

Revised Fall 2016

HRT 115

Plant Propagation

COURSE OUTLINE

Prerequisites:

None

Course Description:

Teaches principles and practices of plant propagation methods. Examines commercial and home practices. Provides experience in techniques using seed-spores, cuttings, grafting, budding, layering, and division.

Semester Credits: 3 Lecture Hours: 2 Lab/Recitation Hours: 2

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3098 Colonial Ave
Roanoke, VA 24015
(540)-857-7272



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Course Outcomes

At the completion of this course, the student should be able to:

1. Describe the evolution of plant propagation during human history.
2. Describe aspects of modern plant propagation activities.
3. Identify the environment factors affecting propagation.
4. Describe the physical structures for managing the propagation environment.
5. Describe the containers for propagating and growing younger liner pots.
6. Describe the different types of cuttings.
7. Explain how stock plants can be manipulated to maximize adventitious root formation.
8. Explain how cuttings are prepared for propagation.
9. Explain the requirements for successful graftage.
10. Describe the techniques of detached scion graftage, approach graftage, and repair graftage.
11. Discuss the preparation for grafting—tools, accessories, machines, automation, and processing scionwood.
12. Discuss the importance and utilization of budding.
13. Describe the different types of rootstocks utilized for budding.
14. Explain the management practices of summer, spring, and June budding.
15. Discuss the uses of layering in propagation.
16. Understand the physiological characteristics of layering.
17. Describe soil conditions for field layering.
18. Define structure.
19. Characterize growth and development patterns.
20. Describe propagation systems for each of the main classes of geophytes: bulbs, corms, tubers, tuberous roots and stems, rhizomes, and pseudobulbs.
21. Define the uses of micropropagation.
22. Compare advantages and disadvantages of multiplying plants by micropropagation.
23. Describe the procedure used for micropropagation.
24. Describe the process of germination.
25. Compare methods for measuring germination.
26. Define the environmental and disease factors influencing germination.
27. Define the major systems for seeding production.
28. Describe the procedures for seedling production in temporary nursery beds.

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Required Materials:

Textbook:

Hartmann and Kesters Plant Propagation: Principles and Practices, Eighth edition,
Authors: H. T. Hartmann, D. E. Kester, F.T. Davies and R. L. Geneve; ISBN: 0-13-
679235-9

The following supplementary materials are available:

- 1.
- 2.
- 3.

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Topical Description: (Outline chapters and sections to be covered in the book – may include timeline)

1. General Aspects of Propagation **Week 1**
 - a. Introduction/History of Plant Propagation (chapter 1)
 - b. Propagation Environment (chapter 3)
 - i. Environmental factors
 - ii. Physical structures
 - iii. Container and Growing Media
 - iv. Biotic Factors
2. Vegetative propagation **Week 2, 3 and 4**
 - a. Techniques of Propagation by Cuttings (chapter 10) **Week 2**
 - i. Types of cuttings
 - ii. Treatment of cuttings
 - iii. Environmental considerations
 - iv. Handling cuttings after rooting
 - b. Techniques of Grafting (chapter 12) **Week 3**
 - i. Requirements for successful grafting
 - ii. Types of grafts
 - iii. Tools and accessories
 - c. Techniques of Budding (chapter 13) **Week 3**
 - i. Rootstock considerations
 - ii. Time of budding
 - iii. Types of budding
 - d. Layering and Its Natural Modifications (chapter 14) **Week 4**
 - i. Procedures in layering
 - ii. Natural layering
 - e. Propagation by Specialized Stems and Roots (chapter 15) **Week 4**
 - i. Separation and division techniques
 - ii. Examples of specialized stems and roots
 - f. Techniques of Micro propagation (chapter 18) **Week 5**
 - i. Uses for micro propagation
 - ii. Facilities and equipment
 - iii. Procedures in micro propagation
3. Seed Propagation **Week 6 and 7**
 - a. Principles of Propagation from Seeds (chapter 7) **Week 6**
 - i. The germination process



- ii. Environmental factors affecting seed germination
 - b. Techniques of Propagation by Seed (chapter 8) Week 7
 - i. Treatments to facilitate germination
 - ii. Seedling production
- 4. Exam Week 8

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Notes to Instructors

(List information about optional topics, departmental exams, etc.)

1. Career opportunities
2. New Plants from Micropropagation
- 3.
- 4.

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