

Master Gardener Core Training

Learning Objectives

St Charles County Extension

Plants and Their Environment

- Distinguish differences between fields of study in botany and horticulture.
- Be able to classify plants by their life cycle (annual, biennial, perennial).
- Be able to classify plants by their class (gymnosperm, angiosperm [monocot, dicot]).
- Become familiar with the binomial system of plant nomenclature.
- Understand the structure of seeds and the germination process.
- Be able to identify plant parts (roots, stems, buds, leaves, flowers, and fruits) and describe their functions.
- Differentiate between xylem and phloem structures and functions.
- Understand the processes of photosynthesis, respiration and transpiration in plants.
- Describe how the environment (light, temperature and water) affects plant growth.

Soils, Plant Nutrition and Nutrient Management

- Describe the basic physical and biological components of soil.
- Describe how soils are formed.
- Explain the characteristics of soil such as color, texture, structure, and moisture-holding capacity and how they are determined.
- Know the essential structural-, macro- and micronutrients necessary for plant growth.
- Describe how land features such as slope and erosion affect the management of different soils.
- Know the definition and uses of fertilizer and the different types of available organic and inorganic fertilizer products.
- Define pH and its significance in plant growth and how pH can be modified for different soils.
- Describe the basic components of compost and how to produce it.
- Describe how to obtain a soil sample and interpret soil test results.

Plant Propagation

- Understand methods of sexual and asexual propagation including cuttings, layering, grafting, tissue culture, and seed production.
- Understand the sexual reproductive cycle of plants and how seeds are produced.
- Be able to classify plants by lifecycle (annual, biennial or perennial).

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- Describe how the environmental factors of temperature, moisture, light and seed depth influence seed germination.

- Know the basic techniques for planting seeds, transplanting seedlings and fertilizing seedlings. Describe propagation of plants by specialized structures such as bulbs, corms, tubers and rhizomes.
- Understand advantages and disadvantages of asexual and sexual propagation.
- Understand the effects of physiological maturity on plant propagation.
- Understand the role of plant hormones in plant propagation

Vegetable Gardening

- Understand the importance of site selection and soil preparation for a successful vegetable garden.
- Understand the importance of choosing the proper varieties for your area and site.
- Know the more common members of the different garden vegetable plant families.
- Learn the principles and importance of crop rotation.
- Differentiate between cool-season and warm-season vegetables and when each type should be planted in your area.
- Understand how to determine freeze dates and number of frost-free days for your area.
- Learn the basic techniques for planting vegetables, mulching, watering, and harvesting vegetable crops.
- Understand the necessary components for starting vegetable transplants such as media, soil pasteurization, temperature, watering, light requirements and fertilization.
- Become familiar with common pest problems (diseases, insects, weeds and wildlife) in vegetable crops and their management options.

Fruit Production

- Be able to describe the soil, light, and water requirements for fruit trees, as well as small fruits such as strawberries, blueberries, brambles, grapes, currants and gooseberries.
- Understand the principles of proper planting, cultivation, fertilization, pruning, maintenance and renovation for small fruits
- Know the important characteristics to look for when selecting the best varieties of fruit trees for this area.
- Be able to describe the proper procedures for planting fruit trees
- Become familiar with the principles of pruning and training different species of fruit trees found in the home orchard or landscape.
- Know how to managing fruit set, fertilization, harvest and storage of fruit
- Learn about common diseases and insects and wildlife, which challenge fruit growers.
- Become familiar with grower's options in dealing with these and other pest problems.

Herbaceous Ornamentals

- Discuss the importance of soil preparation, light exposure, site adaptability and site selection when planning the flower garden or container gardens.
- Define the terms annual, perennial, biennial and bulbous plants and learn the uses, advantages, and disadvantages for each in the home landscape.
- Discuss design elements such as color, texture and form and their use in designing the home flower garden.
- Discuss selection of bedding plants, starting annuals from seed, and use of transplants.
- Describe cultural management of the flower garden and the container garden, including watering, weeding and fertilizing.
- Learn the specific requirements for growth and maintenance of the most common perennials such as irises, daylilies, peonies, chrysanthemums, hostas, roses and ornamental grasses.
- Become familiar with common pest problems (diseases, insects, weeds and wildlife) in flower gardens and their management options.

Residential Landscaping

- List the factors to consider when beginning the initial landscape design process.
- Identify the key components to analyze when performing an environmental site analysis.
- Discuss the principles of unity, simplicity, emphasis, balance and proportion and their use in landscape design.
- Describe the role of plants and hardscape elements of a landscape design.
- Appreciate how plant arrangement in the landscape is crucial to the aesthetics and function of the landscape.
- Understand how practices such as plant selection, proper planting and correct maintenance procedures contribute to the successful landscape.
- Be aware of the options for different plant selections in the edible landscape

Establishment and Care of Woody Ornamentals

- Understand the basics of how woody plant systems operate.
- Learn the proper method of selecting the right plant for the right spot
- Understand the principles of good planting techniques for trees and shrubs.
- Learn how to properly maintain woody plants including, watering, mulching, pruning and fertilization.
- Learn a plant problems diagnosis system and review several common woody plant “diseases” (disease defined in its broadest sense as anything that causes stress to a woody plant).

Managing Lawns and Turfgrass

- Gain an understanding of the proper techniques for establishing a lawn by seed or by sod, including the advantages and disadvantages of each.
- Understand the differences between cool and warm season grasses and the characteristics of the most commonly used types of each.
- List and explain the steps for proper site preparation of the planting site.
- Learn the proper maintenance and cultural practices for turf management such as mowing, fertilizing, irrigating, renovating, and cultivating.
- Become familiar with common pest problems (diseases, insects, weeds and wildlife) in turf and their management options.

Native Plants

- Learn key definitions
- Name the benefits native plants bring to local eco-systems
- Define the characteristics of native environments, i.e. glade, savannah, prairie, woodland
- Understand the importance of regional plant selection
- Learn ways to use native plants in home garden areas, i.e. butterfly, rain, woodland
- Learn the steps to establish an area using plant plugs
- Learn the steps to establish an area using native seeds
- Become familiar with species suitable for home gardens
- Become familiar with native plant sources
- Become familiar with resources for reference

Insects

- Learn the basic characteristics and major classifications of insects.
- Understand the basic anatomy of insects.
- Describe the differences between incomplete and complete metamorphosis life cycles in insects.
- Understand the basic philosophies of integrated pest management (IPM).
- Understand the importance of insect pollination.
- Learn the common symptoms of insect damage and how to diagnosis insect damage.
- Learn about available sources of help for insect damage diagnosis.

Preventing and Managing Plant Diseases

- Describe the differences between non-infectious and infectious disease.
- Identify the types of pathogens which can cause plant disease.
- Understand the factors necessary for plant disease to occur.
- Develop a knowledge of symptoms and causal organisms of commonly occurring diseases of horticultural plants.
- Understand basic plant disease control methods and IPM management practices.
- Learn about available sources of help for plant disease diagnosis.
- Be able to determine if symptoms on a plant are evidence of a problem rather than the normal appearance of that plant.
- Understand how patterns of damage can be related to living or non-living factors.
- Be aware of how the development of symptoms over time relates to diagnosis of living and non-living factors.
- Identify common symptoms and signs of disease caused by bacterial, fungal, and viral pathogens and nematodes.
- Know the signs and symptoms of plant damage caused by insects.
- Gain an understanding of how mechanical, environmental and chemical factors cause damage to plants.
- Learn about available sources of help for plant problem diagnosis.

Using Pesticides Safely in the Home and Garden

- Learn the importance of determining pest thresholds and monitoring pest populations to IPM.
- Understand how cultural, physical, chemical and biological management strategies all play a key role in IPM.
- Describe the movement of pesticides in both air and water.
- Become familiar with the important information found on pesticide labels in order to protect the applicator and the environment.
- Understand the concepts of toxicity and exposure in relation to the hazards of pesticide use.
- Know the proper protective equipment; safety procedures; and storage and disposal techniques to use when handling pesticides.
- Gain an understanding of pesticide ingredients, characteristics and formulations.
- Discuss the basic application techniques and equipment for applying pesticides.
- Become familiar with current University of Missouri Extension pest management recommendations.