Learning Objectives

Module 1: Introduction to Produce Safety

Objective 1
Develop a better understanding of produce safety and how it may impact your fruit and vegetable farm.

Objective 2
Identify the types of human pathogens that contaminate fresh produce and give an example of each.

Objective 3
Understand common pathways by which produce might become contaminated on the farm.

Objective 4
Describe strategies to prevent and reduce risks of contamination by human pathogens.

Objective 5
Understand the value of your commitment to implementing food safety practices.

Critical Concepts
- Produce safety and its’ relevance to your farm
- Foodborne illness outbreak impacts to the produce industry and consumers
- Basic introduction to the Food Safety Modernization Act’s Produce Safety Rule
- Different types of foodborne illness organisms
- Environmental factors that can contribute to human pathogen growth and survival
- Why prevention of contamination is critical to produce safety
- Basic introduction to Good Agricultural Practices (GAPs)
- Unique challenges in produce safety
- The importance of a grower’s commitment to produce safety
- How to conduct a basic risk assessment
- Introduction to Standard Operating Procedures (SOPs)
- Steps involved in monitoring, recordkeeping, and corrective actions
- The value of a Farm Food Safety Plan
Learning Objectives
Module 2: Worker Health, Hygiene, and Training

Objective 1
Identify the potential routes of contamination associated with workers that could result in the contamination of fresh fruits and vegetables in produce fields and packinghouses.

Objective 2
Identify adult learning concepts that should be considered when developing a training program.

Objective 3
Describe topics that must be included in a worker training program and what sanitary facilities need to be provided to reduce the risk of fresh produce contamination.

Objective 4
Describe how to monitor that facilities are available and maintained, and that appropriate health and hygiene practices are being followed by everyone on the farm.

Objective 5
Describe corrective actions that can be taken when health and hygiene policies are not followed or when facilities are not maintained.

Objective 6
Identify the records and recordkeeping tools that could be used to monitor and manage a worker health, hygiene, and training program.

Critical Concepts
- Food safety risks and potential routes of contamination from workers
- Importance of worker training
- Principles of adult learning important to use in worker training programs
- Key parts of a worker training program
- Potential training challenges
- Understanding cultural differences and language barriers
- Development of policies to encourage and enforce proper food safety behaviors
- Development of worker illness and injury policies
- Proper sanitary facilities and resources that need to be provided and maintained
- Steps involved in monitoring, recordkeeping, and corrective actions
Learning Objectives
Module 3: Soil Amendments

Objective 1:
Identify risks and potential routes of contamination that could be associated with different types of soil amendments.

Objective 2:
Explain soil amendment handling practices that can help reduce food safety risks to produce.

Objective 3:
Identify key strategies such as time/temperature management of compost and soil amendment application to harvest intervals that will reduce the risk of human pathogens contaminating produce.

Objective 4:
Describe what corrective actions may be utilized if a soil amendment has been found to present an immediate contamination risk to the crop due to improper handling, application, composting, or storage.

Objective 5:
Identify records that should be kept and reviewed in a timely manner to monitor and manage the source, quality, handling practices, and proper use of soil amendments to reduce the risk of contaminating fresh produce.

Critical Concepts
- Understand and assess produce safety risks posed by soil amendments
- Highlight different types of soil amendments including non-manure based and chemical amendments, biosolids, and green wastes and the risks they pose
- The value of manure in soil fertility and farm systems
- Pathogens in raw manure and factors that affect pathogen presence in manure
- GAPs to reduce risks associated with soil amendments
- The value of composting and other treatment practices in reducing risks
- Key considerations for application of soil amendments and harvest intervals
- Prevention of leaching, run-off, and wind drift through proper storage
- Methods to reduce cross-contamination in storage areas and on equipment and tools
- Worker training considerations when handling soil amendments
- Steps involved in monitoring, recordkeeping, and corrective actions
Learning Objectives
Module 4: Wildlife, Domestic Animals, and Land Use

Objective 1:
Identify the potential routes of contamination associated with wildlife, domestic animals, and land use.

Objective 2:
Describe practices that reduce risks associated with wildlife, domestic animals, and land use.

Objective 3:
Describe co-management strategies that address both conservation and food safety goals.

Objective 4:
Describe the importance of conducting a pre-plant and pre-harvest assessment of fields to determine risks associated with animal intrusion or presence of fecal contamination.

Objective 5:
Describe corrective actions that could be used if significant risks from wildlife, domestic animals, or land use are present in the production field.

Objective 6:
Identify records that should be kept to document any management, monitoring, or corrective actions that are taken to reduce produce safety risks in and around produce fields.

Critical Concepts
- Basic understanding of food safety risks from wildlife and domestic animals
- Risks related to land use, including adjacent lands not owned by the grower
- Understanding principles of co-management of food safety and conservation practices
- Monitoring for wildlife activity and implementing methods to minimize wildlife intrusion in produce fields
- Considerations for domestic animal management on the farm
- The value of pre-plant and pre-harvest risk assessments
- Identifying signs of animal intrusion
- Actions to take if fecal contamination is found in produce fields
- Principles of worker training to reduce risks from animals
- Development of SOPs to guide the implementation of actions, including monitoring and reporting risks related to animals and land use
- Recordkeeping and corrective actions for wildlife and domestic animal management
Learning Objectives
Module 5—Part I: Production Water

Objective 1:
Identify risks that can impact the microbial safety of agricultural water sources.

Objective 2:
Describe practices such as water application methods and timing that can reduce produce safety risks.

Objective 3:
Adopt practices for managing agricultural water that limit impacts to and from the environment and wildlife habitat.

Objective 4:
Describe the importance of water testing for different production water sources (municipal, well, surface) as well as the required testing and monitoring frequency.

Objective 5:
Describe current water quality standards, and their limitations, that are used to assess the microbial quality of water and its applicability for safe use.

Objective 6:
Describe corrective actions that could be taken if water test results are non-compliant with federal standards or an immediate food safety hazard indicates an unacceptable risk to fruit and vegetable crops.

Objective 7:
Identify records that should be kept to document and monitor water sources and uses, water quality, and any water application information that impacts the safety of produce.

Critical Concepts
- How to evaluate the quality and minimize contamination of surface water, ground water, and public water sources and distribution systems
- Water quality criteria for untreated agricultural water sources used during growing activities that directly contact produce crops
- Impacts of water application methods and timing on produce safety
- Examples of how to calculate geometric means, statistical threshold values, and microbial die-off rates
- Establishing testing frequencies and water quality baselines to assess water quality
- How to collect water samples and find appropriate testing laboratories
- Corrective actions such as how to treat agricultural water if it does not meet the microbial standards
- Recordkeeping practices that can be used to document agricultural water quality
Learning Objectives
Module 5—Part II: Postharvest Water

Objective 1:
Understand the quality of water required for use in harvest and postharvest practices.

Objective 2:
Identify ways postharvest water may become contaminated before and during use.

Objective 3:
Define cross-contamination and infiltration.

Objective 4:
Understand the purpose of adding a sanitizer to postharvest water.

Objective 5:
Describe key practices that should be used to maintain and monitor the quality of water used in postharvest activities (sanitizer level, pH level, turbidity, ORP, temperature).

Objective 6:
Identify records needed to properly monitor and manage the microbial quality and use of postharvest water to reduce the risks of contaminating fresh produce.

Objective 7:
Describe corrective actions that may be taken if postharvest water management fails to keep water quality within the farm’s established baseline or if there is reason to believe postharvest water is contaminated.

Critical Concepts
- Types of postharvest water uses and ways they impact produce safety
- How to prevent cross-contamination by monitoring water quality and using sanitizers
- FSMA Produce Safety Rule water quality criteria for postharvest uses
- Key water quality variables to manage in postharvest water systems, including pH, temperature, and turbidity
- When water needs to be changed and how to properly dispose of grey water
- Available sanitizers, how to select an appropriate sanitizer, and the importance of reading sanitizer labels
- SOPs for workers to guide postharvest water management practices such as adding sanitizer to wash water or when to change batch water
- Monitoring and recordkeeping practices to help manage sanitizer use
Learning Objectives
Module 6: Postharvest Handling and Sanitation

Objective 1:
Identify potential routes of contamination associated with harvesting, washing, packing, storage, and transportation activities.

Objective 2:
Identify key sanitary practices that can be implemented and maintained to reduce identified risks in produce handling areas.

Objective 3:
Identify the steps involved in cleaning and sanitizing food contact surfaces.

Objective 4:
Define key parts of a pest control program that will reduce or eliminate rodents, birds, insects, and other pests from postharvest handling areas.

Objective 5:
Describe key practices for transporting fresh produce that will minimize produce safety risks.

Objective 6:
List critical practices that need to be monitored during postharvest handling to ensure sanitary practices are being followed.

Objective 7:
Describe corrective actions that could be taken to reduce the risk of contaminating produce during postharvest handling.

Objective 8:
Identify key records to document postharvest handling practices that prevent the contamination of fresh produce.

Critical Concepts
- Common produce safety risks that occur during postharvest handling
- Principles of basic and advanced sanitation
- Defining zones within packing areas to prioritize cleaning and sanitation efforts
- Understand the difference between cleaning and sanitizing
- Outline principles of sanitary design and construction, including retrofitting equipment
- General packing area maintenance and appropriate packing containers
- Pest control management in produce packing and storage areas
- Considerations for sanitary transportation of produce
- Standard Operating Procedures (SOPs) that can be developed for postharvest activities
- Chemical and physical food safety risks that may exist on the farm and in packing areas
- Corrective actions and recordkeeping that can be used to reduce risks
Learning Objectives
Module 7: How to Develop a Farm Food Safety Plan

Objective 1:
Name essential parts to include in a farm food safety plan.

Objective 2:
Describe why one qualified person should be designated as the person responsible for the food safety plan on every farm.

Objective 3:
Conduct a risk assessment of the farm’s practices (e.g. irrigation water), define the risks, and describe what practices could be put into place to minimize the risks.

Objective 4:
List key areas that should be included in a traceability system that is able to trace produce one step forward (to buyer) and one step back (to field).

Objective 5:
Identify resources available to assist in developing a farm food safety plan.

Critical Concepts
- Key reasons and benefits of developing a farm food safety plan
- Designating a person in charge and the value of being committed to food safety
- Basic parts to include in a farm food safety plan
- Three steps to developing a plan: assess risks, develop practices, and document
- Using knowledge and resources to your advantage
- Steps to develop an effective traceability program for your farm
- How to define produce ‘lots’ and conduct a mock recall
- The need and value of establishing a ‘clean break’
- Produce labeling and modified requirements for FSMA exempt growers