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Fundamentals of Horticulture (Theory & Practices)

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Preface

The Book, *Fundamentals of Horticulture (Theory & Practices)*, the art and science of cultivating plants for food, medicinal purposes, and aesthetic enjoyment, stands at the intersection of human civilization and the natural world. As global populations rise and nutritional security becomes an increasingly urgent priority, the role of horticulture in sustainable agriculture has never been more vital. *Fundamentals of Horticulture (Theory & Practices)* are designed to provide a comprehensive, structured introduction to this vast discipline for students, researchers, and aspiring practitioners alike.

This book serves as a foundational guide, bridging the gap between theoretical principles and practical field applications. The text is meticulously organized into five core chapters, progressing from the foundational science of plant life to the intricate management of orchards and production systems. We begin by exploring the history and classification of horticultural crops, establishing a clear understanding of the soil and climatic requirements that dictate success in the field. From there, the book delves into the fascinating world of plant propagation, examining both sexual and asexual methods and the complexities of stock-scion relationships.

Central to our study are the physiological processes that govern production. We explore the lifecycle of crops—from juvenility and flower bud differentiation to the critical mechanisms of pollination, fertilization, and the transformative potential of bio-regulators. By understanding the “why” and “how” of fruit set and development, students can better address the challenges of unfruitfulness and yield optimization. Furthermore, the volume provides essential technical guidance on the physical management of orchards, including canopy architecture through training and pruning, as well as the strategic application of irrigation and fertilizers.

Beyond production, this text acknowledges the realities of the modern agricultural economy. It addresses the importance of post-harvest handling, supply chain logic, and marketing, ensuring that the reader views horticulture not just as an act of gardening, but as an integral component of a broader economic system. The inclusion of practical exercises ensures that theoretical knowledge is reinforced through hands-on engagement.

It is my hope that this book serves as an indispensable resource, fostering both a deep appreciation for the science of horticulture and the technical proficiency required to cultivate a greener, more bountiful future.

Authors

Syllabus

Fundamentals of Horticulture

Theory

Horticulture: Its different branches, importance and scope, Horticulture and botanical classification, soil and climate for horticultural crops. Plant propagation: methods and propagation structures, seed dormancy and seed germination, Merits and demerits of sexual and asexual propagation Stock-scion relationship.

Principles of orchard establishment, principles and methods of training and pruning of fruit crops, Juvenility and flower bud differentiation, unfruitfulness in horticultural crops, pollination, pollinizers and pollinators, fertilization and parthenocarpy, importance of bio regulators in horticultural crops, irrigation and its methods, Fertilizer application in horticultural crops.

Practical

Identification and nomenclature of fruit, Layout of an orchard, pit making and system of planting, Nursery raising techniques of fruit crops, Understanding of plant propagation structures, Propagation through seeds and plant parts, Propagation techniques for horticultural crops, Container, potting mixture, potting and repotting, Training and pruning methods on fruit crops, Preparation of fertilizer mixture and application, Preparation and application of PGRs, Layout of different irrigation systems, Maturity studies, harvesting, grading, packaging and storage.

Contents

Preface v

Syllabus vii

Unit-I Foundations of Horticulture 1

Focus: *Understanding the discipline, its scope, and the basic environmental requirements*

1. Introduction to Horticulture: Definition, History, and Development 3
2. Different Branches of Horticulture (Pomology, Olericulture, Floriculture, Etc) 9
3. Importance and Scope of Horticultural Crops in the Economy and Nutrition 15
4. Horticulture and Botanical Classification of Crops 23
5. Soil and Climate Requirements for Horticultural Crops 29

Unit-II Plant Propagation and Seed Physiology 35

Focus: *The science of multiplying plants and the mechanics of seed development*

6. Plant Propagation Methods (General Overview) 37
7. Propagation Structures of Horticultural Crops 43
8. Seed Dormancy: Causes and Breaking Methods 49
9. Seed Germination: Process, Requirements, and Testing 55
10. Merits and Demerits of Sexual (Seed) Propagation 61
11. Merits and Demerits of Asexual (Vegetative) Propagation 67
12. Stock-Scion Relationship: Compatibility and Graft Union 73

Unit-III Orchard Management and Canopy Architecture **79**

Focus: *Establishing and maintaining the physical structure of fruit orchards*

- | | |
|---|----|
| 13. Principles of Orchard Establishment: Site Selection, Layout, and Planting Systems | 81 |
| 14. Principles and Methods of Training Young Plants | 87 |
| 15. Pruning of Fruit Crops: Objectives, Timing and Techniques | 93 |

Unit-IV Physiology of Flowering and Fruit Set **99**

Focus: *Understanding the reproductive biology and factors affecting yield*

- | | |
|---|-----|
| 16. Juvenility and Flower Bud Differentiation | 101 |
| 17. Unfruitfulness in Horticultural Crops: Causes, Consequences and Mitigation | 109 |
| 18. Pollination, Pollinizers and Pollinators | 117 |
| 19. Fertilization and Parthenocarpy: Mechanisms and Importance | 123 |
| 20. Importance of Bio-Regulators (Plant Growth Regulators) in Horticultural Crops | 129 |

Unit-V Cultural Operations and Marketing **135**

Focus: *Sustaining growth, maximizing production, and reaching the consumer*

- | | |
|---|-----|
| 21. Irrigation: Principles and Management Methods | 137 |
| 22. Fertilizer Application: Timing, Methods and Nutrient Management | 145 |
| 23. Marketing: Supply Chain, Post-Harvest Handling and Economics | 151 |

Practical	158
1. Identification and Nomenclature of Fruit and Vegetable Crops	159
2. Layout of an Orchard	165
3. Pit Making and Systems of Planting	171
4. Nursery Raising Techniques of Fruit Crops	177
5. Plant Propagation Structures	185
6. Propagation through Seeds and Plant Parts	189
7. Propagation Techniques for Horticultural Crops	195
8. Containers, Potting Mix, and Repotting in Plant Cultivation	201
9. Training and Pruning Methods on Fruit Crops	205
10. Preparation of Fertilizer Mixture and Application	209
11. Preparation and Application of Plant Growth Regulators (PGRs)	215
12. Layout of Different Irrigation Systems	221
13. Maturity Studies, Harvesting and Grading	229
14. Packaging and Storage	235
• About the Authors	243