

Introduction to Horticulture

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Key concepts, major branches, and practical applications

1. What Is Horticulture?

- **Definition** – The science and art of cultivating plants for food, medicine, aesthetics, and environmental benefits.
 - **Scope** – Includes plant breeding, production, protection, post-harvest handling, and landscape design.
 - **Goal** – Improve plant quality, yield, and sustainability while meeting human needs and enhancing ecosystems.
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2. Major Branches

Branch	Focus	Typical Activities
Pomology	Fruit crops	Orchard design, thinning, thinning, harvest timing
Olericulture	Vegetables	Bed preparation, spacing, succession planting
Floriculture	Ornamental flowers & foliage	Cutting production, greenhouse management
Landscape Horticulture	Public & private green spaces	Tree selection, turf management, hardscape integration
Post-harvest Technology	Storage & processing	Cooling, packaging, shelf-life extension
Plant Breeding & Genetics	Developing new varieties	Hybridization, marker-assisted selection

3. Core Principles

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1. **Plant Physiology** – Understanding photosynthesis, respiration, water relations, and nutrient uptake.
 2. **Soil Science** – Soil texture, structure, pH, organic matter, and fertility management.
 3. **Climate & Microclimate** – Temperature, light, humidity, and wind effects on growth.
 4. **Integrated Pest Management (IPM)** – Combining cultural, biological, mechanical, and chemical controls.
 5. **Sustainable Practices** – Crop rotation, cover cropping, mulching, water use efficiency, and organic amendments.
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4. The Horticultural Production Cycle

1. **Planning & Site Selection**
 - Climate suitability, soil testing, water availability.
 2. **Propagation**
 - Seeds, cuttings, grafting, tissue culture.
 3. **Establishment**
 - Bed preparation, planting layout, irrigation setup.
 4. **Cultural Management**
 - Fertilization, pruning, training, mulching.
 5. **Pest & Disease Management**
 - Monitoring, scouting, threshold-based interventions.
 6. **Harvest & Post-Harvest**
 - Maturity indicators, gentle handling, cooling, packaging.
 7. **Marketing & Distribution**
 - Direct sales, farmers' markets, wholesale, value-added products.
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5. Essential Tools & Equipment

- **Hand tools:** trowels, pruners, hand forks, dibbers.
 - **Mechanical aids:** tractors, tillers, sprayers, irrigation systems.
 - **Greenhouse infrastructure:** benches, shading screens, climate control units.
 - **Laboratory equipment:** soil test kits, pH meters, nutrient analyzers.
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6. Common Horticultural Crops (Examples)

Category	Representative Crops
Fruit	Apples, berries, citrus, grapes, mangoes
Vegetable	Tomatoes, lettuce, carrots, peppers, beans
Herb	Basil, mint, rosemary, thyme
Ornamental	Roses, tulips, chrysanthemums, ornamental grasses
Tree & Shrub	Maples, conifers, hedges, ornamental palms

7. Career Paths in Horticulture

- **Production Manager** – Oversees large-scale farms or nurseries.
- **Landscape Designer / Architect**