# Training Course on Post-Harvest Physiology and Shelf-Life Extension of Crops

Professional Development Training Course Outline

| | | | |
|---|---|---|---|
| **Category** | Agriculture | **Duration** | 10 Days |
| **Base Fee** | $3,000 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

Post-harvest losses are a significant challenge affecting global food security, agricultural profitability, and sustainable supply chains. Training Course on Post-Harvest Physiology and Shelf-Life Extension of Crops is designed to equip agripreneurs, researchers, food processors, and extension officers with the critical skills and knowledge needed to minimize losses, enhance quality retention, and improve the marketability of horticultural and agricultural produce. Through a science-driven yet practical curriculum, participants will explore innovative post-harvest handling techniques, storage technologies, and biological principles that impact the shelf-life and value of fresh produce.

Using climate-smart strategies, digital post-harvest solutions, and eco-friendly technologies, this course focuses on preserving freshness, reducing food waste, and maximizing returns for farmers and agro-processors. Emphasizing real-world application, participants will engage in hands-on demonstrations, case studies, and scenario-based learning aligned with emerging trends and global best practices.

## Programme Curriculum

**Training Course on Post-Harvest Physiology and Shelf-Life Extension of Crops**

**Introduction**

Post-harvest losses are a significant challenge affecting global food security, agricultural profitability, and sustainable supply chains. Training Course on Post-Harvest Physiology and Shelf-Life Extension of Crops is designed to equip agripreneurs, researchers, food processors, and extension officers with the critical skills and knowledge needed to minimize losses, enhance quality retention, and improve the marketability of horticultural and agricultural produce. Through a science-driven yet practical curriculum, participants will explore innovative post-harvest handling techniques, storage technologies, and biological principles that impact the shelf-life and value of fresh produce.

Using climate-smart strategies, digital post-harvest solutions, and eco-friendly technologies, this course focuses on preserving freshness, reducing food waste, and maximizing returns for farmers and agro-processors. Emphasizing real-world application, participants will engage in hands-on demonstrations, case studies, and scenario-based learning aligned with emerging trends and global best practices.

**Training Objectives**

Participants will be able to:

1. Understand the physiological processes affecting crop deterioration post-harvest.
2. Analyze the biochemical changes during ripening and senescence.
3. Implement cold chain management techniques effectively.
4. Apply modified atmosphere packaging (MAP) and controlled environment practices.
5. Utilize smart post-harvest technologies for real-time quality tracking.
6. Improve post-harvest handling systems for different crop categories.
7. Explore packaging innovations that extend freshness and minimize microbial growth.
8. Assess the role of ethylene management in shelf-life optimization.
9. Introduce digital tools for post-harvest monitoring and inventory control.
10. Evaluate storage structures and environmental control systems for optimal conditions.
11. Conduct shelf-life testing and quality assurance procedures.
12. Design sustainable supply chain models with reduced post-harvest loss.
13. Integrate climate-resilient and eco-friendly solutions in post-harvest systems.

**Target Audience**

1. Agricultural extension officers
2. Agribusiness professionals
3. Researchers in crop sciences and food technology
4. Fresh produce exporters
5. Post-harvest technologists
6. Horticultural value chain actors
7. Government policy makers in agriculture
8. Supply chain and logistics managers

**Course Duration:** 10 days

**Course Modules**

**Module 1: Introduction to Post-Harvest Physiology**

- Importance of post-harvest physiology
- Cell metabolism post-harvest
- Respiration and water loss
- Key factors affecting crop deterioration
- Harvest maturity indices
- **Case Study**: Mango ripening in tropical climates

**Module 2: Biochemical Changes During Storage**

- Enzymatic activities and softening
- Sugar and starch metabolism
- Color, flavor, and texture transitions
- pH and acidity variations
- Monitoring biochemical indicators
- **Case Study**: Tomato ripening and pectin breakdown

**Module 3: Cold Chain Management**

- Components of a cold chain system
- Pre-cooling and hydrocooling
- Refrigerated transport and storage
- Temperature monitoring and data logging
- Energy-efficient cold storage solutions
- **Case Study**: Avocado export cold chain from Kenya

**Module 4: Ethylene Management**

- Ethylene production and sensitivity
- Ethylene inhibitors and absorbers
- Storage compatibility matrix
- Controlled ventilation systems
- Ethylene scrubbers in storage
- **Case Study**: Banana ripening chambers

**Module 5: Modified and Controlled Atmosphere Storage**

- MAP vs. CA principles
- Gas composition requirements
- Film permeability and packaging types
- Integration with refrigeration
- Safety and shelf-life extension
- **Case Study**: MA packaging of strawberries

**Module 6: Post-Harvest Handling Practices**

- Sorting, grading, and packaging
- Minimizing mechanical injuries
- Sanitation and hygiene protocols
- Pest and disease control post-harvest
- Traceability systems
- **Case Study**: Packhouse operations in South Africa

**Module 7: Digital Post-Harvest Tools**

- IoT for storage monitoring
- Blockchain for traceability
- Mobile-based inventory apps
- AI in quality prediction
- Digital data analytics
- **Case Study**: Smart crates with sensors in Uganda

**Module 8: Packaging Innovations**

- Active and intelligent packaging
- Biodegradable vs. plastic materials
- Labeling for safety and branding
- Packaging for export markets
- Recyclable and sustainable solutions
- **Case Study**: Vacuum-sealed spinach exports

**Module 9: Storage Environment Optimization**

- Relative humidity management

- Lighting control in storage
- Air circulation and filtration
- Temperature zoning
- Structural material considerations
- **Case Study**: Onion storage in arid zones

**Module 10: Shelf-Life Testing Techniques**

- Physical and sensory evaluation
- Microbial load testing
- Chemical analyses (TSS, acidity)
- Predictive shelf-life modeling
- Accelerated shelf-life tests
- **Case Study**: Shelf-life audit of cut pineapples

**Module 11: Post-Harvest Loss Assessment**

- Quantifying losses by crop
- Loss points in the value chain
- Economic implications
- Strategies to reduce losses
- Monitoring and reporting
- **Case Study**: Grain losses in sub-Saharan Africa

**Module 12: Supply Chain & Logistics Integration**

- Farm-to-market logistics
- Value chain coordination
- Post-harvest inventory control
- Export compliance and certifications
- Risk management strategies
- **Case Study**: Export logistics for fresh flowers

**Module 13: Climate-Smart Post-Harvest Technologies**

- Solar-powered cold rooms
- Low-cost evaporative coolers
- Eco-friendly insulation materials
- Climate data for harvest scheduling
- Community-based storage hubs
- **Case Study**: Solar chillers for milk in East Africa

**Module 14: Policy and Regulatory Frameworks**

- Food safety regulations
- Import-export standards
- Codex Alimentarius applications
- Certification schemes (GLOBALG.A.P.)
- Quality labeling systems
- **Case Study**: Compliance for EU horticultural markets

**Module 15: Entrepreneurship in Post-Harvest Management**

- Value addition and agro-processing
- Business modeling and planning
- Access to finance for post-harvest ventures

- Market linkages and branding
- Start-up success stories
- **Case Study**: Youth-led packhouse business in Rwanda

**Training Methodology**

- Interactive lectures with visual demonstrations
- Group discussions and experience-sharing
- Hands-on practicals and fieldwork
- Video documentaries and expert guest speakers
- Scenario-based learning with feedback
- Use of ICT tools and mobile apps in practice

**Register as a group from 3 participants for a Discount**

**Send us an email: info@fineskilltrainingcenter.org or call** *+254769199797*

***Certification***

*Upon successful completion of this training, participants will be issued with a globally- recognized certificate.*

***Tailor-Made Course***

*We also offer tailor-made courses based on your needs.*

**Key Notes**

**a.** The participant must be conversant with English.

**b.** Upon completion of training the participant will be issued with an Authorized Training Certificate

**c.** Course duration is flexible and the contents can be modified to fit any number of days.

**d.** The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

**e.** One-year post-training support Consultation and Coaching provided after the course.

**f.** Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

## Upcoming Scheduled Sessions

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 04 Dec 2026 | Online | $2,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $3,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $6,000 |

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 04 Dec 2026 | Physical | $6,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $9,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |

Ready to enroll or request a customized program? Book online or contact us:

**Register Online Now**

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com