

2024 Ornamental Horticulture

Program Standards

CONTENT STANDARD 1.0: PROFESSIONAL ORGANIZATIONS AND LEADERSHIP

Performance Standard 1.1: Student Leadership in Career Technical Student Organizations (CTSO) and Professional Associations

- 1.1.1 Explore the role of professional organizations and/or associations in the horticulture industry.
- 1.1.2 Define the value, role, and opportunities provided through career technical student organizations.
- 1.1.3 Engage in career exploration and leadership development.

Performance Standard 1.2: Supervised Agricultural Experience

- 1.2.1 Maintain SAE record books.
- 1.2.2 Describe the proficiency award areas related to SAE program area.
- 1.2.3 Describe necessary steps to receive higher degrees in FFA.

CONTENT STANDARD 2.0: CAREER OPPORTUNITIES

Performance Standard 2.1: Career Exploration in Ornamental Horticulture

- 2.1.1 Identify potential careers in ornamental horticulture and plant science.
- 2.1.2 Describe employability traits required for a successful career in the ornamental horticulture industry.
- 2.1.3 Describe industry education and certification requirements to enter or advance in the industry.

CONTENT STANDARD 3.0: SAFETY IN THE INDUSTRY

Performance Standard 3.1: Safe Work Practices

- 3.1.1 Follow personal protection equipment (PPE) requirements, according to industry and OSHA guidelines.
- 3.1.2 Describe the importance of the information on safety data sheets (SDS) and where they can be located.
- 3.1.3 Identify common hand tools and power equipment.
- 3.1.4 Demonstrate safety practices when using hand tools and power equipment, including following manufacturer guidelines, identifying hazards, and using safety features of the tools and equipment.

CONTENT STANDARD 4.0: PLANT ANATOMY

Performance Standard 4.1: Plant Cells

- 4.1.1 Label the parts of a plant cell.
- 4.1.2 Compare a plant to an animal cell.
- 4.1.3 Describe the function of plant cell organelles.

Performance Standard 4.2: Root Anatomy

- 4.2.1 Describe the functions of roots in plants.
- 4.2.2 Identify the parts of a root.
- 4.2.3 Compare the two major types of root systems.
- 4.2.4 Describe specialized structures in roots.

Performance Standard 4.3: Stem Anatomy

- 4.3.1 List the functions of a stem.
- 4.3.2 Identify the external structures of a stem.
- 4.3.3 Describe the internal structures of a stem cell.
- 4.3.4 Describe specialized structures in stems.

Performance Standard 4.4: Leaf Anatomy

- 4.4.1 Define the main parts of a leaf.
- 4.4.2 Compare common vein patterns found in leaves.
- 4.4.3 List the functions of a leaf, including photosynthetic energy conversion.
- 4.4.4 Define the difference between leaf shape and leaf margin.
- 4.4.5 Compare major leaf arrangements (i.e., alternating, opposite, whorled, basal).

Performance Standard 4.5: Flower Anatomy

- 4.5.1 Describe the parts of a flower.
- 4.5.2 Describe the function of a flower.
- 4.5.3 Compare types of flowers (e.g., complete, incomplete, perfect, imperfect).
- 4.5.4 Describe the process of plant pollination and fertilization.

Performance Standard 4.6: Fruit Anatomy

- 4.6.1 Describe the parts of a fruit.
- 4.6.2 Identify types of fruits of economic importance in Idaho.

Performance Standard 4.7: Seed Anatomy

- 4.7.1 Identify the major parts of a seed.
- 4.7.2 List the function of each major part of a seed.

CONTENT STANDARD 5.0: PLANT PHYSIOLOGY

Performance Standard 5.1: Energy Conversion In Plants

- 5.1.1 Describe the process of photosynthesis.
- 5.1.2 Describe the process of respiration.

Performance Standard 5.2: Transport within a Plant System

- 5.2.1 Compare the active and passive transport of water and nutrients through the root systems.
- 5.2.2 Compare the structure and function of xylem and phloem cells and tissues.

Performance Standard 5.3: Environmental Requirements for Plant Growth

- 5.3.1 Determine the effect of different light sources (e.g., spectrum, intensity) on plant growth (e.g., artificial, natural).
- 5.3.2 Describe the effects of water quality on plant growth (e.g., pH, hardness).
- 5.3.3 Describe the effects of temperature on plant growth.
- 5.3.4 Describe the factors that affect plant suitability for a selected site, using a hardiness zone map and heat zone map.
- 5.3.5 Define plant tropisms (e.g., *photo-*, *thigma-*, *gravi-*).

Performance Standard 5.4: Plant Growth Regulators

- 5.4.1 Compare the functions of plant hormones.
- 5.4.2 Describe commercial uses for plant growth regulators.

CONTENT STANDARD 6.0: PLANT IDENTIFICATION SKILLS

Performance Standard 6.1: Plant Categorization

- 6.1.1 Describe the classification and naming of plants.
- 6.1.2 Identify the major groups of plants.
- 6.1.3 Describe the difference between monocot and dicot.
- 6.1.4 Categorize common plants by life cycle (e.g., annuals, perennials).
- 6.1.5 Categorize plants by growth habits (e.g., mounding, trailing).
- 6.1.6 Describe the importance of identifying plants by botanical and common names in the industry.

CONTENT STANDARD 7.0: GROWING MEDIA

Performance Standard 7.1: Soil Texture and Structure

- 7.1.1 List the components of soil.
- 7.1.2 Describe the concept of soil texture and its importance.
- 7.1.3 Classify the texture of a soil sample.
- 7.1.4 Identify various soil structures, their formation, and importance in agriculture production.

Performance Standard 7.2: Soilless Growing Media

- 7.2.1 Identify the components and source of soilless growing media.

- 7.2.2 Describe the functions of growing media.
- 7.2.3 Determine desirable properties of growing media (i.e., drainage, organic matter, micro-organisms).
- 7.2.4 Evaluate the advantages and disadvantages of soilless media.

Performance Standard 7.3: Chemical Characteristics of Growing Media

- 7.3.1 Determine pH range of growing media for optimal plant growth.
- 7.3.2 Interpret pH test results of a growing media sample.
- 7.3.3 Describe the importance of electrical conductivity (EC) of various growing media.
- 7.3.4 Analyze the relationship between soil media and nutrient availability.

Performance Standard 7.4: Water-Holding Capacity (WHC)

- 7.4.1 Describe water-holding capacity of soils and its relationship to the water cycle.
- 7.4.2 Describe the factors that determine a soil's water-holding capacity.

CONTENT STANDARD 8.0: PLANT NUTRITION

Performance Standard 8.1: Fertilizer Formulation

- 8.1.1 Compare macronutrients and micronutrients.
- 8.1.2 Measure pH and describe how it is modified.
- 8.1.3 Identify the main components of fertilizer.
- 8.1.4 Interpret a fertilizer label.
- 8.1.5 Categorize methods of application (e.g., granular, time released, injector, foliar).
- 8.1.6 Calculate a lawn fertilizer application rate.

Performance Standard 8.2: Plant Nutrients

- 8.2.1 Correlate plant symptoms to nutritional deficiency.
- 8.2.2 Correlate plant symptoms to plant toxicity

CONTENT STANDARD 9.0: INTEGRATED PEST MANAGEMENT (IPM)

Performance Standard 9.1: Integrated Pest Management

- 9.1.1 Define Integrated Pest Management (IPM) (e.g., physical, chemical, mechanical, biological).
- 9.1.2 Describe the benefits of IPM.

Performance Standard 9.2: Common Pests and Diseases

- 9.2.1 Identify common plant pests and diseases.
- 9.2.2 Identify common weeds, insects, rodents, and fungi.
- 9.2.3 Compare abiotic and biotic diseases.
- 9.2.4 Identify abiotic plant injuries.

Performance Standard 9.3: Safe Handling, Use, and Storage of Pesticides

- 9.3.1 Identify safety measures when applying pesticides.
- 9.3.2 Interpret pesticide labels.
- 9.3.3 Describe procedures for storing and disposing of pesticides.
- 9.3.4 Evaluate environmental and consumer concerns regarding pest management and biodiversity.
- 9.3.5 Describe requirements for obtaining pesticide applicator licenses.

CONTENT STANDARD 10.0: PLANT PROPAGATION

Performance Standard 10.1: Sexual Propagation of Ornamental Plants

- 10.1.1 Compare sexual and asexual propagation.
- 10.1.2 Describe the process of seed germination.
- 10.1.3 Identify the conditions needed for seed germination.
- 10.1.4 Compare the methods of seed preparation.
- 10.1.5 Demonstrate the technique for sowing seeds.
- 10.1.6 Calculate germination percentage.

Performance Standard 10.2: Asexual Propagation of Ornamental Plants

- 10.2.1 Describe optimum conditions for asexual propagation.



- 10.2.2 Demonstrate techniques used to propagate plants by cutting.
- 10.2.3 Demonstrate techniques used to propagate plants by division.
- 10.2.4 Demonstrate techniques used to propagate plants by separation.
- 10.2.5 Demonstrate techniques used to propagate plants by layering.
- 10.2.6 Describe micropropagation and its importance in the ornamental horticulture industry.
- 10.2.7 Describe grafting and its importance in the ornamental horticulture industry.

CONTENT STANDARD 11.0: ORNAMENTAL HORTICULTURE CROPS

Performance Standard 11.1: Crop Production

- 11.1.1 Develop a growing schedule for a spring plant sale.
- 11.1.2 Space crops, using best management practices.
- 11.1.3 Select containers and medium suitable for a crop.

Performance Standard 11.2: Growth Maintenance Procedures

- 11.2.1 Compare hard and soft pinches.
- 11.2.2 Pinch plants, using best management practices.
- 11.2.3 Demonstrate pruning techniques.
- 11.2.4 Demonstrate watering techniques.

Performance Standard 11.3: Transplanting

- 11.3.1 Identify the stage of plant growth for transplanting.
- 11.3.2 Demonstrate transplanting procedures to industry standards.

Performance Standard 11.4: Production Standards

- 11.4.1 Describe how to harden plants.
- 11.4.2 Prepare plants for sale, using best management practices.
- 11.4.3 Describe industry crop standards for greenhouse ornamental crop production (e.g., American National Standards Institute [ANSI], American Standard for Nursery Stock [ASNS], National Association for Landscape Professionals [NALP]).

CONTENT STANDARD 12.0: PLANT TECHNOLOGIES

Performance Standard 12.1: Selective Plant Breeding

- 12.1.1 Describe the selective plant breeding process.
- 12.1.2 Describe how to estimate the heritability of certain traits.
- 12.1.3 Predict the genotypes and phenotypes from monohybrid and dihybrid crosses, using a Punnett Square.

Performance Standard 12.2: Genetic Engineering

- 12.2.1 Describe the advantages and disadvantages for genetic manipulation of plants.
- 12.2.2 Identify transgenic plants on the market.
- 12.2.3 Describe how biotechnology can create new plant varieties.

Performance Standard 12.3: Hydroponic Techniques

- 12.3.1 Define hydroponics and its importance to society.
- 12.3.2 Describe procedures used in hydroponic plant production.

CONTENT STANDARD 13.0: ORNAMENTAL DESIGN STANDARDS

Performance Standard 13.1: Principles and Elements of Design

- 13.1.1 Compare visual balance, using symmetry, asymmetry, and massing.
- 13.1.2 Describe how the principles of dominance and focal point are used in design.
- 13.1.3 Describe the function of proportion and scale in a design.
- 13.1.4 Describe the function of rhythm in a design.
- 13.1.5 Describe the relationship of color to emotions and symbolism.
- 13.1.6 Create a desired design atmosphere, using color, texture, and form.

Performance Standard 13.2: Implementation of Principles and Elements of Design

- 13.2.1 Create a design.
- 13.2.2 Justify design choices (i.e., design elements) of a completed design.

CONTENT STANDARD 14.0: BUSINESS CONCEPTS

Performance Standard 14.1: Marketing



- 14.1.1 Describe the need for developing a marketing plan.
- 14.1.2 Develop a marketing plan for ornamental crop sales.
- 14.1.3 Design a business display for an identified target audience (e.g., social media, signage, production displays).

Performance Standard 14.2: Principles of Sales

- 14.2.1 Analyze the relationship between marketing and selling.
- 14.2.2 Demonstrate the use of a point of sale (POS) system or other electronic invoice system.
- 14.2.3 Describe the importance of supply inventory.
- 14.2.4 Describe characteristics of an effective salesperson and terminology related to sales.
- 14.2.5 Participate in a speech or presentation activity.
- 14.2.6 Analyze the customer buying process.
- 14.2.7 Identify the steps involved in the selling process.
- 14.2.8 Identify the benefits of various types of sales, including through social media and e-commerce.
- 14.2.9 Assess the components of an effective business website.

Performance Standard 14.3: Business Management

- 14.3.1 Describe factors of business management (e.g., cost of goods sold, product markup, estimates and bids, sales price, profit).
- 14.3.2 Demonstrate work ethic and professionalism (i.e., Idaho Workplace Readiness Skills) necessary for success in the industry.