Define the purpose for developing a marketing plan.
- 10.1.3 Create a business display to a target market.

Performance Standard 10.2: Principles of Sales

- 10.2.1 Compare and contrast the relationship between marketing and selling.
- 10.2.2 Calculate markup.
- 10.2.3 Complete a sales ticket.
- 10.2.4 Complete a pre-sale and post-sale plant inventory.
- 10.2.5 Determine cost of sales.
- 10.2.6 Complete estimates and bids (cost analysis).
- 10.2.7 Identify the characteristics of an effective salesperson, and define related terms.
- 10.2.8 Analyze the customer buying process.
- 10.2.9 Identify the steps involved in the selling process.
- 10.2.10 Identify the benefits of different types of sales, including website and e-commerce.
- 10.2.11 Assess the basic components and content of a business website.

CONTENT STANDARD 11.0: PLANT TECHNOLOGIES

Performance Standard 11.1: Selective Plant Breeding

- 11.1.1 Describe the selective plant breeding process.
- 11.1.2 Explain how to estimate the heritability of certain traits.
- 11.1.3 Predict the genotypes and phenotypes from monohybrid and dihybrid crosses using a Punnett Square.
- 11.1.4 Describe sex determination, linkage, crossover, and mutation.
- 11.1.5 Describe how biotechnology tools are used to monitor and direct plant breeding.

Performance Standard 11.2: Genetic Engineering of Plants

- 11.2.1 Explain the advantages and disadvantages for genetic manipulation of plants.
- 11.2.2 Identify transgenic plants on the market.

Performance Standard 11.3: Micropropagation Techniques

- 11.3.1 Define micropropagation and its importance.
- 11.3.2 Explain applications of micropropagation.
- 11.3.3 Identify tools and materials for micropropagation procedures.
- 11.3.4 Describe procedures used in micropropagation.

Performance Standard 11.4: Hydroponic Techniques

- 11.4.1 Define hydroponics and its importance to society.
- 11.4.2 Explain applications of hydroponics.
- 11.4.3 Describe procedures used in hydroponic plant production.

CONTENT STANDARD 12.0: ORNAMENTAL DESIGN STANDARDS

Performance Standards 12.1: Principles and Elements of Design

- 12.1.1 Compare and contrast balance using symmetry, asymmetry, and massing.
- 12.1.2 Explain how the principles of dominance and focal point are used in design.
- 12.1.3 Determine appropriate proportion and scale in a design.
- 12.1.4 Illustrate how to establish rhythm in a design.
- 12.1.5 Discuss relationship of color to emotions/symbolism.
- 12.1.6 Use color, texture, and form to create a desired atmosphere.

Performance Standard 12.2: Implementation of Principles and Elements of Design

- 12.2.1 Create a project using principles and elements of design.
- 12.2.2 Justify design choices of finished project.

CONTENT STANDARD 13.0: CAREER OPPORTUNITIES IN ORNAMENTAL HORTICULTURE

Performance Standard 13.1: Careers in Ornamental Horticulture

- 13.1.1 Research potential careers in ornamental horticulture and plant science.
- 13.1.2 Demonstrate employability skills for a career in the ornamental horticulture industry.
- 13.1.3 Research additional industry certifications available.

CONTENT STANDARD 14.0: LEADERSHIP TRAINING THROUGH AGRICULTURAL EDUCATION

Performance Standard 14.1: Effective Leadership and Leadership Training

- 14.1.1 Expand leadership experience by participating in a chapter activity.
- 14.1.2 Participate in a career development event at the local level or above.
- 14.1.3 Exhibit leadership skills by demonstrating proper parliamentary procedure.
- 14.1.4 Participate in a speech or presentation activity.

Performance Standard 14.2: School and Community Awareness

- 14.2.1 Participate in a school improvement or community development project.

CONTENT STANDARD 15.0: SUPERVISED AGRICULTURAL EXPERIENCE (SAE) AND AGRICULTURAL CAREER PREPARATION

Performance Standard 15.1: Maintain a Supervised Agricultural Experience

- 15.1.1 Accurately maintain SAE record books.
- 15.1.2 Investigate the proficiency award areas related to SAE program area.
- 15.1.3 Actively pursue necessary steps to receive higher degrees in FFA.