

2025 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 Ornamental 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

- 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

