

# PSA Curriculum Learning Objectives and Critical Concepts

## 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 can contaminate fresh produce and give an example of each.

### **Objective 3:**

Understand common ways that produce may 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
- Basic introduction to the Food Safety Modernization Act's Produce Safety Rule
- Foodborne illness outbreak impacts to the produce industry and consumers
- Different types of foodborne illness organisms
- Why prevention of contamination is critical to produce safety
- Unique challenges in produce safety
- Environmental factors that can contribute to human pathogen growth and survival
- The importance of a grower's commitment to produce safety
- How to conduct a basic risk assessment
- Basic introduction to Good Agricultural Practices (GAPs)
- What Standard Operating Procedures (SOPs) are
- 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 resources 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 facilities and resources that need to be provided and maintained to enable health and hygiene practices
- 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 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 the risks associated with different types of soil amendments including non-manure based and chemical amendments, biosolids, and pre-consumer vegetative wastes
- The value of manure in soil fertility and farm systems
- 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, runoff, 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
- The importance of monitoring, recordkeeping, and corrective actions

# Learning Objectives

## Module 4: Wildlife, Domesticated Animals, and Land Use

### Objective 1:

Identify the potential routes of contamination associated with wildlife, domesticated animals, and land use.

### Objective 2:

Describe practices to mitigate risks associated with wildlife, domesticated 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, domesticated animals, or land use are present in production fields.

### 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 domesticated 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 and associated hazards in produce fields
- Considerations for domesticated 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 domesticated animal management

# Learning Objectives

## Module 5—Part I: Production Water

### **Objective 1:**

Identify risks that may 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, soil, and wildlife habitat.

### **Objective 4:**

Describe the importance of water testing for different water sources (e.g., surface water, ground water, public water supply) used during growing activities as well as the sampling frequencies needed to build microbial water quality profiles.

### **Objective 5:**

Describe FSMA agricultural water quality criteria, and how the microbial water quality profile results are used to assess the microbial quality of a water source and its suitability for intended uses.

### **Objective 6:**

Describe corrective measures and corrective actions that could be taken if a microbial water quality profile or water system inspection indicates that agricultural water is not suitable for its intended use.

### **Objective 7:**

Identify records that must be kept including documentation of agricultural microbial water quality and monitoring of any water treatment (if used).

### **Critical Concepts**

- How to evaluate the quality and minimize contamination of surface water, ground water, and public water sources and distribution systems
- Requirements for agricultural water system inspections
- Requirements for agricultural water sampling frequency and testing
- The geometric mean and statistical threshold value calculations for the microbial water quality profile
- Knowing water quality criteria for untreated agricultural water sources used during growing activities that directly contact produce crops, and how microbial water quality profiles are used to assess if agricultural water is suitable for its intended use
- What corrective measures can be used for water that does not meet the numerical GM and STV criteria.
- Recordkeeping practices that are used to document agricultural water quality

# Learning Objectives

## Module 5—Part II: Postharvest Water

### **Objective 1:**

Understand the water quality criteria required for use in harvest and postharvest practices on covered produce.

### **Objective 2:**

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

### **Objective 3:**

Understand the conditions that lead to cross-contamination and infiltration, and ways to reduce these risks.

### **Objective 4:**

Understand the purpose of adding antimicrobial products, including sanitizers, to postharvest water.

### **Objective 5:**

Describe key practices to maintain and monitor the quality of water used in postharvest activities (e.g., sanitizer level, pH level, turbidity, ORP, temperature).

### **Objective 6:**

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

### **Objective 7:**

Describe corrective actions that may be taken if postharvest water management fails to maintain adequate water quality or if there is reason to believe postharvest water is contaminated.

### **Critical Concepts**

- Types of postharvest water uses and ways they impact produce safety
- Knowing water quality criteria for agricultural water used during and after harvest
- How to reduce the risk of cross-contamination by monitoring water quality and using sanitizers to maintain water quality during use
- Key water quality variables in postharvest water systems, including pH, temperature, and organic material buildup
- When water needs to be changed and how to properly dispose of grey water
- Available antimicrobial products (including sanitizers), how to select an appropriate product, and the importance of reading and following 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 for harvest and postharvest water management

# Learning Objectives

## Module 6: Postharvest Handling and Sanitation

### Objective 1:

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

### Objective 2:

Identify key 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
- Define zones within packing areas to prioritize cleaning and sanitation efforts
- Understand the difference between cleaning and sanitizing
- 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 produce safety 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 and environment.

### **Objective 4:**

Describe management steps and practices to reduce identified risks.

### **Objective 5:**

List key steps involved in developing a traceability system that is able to trace produce one step forward (to buyer) and one step back (to field), including establishing lots and clean breaks.

### **Objective 6:**

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 components to include in a Farm Food Safety Plan
- Three steps to developing a plan: assess risks, develop practices, and document
- How to use 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'
- Understand produce labeling and modified requirements for FSMA exempt growers