Oklahoma CTE

Introduction to Plant and Soil Science (2014)

Adopted 2014

World Agronomy	**a.** Explain systems used to classify plants. PS.01.01.01.A
	b. Compare and contrast the hierarchical classification of agricultural plants. PS.01.01.01.B
	b. Identify agriculturally important plants by common names. PS.01.01.02.B
	c. Identify agriculturally important plants by scientific names. PS.01.01.02.C
Plant Structures and Functions	**a.** Describe the morphological characteristics used to identify agricultural plants. PS.01.01.02.A
	a. Diagram a typical plant cell and identify plant cell organelles and their functions. PS.01.02.01.A
	a. Identify the components, the types and the functions of plant roots. PS.01.02.02.A
	a. Identify the components and the functions of plant stems. PS.01.02.03.A
	a. Discuss leaf morphology and the functions of leaves. PS.01.02.04.A
	a. Identify the components of a flower, the functions of a flower and the functions of flower components. PS.01.02.05.A
	b. Identify the different types of flowers and flower forms. PS.01.02.05.B
	a. Explain the functions and components of seeds and fruit. PS.01.02.06.A
	a. Explain the basic process of photosynthesis and its importance to life on Earth. PS.01.03.01.A
	b. Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis. PS.01.03.01.B
	a. Explain cellular respiration and its importance to plant life. PS.01.03.02.A

	b. Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration. PS.01.03.02.B
	b. Identify the plant responses to plant growth regulators and different forms of tropism. PS.01.03.04.B
	a. Describe the effects air, temperature and water have on plant metabolism and growth. PS.02.01.02.A
	a. Explain pollination, cross-pollination and self-pollination of flowering plants. PS.03.01.01.A
Soil Formation and Use	**a.** Explain the process of soil formation through weathering. ESS.03.02.01.A
	a. Explain how the physical qualities of the soil influence the infiltration and percolation of water. ESS.03.02.03.A
	a. Demonstrate techniques used to identify rock, mineral and soil types. NRS.01.02.05.A
	b. Identify rock, mineral and soil types. NRS.01.02.05.B
	a. Identify the categories of soil water. PS.02.02.02.A
	b. Discuss how soil drainage and waterholding capacity can be improved. PS.02.02.02.B
	a. Discuss the influence of pH and cation exchange capacity on the availability of nutrients. PS.02.03.02.A
Plant Nutrition and Soil Fertility	**a.** Identify biogeochemical cycles. NRS.02.06.01.A
	b. Diagram biogeochemical cycles and explain the processes. NRS.02.06.01.B
	a. Identify the operational components of a pumping or fluid movement system. ESS.03.03.06.A
	a. Identify the essential nutrients for plant growth and development and their major functions. PS.02.03.01.A
	b. Describe nutrient deficiency symptoms and recognize environmental causes of nutrient deficiencies. PS.02.03.01.B
	a. Discuss the influence of pH and cation exchange capacity on the availability of nutrients. PS.02.03.02.A
	a. Identify fertilizer sources of essential plant nutrients, explain fertilizer formulations, and describe different methods of fertilizer application. PS.02.03.04.A

	a. Collect soil and plant tissue samples for testing and interpret the test results. PS.02.03.03.A
	b. Calculate the amount of fertilizer to be applied and calibrate equipment to apply the prescribed amount of fertilizer. PS.02.03.04.B
Tillage and Conservation	**b.** Discuss how soil drainage and waterholding capacity can be improved. PS.02.02.02.B
	a. Demonstrate sowing techniques and provide favorable conditions for seed germination. PS.03.01.02.A
Crop Improvement	**a.** Describe the selective plant breeding process. BS.03.03.01.A
	a. Identify the five groups of naturally occurring plant hormones and synthetic plant growth regulators. PS.01.03.04.A
	a. Explain pollination, cross-pollination and self-pollination of flowering plants. PS.03.01.01.A
	a. Explain the principles behind recombinant DNA technology and the basic steps in the process. PS.03.01.05.A
	b. Give examples of the risks and advantages associated with genetically modified plants. PS.03.01.05.B
Seeding and Planting Practices	**b.** Handle seed to overcome seed dormancy mechanisms and to maintain seed viability and vigor. PS.03.01.02.B
	a. Explain the importance of starting with pest- and disease-free propagation material. PS.03.02.01.A
	a. Explain the reasons for preparing growing media before planting. PS.03.02.02.A
	a. Demonstrate proper planting procedures and post-planting care. PS.03.02.03.A
	a. Identify types of plant pests and disorders. PS.03.03.01.A
Pest Management	**a.** Use proper safety practices/personal protective equipment. CS.06.02.01.A
	a. Identify types of plant pests and disorders. PS.03.03.01.A
	b. Identify major local weeds, insect pests and infectious and noninfectious plant diseases. PS.03.03.01.B
	a. Describe damage caused by plant pests and diseases. PS.03.03.02.A
	b. Diagram the life cycles of major plant pests and diseases. PS.03.03.02.B

	a. Describe pest control strategies associated with integrated pest management. PS.03.03.03.A
	b. Describe types of pesticide controls and formulations. PS.03.03.03.B
	a. Explain risks and benefits associated with the materials and methods used in plant pest management. PS.03.03.04.A
	b. Explain procedures for the safe handling, use and storage of pesticides. PS.03.03.04.B
Harvesting and Marketing	**a.** Identify and use strategies frequently employed in marketing programs, including those used in niche markets. ABS.06.03.01.A
	a. Identify harvesting methods and harvesting equipment. PS.03.05.01.A
	b. Assess the stage of growth to determine crop maturity or salability and demonstrate proper harvesting techniques. PS.03.05.01.B
	a. Identify storage methods for plants and plant products. PS.03.05.03.A
	b. Explain the proper conditions to maintain the quality of plants and plant products held in storage. PS.03.05.03.B
	a. Explain the reasons for preparing plants and plant products for distribution. PS.03.05.04.A
	b. Demonstrate techniques for grading, handling and packaging plants and plant products for distribution. PS.03.05.04.B
Sustainable Agriculture	**a.** Explain sustainable agriculture and objectives associated with the strategy. PS.03.04.01.A
	b. Describe sustainable agriculture practices and compare the ecological effects of traditional agricultural practices with those of sustainable agriculture. PS.03.04.01.B