

Ornamental Horticulture (2024)

PROFESSIONAL ORGANIZATIONS AND LEADERSHIP 1.0

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. 1.1.1
- 2 Define the value, role, and opportunities provided through career technical student organizations. 1.1.2
- 3 Engage in career exploration and leadership development. 1.1.3

2 Supervised Agricultural Experience 1.2

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

CAREER OPPORTUNITIES 2.0

1 Career Exploration in Ornamental Horticulture 2.1

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

SAFETY IN THE INDUSTRY 3.0

1 Safe Work Practices 3.1

- 1 Follow personal protection equipment (PPE) requirements, according to industry and OSHA guidelines. 3.1.1
- 2 Describe the importance of the information on safety data sheets (SDS) and where they can be located. 3.1.2
- 3 Identify common hand tools and power equipment. 3.1.3
- 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. 3.1.4

PLANT ANATOMY 4.0

1 Plant Cells 4.1

- 1 Label the parts of a plant cell. 4.1.1
 - 2 Compare a plant to an animal cell. 4.1.2
 - 3 Describe the function of plant cell organelles. 4.1.3
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2 Root Anatomy 4.2

- 1 Describe the functions of roots in plants. 4.2.1
 - 2 Identify the parts of a root. 4.2.2
 - 3 Compare the two major types of root systems. 4.2.3
 - 4 Describe specialized structures in roots. 4.2.4
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3 Stem Anatomy 4.3

- 1 List the functions of a stem. 4.3.1
 - 2 Identify the external structures of a stem. 4.3.2
 - 3 Describe the internal structures of a stem cell. 4.3.3
 - 4 Describe specialized structures in stems. 4.3.4
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4 Leaf Anatomy 4.4

- 1 Define the main parts of a leaf. 4.4.1
 - 2 Compare common vein patterns found in leaves. 4.4.2
 - 3 List the functions of a leaf, including photosynthetic energy conversion. 4.4.3
 - 4 Define the difference between leaf shape and leaf margin. 4.4.4
 - 5 Compare major leaf arrangements (i.e., alternating, opposite, whorled, basal). 4.4.5
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5 Flower Anatomy 4.5

- 1 Describe the parts of a flower. 4.5.1
 - 2 Describe the function of a flower. 4.5.2
 - 3 Compare types of flowers (e.g., complete, incomplete, perfect, imperfect). 4.5.3
 - 4 Describe the process of plant pollination and fertilization. 4.5.4
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6 Fruit Anatomy 4.6

- 1 Describe the parts of a fruit. 4.6.1
 - 2 Identify types of fruits of economic importance in Idaho. 4.6.2
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7 Seed Anatomy 4.7

- 1 Identify the major parts of a seed. 4.7.1
 - 2 List the function of each major part of a seed. 4.7.2
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1 Describe the process of photosynthesis. 5.1.1

2 Describe the process of respiration. 5.1.2

2 Transport within a Plant System 5.2

1 Compare the active and passive transport of water and nutrients through the root systems. 5.2.1

2 Compare the structure and function of xylem and phloem cells and tissues. 5.2.2

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). 5.3.1

2 Describe the effects of water quality on plant growth (e.g., pH, hardness). 5.3.2

3 Describe the effects of temperature on plant growth. 5.3.3

4 Describe the factors that affect plant suitability for a selected site, using a hardiness zone map and heat zone map. 5.3.4

5 Define plant tropisms (e.g., photo-, thigma-, gravi-). 5.3.5

4 Plant Growth Regulators 5.4

1 Compare the functions of plant hormones. 5.4.1

2 Describe commercial uses for plant growth regulators. 5.4.2

PLANT IDENTIFICATION SKILLS 6.0

1 Plant Categorization 6.1

1 Describe the classification and naming of plants. 6.1.1

2 Identify the major groups of plants. 6.1.2

3 Describe the difference between monocot and dicot. 6.1.3

4 Categorize common plants by life cycle (e.g., annuals, perennials). 6.1.4

5 Categorize plants by growth habits (e.g., mounding, trailing). 6.1.5

6 Describe the importance of identifying plants by botanical and common names in the industry. 6.1.6

GROWING MEDIA 7.0

1 Soil Texture and Structure 7.1

1 List the components of soil. 7.1.1

2 Describe the concept of soil texture and its importance. 7.1.2

3 Classify the texture of a soil sample. 7.1.3

4 Identify various soil structures, their formation, and importance in agriculture production. 7.1.4

2 Soilless Growing Media 7.2

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

- 2 Describe the functions of growing media. 7.2.2
 - 3 Determine desirable properties of growing media (i.e., drainage, organic matter, micro- organisms). 7.2.3
 - 4 Evaluate the advantages and disadvantages of soilless media. 7.2.4
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3 Chemical Characteristics of Growing Media 7.3

- 1 Determine pH range of growing media for optimal plant growth. 7.3.1
 - 2 Interpret pH test results of a growing media sample. 7.3.2
 - 3 Describe the importance of electrical conductivity (EC) of various growing media. 7.3.3
 - 4 Analyze the relationship between soil media and nutrient availability. 7.3.4
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4 Water-Holding Capacity (WHC) 7.4

- 1 Describe water-holding capacity of soils and its relationship to the water cycle. 7.4.1
 - 2 Describe the factors that determine a soil's water-holding capacity. 7.4.2
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PLANT NUTRITION 8.0

1 Fertilizer Formulation 8.1

- 1 Compare macronutrients and micronutrients. 8.1.1
 - 2 Measure pH and describe how it is modified. 8.1.2
 - 3 Identify the main components of fertilizer. 8.1.3
 - 4 Interpret a fertilizer label. 8.1.4
 - 5 Categorize methods of application (e.g., granular, time released, injector, foliar). 8.1.5
 - 6 Calculate a lawn fertilizer application rate. 8.1.6
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2 Plant Nutrients 8.2

- 1 Correlate plant symptoms to nutritional deficiency. 8.2.1
 - 2 Correlate plant symptoms to plant toxicity 8.2.2
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INTEGRATED PEST MANAGEMENT (IPM) 9.0

1 Integrated Pest Management 9.1

- 1 Define Integrated Pest Management (IPM) (e.g., physical, chemical, mechanical, biological). 9.1.1
 - 2 Describe the benefits of IPM. 9.1.2
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2 Common Pests and Diseases 9.2

- 1 Identify common plant pests and diseases. 9.2.1
- 2 Identify common weeds, insects, rodents, and fungi. 9.2.2
- 3 Compare abiotic and biotic diseases. 9.2.3

4 Identify abiotic plant injuries. 9.2.4

3 Safe Handling, Use, and Storage of Pesticides 9.3

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

10.0

1 Sexual Propagation of Ornamental Plants 10.1

- 1 Compare sexual and asexual propagation. 10.1.1
 - 2 Describe the process of seed germination. 10.1.2
 - 3 Identify the conditions needed for seed germination. 10.1.3
 - 4 Compare the methods of seed preparation. 10.1.4
 - 5 Demonstrate the technique for sowing seeds. 10.1.5
 - 6 Calculate germination percentage. 10.1.6
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2 Asexual Propagation of Ornamental Plants 10.2

- 1 Describe optimum conditions for asexual propagation. 10.2.1
 - 2 Demonstrate techniques used to propagate plants by cutting. 10.2.2
 - 3 Demonstrate techniques used to propagate plants by division. 10.2.3
 - 4 Demonstrate techniques used to propagate plants by separation. 10.2.4
 - 5 Demonstrate techniques used to propagate plants by layering. 10.2.5
 - 6 Describe micropropagation and its importance in the ornamental horticulture industry. 10.2.6
 - 7 Describe grafting and its importance in the ornamental horticulture industry. 10.2.7
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ORNAMENTAL HORTICULTURE CROPS

11.0

1 Crop Production 11.1

- 1 Develop a growing schedule for a spring plant sale. 11.1.1
 - 2 Space crops, using best management practices. 11.1.2
 - 3 Select containers and medium suitable for a crop. 11.1.3
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2 Growth Maintenance Procedures 11.2

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

4 Demonstrate watering techniques. 11.2.4

3 Transplanting 11.3

- 1 Identify the stage of plant growth for transplanting. 11.3.1
 - 2 Demonstrate transplanting procedures to industry standards. 11.3.2
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4 Production Standards 11.4

- 1 Describe how to harden plants. 11.4.1
 - 2 Prepare plants for sale, using best management practices. 11.4.2
 - 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]). 11.4.3
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PLANT TECHNOLOGIES

12.0

1 Selective Plant Breeding 12.1

- 1 Describe the selective plant breeding process. 12.1.1
 - 2 Describe how to estimate the heritability of certain traits. 12.1.2
 - 3 Predict the genotypes and phenotypes from monohybrid and dihybrid crosses, using a Punnett Square. 12.1.3
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2 Genetic Engineering 12.2

- 1 Describe the advantages and disadvantages for genetic manipulation of plants. 12.2.1
 - 2 Identify transgenic plants on the market. 12.2.2
 - 3 Describe how biotechnology can create new plant varieties. 12.2.3
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3 Hydroponic Techniques 12.3

- 1 Define hydroponics and its importance to society. 12.3.1
 - 2 Describe procedures used in hydroponic plant production. 12.3.2
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**ORNAMENTAL DESIGN
STANDARDS 13.0**

1 Principles and Elements of Design 13.1

- 1 Compare visual balance, using symmetry, asymmetry, and massing. 13.1.1
 - 2 Describe how the principles of dominance and focal point are used in design. 13.1.2
 - 3 Describe the function of proportion and scale in a design. 13.1.3
 - 4 Describe the function of rhythm in a design. 13.1.4
 - 5 Describe the relationship of color to emotions and symbolism. 13.1.5
 - 6 Create a desired design atmosphere, using color, texture, and form. 13.1.6
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2 Implementation of Principles and Elements of Design 13.2

- 1 Create a design. 13.2.1

- 2 Justify design choices (i.e., design elements) of a completed design. 13.2.2
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BUSINESS CONCEPTS

14.0

1 Marketing 14.1

- 1 Describe the need for developing a marketing plan. 14.1.1
 - 2 Develop a marketing plan for ornamental crop sales. 14.1.2
 - 3 Design a business display for an identified target audience (e.g., social media, signage, production displays). 14.1.3
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2 Principles of Sales 14.2

- 1 Analyze the relationship between marketing and selling. 14.2.1
 - 2 Demonstrate the use of a point of sale (POS) system or other electronic invoice system. 14.2.2
 - 3 Describe the importance of supply inventory. 14.2.3
 - 4 Describe characteristics of an effective salesperson and terminology related to sales. 14.2.4
 - 5 Participate in a speech or presentation activity. 14.2.5
 - 6 Analyze the customer buying process. 14.2.6
 - 7 Identify the steps involved in the selling process. 14.2.7
 - 8 Identify the benefits of various types of sales, including through social media and e-commerce. 14.2.8
 - 9 Assess the components of an effective business website. 14.2.9
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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). 14.3.1
- 2 Demonstrate work ethic and professionalism (i.e., Idaho Workplace Readiness Skills) necessary for success in the industry. 14.3.2